



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
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*EDMUND G. BROWN JR., Governor*  
*CHARLTON H. BONHAM, Director*



May 23, 2018

Joseph Yun  
Executive Officer  
California Water Commission  
P.O. Box 942836  
Sacramento, CA 94236-0001

Dear Mr. Yun:

### **RELATIVE ENVIRONMENTAL VALUE OF WATER STORAGE INVESTMENT PROGRAM PROJECTS AND DEPARTMENT FINDINGS**

Thank you for your leadership during this process. As you know, the California Department of Fish and Wildlife (Department) is tasked with the responsibility of making recommendations to the California Water Commission (Commission). I acknowledge the complexity of the process has been challenging for you, Commissioners, the reviewing agencies, and each applicant. No one has tried a competitive approach to water storage on such a scale before. The good news is that the Commission and applicants are as close as ever to adding much needed water storage capacity through a portfolio of different types of projects across a diverse geography.

This competitive approach must adhere to the controlling statute and the implementing regulations. At each step of your process, our Department has always based our recommendations on the plain instructions in the statute and the regulations. All of the current applicants, as members of a broad-based stakeholder advisory group, helped develop these regulations during a two-year dialogue. At the last Commission meeting, the Department's recommendations to the Commission on monetized ecosystem benefits to include in the public benefit ratio calculations were discussed. This package contains our next assignment under the regulations related to our calculation of relative environmental value for the ecosystem improvements of a project and preliminary findings. However, as I describe at the end of this letter, each applicant retains an important obligation to complete due diligence for their projects promptly.

Pursuant to the Water Storage Investment Program (WSIP) regulations, this letter and attachments transmit to California Water Commission (Commission) staff (1) the relative environmental value scores calculated by the California Department of Fish and Wildlife (Department) and (2) the Department's findings on the public benefits claimed by each WSIP project. The WSIP regulations require the Department to calculate a relative environmental value for ecosystem improvements, based on information supplied in each project's application. (Cal. Code Regs. tit. 23, § 6007, subd. (c).) Additionally, if the Department "finds the public benefits as described in a project's application meet all of the requirements of Water Code section 79750 *et seq.* for which the reviewing

agency is responsible, the reviewing agency shall provide to the Commission a written statement confirming the finding.” (Cal. Code Regs., tit. 23, § 6012, subd. (d).) This finding is a “preliminary assessment of public benefits based on information supplied in the application that indicates that a project’s public benefits meet the requirements of Water Code section 79750 *et seq.*” (Cal. Code Regs., tit. 23, § 6012, subd. (a).)

For each ecosystem benefit quantified, project applications were required to identify at least one applicable ecosystem priority listed in section 6007, subdivision (c), of the WSIP regulations. (Cal. Code Regs., tit. 23, § 6003, subd. (a)(1)(Q).) The Department applied the 10 relative environmental value criteria outlined in Table 2 of section 6007, subdivision (c)(1)(A)(1), to score each of the ecosystem priorities identified by the applicant. Based on information supplied in the application, the Department considered information supporting ecosystem benefits including the analytical methods, modeling results, and physical, chemical, or biological information. (Cal. Code Regs., tit. 23, § 6007, subd. (c)(1)(A)(1).) Section 6007, subdivision (c)(1)(A)(2), states the score shall be assigned by evaluating the degree of change between with- and without-project conditions, and the degree to which ecosystem improvements associated with each claimed priority would be provided by a project.

The relative environmental value scores reflect the Department’s critical and thorough evaluations of project applications and include comments to the Commission and its staff that address the many aspects of the projects as proposed. The Department’s analysis contained in this package is consistent with our analysis related to public benefits.

The Department recognizes that the projects in many cases have a long history in water management planning in California, and have additional steps in front of them that will refine the projects, reduce uncertainties, and further inform the Commission’s decisionmaking. The regulations emphasize the preliminary nature of the findings submitted to you today, and the fact that changes may occur after a reviewing agency’s findings. (Cal. Code Regs., tit. 23, § 6012(g).) Moreover, prior to the Commission encumbering funding, each successful applicant must enter into enforceable contracts for public benefits and non-public benefit cost shares, complete feasibility studies and environmental documentation, obtain all required federal, state, and local approvals, and provide extensive additional information to the Commission, as applicable, on items including labor compliance, urban water management plans, agricultural water management plans, and groundwater management plans or GSP(s). (Cal. Code Regs., tit. 23, § 6013(a)(1), (c).)

