

December 1, 2021

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Director, California Department of Fish and Wildlife
1416 Ninth Street, 12th Floor
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Subject: Negative Biological Resource Effects of the Pacheco Dam Project

Dear Director Bonham:

This letter contains my comments on negative biological resource effects associated with the Pacheco Dam Project.¹ As discussed in your 29 January 2018 letter to the California Water Commission, the Water Storage Investment Program (“WSIP”) regulation require an applicant to disclose and quantify, where possible, any impacts or negative effects the proposed project would impose on the ecosystem to the extent that those impacts are less than fully mitigated. Valley Water has failed to satisfy this requirement.

In this letter, I provide evidence of the following:

1. The currently proposed project has additional and more severe negative impacts than the project proposed in Valley Water’s 2017 WSIP application.
2. Project impacts have not been quantified in accordance with the WISP requirements.
3. Project impacts would not be fully mitigated because the mitigation measures proposed by Valley Water: (a) are not roughly proportional to project impacts, and (b) may not be feasible.
4. Valley Water has grossly underestimated the project’s environmental mitigation costs.
5. The overall value of the project to the South-Central California Coast Steelhead is minimal.

The California Department of Fish and Wildlife’s (“CDFW”) ongoing duties under Water Code section 79755(a)(3) and California Code of Regulations Title 23 section 6012(g) require reevaluation of CDFW’s prior preliminary determinations with respect to the Pacheco Dam in light of the information contained in this letter and other project documents.

1. Due to Modifications of the Dam Location, the Currently Proposed Project Would Have Additional and More Severe Impacts Than the Project Proposed in the WSIP Application

The currently proposed dam project is different from the project evaluated by the Water Commission and CDFW in 2017 and 2018. Specifically, after Valley Water submitted its WSIP application in 2017, the proposed dam was moved 1.3 miles upstream due to earthquake risks at the originally proposed location. This has resulted in a substantial increase in the magnitude of

¹ My qualifications are attached as Exhibit A.

the project's impacts on sensitive biological resources. Because the currently proposed project has been moved 1.3 miles further upstream, it would impact more terrestrial habitat than the project proposed in the WSIP application (i.e., there would be less overlap between the project's inundation area and the existing dam's inundation area). In addition, the currently proposed project would require a new electrical switchyard, 4.1 miles of new transmission lines, 35.2 miles of additional roads, 6,100 feet of additional pipeline, and it would directly impact at least 165.3 acres of "protected" conservation lands (Table 1).

The negative effects that the proposed project would impose on the ecosystem are not limited to its impact footprint. The dam proposed in the WSIP application was an earthfill structure consisting of an impervious, low-plasticity silt or clay core, flanked by an outer shell of random fill.² The currently proposed dam would be constructed of a hardfill mix of cement and fly ash surrounded by a conventional concrete mix on the upstream and downstream faces of the dam.³ Thus, a fundamental difference between the previously proposed project and the currently proposed project is the amount of concrete, cement, and fly ash required to construct the dam. The currently proposed dam would require: (a) 34,000 cubic yards ("CY") of concrete,⁴ (b) 500,000 to 1 million CY of cement and fly ash (a coal combustion product),⁵ (c) 3.6 million CY of hardfill mix,⁶ and (d) 0.93 million CY of excavation.⁷

The environmental impacts of concrete production are significant. Currently, global concrete production accounts for more than five percent of anthropogenic carbon dioxide emissions annually, mostly attributable to the production of cement clinker.⁸ On average, producing one millitonne (one kilogram) of Portland cement clinker releases 0.87 tons of CO₂ into the atmosphere.⁹ In addition, cement production generates nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), methane (CH₄), particulate matter (PM), volatile organic compounds (VOC), and other toxic emissions (e.g., heavy metals, dioxins and furans).¹⁰ The negative effects the project's use of concrete, cement, and fly ash would have on ecosystem resources have not been disclosed or quantified.

In addition to the increase in concrete, cement, and fly ash, the currently proposed project entails a substantial increase in the amount of aggregate (gravel) needed to construct an additional 35 miles of roadways (Table 1). Understanding the overall environmental impacts of the currently proposed project would require life-cycle analysis, which has not been conducted. However, based on the amount of concrete, cement, and fly ash that would be required to construct the dam, it is clear that the negative effects of the proposed project have increased substantially since the Water Commission and CDFW conducted their review of the Pacheco Dam.

² WSIP Application, Eligibility and General Project Information, A3: Project Description, pp. 1-10 and -15.

³ DEIR, Alternatives Development and Project Description Appendix, p. 2-57.

⁴ *Ibid.*, Table 3-4.

⁵ *Ibid.*, Table 3-30.

⁶ DEIR, p. ES-7.

⁷ DEIR, p. 2-17.

⁸ Gursel AP, Masanet E, Horvath A, Stadel A. 2014. Life-cycle inventory analysis of concrete production: A critical review. *Cement & Concrete Composites* 51:38-48.

⁹ *Ibid.*

¹⁰ *Ibid.*

Table 1. Main project facilities that would impact biological resources: WSIP application versus Draft Environmental Impact Report (“DEIR”).

<u>Project Component</u>	<u>Impacts</u>		
	<u>WSIP App (2017)</u>	<u>DEIR (2021)</u>	<u>Difference</u>
Dam location	0.5 mile upstream from existing dam	1.8 mile upstream from existing dam	+1.3 miles further upstream, with approximately 1.3 miles of newly inundated creek
Dam type	Earthfill	Hardfill	+Significant increase in concrete and cement
New pipeline	4,700 feet ¹¹	10,800 feet ¹²	+6,100 feet
New roads	9.6 miles (2.7 miles permanent) ¹³	44.8 miles (37.6 miles permanent). ¹⁴	+35.2 miles (34.9 miles permanent)
Transmission line	Upgrades to 16 miles of existing transmission line. ¹⁵	4.1 miles of new transmission line, 26 new power poles, and new switchyard. ¹⁶	+4.1 miles of new transmission line, 26 new power poles, and new switchyard.
Staging areas	Not quantified	83.7 acres ¹⁷	Unable to calculate
Borrow areas	Not quantified	52.5 acres (6.1 MCY of material) ¹⁸	Unable to calculate
Disposal areas	Not quantified	75.6 acres ¹⁹	Unable to calculate
Conservation lands impacted	None	151.7 acres of Romero Ranch. ²⁰ 13.6 acres of Henry W. Coe State Park. ²¹ Switchyard and road construction in Cottonwood Creek WA (impacts not quantified). ²²	+Direct impacts to at least 165.3 acres of conservation lands.

