

**STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD**

**In the matter of:
July 17, 2020 Water Quality Certification For Federal Permit Or License
for Yuba County Water Agency
Yuba River Development Project (FERC No. 2246)**

**YUBA COUNTY WATER AGENCY'S PETITION FOR
RECONSIDERATION OF JULY 17, 2020 WATER QUALITY
CERTIFICATION FOR FEDERAL PERMIT OR LICENSE**

Appendix D

**TECHNICAL MEMORANDUM ON
CONDITION 6 – CLOSURES AT LOHMAN RIDGE DIVERSION TUNNEL**

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APPENDIX D

TECHNICAL MEMORANDUM ON CONDITION 6 – CLOSURES AT LOHMAN RIDGE DIVERSION TUNNEL

1.0 SUMMARY OF ANALYSIS AND CONCLUSIONS

Condition 6 of the State Water Resources Control Board's (SWRCB) Water Quality WQC (SWRCB 2020, or WQC) is not supported by the available evidence and would preclude hydroelectric generation by Yuba County Water Agency (YCWA) worth almost \$22,000,000 over the expected 50-year term of a new license for the Yuba River Development Project (Project). The Federal Energy Regulatory Commission (FERC) and United States Department of Defense, Army Corps of Engineers (USACE) analyzed the proposal now embodied in Condition 6 in their January 2019 Final Environmental Impact Statement (FERC and USACE 2019, or Final EIS) for relicensing of the Project and concluded that the extended closures of the tunnel beyond those recommended by FERC and USACE in the Final EIS were not justified because the costs far outweighed the benefits:

- Would result in a reduced entrainment of only 845 fish over 41 years, about 21 fish per year;
- The fish that would be entrained without the extended closures now stated in Condition 6:
 - Would not be subject to mortality because the intake does not lead to generating facilities that could subject entrained fish to mortality through turbine strikes;
 - Can swim back through the diversion tunnel and return to the Middle Yuba River;
 - Would not affect the fish community in the Middle Yuba River because studies of the fishery located upstream of the intake document several similar fish species as well as multiple age-classes for fishes; and
 - Would not affect important migratory periods of rainbow trout because they are able to complete their life cycle without any migration.
- The estimate average annual cost of \$457,090 (i.e., almost \$22 million over the YCWA anticipated 50-year-term of the new license) is not warranted given that Condition 6 would have very limited environmental benefit.

In addition, YCWA notes:

- No Endangered Species Act (ESA)-listed, California Endangered Species Act (CESA)-listed fishes or anadromous fishes are would be entrained; and

- The fishery in the vicinity of the intake is not unique, has limited recreation/economic value due to marginal access, and is not a subsistence fishery.

The WQC contains no analysis to contradict these analyses or any rationale for imposing Condition 6 that accounts for the flaws in, and issues with, the proposal to close Lohman Ridge Diversion Tunnel for periods beyond those recommended by FERC and USACE in their Final EIS. In essence, the WQC's adoption of Condition 6 reflects the SWRCB's wholesale adoption of a proposal made by the California Department of Fish and Wildlife (CDFW) (CDFW 2017) and the United States Department of the Interior (DOI) (DOI 2017) made to FERC and USACE that FERC and USACE rejected in their Final EIS for specific technical reasons. The WQC contains no technical explanation for its adoption of Condition 6 and does not address FERC's and USACE's technical analysis in the Final EIS that caused them to reject the related proposal by CDFW and USACE.

WQC should not include condition 6 specifying additional tunnel closures because there is very limited environmental benefit with only 21 fish entrained per year, the entrained fish would not be subject to mortality because they are not moved to a powerhouse intake and the cost is extensive at \$22 million of lost generation revenues over the expected 50 year license term. This is supported by FERC's and USACE's analysis in the FEIS. Furthermore, the WQC does not provide any analysis or technical support for additional tunnel closures to what YCWA proposed with USFS support. Also, the WQC does not provide any analysis or technical support for the claimed aquatic biota benefit of condition 6.

2.0 CONDITION 6

At pages 43 and 44 of the WQC, Condition 6 states:

No later than five years following license issuance, the Licensee shall manage closures of the Lohman Ridge Diversion Tunnel as described in this condition.

