State of California
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Info: (916) 341-5300, FAX: (916) 341-5400
Web: http://www.waterboards.ca.gov/waterrights

PETITION TO RECONSIDER

We have carefully read the following:

August 4, 2015, Order Approving Temporary Urgency Change In the Matter of Permits 16597, 16598, 16599, and 16600 (Applications A014858A, A014859, A019303, and A019304), U.S. Bureau of Reclamation

Address, email address and phone number of petitioners:

Gary Bobker, Program Director, The Bay Institute, Pier 35, The Embarcadero at Beach Street, San Francisco, CA 94133, bobker@bay.org, 415-272-6616

Petition to reconsider based on ENVIRONMENTAL OR PUBLIC INTEREST CONSIDERATIONS

· not best serve the public interest

· have an adverse environmental impact □

State facts which support the foregoing allegations:

· see attached

Under what conditions may this protest be disregarded and dismissed? (Conditions should be of a nature that the petitioner can address and may include mitigation measures.):

· see attached

All protests must be signed by the protestant or authorized representative:

Signed:

Gary Bobker
The Bay Institute

Date: September 2, 2015

Provide the date served and method of service used:

Email transmitting this form and appendix sent on 9/2/15 to: tom.howard@waterboards.ca.gov, cc'd to chris.carr@waterboards.ca.gov and lholm@usbr.gov.

ENVIRONMENTAL AND PUBLIC INTEREST CONSIDERATIONS REGARDING THE BAY INSTITUTE'S PETITION TO RECONSIDER THE AUGUST 4, 2015, ORDER APPROVING TEMPORARY URGENCY CHANGE IN THE MATTER OF PERMITS 16597, 16598, 16599, AND 16600 (APPLICATIONS A014858A, A014859, A019303, AND A019304), U.S. BUREAU OF RECLAMATION

This petition by the Bay Institute (TBI) to reconsider the State Water Resources Control Board (SWRCB) Executive Director's August 4, 2015, order is based on our finding that neither the June 17, 2015, Temporary Urgency Change Petition (TUCP) documents submitted by the U.S. Bureau of Reclamation (Reclamation) nor the August 4 order approving the TUCP, nor Reclamation's August 10, 2015, response to our July 13, 2015, protest letter, adequately analyze the likely impacts to salmonids and other aquatic species of relaxing the Dissolved Oxygen (DO) objective on the Stanislaus River below Goodwin Dam, and therefore fail to disclose potentially devastating effects on environmental and public interest values of the Stanislaus River and downstream areas.

Rather than providing an adequate analysis of the potential effects, none of these documents do much more than merely assert that impacts to fisheries and the public interest will be small or non-existent while providing little or no evidence to support those conclusions. In several areas, Reclamation and the State Water Board simply ignore the potential and high likelihood for unreasonable harm to public environmental resources. In addition, Reclamation's response to our previous objections is erroneous and misleading.

The repeated failure of the SWRCB to enforce water quality objectives to protect fish and wildlife beneficial uses during the drought, including but not limited to the Stanislaus DO objective, means that public trust fisheries and other instream uses of water are being pushed to the breaking point during the drought. The gravity and potentially irreversible nature of the effects of relaxing the objectives, and the fundamental inconsistency of doing so with numerous legal mandates[1] has been repeatedly minimized or overlooked.

Impacts to fall-run Chinook salmon of the Stanislaus River

[1] Including, but not limited to the federal Clean Water Act; the Central Valley Project Improvement Act

In our July 13, 2015 protest letter, we noted that allowing dissolved oxygen (DO) levels to drop to 5mg/L at the Ripon gauge would be harmful to salmonids attempting to enter the Stanislaus River (for further discussion of the potential impacts, see below). Reclamation and the SWRCB continue to ignore the potentially catastrophic impacts of reduced DO standards to adult fall-run Chinook salmon entering the Stanislaus River. The August 4 order states that fall-run Chinook salmon and steelhead attempting to return to the Stanislaus River in the fall of 2015:

> *"…may also be affected by low flow, high temperature and low DO conditions likely to occur until conditions cool and precipitation events occur. These effects will continue downstream into the San Joaquin River and to some extent the Delta. However, the degraded conditions are primarily the result of the larger drought issues, rather than this particular change."* [August 4 TUC Order at p. 9].