¹¹ WISP Application, Eligibility and General Project Information, A3: Project Description, Table 1-1.

¹² DEIR, p. ES-8.

¹³ WISP Application, Eligibility and General Project Information, A3: Project Description, Table 1-1.

¹⁴ DEIR, Table 2-1.

¹⁵ WISP Application, Eligibility and General Project Information, A3: Project Description, Table 1-1 and p. 1-14.

¹⁶ DEIR, pp. ES-8 and 2-21. The Project Description chapter of the DEIR does not discuss or map the switchyard. However, according to the Aesthetics chapter (pp. 3.2-9 and -10), a new switchyard is proposed near Fifield Road approximately 500 feet north of SR 152. DEIR, Figure 3.2-1 depicts the switchyard (“transmission interconnection”) on the east side of Fifield Road, which is in the Cottonwood Creek Wildlife Area.

¹⁷ DEIR, Table 2-2.

¹⁸ *Ibid.*

¹⁹ *Ibid.*

²⁰ DEIR, Table 3.5-18.

²¹ DEIR, p. 3.13-13.

²² DEIR, pp. 3.13-10, 3.17-2, and Figure 2-10. *See also* DEIR, Figure 3.2-1 (depicting switchyard location).

2. Valley Water Failed to Quantify the Project’s Negative Impacts on Biological Resources

California Code of Regulations, Title 23 Section 6004, subdivision (a)(3)(B) states:

“The applicant shall disclose and quantify, where possible, any impacts or negative effects the proposed project would impose on the ecosystem, water quality, uses and storage of water, or resources relative to the without-project future condition during the planning horizon, to the extent that those impacts are less than fully mitigated. If the analysis used to quantify the negative effects is different from that shown in the applicant's CEQA or other environmental documents, the applicant shall describe how and why they are different and the implications of those differences.”

Valley Water’s WSIP application failed to quantify the negative effects of the proposed project. However, now that the DEIR has been released, it is clear that the project would have immense impacts on biological resources. The new dam would inundate approximately 1,500 acres of land that supports sensitive natural communities and numerous special-status species.²³ In addition, the project’s facilities (e.g., new roads, transmission line, and pipeline) would eliminate, fragment, and degrade an extensive (but unquantified) amount of habitat outside of the inundation zone.

a. Certain Terrestrial Species/Habitat Impacts Traded for Uncertain Steelhead Benefits

Valley Water did not survey the areas that would be impacted by the proposed access routes, auxiliary roads, electrical substation, and transmission lines.²⁴ In addition, Valley Water did not survey all of the areas that would be impacted by construction of the dam.²⁵ However, the portions of the study area that were surveyed indicate the project would impact at least:

- 16 sensitive natural communities across 135.9 acres (excluding sycamore alluvial woodland communities).²⁶
- 158.9 acres of Sycamore Alluvial Woodland.²⁷
- 1,057 acres of oak woodlands.²⁸
- 149 acres of potential waters of the United States and 241 acres of potential waters of the State.²⁹

²³ Based on land surface area of terrestrial habitat that would be inundated by the new dam.

²⁴ DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment A, p. 2-1.

²⁵ The DEIR makes several references to surveys in the study area “where legal access was available” (e.g., DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment A, Exhibit C, p. 2-2). However, the DEIR does not quantify or map the portions of the study area that were surveyed.

²⁶ DEIR, Table 3.5-6.

²⁷ DEIR, Table 3.5-7.

²⁸ DEIR, p. 3.5-71 and Table 3.5-6.

²⁹ DEIR, p. 3.5-74.

- 34 populations of 8 special-status plant species.³⁰
- Habitat or potential habitat for 36 special-status animal species, many of which are federally or state listed.³¹
- 3 bald eagle territories³² and 3 golden eagle territories.³³
- 1,778 acres of critical habitat for the California red-legged frog.³⁴
- 1,778 acres of habitat for the California tiger salamander.³⁵

Over 83% of the monetary value of the public benefits that Valley Water claims the project would provide is attributed to ecosystem improvements to Pacheco Creek for the South-Central California Coast steelhead (“SCCC steelhead”).³⁶ I concur with CDFW’s assessment that the project’s benefits to SCCC steelhead are uncertain because they are based on limited empirical data, unjustified assumptions, and an untested model with questionable accuracy.³⁷ Indeed, even Valley Water has admitted that the project might not provide *any* benefit to the SCCC steelhead. According to Valley Water’s WSIP application: “[o]ne source of uncertainty is how South-Central California Coast (SCCC) steelhead will respond to improved flow conditions in Pacheco Creek, since SCCC steelhead do not currently have an annual presence in that waterway.”³⁸

Habitat is defined as: “the resources and conditions present in an area that produce occupancy—including survival and reproduction—by a given organism.”³⁹ Therefore, even if the project generates “improved flow conditions in Pacheco Creek,” it has not improved habitat for the SCCC steelhead unless the organism exhibits a positive response (e.g., increased occupancy, survival, and reproduction).

³⁰ DEIR, p. 3.5-79.

³¹ DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment A, p. 2-4 and Exhibit E, Table 4-1.

³² Valley Water failed to detect a conspicuous bald eagle nest located adjacent to Pacheco Creek, upstream of the proposed dam. I easily detected the nest during a September 2021 site visit. According to the landowner, the nest contained eagle chicks in 2021, and has been active for many years. It is unclear whether this nest is associated with one of the three bald eagle territories discussed in Valley Water’s eagle survey report (DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment D).

³³ DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment D, p. 3-2.

³⁴ DEIR, p. 3.5-86.

³⁵ *Ibid.*

³⁶ See California Water Commission. 2018 Apr 20. Public Benefit Ratio Appeal Response. Table 3.

³⁷ California Department of Fish and Wildlife. 2018 May 23. Relative Environmental Value of Water Storage Investment Projects and Department Findings. Pacheco Reservoir Expansion Project – Relative Environmental Value Score submitted to J. Yun, Executive Officer, California Water Commission by C. Bonham, Director, California Department of Fish and Wildlife. Available at: <https://cwc.ca.gov/-/media/CWC-Website/Files/Documents/2018/WSIP/TechReview/Pacheco_CDFW_REV.pdf>. (Accessed 23 Nov 2021). See also California Department of Fish and Wildlife. 2019 Oct 2. Comments on the San Luis Low Point Improvement Project Draft Environmental Impact Statement/Environmental Impact Report. Available at: <<https://ceqanet.opr.ca.gov/2002082020/3>>. (Accessed 23 Nov 2021).