6(A) Spring and Summer Tunnel Closures

If the end-of-March New Bullards Bar Reservoir storage is 775 TAF or greater and the DWR March median water year forecast of total unimpaired runoff in the Yuba River at Smartsville is greater than 2,191 TAF, the Licensee shall, on April 1, close the Lohman Ridge Diversion Tunnel and it shall remain fully closed through September 30 of that calendar year. Concurrent with any Lohman Ridge Diversion Tunnel closure, the Licensee shall open the Log Cabin Diversion Dam low-level outlet and fish release valve. The Licensee may leave the Camptonville Diversion Tunnel fully open. If the subsequent DWR April median water year forecast is less than 2,191 TAF, the Licensee may begin opening the Lohman Ridge Diversion Tunnel within two business days of the publication of DWR's April Bulletin 120 and provide spill reduction consistent with Condition 5 of this certification.

6(B) Fall Tunnel Closures

The Licensee shall fully close the Lohman Ridge Diversion Tunnel from October 1 through December 31 of each year. This condition is subject to temporary

modification for planned activities (e.g., if required for repairs to the dam or associated equipment) in accordance with Condition 1(B) or unplanned events (e.g., equipment malfunction, as accordance with Condition 1(B) or unplanned events (e.g., equipment malfunction, as directed by law enforcement authorities, or in emergencies) in accordance with Condition 1(C)).

6(C) Notifications

For spring tunnel closures, the Licensee shall monitor the March DWR Bulletin 120 forecast and New Bullards Bar Reservoir elevation and make a good faith effort to notify the USFS, CDFW, USFWS, FERC, and State Water Board staff at least five days prior to any anticipated tunnel closure. The Licensee shall notify USFS, CDFW, USFWS, FERC, and State Water Board staff at least one day prior to any anticipated tunnel closure, and provide notification following tunnel closure that notes the date and time the tunnel was closed, as well as when the tunnel is subsequently opened. Concurrent with these notifications, the Licensee shall post a notice at the Our House Diversion Dam and New Colgate Powerhouse public river access points, describing potential flow increases, and coordinate with USFS to post the same notice at other recreation facilities and public river access points downstream of Our House Diversion Dam on the Middle Yuba River.

6(D) Permitting

Where facilities must be modified or constructed to allow for compliance with the required tunnel closures, the Licensee shall submit applications for permits to modify or construct the facilities as soon as reasonably practicable but no later than two years following license issuance, and shall complete the work as soon as reasonably practicable but no later than two years after receiving all required permits and approvals for the work.

3.0 RELEVANT ANALYSIS IN FERC’S AND USACE’S FINAL EIS

FERC and USACE staff adopt in their Final EIS a condition concerning Lohman Ridge Diversion Tunnel closures based on: 1) YCWA’s proposed condition AR11 in its Final License Application, as amended (YCWA 2017, or Amended FLA¹); and 2) the United States Department of Agriculture, Forest Service’s, (Forest Service) Federal Power Act (FPA) final Section 4(e) Condition 35, a mandatory condition. YCWA and the Forest Service collaboratively developed and agreed to the condition, which YCWA included in its DLA as proposed Condition AR11 and the Forest Service included in its 4(e) terms and condition as Condition 35. The two conditions were identical. (p. 5-5 and p. 5-72, Final EIS.) Condition 6 would require YCWA to close the Lohman Ridge Diversion Tunnel at the same times and under the same conditions as recommended by FERC and USACE in their Final EIS, and then also includes additional extended closures (tunnel closures above the tunnel-closure condition in the Final EIS are referenced in this memorandum as “extended closures”). The extended closures are:

¹ Subsequent to filing it Amended FLA, YCWA made a number of amendments to it, but none of them affected Lohman Tunnel closures.