No analysis or evidence is provided to support the suggestion that impacts to migrating salmonids are unavoidable or would have been had Reclamation managed water resources in New Melones reservoir to avoid these impacts.

Reclamation's August 10 response to our protest states:

> *"Central valley fall-run Chinook salmon (Oncorhynchus tshawytscha) are not a listed species under the federal or state endangered species act (ESA); therefore, they were not included in our evaluation"* [Reclamation at p. 3]

The fact that fall-run Chinook salmon are not listed as endangered species does not relieve Reclamation of the responsibility to evaluate and avoid impacts of CVP reservoir operations on populations of this species. In fact, both Reclamation and the SWRCB are responsible for maintaining productivity and abundance of fall-run Chinook salmon below all CVP reservoirs under the federal and state Clean Water Acts (per the 2006 Bay-Delta Water Quality Control Plan), the CVPIA, Fish and Game Code §5937, the public trust doctrine, and other laws and regulations. Central Valley fall-run Chinook salmon, including those that spawn on the Stanislaus River, have economic value because they contribute to a commercial and recreational fishery off the coasts of California and Oregon and an inland recreational fishery in California. These fish also play an important role in riverine, estuarine, and nearshore marine food webs where other species (some with special legal status) feed on them.

Impacts beyond the Stanislaus River

In our objection, we also identified that salmon and other fishes upstream and downstream of the confluence with the San Joaquin River could suffer unreasonable harm if low DO levels on the Stanislaus River triggered inadequate DO conditions throughout the lower San Joaquin River and south Delta migratory corridor. The August 4 order acknowledges that low DO input from the Stanislaus River is likely to exacerbate DO levels in the lower San Joaquin River (see quote from the August 4 order, above); Reclamation does not address this impact at all.

The lower San Joaquin River is already impaired because of chronically low DO levels (CVRWQCB and CBDA 2011; Jassby and Van Nieuwenhuyse 2005). This river is the only

corridor by which Chinook salmon, steelhead, and other migratory species can reach spawning and holding habitats in tributary streams upstream and downstream of its confluence with the Stanislaus River. Thus, if Stanislaus River inputs to the San Joaquin River cause DO levels in the lower San Joaquin River and southern Delta to decline below already inadequate levels, Chinook salmon and steelhead populations in rivers other than the Stanislaus River (e.g., the Merced, Tuolumne, or Calaveras rivers) are likely to be affected negatively. Neither Reclamation nor the SWRCB addressed potential impacts to other water bodies or fish and wildlife populations that are likely to arise from the reduced DO levels and high temperatures that the SWRCB has sanctioned on the Stanislaus River this year.

As documented in the TUCP, the existing DO standard for the Stanislaus River and the Central Valley basin as a whole is designed to protect the benefits of cold water habitat for fishes and other organisms that rely on this habitat. Cold water habitats (COLD) are defined in the Basin Plan as those "that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates." [Basin Plan at p. II-2]. The Basin Plan identifies minimum DO thresholds for COLD habitats as 7mg/L and specifies that, for surface water bodies outside the legal boundaries of the Delta, this standard "shall not be reduced …at any time". [Basin Plan at p. II-5]. The DO limit for warm water habitats (WARM) is 5.0 mg/l. Despite these well-defined thresholds, Reclamation inexplicably asserts that:

> *"We do not expect that the modification of the minimum dissolved oxygen to 5.0 mg/l will have a significant adverse impact to any cold water fish species remaining in the Stanislaus River*." [TUC Petition at p. 3]

For this position to be correct, the differences between conditions that define COLD and WARM habitats would need to be immaterial. To the contrary, the levels of DO (and other environmental parameters) that define COLD habitat values are not arbitrary and failure to meet required levels of DO for this habitat type represents harm to all species that rely on this habitat (including, but not limited to salmonids) and a serious modification to the habitat itself.