³⁸ WSIP Application, Benefit Calculation, Monetization and Resiliency, A12: Uncertainty Analysis, p. 4-1.

³⁹ See Hall L, Krausman P, Morrison M. 1997. The Habitat Concept and a Plea for Standard Terminology. *Wildlife Society Bulletin* 25(1):173-182.

It does not appear that any sampling has been conducted to assess the SCCC steelhead’s response to the Pacheco Reservoir reoperation strategy, which began in 2015.⁴⁰ Thus, there is no evidence that the reoperation strategy is incapable of supporting steelhead in Pacheco Creek. To the contrary, anecdotal accounts by Dr. Jerry Smith indicate the reoperation strategy has greatly improved habitat conditions for steelhead in Pacheco Creek. For example, in 2016-2017 juvenile steelhead were observed in the release zone downstream from the reservoir for the first time in more than a decade.⁴¹

Although there are many uncertainties pertaining to the project’s benefits to SCCC steelhead habitat, the negative impacts the project would have on habitat for other special-status species are certain. Many of these species are as imperiled, or more imperiled, than the SCCC steelhead (Table 2).

Table 2. Imperiled and Critically Imperiled species that would be impacted by the project.⁴²

Species	NatureServe Rank ^a		Habitat Impacts
	State Rank	Global Rank	
SCCC steelhead	S2	G5TQ	Potentially positive, negative, or neutral
Western bumble bee	S1	G2G3	1,731 acres (1,487 acres permanently lost) ⁴³
Crotch bumble bee	S1S2	G3G4	1,731 acres (1,487 acres permanently lost) ⁴⁴
Giant gartersnake	S2	G2	Unknown (no surveys conducted) ⁴⁵
San Joaquin coachwhip	S2?	G5T2T3	1,700 acres (1,490 acres permanently lost). ⁴⁶
San Joaquin kit fox	S2	G4T2	131 acres (86 acres permanently lost) ^{47,48}

⁴⁰ See DEIR, p. 2-69.

⁴¹ WSIP application, Eligibility and General Project Information, A6: Other Application Information. Comment letter 1.1.18.

⁴² California Natural Diversity Database. 2021 Oct. Special Animals List. Available at: <<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline>>. (Accessed 24 Nov 2021). See also California Natural Diversity Database. 2021 Oct. Special Vascular Plants, Bryophytes, and Lichens List. Available at: <<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383&inline>>. (Accessed 24 Nov 2021).

⁴³ DEIR, p. 3.5-84.

⁴⁴ *Ibid.*

⁴⁵ DEIR, p. 3.5-25. Potential habitat occurs in the project access and utility area, which has not been surveyed.

⁴⁶ DEIR, p. 3.5-95.

⁴⁷ DEIR, p. 3.5-108.

⁴⁸ This value is not substantiated and appears erroneous. According to the DEIR (Appendix A, Attachment A, Exhibit E, Table 4-1), there are 520 acres of suitable dispersal habitat and 868 acres of “low or unsuitable” dispersal habitat for the San Joaquin kit fox in the study area, which does not include the project access and utility area.

Table 2. Continued.

Species	NatureServe Rank ^a		Habitat Impacts
	State Rank	Global Rank	
Townsend’s big-eared bat	S2	G4	1,154 acres of potential roosting habitat. ⁴⁹
Hall’s bush-mallow	S2	G2	5 populations ⁵⁰
Most beautiful jewelflower	S2	G2T2	3 populations ⁵¹
Arburua Ranch jewelflower	S2	G3G4T2	Potentially “substantial portions of populations” ⁵²
Sycamore alluvial woodland ⁵³	S1	G1	Approximately 158.9 acres.

Letter codes

- S = Imperilment status in California.
- G = Imperilment status throughout the global range of the species.
- T = Reflects the global status of just the subspecies.
- Q = Questionable taxonomy that may reduce conservation priority.

Rank

- 1 = *Critically Imperiled* (at very high risk of extirpation or extinction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors).
- 2 = *Imperiled* (at high risk of extirpation or extinction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors).
- 3 = *Vulnerable* (at moderate risk of extirpation or extinction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors).
- 4 = *Apparently Secure* (at a fairly low risk of extirpation or extinction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors).
- 5 = *Secure* (at very low risk of extinction due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats).

Uncertainty about the status of an element is expressed in two major ways:

- I) By expressing that ranks as a range of values. For example, S1S2 means the status in California is somewhere between Critically Imperiled and Imperiled.
- II) By adding a “?” to the rank. For example, S2? represents more certainty than S2S3, but less certainty than S2.

⁴⁹ DEIR, p. 3.5-110.

⁵⁰ DEIR, Table 3.5-10.

⁵¹ *Ibid.*

⁵² DEIR, p. 3.5-82. Potential habitat occurs in the project access and utility area, which has not been surveyed.

⁵³ Ranks provided in the California Natural Diversity Database. See DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment A, Exhibit A (CNDDDB results, p. 8).

b. Sensitive Sycamore Alluvial Woodland Community Impacts

Sycamore alluvial woodland is an extremely rare and threatened habitat type that supports numerous special-status species.⁵⁴ By 1996, there were only 17 significant stands of sycamore alluvial woodland (totaling approximately 2,000 acres) remaining in the state.⁵⁵ A statewide assessment by Keeler-Wolf et al. (1997) found the sycamore alluvial woodland along Pacheco Creek to be one of the most important of the 17 surviving stands.⁵⁶

The project would directly (e.g., through removal or inundation) or indirectly (e.g., through operational flows) impact 92% (158.9 acres) of the sycamore alluvial woodlands in the project study area, which encompasses a stand of statewide significance along Pacheco Creek.⁵⁷ This impact would be extremely significant and may not be mitigatable due to the difficulty in finding unhybridized seed sources,⁵⁸ the limited number of sites that potentially could be acquired for compensatory mitigation, and conflicts with the Santa Clara Valley Habitat Plan.⁵⁹

The DEIR claims:

“Within the region surrounding the Project study area (San Benito, Merced, Stanislaus, and Alameda Counties), there are approximately 600 acres of large, intact stands of sycamore alluvial woodlands on private lands that are not currently protected by conservation easements with additional areas within and adjacent to these stands that provide sycamore alluvial woodland restoration and establishment opportunities (Keeler-Wolf, et al. 1997, GreenInfo Network 2021). Within Santa Clara County, specifically along South Fork Pacheco Creek and Pacheco Creek (which is within the Project study area), there are approximately 120 acres of privately owned sycamore alluvial woodlands not protected by conservation easements (approximately 16 acres of sycamore alluvial woodlands along Pacheco Creek are owned by SCVHA) (Keeler-Wolf, et al. 1997, GreenInfo Network 2021, Attachment B of the Biological Resources – Botanical/Wildlife Appendix). As a result, the mitigation acreage required under Mitigation Measure BI-2c at a minimum 2:1 ratio is substantially less than the area of the lands available to provide compensatory mitigation for Proposed Project impacts on sycamore alluvial woodlands. Therefore, compensatory mitigation for impacts on

⁵⁴ San Francisco Estuary Institute-Aquatic Science Center and H.T. Harvey & Associates. 2017. Sycamore Alluvial Woodland: Habitat Mapping and Regeneration Study. Prepared for the California Department of Fish and Wildlife Local Assistance Grant Program. A Report of SFEI-ASC’s Resilient Landscapes Program and H.T. Harvey & Associates, Publication # 816, San Francisco Estuary Institute, Richmond, CA.

⁵⁵ *Ibid.* Significant stand was defined as an occurrence covering at least 10 acres.

⁵⁶ Grossinger RM, Beller EE, Salomon MN, Whipple AA, Askevold RA, Striplen CJ, Brewster E, Leidy RA. 2008. South Santa Clara Valley Historical Ecology Study, including Soap Lake, the Upper Pajaro River, and Llagas, Uvas-Carnadero, and Pacheco Creeks. Prepared for the Santa Clara Valley Water District and The Nature Conservancy. A Report of SFEI’s Historical Ecology Program, SFEI Publication #558, San Francisco Estuary Institute, Oakland, CA. p. 83.

⁵⁷ DEIR, Table 3.5-7, pp. 3.5-68 and -69, and Biological Resources - Botanical/Wildlife Appendix, Attachment B, Table 3-1.

⁵⁸ California Department of Fish and Wildlife. 2019 Oct 2. Comments on the San Luis Low Point Improvement Project Draft Environmental Impact Statement/Environmental Impact Report. Available at: <<https://ceqanet.opr.ca.gov/2002082020/3>>. (Accessed 23 Nov 2021).

⁵⁹ DEIR, p. 3.5-114.

sycamore alluvial woodlands resulting from the Proposed Project is considered feasible.”

These claims conflict with information provided by the CNDDDB and the two sources cited in the DEIR (i.e., Keeler-Wolf et al. 1997, GreenInfo Network 2021). For example, according to the CNDDDB, there are six occurrences of sycamore alluvial woodland in Merced, Stanislaus, and Alameda Counties (none in San Benito County). However, only three of the occurrences are on private land. Portions of two of these occurrences are already protected by a conservation easement or other mechanism.⁶⁰ The third occurrence (EO Index 8280) is 87.4 acres and consists of “small to medium sized” sycamores in a linear band extending for over two miles along Arroyo Mocho. I was unable to identify the number of parcels associated with the three occurrences of sycamore alluvial woodland on private land. Thus, it is unknown what number of property owners would need to be willing to work with Valley Water to satisfy the project’s compensatory mitigation requirement. However, the fact that there are only three occurrences on private lands in neighboring counties, and that not all private landowners may be willing to sell their property (or have it encumbered by a conservation easement), provides substantial evidence that the sycamore alluvial woodland mitigation proposed in the DEIR may not be feasible.

The DEIR suggests there are 120 acres of privately-owned sycamore alluvial woodlands along South Fork Pacheco Creek and Pacheco Creek that could be protected by conservation easements. However, almost all of these woodlands would be indirectly impacted by perennial flows created by the project to the point that they may be eliminated.⁶¹ Thus they do not serve as viable mitigation sites. Furthermore, a substantial amount of the woodlands is located on conservation properties owned by the Santa Clara Valley Habitat Authority (e.g., the 142-acre Pacheco Creek Habitat Preserve and 102-acre Ciraulo parcel).⁶²

3. The Proposed Mitigation Measures Fail to Fully Mitigate the Project’s Negative Impacts

Applicants to the WSIP must disclose and quantify, where possible, any impacts or negative effects the proposed project would impose on the ecosystem, water quality, uses and storage of

⁶⁰ California Protected Areas Database. 2021. Available at: <<https://www.calands.org/>>. (Accessed 23 Nov 2021).

⁶¹ DEIR, Biological Resources - Botanical/Wildlife Appendix, p. 3.5-68 (“[o]ver time, the sycamore alluvial woodlands in these areas could further transition to mixed riparian communities that do not include California sycamore as a dominant species.”). *See also* Grossinger RM, Beller EE, Salomon MN, Whipple AA, Askevold RA, Striplen CJ, Brewster E, Leidy RA. 2008. South Santa Clara Valley Historical Ecology Study, including Soap Lake, the Upper Pajaro River, and Llagas, Uvas-Carnadero, and Pacheco Creeks. Prepared for the Santa Clara Valley Water District and The Nature Conservancy. A Report of SFEI’s Historical Ecology Program, SFEI Publication #558, San Francisco Estuary Institute, Oakland, CA. *See also* Spencer WD, Barry SJ, and six others (Independent Science Advisors). 2006. Report of Independent Science Advisors for Santa Clara Valley Habitat Conservation Plan / Natural Community Conservation Plan (HCP/NCCP). Available at: <<https://scv-habitatagency.org/DocumentCenter/View/93/Report-of-the-Independent-Science-Advisors-for-the-Santa-Clara-Valley-HCP-NCCP?bidId=>>>. (Accessed 1 Dec 2021).