- Where the Lohman Ridge Diversion Tunnel would be closed in April:
 - Condition 6 would base the closure on if the end of March New Bullards Bar Reservoir storage is 775,000 acre-feet (ac-ft) or greater and DWR's March forecast is greater than 2,191,000 ac-ft (i.e., an Above Normal WY), whereas the condition adopted by FERC and USACE staff would base the closure on if the end of March New Bullards Bar Reservoir storage is 775,000 acre-feet or greater and the subsequent DWR's April forecast is equal to or greater than 3,240,000 ac-ft (i.e., a Wet Water Year (WY));
 - Condition 6 would require the tunnel be closed on April 1, whereas the condition adopted by FERC and USACE staff would require the tunnel be closed within 2 business days of when DWR publishes its April Bulletin 120, which usually occurs in the first 7 business days of the month; and
 - Condition 6 would allow YCWA to open the tunnel, which it closed based on the March DWR forecast, if DWR's subsequent April median water year forecast is less than 2,191,000 ac-ft, whereas the condition adopted by FERC and USACE staff does not include a provision whereby YCWA may open the tunnel in April because the tunnel would be closed based on the April DWR forecast and not the March DWR forecast;
- Where the Lohman Ridge Diversion Tunnel would be closed from October through December:
 - Condition 6 would close the tunnel in all WYs, whereas the condition adopted by FERC and USACE staff would close the tunnel in Wet, Above Normal or Below Normal WYs if the end of September New Bullards Bar Reservoir storage is 600,000 ac-ft or greater (FERC and USAC staff would not close the tunnel in Dry and Critically Dry WYs).

Condition 6's extended closures are the same as those recommended to FERC and USACE by CDFW in CDFW's FPA Section 10(j) recommendation 2.13 (pp. 26 through 28, CDFW 2017) and by DOI in its Section 10(j) recommendation 10 (pp. 78 through 83, DOI 2017). CDFW's and DOI's recommendations were identical. At page 133 of its recommendations, CDFW states that the objective of its recommendation is to "*Reduce entrainment of all life-stages of rainbow trout from the Middle Yuba River upstream of [Our House Diversion Dam] OHDD into the Project's Lohman Ridge Diversion Tunnels to less than significant levels.*" In addition, CDFW references 19 geomorphic processes and riparian habitat related objectives, none of which can be analyzed in detail because of the general manner in which they are stated.

FERC analyzed CDFW's and DOI's extended closures recommendations in FERC's May 2018 Draft Environmental Impact Statement (FERC 2018, or Draft EIS) and FERC and USACE staff analyze CDFW's and DOI's extended closures recommendations in their Final EIS. With regards to entrainment, FERC and USACE state at pages 3-201 and 3-202 of the Final EIS:

With a daily entrainment rate of 0.56 fish/day, [DOI] FWS and California DFW's recommendation would reduce entrainment into the Lohman Ridge Diversion Tunnel by approximately 845 fish over 41 years [about 21 fish per year] compared to YCWA's proposed measure AR11. However, unlike the intake structures associated with the New Colgate, New Bullards Bar Minimum Flow, and Narrows

2 Powerhouses, the Lohman Ridge and Camptonville Diversion Tunnels do not lead to generating facilities that could subject entrained fish to direct mortality through turbine strikes. Additionally, YCWA's entrainment study documented individual fish passing the passive integrated transponder antennas multiple times, indicating that entrained fish could swim back through the diversion tunnels and return to Oregon Creek or the Middle Yuba River.

This led FERC and USACE to conclude at page 5-42 of the Final EIS:

Considering the low daily entrainment rates and the limited risk of mortality associated with entrainment through turbines, we conclude YCWA's proposed measure AR11 would reduce the existing entrainment rates and that the higher frequency of tunnel closures [i.e., extended closures] recommended by [DOI] FWS and California DFW would have negligible additional benefit.

In addition, FERC and USACE examined whether entrainment at Lohman Ridge Diversion Tunnel adversely affects fish populations in the vicinity of the tunnel intake. At page 3-202 of the Final EIS, FERC and USACE conclude:

During relicensing studies of the fishery located upstream of Englebright Reservoir, YCWA documented several similar fish species in New Bullards Bar Reservoir and in both Middle Yuba River and Oregon Creek (e.g., rainbow trout, Sacramento pikeminnow, and Sacramento sucker), as well as multiple age-classes for fishes in Middle Yuba River and Oregon Creek suggesting that existing entrainment does not affect the fish communities in either New Bullards Bar Reservoir, Middle Yuba River, or Oregon Creek.