This letter and attachments represent the completion of the Department’s technical review of WSIP projects for the purpose of contributing toward the maximum conditional eligibility determination of each project that the Commission must make. The Department looks forward to continuing to work with the Commission and project

Mr. Joseph Yun, Executive Officer  
California Water Commission  
May 23, 2018  
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applicants in the next phase of the WSIP.

Sincerely,

A handwritten signature in black ink, appearing to read "C. H. Bonham", with a long horizontal line extending to the right.

Charlton H. Bonham  
Director

Encl: CDFW Findings on WSIP Public Benefits, Relative Environmental Value  
Scores, Technical Review Comments

ec: California Department of Fish and Wildlife

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## Los Vaqueros Reservoir Expansion Project – Relative Environmental Value Score

### Project Overview

The Contra Costa Water District (Applicant) is proposing the Los Vaqueros Reservoir Expansion Project (Project). The Project would expand the storage capacity of the existing Los Vaqueros Reservoir from 160 thousand acre-feet (TAF) to 275 TAF, upgrade existing conveyance facilities, construct new conveyance such as the Transfer-Bethany Pipeline, and re-operate existing facilities. Project water would be diverted from existing Delta intakes at the Applicant’s Rock Slough, Old River and Middle River Intakes, and at the Freeport Intake on the Sacramento River. The Project proposes to improve the Rock Slough Fish Screen to reduce entrainment and impingement for the benefit of fall-run Chinook salmon. Consistent with the Central Valley Project Improvement Act, the Project also proposes to provide Incremental Level 4 water to south-of-Delta wildlife refuges for habitat enhancement.

### Ecosystem Priorities Identified by the Applicant

The Applicant has identified the following ecosystem priorities:

- Priority 13 – Remediate unscreened or poorly screened diversions to reduce entrainment of fish.
- Priority 14 – Provide water to enhance seasonal wetlands, permanent wetlands, and riparian habitat for aquatic and terrestrial species on State and Federal wildlife refuges and on other public and private lands.

The California Code of Regulations requires the California Department of Fish and Wildlife (Department) to apply 10 Relative Environmental Value (REV) criteria to score each of the priorities that an applicant claims would be provided by a project. (Cal. Code Regs., tit. 23, § 6007, subd. (c)(1)(A)(1).) Based on the information provided in the application, the Department scored each ecosystem priority listed above to determine the ecosystem REV score shown below. To implement REV Criterion 1, the Department has developed a standard calculation to assign points based on the number of ecosystem priorities a project has claimed. For each priority claimed, the Department added 0.375% to a project’s final ecosystem REV score. REV Criterion 2 through 10 were each scored on a scale of 0 to 6. Detailed scores are provided in Table 1. A summary of comments for each Priority-REV combination is provided in Los Vaqueros Reservoir Expansion Project – Technical Review Comments.

### REV Score Summary

|                                                                   |              |
|-------------------------------------------------------------------|--------------|
| Total Points Possible                                             | 108          |
| Total Points Received                                             | 51.8         |
| Additional % for Number of Ecosystem Priorities (REV Criterion 1) | 0.8%         |
| <b>Total REV Score</b>                                            | <b>48.8%</b> |

## Los Vaqueros Reservoir Expansion Project – Technical Review Comments

### REV Criterion 1 (Number of different ecosystem priorities claimed)

To implement Relative Environmental Value (REV) Criterion 1, the California Department of Fish and Wildlife (Department) has developed a standard calculation to assign points based on the number of ecosystem priorities a project has claimed. For each priority claimed, the Department added 0.375% to a project's final ecosystem REV score. The Department has applied the standard calculation to each of the projects.

In its application for funding under the Water Storage Investment Program, the Contra Costa Water District (applicant) identified two ecosystem priorities for the Los Vaqueros Reservoir Expansion Project (Project). The calculation described above resulted in an increase of 0.8% for the Project's ecosystem REV score. The Department applied the other nine REV criteria to each priority identified by the applicant. The Department's evaluation of each priority is described below.

#### **Priority 13: Remediate unscreened or poorly screened diversions to reduce entrainment of fish Priority 13 – REV Criterion 2 (Magnitude of ecosystem improvements) Score = 1.7**

The applicant estimates an improvement to eight fall-run Chinook salmon per year between with- and without-Project conditions. The application provided sufficient support to demonstrate this improvement based on upgrades to the Rock Slough Fish Screen, but the magnitude of the benefit is small. Based on the Rock Slough fish monitoring data provided by the applicant and the July 3, 2017 National Marine Fisheries Service (NMFS) Biological Opinion for the Rock Slough Fish Screen Facilities Improvement Project, the existing fish screen appears effective in limiting fish entrainment and impingement. Annual entrainment of fall-run Chinook reached a high of 35 fish immediately after screen installation in 2011, followed by a reduction to 0-7 fish per year between 2012 and 2016. In addition, other runs of Chinook salmon have not been observed at the screen since it was constructed. However, the applicant included documentation supporting the projected, yet small, improvement in the protection of fall-run Chinook salmon.