⁶² *See* <<https://scv-habitatagency.org/DocumentCenter/View/1201/03>>. *See also* DEIR, Biological Resources - Botanical/Wildlife Appendix, Attachment B, Exhibit A.

water, or resources relative to the without-project future condition during the planning horizon, to the extent that those impacts are less than fully mitigated.⁶³

The California Fish and Game Code states that measures required to meet the “fully mitigated” standard must be: (a) roughly proportional in extent to the impact, and (b) capable of successful implementation.⁶⁴ The fully mitigated standard is different (and more stringent) than the agency’s duty to mitigating an impact, where feasible, to “less than significant” levels under CEQA.⁶⁵ As explained below, the project’s mitigation measures as now disclosed in the DEIR fail to fully mitigate project impacts.

a. The Project’s Mitigation Measures Are Not Roughly Proportional in Extent to Its Impacts

i. *Swainson’s hawk-*

Valley Water’s proposed measures for project impacts on the Swainson’s hawk provides a clear example of mitigation measures that *are not* roughly proportional to the project’s impacts on the ecosystem. The project would permanently impact approximately 1,500 acres of nesting and foraging habitat for the Swainson’s hawk.⁶⁶ Although Valley Water did not conduct surveys for Swainson’s hawks, there are CNDDDB records of at least three active nest sites (territories) within 10 miles of the project site.⁶⁷ Therefore, in accordance with CDFW’s mitigation guidelines, compensatory mitigation would be needed to “fully mitigate” the project’s impacts on the Swainson’s hawk.⁶⁸

The project does not include any compensatory mitigation for impacts to Swainson’s hawk foraging habitat (and potential nesting habitat).⁶⁹ Instead, the DEIR merely proposes: (a) pre-construction nesting bird surveys, and if a nest is located, (b) an avoidance buffer (of unspecified

⁶³ Title 23 Section 6004, subdivision (a)(3)(B). *See also* California Water Commission. 2016 Nov. Water Storage Investment Program: Technical Reference. pp. 4-92 and -93.

⁶⁴ Cal. Fish & Game Code § 2081.

⁶⁵ *See for example*, Pub. Resources Code § 21002 (referring to the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or mitigation measures to avoid or substantially lessen the impacts of a project); Cal. Code Regs., tit. 14, § 15091 (findings required that changes or alterations in the project have been required to avoid or substantially lessen identified significant effects), § 15370 (definition of mitigation).

⁶⁶ *See* DEIR, Table 3.5-15 (which appears to exclude impacts in the project’s access and utility area). The DEIR does not quantify impacts to the Swainson’s hawk. However, according to the DEIR (pp. 3.5-38 and -39), the woodland and scrub habitats in the project area provide suitable nesting habitat for Swainson’s hawks, and the grasslands and pastures provide suitable foraging habitat.

⁶⁷ California Natural Diversity Database. 2021. RareFind 5 [Internet]. California Department of Fish and Wildlife [Nov 9, 2021].

⁶⁸ California Department of Fish and Game. 1994. Staff report regarding mitigation for impacts to Swainson’s hawks (*Buteo swainsoni*) in the Central Valley of California.

⁶⁹ The DEIR provides conflicting information on the site’s ability to support nesting Swainson’s hawks. Although the DEIR (pp. 3.5-38 and -39) admits the woodland and scrub habitats provide suitable nesting habitat for the species, it subsequently states construction-related impacts “would not occur given the lack of nesting habitat present in/near the areas where construction activities would occur under the Proposed Project” (p. 3.5-97). This statement is illogical because the project involves removal of trees that provide potential nesting substrates for Swainson’s hawks. *See* DEIR, Alternatives Development and Project Description Appendix, p. 3-54.

size) would be established around the nest.⁷⁰ These measures fail both to fully mitigate impacts on the Swainson's hawk and to mitigate impacts to less than significant levels.

ii. Riparian Vegetation-

CDFW's scoping comments informed Valley Water that riparian vegetation provides many important ecosystem functions, and that appropriate and effective compensatory mitigation for loss of riparian habitat would require replacement plantings (i.e., habitat creation or restoration) at a ratio of at least 3:1 per area impacted.⁷¹ Presumably this is the ratio CDFW believes is necessary to fully mitigate the project's impacts on riparian habitat. Contrary to CDFW's guidance, the DEIR proposes a habitat *preservation* ratio of 2:1,⁷² which is inconsistent with the ratio recommended by CDFW and would result in the net loss of riparian habitat (i.e., because there is no habitat creation or restoration component).

iii. Santa Clara Valley Habitat Plan-

The Santa Clara Valley Habitat Plan ("Habitat Plan") is both a habitat conservation plan ("HCP") and a natural community conservation plan ("NCCP") that was approved by the USFWS and CDFW in 2013. To approve an NCCP under the 2003 NCCP Act, CDFW must find that the mitigation and conservation measures in the plan are roughly proportional in time and extent to the impact on habitat or covered species authorized under the plan.⁷³ Valley Water was one of the entities that prepared the Habitat Plan and it is one of the Habitat Plan's Permittees. As a result, when Valley Water submitted its WSIP application, it was aware that fully mitigating the project's impacts would require mitigation and conservation measures no less stringent than those in the Habitat Plan.

Although the Pacheco Dam project is located in the Habitat Plan Permit Area, it is not a covered activity under the Habitat Plan. However, the Habitat Plan describes a special major amendment procedure and conservation strategy for terrestrial covered species that could be implemented for the project. The Habitat Plan states: "[w]hether this Plan is amended to cover this project or not, the conservation strategy for the Pacheco Dam Reconstruction and Reservoir Enlargement Project will be consistent with the conservation strategy in this Plan."⁷⁴ Thus, when Valley Water submitted its WSIP application, CDFW may have assumed the project's impacts would be fully mitigated because Valley Water had committed to implementing a conservation strategy consistent with the conservation strategy in the Habitat Plan. However, the DEIR makes clear that Valley Water *does not* plan to implement a conservation strategy consistent with the one in the Habitat Plan.

There are numerous ways in which the proposed project fails to adhere to the conservation strategy in the Habitat Plan. The most significant deviation relates to compensatory mitigation.

⁷⁰ DEIR, pp. 3.5-49 and -103.

⁷¹ DEIR, Public and Agency Scoping Process Appendix, Attachment B, p. 1-6.

⁷² DEIR, p. 3.5-312.

⁷³ ICF International. 2012. Final Santa Clara Valley Habitat Plan. p. 1-23. *See also* Cal. Fish & Game Code § 2800-2835. Available at: <<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=107422&inline>>.

⁷⁴ ICF International. 2012. Final Santa Clara Valley Habitat Plan. p. 10-34.