Importantly, FERC and USACE determine at page 3-202 of the Final EIS that entrainment does not affect rainbow trout by blocking needed migration:

[DOI] FWS also comments that the frequency of tunnel closures proposed in YCWA's measure AR11 does not cover the most important migratory periods of rainbow trout. Rainbow trout, however, are not a facultative anadromous species, and as such, they are able to complete their life cycle without any migration. Moreover, the passive integrated transponder tag detections in the Lohman Ridge and Camptonville Diversion Tunnels indicate limited fall and spring movements of rainbow trout in the project area.

FERC's and USACE's conclusion is not reached in a vacuum. As stated at page 5-57 of the Final EIS:

Following review of the agencies' response to our section 10(j) preliminary determination, comments on the draft EIS, and our attempts to resolve the inconsistencies, as discussed in section 5.1.3, Other Measures Not Recommended by Staff, we continue to find that there would be limited effects of the extended closures on fish populations. Additionally, we analyzed the cost of the extended

closures on generation. We determined, based on the current water record, the additional closures would have resulted in greater reductions in water through the tunnel than spill volumes at New Bullards Bar Dam. In other words, not all of the water diverted through the Lohman Ridge Diversion Tunnel would have spilled at New Bullards Bar Dam, so there would have been a loss in water available for generation. We estimate the levelized annual cost on generation to be \$457,090 and determine the benefits are not worth the costs.

At page 4-22 of the Final EIS, FERC and USACE state they based their estimated levelized annual cost of \$457,090 on information provided by YCWA in its Ready for Environmental Analysis (REA) Notice reply comments filed with FERC on October 10, 2017 (YCWA 2017a²). Based on a run of the relicensing Water Balance and Operations Model, YCWA estimated that, on average, the extended closure in spring would result in 265,499 ac-ft of water not passing New Colgate Powerhouse with a commensurate average annual generation loss of \$345,480 (p. 134, YCWA 2017a), and that, on average, the extended closure in the fall would reduce average annual generation by \$138,254 (p. 143, YCWA 2017a), with a total reduction in generation due to the combined spring and fall extended closures of \$483,784.

Based on its analysis, FERC and USACE conclude at page 5-43 of the Final EIS:

Therefore, while we find that YCWA's proposed tunnel closure would benefit environmental resources, we do not agree that the benefits of the additional tunnel closures recommended by the agencies [CDFW] are worth the estimated levelized annual cost of \$457,090, and we do not recommend including them as part of any license issued for the project.

YCWA is not aware why FERC's and USACE's average annual cost is approximately \$26,000 less than YCWA's estimate, but, using these estimates, the cost for the extended closures is between \$22,854,500 and \$24,189,200 over the YCWA anticipated 50-year-term of the new license.

4.0 SWRCB'S RATIONALE FOR CONDITION

Pages 15 and 16 of the WQC lists the material the SWRCB staff reviewed and considered when preparing its WQC. The SWRCB's provided two rationales for Condition 6. These were that closure of the tunnel would protect: 1) fish and aquatic resources by reducing entrainment into the Lohman Ridge Diversion Tunnel during peak entrainment timeframes; and 2) aquatic biota by minimizing downstream Project-related flow fluctuations that are uncharacteristic of the natural hydrograph (p. 21, WQC). The WQC does not contain any additional rationale, analysis or discussion regarding Condition 6, or mention CDFW's recommendation 2.13, DOI's recommendation 10.

² Section 3.D.1, *Periodically Close Lohman Ridge Diversion Tunnel*, (pp. 127 through 145) from YCWA's October 10, 2017, REA Notice reply is included in Attachment D1 to this appendix.