#### **Priority 13 – REV Criterion 3 (Spatial and temporal scale of ecosystem improvements) Score = 1.3**

In general, Rock Slough provides limited habitat for Chinook salmon because of warm water temperatures and infestation of invasive aquatic plants. The Project would provide small habitat benefits to Chinook salmon by improving approximately four acres of invasive aquatic plant-infested habitat for salmon in front of the screens. The applicant also proposes improvements to the two acres behind the screens, but these improvements would not enhance habitat for Chinook salmon because salmon are not present there. The Project improvements would be likely to provide benefits for Chinook salmon from October through May, which is an appropriate temporal scale because historical monitoring data indicate salmonids were observed in Rock Slough or at the fish screen during this time. However, the applicant did not point to supporting documentation to justify the temporal scale of this improvement.



**Priority 13 – REV Criterion 4 (Inclusion of an adaptive management and monitoring program that includes measurable objectives, performance measures, thresholds, and triggers to achieve the ecosystem benefits) Score = 3.0**

The General Information Worksheet and Ecosystem Priority Worksheet describe a general adaptive management approach for the salmonid ecosystem benefit. Preliminary adaptive management strategies include the use of the adaptive management plan developed by the applicant in conjunction with the U.S. Bureau of Reclamation, NMFS, and the U.S. Fish and Wildlife Service. Monitoring and reporting of screen performance would support operational actions and decisions. The applicant would consult with relevant partners and regulatory agencies for any operational changes to ensure the realization of the salmonid ecosystem benefit. Operational actions and funding sources are described in the supporting documentation.

**Priority 13 – REV Criterion 5 (Immediacy of ecosystem improvement actions and realization of benefits) Score = 1.7**

The applicant estimates that construction of Project facilities may begin as early as 2020. However, the Project schedule provided in the application did not present a timeline or description for the construction and completion of the Rock Slough Fish Screen Improvement Project, specifically. The assumption of immediate realization of salmon benefits after fish screen improvements is not justified by the information presented in the applicant's Project schedule. However, regular invasive aquatic plant control at the screens is likely to reduce impingement soon after implementation.

**Priority 13 – REV Criterion 6 (Duration of ecosystem improvements) Score = 1.7**

The applicant proposes that the salmon benefits from fish screen improvements would occur for 100 years. Routine operation and maintenance of the facilities would likely ensure a long-term benefit of reduced fish entrainment and impingement at the Rock Slough Fish Screen. However, the applicant did not point to supporting documentation to justify the anticipated duration of ecosystem benefits. Additionally, the information provided in the application does not address potential future changes to invasive aquatic plant conditions in Rock Slough or discuss whether the magnitude of ecosystem improvement is anticipated to change over time.

**Priority 13 – REV Criterion 7 (Consistency with species recovery plans and strategies, initiatives, and conservation plans) Score = 1.3**

The proposed benefit under Priority 13 is consistent with one action identified in the NMFS Central Valley Salmon and Steelhead Recovery Plan. Specifically, the proposed improvements at the Rock Slough Fish Screen meet the Plan's action DEL-1.23, to improve fish screening to reduce mortality from entrainment. The application also states that the "Project is intended to operate in such a way as to avoid increasing reverse flows in Old and Middle River" and may reduce entrainment and salvage at the Central Valley Project (CVP) or State Water Project (SWP) export facilities. However, information presented in the Draft Supplement to the applicant's Final Environmental Impact Report indicates that the action alternatives could increase positive Old and Middle River flows, but would not affect direct entrainment or impingement of fish at the CVP and SWP export facilities.

**Priority 13 – REV Criterion 8 (Location of ecosystem improvements and connectivity to areas already being protected or managed for conservation values) Score = 1.3**

The applicant states the Rock Slough Fish Screen and proposed improvements are necessary because of operations at the Rock Slough Intake and the Contra Costa Canal. The application states that the 1992 Central Valley Improvement Act required the U.S. Bureau of Reclamation to construct a fish screen in Rock Slough. On average, low numbers of Chinook salmon, most having strayed during migration, are observed in Rock Slough or at the screen. Therefore, the improvement location provides minimal benefit to salmon. The Rock Slough Fish Screen has no connection to managed conservation areas. The applicant did not point to supporting information to indicate connectivity to existing protected or managed areas for conservation values.