Both the Habitat Plan and the DEIR incorporate compensatory mitigation for impacts to habitat for special-status species. However, the mitigation ratios proposed in the DEIR are significantly less than those in the Habitat Plan. Specifically, the mitigation ratios in the Habitat Plan range from 3:5:1 to 20:1 (depending on land cover type).⁷⁵ Yet Valley Water is proposing a 2:1 ratio for impacts to some of the land cover (habitat) types in the project area, and no compensatory mitigation whatsoever for impacts to other land cover types.⁷⁶

The DEIR also is deficient in mitigating impacts to various types of wetlands and aquatic resources. For example, the Habitat Plan requires two acres of wetland preservation and two acres of wetland creation (or restoration) for each acre of seasonal wetland impacted by a covered activity (i.e., a compensation ratio of 4:1).⁷⁷ The DEIR only incorporates a 2:1 mitigation ratio for impacts to seasonal wetlands (and other aquatic resources), and it allows Valley Water to satisfy the mitigation requirement through *enhancement* of existing wetlands.⁷⁸ Although wetland enhancement results in the gain of selected aquatic resource function(s), it may also lead to a decline in other aquatic resource function(s).⁷⁹ Furthermore, enhancement does not result in a gain in aquatic resource area, and thus, it does not achieve the “no net loss” policy for wetlands.⁸⁰ As a result, the mitigation proposed by Valley Water does not fully mitigate the project’s impacts on wetlands and other aquatic ecosystems.

Another important distinction between the Habitat Plan and the DEIR is that the Habitat Plan requires compensatory mitigation before impacts occur. The DEIR has no such provision, and in some instances, explicitly states that mitigation would only be implemented after impacts occur. This violates the full mitigation standard established in the NCCP Act, which requires mitigation and conservation measures that are roughly proportional “*in time* and extent to the impact.”⁸¹

In addition to compensatory mitigation, the Habitat Plan incorporates a suite of measures to avoid and minimize impacts on covered species. To ensure avoidance and minimization measures are effectively implemented, the Habitat Plan incorporates habitat models that identify specific locations within the Plan Area that must be surveyed for a given species. The project site contains identified “survey areas” for the San Joaquin kit fox, least Bell’s vireo, and tricolored blackbird.⁸² However, instead of conducting the surveys prescribed in the Habitat Plan, the DEIR assumes that there is no denning (San Joaquin kit fox) or nesting (least Bell’s

⁷⁵ Excluding Mixed Evergreen Forest, Redwood Forest, and Knobcone Pine Woodland, which have lower ratios because their abundance would not be significantly impacted by covered activities. See ICF International. 2012. Final Santa Clara Valley Habitat Plan. Tables 5-11, -12, and -16. Mitigation ratios for terrestrial land cover types were calculated from value provided in Table 5-11.

⁷⁶ See DEIR, pp. 3.5-310 through -324.

⁷⁷ ICF International. 2012. Final Santa Clara Valley Habitat Plan. Table 5-12.

⁷⁸ DEIR, p. 3.5-316.

⁷⁹ US Army Corps of Engineers, South Pacific Division. 2017. Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios. p. 2. Available at: <<http://www.spd.usace.army.mil/Portals/13/docs/regulatory/qmsref/ratio/12501-SPD.pdf>>.

⁸⁰ In 1989 the United States government established the goal of achieving a “no overall net loss” of wetland acres and functions due to historic and ongoing wetland losses throughout the U.S. The State of California adopted a similar policy in 1993 (Executive Order W-59-93).

⁸¹ Cal. Fish & Game Code § 2805 and 2820 [emphasis added].

⁸² Santa Clara Valley Habitat Agency Geobrowser. Available at: <<http://www.hcpmaps.com/habitat/>>. (Accessed 26 Nov 2021).

vireo and tricolored blackbird) habitat for these species within the project's impact areas.⁸³ Valley Water could have no basis for this conclusion unless and until all areas that would be affected by the project have been surveyed. As discussed previously, Valley Water did not conduct habitat assessment surveys in areas that would be impacted by the proposed access routes, auxiliary roads, electrical substation, and transmission lines. In addition, Valley Water did not survey all of the areas that would be inundated after construction of the dam.

b. The Project's Mitigation Measures May Not Be Capable of Successful Implementation

According to the DEIR: “[c]ompensatory mitigation will be accomplished through either the purchase of credits at an agency-approved mitigation bank that services the project area, through the establishment of a single or multiple permittee-responsible mitigation sites or a combination of both.”⁸⁴ However, these mitigation options may not be feasible. Mitigation (or conservation) banks do not sell credits for many of the resources that would be impacted by the project. For example, although the DEIR suggests Valley Water could purchase 200 acres of foothill yellow-legged frog credits at a conservation bank,⁸⁵ there are no conservation banks that sell credits for impacts to the foothill yellow-legged frog.⁸⁶

The DEIR states: “Valley Water will mitigate for unavoidable impacts on habitat for California tiger salamander, California red-legged frog, including USFWS-designated Critical Habitat; and foothill yellow-legged frog at minimum 2:1 ratio for both upland and aquatic habitat or as determined by the resource agencies as achieving equivalent or greater mitigation.”⁸⁷ The project would impact approximately 1,778 acres of habitat for the California tiger salamander (“CTS”) and California red-legged frog (“CRLF”).⁸⁸ Therefore, the project would require approximately 3,556 acres of compensatory mitigation for impacts to these two species. Although there are several conservation banks that sell CTS and CRLF credits, the banks in the project's service area do not appear to have enough “available credits” to satisfy the project's large mitigation requirement.⁸⁹

Both the California Tiger Salamander Recovery Plan and the California Red-legged Frog Recovery Plan emphasize the importance of viable metapopulations. For example, one of the recovery criteria for the California red-legged frog is: “[p]opulations are geographically distributed in a manner that allows for the continued existence of viable metapopulations despite fluctuations in the status of individual subpopulations (i.e., when populations are stable at each

⁸³ DEIR, pp. 3.5-97 and -109.

⁸⁴ See DEIR, pp. 3.5-310 through -324.

⁸⁵ See DEIR Table 3.5-12 (impacts) and p. 3.5-320 (mitigation).

⁸⁶ See California Department of Fish and Wildlife. 2021. Conservation and Mitigation Banks Established in California by CDFW [webpage]. Available at: <<https://wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks#r3>>. (Accessed 26 Nov 2021).

⁸⁷ DEIR, p. 3.5-320.

⁸⁸ DEIR, p. 3.5-86.

⁸⁹ U.S. Army Corps of Engineers. 2021. RIBITS (Regulatory In lieu fee and Bank Information Tracking System) [website]. Available at: <<https://ribits.ops.usace.army.mil/ords/f?p=107:2>>. (Accessed 26 Nov 2021).

core area).”⁹⁰ This is important because it may not possible to purchase 3,556 acres of CTS and CRLF habitat in Santa Clara County due to conflicts with the Habitat Plan and scarcity of large parcels available for acquisition. Whereas acquiring compensation lands may be possible in other regions (e.g., counties or watersheds), that approach would not mitigate impacts to the CTS and CRLF metapopulations affected by the project.⁹¹

Most of the mitigation measures in the DEIR are: (1) dependent on future survey efforts, (2) vague, and (3) deferred (e.g., mitigation consists of preparing a mitigation plan). This makes it impossible for the Water Commission, CDFW, and public to understand the degree to which the project’s significant impacts would (or could) actually be mitigated.