At page 3 of Attachment B of its preliminary Terms and Conditions (SWRCB 2017), SWRCB staff recommended to FERC and USACE preliminary term and condition 7, *Tunnel Closures at Lohman Ridge and Camptonville Diversion Tunnels*, which stated:

The State Water Board will likely require a schedule to periodically close the Lohman Ridge Diversion Tunnel on the Middle Yuba River and the Camptonville Diversion Tunnel on Oregon Creek. The schedule will likely be determined based on water year types as described in Preliminary Condition 4, and New Bullards Bar Reservoir water level elevation. The goal of this schedule is to restore a more natural hydrograph in Oregon Creek downstream of Log Cabin Diversion Dam and the Middle Yuba River downstream of Our House, and to enhance aquatic habitat quality and quantity for native biota. The objective of the schedule to close the Lohman Ridge Diversion Tunnel is to reduce the number of years when water from the Middle Yuba River and Oregon Creek is diverted to New Bullards Bar Reservoir when New Bullards Bar is spilling or when such a diversion would result in spill at New Bullards Bar Dam, and allow the water to naturally continue down the Middle Yuba River and Oregon Creek instead.

Since the preliminary term and condition generally proposed by SWRCB staff did not include any specific recommendations, FERC could not conduct a detailed evaluation of the SWRCB's Condition 6 in its Draft EIS, and FERC and USACE could not conduct a detailed evaluation of it in their Final EIS.

The WQC's rationale for Condition 6, however, fails to consider, address or even mention FERC's and USACE's analysis in the Final EIS regarding the extended closures that Condition 6 would impose on YCWA, and the WQC fails to provide any reasonable basis for Condition 6.

5.0 YCWA'S ADDITIONAL SUPPORTING TECHNICAL MATERIAL

The discussion below focuses only the extended closures, and assumes:

- The Deputy Director does not modify Condition 6 or Condition 3(A), and those two conditions would be in effect for the term of the WQC regardless of other changes to the WQC.

5.1 SWRCB's First Rationale for Condition - Reduction of Entrainment during Peak Entrainment Periods in Dry and Critically Dry Water Years

In addition to the lack of technical support for the extended closures presented by FERC and USACE in the Final EIS, YCWA adds:

- No Endangered Species Act-listed fishes or anadromous fishes are entrained. None occurs in the vicinity of the intake.

- The fishery in the vicinity of the intake is not unique, has limited recreation/economic value due to marginal access, and is not a subsistence fishery.

5.2 SWRCB’s Second Rationale for Condition - Protection of Aquatic Biota by Minimizing Downstream Water Level Fluctuations

The WQC provides no evidence to support the SWRCB’s position that closing the Lohman Ridge Diversion Tunnel in October through December in all years would provide added protection to aquatic biota in the Middle Yuba River by minimizing downstream Project-related flow fluctuations that are uncharacteristic of the natural hydrograph. In fact, the hydrograph is not critical for any aquatic life stages in this period. Periodic higher flows during the October-December period are not critical for rainbow trout adult or juvenile life stages, hardhead, or smallmouth bass, the three fish species in the reach, and not pertinent to rainbow trout spawning or fry emergence. Periodic higher flows during this period would not benefit foothill yellow-legged frog (FYLF), which may occur in this reach. FYLF tadpoles typically complete metamorphosis no later than September, and post-metamorphic dispersal of FYLF, which may still be occurring in October, is not known to be related to periodic higher flows. No critical benefits to western pond turtle, which also may occur in this reach, during this period are evident. In addition, periodic higher flows during this period are not critical for sustaining established riparian vegetation or survival of seedlings of riparian trees and shrubs, which is instead related to recession of ground water through the growing season in spring relative to rate of seedling root growth. High energy, or periodic high flows, events that are beneficial to improving rainbow trout spawning gravel condition, regenerating or maintaining suitable FYLF breeding and larval rearing habitats, and periodically removing encroaching riparian vegetation do not typically occur during October through December, but occur in late winter and spring. These are driven by late winter and spring precipitation and spring and summer snowmelt-runoff, not autumn or early winter precipitation. Similarly, other ecological processes, including in channel LWM recruitment, sediment transport, and maintaining suitable water temperatures, are not dependent on increased flows during in fall, but typically occur in spring.