Impacts to other fishes on the Stanislaus River

Our July 13, 2015, protest identified potential impacts to imperiled steelhead and spring-run Chinook salmon on the Stanislaus River. Reclamation's August 10 response ignores certain likely impacts and is otherwise flawed, inaccurate, and misleading.

First, since Reclamation has no DO monitoring station upstream of Ripon, its claims about the likely impact of lowering the DO standard at Ripon are based on inferences from "DO measurements [that have been] taken periodically in areas upstream during fisheries monitoring activities" [Reclamation August 10 Response at p. 1]. Given the extraordinarily low flow conditions and high temperatures currently on the Stanislaus and the extremely limited and ad hoc nature of previous observations of conditions upstream of Ripon, Reclamation's guesses regarding DO levels upstream of its monitoring location (at Ripon) are insufficient to draw conclusions regarding harm to ESA listed species or other species. Furthermore, it is important to note that Reclamation provides no evidence to support its claim that DO upstream is 0.5-1.0mg/L

higher than at Ripon. The "studies" that Reclamation cites in support of this statement compare DO at the Stanislaus River's weir with DO at Rough and Ready Island (which is downstream of Ripon). Reclamation's response references email alerts from a consultant and date from 2006; since these results are reported only as a range over several days (Table 1) there is no way of knowing precisely how DO changes between Orange Blossom Bridge (OBB) and Ripon; the minimum difference in DO's between these two locations will determine the minimum DO experienced by fish at OBB when DO drops to 5mg/L at Ripon. Finally, Reclamation admits that since it cannot predict how DO may respond to meteorological, flow, and other influencing factors over the next several months, it can only "anticipate" that instances of DO <7mg/L will be above the 5mg/L and that such low DO's will be "short" in duration.

What Reclamation's response demonstrates is that DO levels downstream of Ripon are very likely to be lower than they are at Ripon (Table 1). If DO levels at Ripon drop to 5mg/L, it is very likely that DO levels downstream on the San Joaquin will reach levels that inhibit salmon migration, block it completely, or even lead to direct mortality. Any of these outcomes would likely result in reduced reproductive success. In addition to the impacts of low DO on migrating salmonids, low DO is also a threat to green and white sturgeon which may attempt to migrate through or rear in the San Joaquin River and southern Delta (CVRWQCB and CBDA 2006). Sturgeon are generally much more sensitive to low DO than are salmonids (Cech and Doroshov 2004).

Table 1. *Comparison of dissolved oxygen levels, flow rates, and temperatures at Stanislaus River Weir and Rough and Ready Island (e.g. Stockton Deepwater Ship Channel) on the mainstem San Joaquin River between September and December of 2006 and recently in 2015. Reclamation erroneously implied that the references it cited compared DO levels at Orange Blossom Bridge with those at Ripon. The data reveal a significant drop in DO between the weir and Orange Blossom Bridge, but do not allow for a precise estimate of decline in DO between those two locations (much less at Ripon). Furthermore, current flow rates and temperatures suggest that any comparison between conditions in 2006 and 2015 is likely to only minimally informative.*

	Time Period				
	9/6 – 9/24/06	9/25 – 10/8/06	10/9 – 10/22/06	11/20 -- 12/3/06	Current (8/7-8/20/15)
Source	http://fishsciences.net/postcards/postcard1.htm	http://fishsciences.net/postcards/postcard2.htm	http://fishsciences.net/postcards/postcard3.htm	http://fishsciences.net/postcards/postcard6.htm	CDEC (Station ID's OBB, RRI)
Flow Range at OBB (cfs)	473-1,289	1,266-1,321	1,293-1,313	597-622	220-182
Temperature Range (ºF)	55.2-61.7	54.1-56.4	52.5-55.9	48.8-54.6	67.4-74.3
DO Stanislaus Weir (mg/L)	9.0-10.3	9.9-10.2	10.13-11.15	9.34-11.28	N/A (6.8-8.4 mg/L; @Ripon
DO Rough & Ready Island (mg/L)	6.4-8.5	6.8-7.8	7.38- (error)	8-9	5.13-8.05