4. Valley Water Has Grossly Underestimated the Project’s Environmental Mitigation Costs

The WSIP application listed: (a) the project’s potential impacts on biological resources, and (b) potential minimization and mitigation measures for those impacts.⁹² The WSIP application did not quantify each of the project’s potential impacts. However, according to the WSIP application, the total cost for “initial environmental mitigation and compliance obligations” would be \$41 million.⁹³ The WSIP application states:

“Initial environmental mitigation and compliance obligation costs includes costs for potential mitigation, primarily biological and cultural mitigation actions. The environmental mitigation costs were estimated at 6 percent of total field cost. This cost does not account for Pacheco Creek channel restoration activities.”⁹⁴

Valley Water released a document titled *Supplemental Feasibility Documentation* in November 2021. According to that document, the environmental mitigation and compliance obligation costs would be \$59.7 million.⁹⁵ These costs “were estimated based upon identified mitigation measures in the San Luis Low Point Improvement Project Draft EIS/EIR.”⁹⁶

Valley Water has not provided reliable estimates of the project’s negative impacts on biological resources. First, no basis was provided for using the total field cost⁹⁷ to estimate the environmental mitigation costs; in my professional experience with other infrastructure projects, there would be no direct correlation between the environmental mitigation costs and the costs to construct the dam (and related facilities). Furthermore, if environmental mitigation costs are 6

⁹⁰ U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp.

⁹¹ The California tiger salamander, California red-legged frog, foothill yellow-legged frog, and western pond turtle have metapopulation structures.

⁹² WSIP Application, Feasibility and Implementation Risk, A5: Impacts and Consultation. Table 2.1.

⁹³ WSIP Application, Benefit Calculation, Monetization, and Resiliency, A8: Total Project Cost Estimate, Table 1-2.

⁹⁴ *Ibid*, p. 1-4.

⁹⁵ AECOM, Stantec, GEI Consultants. 2021 Nov. Supplemental Feasibility Documentation, Table 4-12.

⁹⁶ *Ibid*, p. 4-18.

⁹⁷ Total cost to construct the project, excluding planning, engineering, design, and construction management costs. See 2017 WSIP Application, Benefit Calculation, Monetization, and Resiliency, A8: Total Project Cost Estimate, Table 1-2.

percent of the total field cost, those costs would now be \$78.6 million (based on total field cost of \$1,571.9 million for the currently proposed project).⁹⁸

Second, it was not reasonable for Valley Water to use the mitigation measures in the San Luis Low Point Improvement Project Draft EIS/EIR to estimate the environmental mitigation costs of the proposed project. Compensatory mitigation is generally the most expensive component of a project's environmental mitigation costs. Because surveys for special-status species and wetlands had been not conducted for the San Luis Low Point Improvement Project, Valley Water had no idea how much compensatory mitigation would be required for that project's impacts on those resources.⁹⁹ This is reflected in Mitigation Measure TERR-1, which states: “[f]or unavoidable impacts to special-status plant species and sensitive natural communities, *compensatory mitigation may be required* based on recommendations of the qualified biologist in coordination with resource agencies.”¹⁰⁰

Third, the environmental documents prepared for the project (i.e., WISP application, San Luis Low Point Improvement Project Draft EIS/EIR, and Pacheco Dam DEIR) identify “purchasing credits in conservation banks” as a means of potentially mitigating the project's permanent impacts on sensitive natural communities and habitats for special-status species.¹⁰¹ Therefore, the cost of mitigation credits would need to be incorporated into Valley Water's estimate of environmental mitigation costs. However, it is clear that Valley Water's environmental mitigation cost estimate failed to account for the actual cost of mitigation credits.

In 2018, Valley Water purchased CTS upland mitigation credits from the Sparling Ranch Conservation Bank at a cost of \$35,000 per credit (acre).¹⁰² As discussed above, the project would require approximately 3,556 credits to satisfy the 2:1 compensatory mitigation ratio established in the DEIR (mitigation measure BI-8b).¹⁰³ Based on the sale price in 2018, these credits would cost over \$124 million. Even if the 1:1 ratio proposed in the San Luis Low Point Improvement Project Draft EIS/EIR is applied, the cost for CTS credits alone (\$62 million) would exceed the estimate Valley Water provided for *all* environmental mitigation obligations (\$59.7 million according to the Supplemental Feasibility Documentation).¹⁰⁴

⁹⁸ AECOM, Stantec, GEI Consultants. 2021 Nov. Supplemental Feasibility Documentation, Table 4-12.

⁹⁹ San Luis Low Point Improvement Project Draft EIS/EIR, p. 4-106 (“[a] formal delineation of wetlands and other waters has not yet been performed for this proposed alternative”) and p. 3-32 (“[f]ocused surveys for special-status plants and wildlife have not been completed in all areas; the absence of documented special-status species occurrences does not indicate species absence”).

¹⁰⁰ San Luis Low Point Improvement Project Draft EIS/EIR, p. 4-109 [emphasis added].

¹⁰¹ For example, see WSIP Application, Feasibility and Implementation Risk, A5: Impacts and Consultation. Table 2.1.

¹⁰² Valley Water. 2018 Aug 14. Board Agenda Memorandum for 9 Oct 2018 meeting of the Board of Directors. Available at: <<https://scvwd.legistar.com/LegislationDetail.aspx?ID=3678801&GUID=E748158B-3D9A-4BED-A6B4-93772BE66830&Options=&Search=&FullText=1>>. (Accessed 28 Nov 2021).

¹⁰³ DEIR, pp. 3.5-86, -320, and -321.

¹⁰⁴ The project would have numerous additional mitigation obligations beyond acquisition of CTS credits. For example, Valley Water would also need to purchase credits (or acquire mitigation sites) for impacts to sensitive natural communities, wetlands and other jurisdictional waters, special-status plants, CRLF, foothill yellow-legged frog, and Romero Ranch. See DEIR, pp. 3.5-310 through -324.