Further, extended tunnel closures in October through December have a considerable cost, especially considering they would have no environmental benefit. FERC and USACE staff recommended closing the tunnel from October through December in Wet, Above Normal or Below Normal WYs if the end of September New Bullards Bar Reservoir storage is 600,000 ac-ft or greater, whereas Condition 6 closes the tunnel in all years. Over the 41-year-long period of record, the Condition 6 would close the Lohman Ridge Diversion Tunnel from October through December in 17 WYs that would not be closed under FERC and USACE staff’s recommendation. Table 1 shows that, 13 of these 17 additional tunnel closures would be in Dry (D) and Critically Dry (CD) WYs, when water for generation and power is most valuable and entrainment is lowest, as discussed above. In addition, the table shows that an average of 11,749 acre-feet, and almost 60,000 acre-feet in one year that would be available for power generation and meeting water supply needs would not be available if Condition 6 was implemented.

Table 1. Years in which the WQC Condition 6 would close the Lohman Ridge Diversion Tunnel from October through December and FERC’s and USACE’s condition in the Final EIS would not.

Water Year	Previous May	End-of-September NBB Reservoir Storage	Oct – Dec
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	(WY Type)	(ac-ft)	Middle Yuba River Diversion to New Bullards Bar Reservoir That Would Not Occur Under WQC Condition 6 (ac-ft)
1978	CD	212,869	13,937
1989	CD	410,539	9,010
1977	CD	457,401	92
1988	CD	475,811	9,131
1993	D	481,733	7,107
2002	D	486,869	14,783
1995	D	495,463	11,204
2008	D	527,209	1,704
2009	D	554,407	4,780
1982	D	574,008	59,558
1986	D	619,702	10,366
1991	D	656,056	2
1992	D	657,455	1,563
2005	BN	517,195	5,972
1971	AN	509,378	29,260
1998	W	542,080	5,221
1970	W	551,051	16,042
Average	--	--	11,749
Total = 17 Years (4 CD WYs, 9 D WYs, 1 BN WY, 1 AN WY and 2 W WY)			

Source: Scenario 12 (Complete Amended FLA Run)

The lost benefit of this water in New Bullards Bar Reservoir is simply not warranted since the closures would provide no measurable benefit to aquatic resources in the Middle Yuba River downstream of Our House Diversion Dam. As discussed above, contrary to the SWRCB's position, providing fluctuations that are more characteristic of the natural hydrograph would have no benefit to aquatic resources in the October through December period.

6.0 REFERENCES

California Department of Fish and Wildlife (CDFW). 2017. Recommended Conditions for Fish and Wildlife Protection, Mitigation, and Enhancement Provided Under the Federal Power Act and 18 CFR § 4.34 (b)(2)1.2 in the Relicensing of Yuba River Development Project FERC Project No. 2246. Dated August 25, 2017.

Federal Energy Regulatory Commission (FERC). 2018. Draft Environmental Impact Statement for Hydropower License – Yuba River Development Project – Project No. 2246-065 – California. Dated May 2018.

_____ and United States Department of Defense, Army Corp's of Engineers (FERC and USACE). 2019. Final Environmental Impact Statement for Hydropower License – Yuba River Development Project – Project No. 2246-065 – California. Dated January 2019.

State of California. State Water Resources Control Board (SWRCB). 2017. Comments on Ready for Environmental Analysis and Preliminary Terms and Conditions for Yuba River Development Project, Federal Energy Regulatory Commission Project No. 2246; Yuba and Nevada Counties. Dated

- _____. 2020. In the Matter of Water Quality Certification for Yuba County Water Agency, Yuba River Development Project, Federal Energy Regulatory Commission Project No. 2246. Water Quality Certification for Federal Permit or License. Dated July 17, 2020.
- United States Department of the Interior (DOI). 2017. Comments, Recommendations, Terms and Conditions, and Prescriptions – Notice Ready for Environmental Analysis for the Yuba River Development Project, Federal Energy Regulatory Commission Project No. P-2246-065; Yuba, Nevada, and Sierra Counties, California. Dated August 22, 2017.
- Yuba County Water Agency (YCWA). 2017. Amended Application for New License, Major Project – Existing Dam. Yuba River Development Project, FERC Project No. 2246-065.
- _____. 2017a. Response to Comments, Recommendations, Preliminary Terms and Conditions, and Preliminary Fishway Prescriptions (YCWA's Response). Yuba River Development Project, FERC Project No. 2246-065. Dated October 9, 2017.