Second, Reclamation fails to analyze the impact to adult steelhead that currently reside in the Stanislaus or adults that will attempt to migrate into the Stanislaus or other San Joaquin River tributaries this fall. There is a high likelihood of impact to some segment of this listed population and there will certainly be degradation of habitat that steelhead could otherwise use. Reclamation is responsible for avoiding harm to the adult steelhead under numerous laws including the federal ESA. The risks and uncertainties surrounding impacts to steelhead currently residing on the Stanislaus that arise from Reclamation's previous and planned management of Stanislaus River water resources are quite clear, but its claim that impacts will not occur is pure speculation. For example, the biological review of this issue states:

> *Oxygen distress can occur in salmonids at DO concentrations less than 6.5 mg/L causing reduced swimming ability and growth. No DO gage data is available upstream of Ripon, so it is not known how a 5 mg/L target at Ripon translates to the downstream extent of DO of 7.0 mg/L or higher. Temperatures at Ripon (RM 9) are expected to be unsuitable for rearing steelhead juveniles and adult steelhead during the summer of WY 2015, so contraction of suitable DO conditions may not impact juvenile or adult steelhead if they are holding farther upstream where temperatures are cooler and dissolved oxygen is expected to be higher*. [August 4 Order at p. 5, quoting from the biological review. Emphasis added]

Reclamation is also equivocal about the location of juvenile steelhead rearing in the Stanislaus ,stating that they are "primarily found upstream of Orange Blossom Bridge…" but that "low densities of juveniles are *often* found downstream to Orange Blossom Bridge". Reclamation response at p. 1, emphasis added]. Similarly, Reclamation can only offer speculation about the existence of maturing spring-run Chinook salmon in the Stanislaus, claiming only that "few Chinook salmon typically enter the river during the spring period" [Reclamation response at p. 2]. Populations of spring-running Chinook salmon may indeed be small; but the fact is that small populations often require additional protections to ensure their persistence. Such statements undermine rather than support the finding that the TUC will not result in unreasonable impacts to fish and wildlife or the environment.

Furthermore, Reclamation acknowledges that "…adult steelhead may begin entering the river as early as October" [Reclamation response at p. 1]; this general statement applies also to steelhead attempting to migrate into other San Joaquin tributaries. Thus, DO levels below 7mg/L, high water temperatures, and low flow rates on the Stanislaus River in October and November are extremely likely to harm migrating adult steelhead throughout the San Joaquin Basin and potentially in the southern Delta as well.

Contrary to the findings of the biological review and the Basin Plan (referenced above) and other studies of low dissolved oxygen levels on salmonids (e.g., Raleigh et al 1986) and other fishes , Reclamation incorrectly claims that DO levels of 5mg/L are sufficiently protective of salmonids (the needs of vertebrate and invertebrate wildlife species or other fish species are completely ignored). For example, Reclamation argues that "considerable loss of production" in Chinook salmon (the level of impact USEPA [1986] associates with DO levels of 5mg/L) is acceptable.

Even if this level of impact were acceptable, it is an underestimate of the real-world impacts to salmonids that will be exposed to low DO conditions on the Stanislaus in 2015 because Reclamation has not accounted the effect of other variables on low DO conditions, whereas USEPA specifically caveats its findings regarding DO impacts in relationship to other variables. USEPA (1986) states:

- "Since high temperatures and low dissolved oxygen commonly occur together in natural environments, th[e] likelihood of additive or synergistic effects of these two potential stresses is a most important consideration";
- "High temperatures almost always increase the adverse effects of low dissolved oxygen concentrations";
- "Because most laboratory tests are conducted at temperatures near the mid-range of a species temperature tolerance, criteria based on these test data will tend to be under-protective at higher temperatures …" ; *and*
- Toxicity of zinc, lead, copper, and monohydric phenols was increased at dissolved oxygen levels as high as 6.2 mg/L (citing Lloyd 1961, a study of low DO effect on toxicity of several poisons to rainbow trout).