**Priority 13 – REV Criterion 9 (Efficient use of water to achieve multiple ecosystem benefits) Score = 0**

The application states that this criterion is “not applicable” and does not identify any efficient uses of water to achieve multiple ecosystem benefits.

**Priority 13 – REV Criterion 10 (Resilience of ecosystem improvements to the effects of changing environmental conditions, including hydrologic variability and climate change) Score = 2.3**

The applicant states that the Rock Slough Fish Screen was designed with the flexibility to adjust operations to ensure the screens operate as intended to benefit salmonids. The application describes the proposed physical improvements to the screen and identifies maintenance activities and an invasive aquatic plant management program to account for anticipated increases in air and water temperatures which could increase invasive plant growth. In addition, the application states that the location and design of the facility accounts for sea level rise. However, the applicant did not provide an analysis of benefit resiliency to other changing environmental uncertainties identified by the Department in the ecosystem worksheet. Based on the described operations and maintenance activities, the salmon benefit appears resilient to changing environmental conditions. However, the applicant did not point to additional supporting documentation to further explain the resilience of the ecosystem benefit.

**Priority 14: Provide water to enhance seasonal wetlands, permanent wetlands, and riparian habitat for aquatic and terrestrial species on State and Federal wildlife refuges and on other public and private lands**

**Priority 14 – REV Criterion 2 (Magnitude of ecosystem improvements) Score = 5.3**

With an average annual delivery of 46 TAF and 41 TAF under 2030 and 2070 conditions, respectively, the Project would provide a large volume of Incremental Level 4 (IL4) refuge water supply for south-of-Delta wildlife refuges. The application indicates that the Project could supply varying volumes of refuge water in all water year types. IL4 deliveries from the Project would complement existing efforts to improve and manage refuge wetland ecosystems for wetland dependent species, and would also contribute toward the wetland goals of the Central Valley Joint Venture (CVJV).

**Priority 14 – REV Criterion 3 (Spatial and temporal scale of ecosystem improvements) Score = 5.0**

The spatial and temporal scale of the improvements provided by the Project would be beneficial for refuge wetlands. The Project would deliver IL4 water to 14 south-of-Delta wildlife refuges in the San

Joaquin Valley, which collectively represent an integral portion of the current wetland base in the Central Valley. The Grasslands Ecological Area, the largest wetland complex in the interior of California, consists of 12 of the 14 refuges the Project would serve. The application indicates that the Project could provide IL4 water at different times throughout the year, depending on water year type. The application notes that these refuges have water demands in all months of all water year types, and that IL4 water is typically needed from March through mid-August. The table provided in the worksheet for monthly habitat needs and water deliveries appears to focus primarily on waterfowl needs. A discussion was not provided for the seasonal needs of both nonbreeding and breeding shorebirds and waterbirds, which do not necessarily coincide with those of waterfowl. The application also does not discuss temporal needs of riparian habitat or the timing of water deliveries to support riparian habitat. Due to year-round demand, there is flexibility in the timing of IL4 deliveries. However, the supporting documentation cited in the worksheet does not discuss the available operational capacity of the Transfer-Bethany pipeline throughout the year for IL4 water conveyance.

**Priority 14 – REV Criterion 4 (Inclusion of an adaptive management and monitoring program that includes measurable objectives, performance measures, thresholds, and triggers to achieve the ecosystem benefits) Score = 4.8**

The General Information Worksheet describes an adaptive management approach including a framework for developing a monitoring and adaptive management program that provides for coordination and consultation with various agencies to ensure the realization of the proposed benefits. The application indicates that adaptive management for refuge water benefits will be coordinated with the Department, U.S. Bureau of Reclamation, refuge managers, and the Interagency Refuge Water Management Team. The application discusses performance measures, accounting of refuge water, and operational decisions regarding the delivery and/or temporary storage of IL4 water. In addition, the application identifies funding sources for the program, which includes current funding from the applicant for a monitoring program and potential funding from Local Agency Partners for any additional monitoring requirements and adaptive management.

**Priority 14 – REV Criterion 5 (Immediacy of ecosystem improvement actions and realization of benefits) Score = 4.3**

The application estimates that IL4 water can be delivered to the south-of-Delta refuges upon the completion of the Transfer-Bethany Pipeline, which could occur as early as 2023. The applicant projects full realization of benefits after the refill of the reservoir is complete, which is estimated to occur by 2028. The Project schedule presented in the application for permit acquisition and construction is reasonable. However, it is possible that the environmental permitting process could extend this timeline by several years. The construction sequencing of Project components appears to be planned to ensure the realization of the claimed benefits.