[USEPA 1986 at p. 25; see also at p. 3 and p. 27].

Salmonids currently in the Stanislaus River and the fall-run Chinook salmon and steelhead that migrate into the system this fall will contend with high temperatures, low flows, contaminated water quality, and water export operations along their migratory corridor. Each of these factors is likely to delay migration and/or exacerbate the effect of low DO levels; thus, citing USEPA's description of the effects of low DO alone will underestimate impacts to fish in the Stanislaus River and other San Joaquin River tributaries this year.

Reclamation's attempt to characterize relationships between flow, temperature, and dissolved oxygen in the Stanislaus River is statistically flawed and misleading. While the point of this exercise is neither stated nor clear, the fact is that the analyses are invalid in numerous ways. For example, Reclamation admits one of the shortcomings of its approach to analyzing these data by saying "under the range of flows available under existing drought-related low storage conditions, historical data indicate that slight changes in flows would not have appreciable effect on DO levels." [Reclamation August 10 response at p. 2]. Flow, storage, and temperature conditions that exist now are extremely rare; thus, it is misguided to compare the effect of flow on DO under a whole range of flow and temperature conditions that are very unlike the conditions we have now.

Another example of Reclamation's invalid "analysis" of factors controlling DO on the Stanislaus River is the inclusion of data that Reclamation knows to be incorrect. Reclamation states: "With few exceptions, episodes of DO <6mg/L are associated with sensor clogging or other maintenance issues rather than actual low DO in the water column" [Reclamation August response at p. 1-2]. Displaying and analyzing data that are known to be erroneous is serious violation of statistical procedure. The frequency of these episodes (e.g., as indicated in Reclamation August 10 response Figures 1 and 2) suggests that Reclamations DO monitoring is

prone to failure, especially at low flows; in other words, Reclamation frequently does not know what DO levels are in the Stanislaus River under low flow conditions.

Reclamation appears to be arguing that it cannot control DO in the Stanislaus River by altering flow rates because temperature is actually the dominant force in determining DO levels in the river. Even if this were true, Reclamation has significant control of summer and fall temperatures in the River, both through management of storage levels and through current release rates. As a result, Reclamation has a good deal of control over DO levels. Had Reclamation managed reservoir operations to prioritize maintaining proper temperature and DO conditions, it might not now need to claim that it is helpless to affect DO levels in the river (a claim that we dispute). Indeed, Reclamation's operations played a large role in creating current conditions within New Melones Reservoir; the agency must consequently take responsibility for those conditions and how they affect its current options and ability to protect public trust resources. Reclamation's claims that its deliveries to senior water rights holders cannot be modified is incorrect; certainly, the SWRCB's authority allows it to modify water deliveries when doing so would be in the public interest or when failing to do so would lead to unreasonable harm to public trust resources.

Reclamation's point regarding what would have happened if "unrelaxed" D-1641 water objectives had been met this spring is irrelevant. In fact, a large part of the basis for allowing Reclamation not to comply with the D-1641 objectives for San Joaquin River inflows and Delta outflows in critically dry years this winter, spring, and summer was to allow for protection of migrating, spawning, and rearing salmonids on the San Joaquin tributaries. At issue is why Reclamation did not maintain sufficient water resources in New Melones Reservoir to protect fish populations as numerous state and federal laws require. Reclamation's August 10 response to our protest is silent on this point.

Literature Cited

Cech, J. J., Jr. and S. I. Doroshov. 2004. Chapter 3: Environmental requirements, preferences, and tolerance limits of North American sturgeons. Pages 73–86 in G. T. O. Lebreton, F. W. H. Beamish, R. S. McKinley (eds), Sturgeons and Paddlefish of North America. Netherlands: Kluwer Academic Publishers.

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Jassby, A. D. and E. E. Van Nieuwenhuyse. 2005. Low dissolved oxygen in an estuarine channel (San Joaquin River, California): Mechanisms and models based on long-term time series. San Francisco Estuary and Watershed Science 2:1–33

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