**Priority 14 – REV Criterion 6 (Duration of ecosystem improvements) Score = 3.3**

The application's Calsim-II model analysis indicates Project deliveries of IL4 water under both 2030 and 2070 conditions, which could provide long-term benefits to wildlife refuges. However, the supporting documents do not provide a justification for the assumed 100-year duration of the refuge water benefits. The model analysis indicates a decrease in average volume of IL4 water from the Project in 2030 (46 TAF) to 2070 (41 TAF) conditions, which is not consistent with the statement in the application that the magnitude of the benefit is not anticipated to change. In addition, the application does not



discuss the expected operational life of new facilities such as the Transfer-Bethany Pipeline, or upgraded and existing facilities that would be used to provide this ecosystem benefit.

**Priority 14 – REV Criterion 7 (Consistency with species recovery plans and strategies, initiatives, and conservation plans) Score = 5.3**

The application describes consistency with the CVJV Implementation Plan, the State Wildlife Action Plan, the U.S. Fish and Wildlife Service Draft Recovery Plan for the Giant Garter Snake, and the California Water Action Plan 2016 Update. Providing water to wildlife refuges is responsive to many of the objectives and priorities identified in these plans. For example, the proposed improvement will contribute to the CVJV Implementation Plan to provide water annually to wetland habitat in the San Joaquin Basin to meet integrated bird habitat objectives. In addition, the delivery of refuge water will contribute to recovery actions for giant garter snake (GGS) that include supplying water to state and federal wildlife refuges and securing water to fully develop or manage habitat for GGS.

**Priority 14 – REV Criterion 8 (Location of ecosystem improvements and connectivity to areas already being protected or managed for conservation values) Score = 5.5**

The proposed ecosystem improvement would occur in a location that would provide benefits to wetland habitat. The location of the improvement should, in turn, provide benefits to birds that use these wetlands as habitat. The Project would provide water to the largest contiguous wetland habitat in California. Many refuge units are contiguous and hydrologically connected and therefore there would be connectivity between areas benefitted by the Project's IL4 water deliveries and existing managed lands. These lands are directly controlled by state or federal agencies or have permanent development easements protecting their use for wetland habitat.

**Priority 14 – REV Criterion 9 (Efficient use of water to achieve multiple ecosystem benefits) Score = 0**

The application states that this criterion is "not applicable" and does not identify any efficient uses of water to achieve multiple ecosystem benefits.

**Priority 14 – REV Criterion 10 (Resilience of ecosystem improvements to the effects of changing environmental conditions, including hydrologic variability and climate change) Score = 4.0**

The application addresses Project uncertainties related to climate change and drought with a Calsim-II model analysis using 2070 climate change scenarios. Based on the model analysis, the application demonstrates the Project's ability to provide refuge water benefits would be resilient to environmental variation, sea level rise and extreme climate scenarios. In addition, the application demonstrates that the Project has the ability to increase drought emergency deliveries and increase carryover storage during a multi-year drought. No analysis was provided regarding the resiliency of the reservoir and other Project facilities to the other changing environmental uncertainties identified by the Department in the ecosystem worksheet.

**Table 1. Relative Environmental Value Scores for the Los Vaqueros Reservoir Expansion Project**

| Priority     | REV2                     | REV3 | REV4 | REV5 | REV6 | REV7 | REV8 | REV9 | REV10 | REV1 | Points Possible                    | Points Received |
|--------------|--------------------------|------|------|------|------|------|------|------|-------|------|------------------------------------|-----------------|
| P 13         | 1.7                      | 1.3  | 3.0  | 1.7  | 1.7  | 1.3  | 1.3  | 0.0  | 2.3   | X    | 54                                 | 14.3            |
| P 14         | 5.3                      | 5.0  | 4.8  | 4.3  | 3.3  | 5.3  | 5.5  | 0.0  | 4.0   | X    | 54                                 | 37.5            |
| <b>TOTAL</b> | REV1 = <sup>1</sup> 0.8% |      |      |      |      |      |      |      |       |      | 108                                | 51.8            |
|              |                          |      |      |      |      |      |      |      |       |      | <b>TOTAL REV SCORE<sup>2</sup></b> | <b>48.8%</b>    |

<sup>1</sup>Additional 0.375 percent applied to total REV score for each priority claimed

<sup>2</sup>Total REV Score equals total points received divided by total points possible, plus REV1 percentage addition