5. The Overall Value of the Project to the SCCC Steelhead Would Be Minimal

The value the project would have to the SCCC steelhead hinges on the “cohort score” generated by Valley Water’s Pacheco Creek Steelhead Habitat Suitability Model (“PCSHSM”). The cohort score provides a relative assessment of how well Pacheco Creek would be able to provide suitable aquatic habitat and passage conditions for a cohort of steelhead over a 14-month freshwater life cycle.¹⁰⁵ The maximum achievable cohort score of 100 represents optimal habitat conditions for the SCCC steelhead with respect to rearing suitability, adult passage suitability, and juvenile outmigration suitability.¹⁰⁶ The minimum cohort score of 0 represents unsuitable habitat conditions for the SCCC steelhead.¹⁰⁷

CDFW expressed several concerns about the PCSHSM and its ability to predict the projected magnitude of project benefits to the steelhead population.¹⁰⁸ One of CDFW’s concerns was that the model was based on limited empirical data (e.g., stream temperature data were collected during a single summer). As a result, Valley Water collected additional data in 2019.¹⁰⁹ When these data were entered into the PCSHSM the “with-project” steelhead cohort scores declined by an average of 38 percent (range 33 to 58 percent, depending on water year type).¹¹⁰ The “with-project” cohort score declined by 58 percent in critical water years when habitat conditions in Pacheco Creek are most limiting to steelhead passage and reproduction (i.e., when enhanced flows are needed most). Because the steelhead cohort scores have been revised since Valley Water submitted its WSIP application, the monetized ecosystem improvement benefit of the project must also be revised.

Valley Water has focused solely on how much the project would increase steelhead cohort scores compared to baseline (“without-project”) conditions. For example, the DEIR states: “[i]mplementation of the Proposed Project would significantly increase the cohort score, by as much as 2,737 percent for existing conditions in critical water years when there is minimal habitat available in baseline conditions, which indicates improved conditions for steelhead survival in lower North Fork Pacheco Creek.”¹¹¹ The project may incrementally improve habitat conditions for steelhead relative to baseline conditions. However, the project’s cohort scores relative to the “without-project” scores are irrelevant in terms of the project’s absolute value to steelhead in Pacheco Creek. The cohort scores (mean 14.5; range 7.8 to 16.7) demonstrate that even with the project, the habitat in Pacheco Creek below the dam would be extremely low quality for steelhead.

¹⁰⁵ DEIR, Water Resources and Fisheries Numerical Modeling Appendix, p. 7-5.

¹⁰⁶ *Ibid.*

¹⁰⁷ *Ibid.*, p. 7-8.

¹⁰⁸ See California Department of Fish and Wildlife. 2018 May 23. Relative Environmental Value of Water Storage Investment Projects and Department Findings. Pacheco Reservoir Expansion Project – Relative Environmental Value Score submitted to J. Yun, Executive Officer, California Water Commission by C. Bonham, Director, California Department of Fish and Wildlife. Available at: <https://cwc.ca.gov/-/media/CWC-Website/Files/Documents/2018/WSIP/TechReview/Pacheco_CDFW_REV.pdf>. (Accessed 23 Nov 2021).

¹⁰⁹ DEIR, Water Resources and Fisheries Numerical Modeling Appendix, p. 7-2.

¹¹⁰ See AECOM, Stantec, GEI Consultants. 2021 Nov. Supplemental Feasibility Documentation, Table 2-1 and WSIP application, Benefit Calculation, Monetization and Resiliency, A5: Quantification Support, Table 2-1.

¹¹¹ DEIR, p. 3.6-43.

Habitat conditions for the SCCC steelhead in Pacheco Creek are dictated by a suite of biotic and abiotic factors that may be affected by the project. Valley Water's argument that the project would improve habitat for steelhead is based on only two factors: (1) flow conditions, and (2) water temperatures. Valley Water has dismissed other project-related factors that may offset any beneficial impacts on steelhead habitat. For example, enhanced flows associated with the project could cause more steelhead to spawn in Pacheco Creek. However, habitat conditions for steelhead in Pacheco Creek have not improved if the eggs, fry, and smolts are subsequently consumed by predatory species that have also benefited by the project's enhanced flows.¹¹² In addition, the project may negatively impact steelhead habitat in Pacheco Creek through discharge of fine sediment, introduction of invasive species, and release of out-of-basin CVP water (which may affect imprinting and homing behavior).¹¹³ Because these and other negative effects are likely to occur if the project is implemented, they must be quantified and subtracted from the project's claimed ecosystem benefits.

6. Conclusion

This letter provides several examples of information recently made available that indicate the potential environmental benefits of the Pacheco Dam project have been overstated while its environmental impacts, particularly on biological resources, have been understated. In addition, there is not a viable plan to fully mitigate the extensive biological impacts of the project. In light of these new facts, it would be appropriate for CDFW to recalculate its preliminary relative environmental value scores and reconsider its prior preliminary findings on public benefits in accordance with CDFW's ongoing duties under Water Code section 79755(a)(3) and California Code of Regulations Title 23 section 6012(g).

Please feel free to contact me (scottcashen@gmail.com or 925-256-9185) with any questions regarding this report.

Sincerely,



Scott Cashen, M.S.
Senior Biologist

cc: Nathan Voegeli, Acting Deputy Director, CDFW (nathan.voegeli@wildlife.ca.gov)
Chad Dibble, Deputy Director, Deputy Director Ecosystem Conservation Division, CDFW (chad.dibble@wildlife.ca.gov)
Scott Cantrell, Water Branch Chief, CDFW (Scott.Cantrell@wildlife.ca.gov)

¹¹² Currently, intermittent flows in Pacheco Creek limit the presence, abundance, and distribution of predatory species (e.g., bullfrog).

¹¹³ DEIR, pp. 3.6-34 and -41. *See also*, DEIR, p. 3.20-34 (potential impacts from sediment transfer remain significant and unavoidable).

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EXHIBIT A

Scott Cashen, M.S.

Senior Wildlife Biologist

Scott Cashen has 28 years of professional experience in natural resources management. During that time he has worked as a field biologist, forester, environmental consultant, and instructor of Wildlife Management. Mr. Cashen focuses on CEQA/NEPA compliance issues, endangered species, scientific field studies, and other topics that require a high level of scientific expertise.

Mr. Cashen has knowledge and experience with numerous taxa, ecoregions, biological resource issues, and environmental regulations. As a biological resources expert, Mr. Cashen is knowledgeable of the various agency-promulgated guidelines for field surveys, impact assessments, and mitigation. Mr. Cashen has led field investigations on several special-status species, including ones focusing on the yellow-legged frog, red-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and various forest carnivores.

Mr. Cashen is a recognized expert on the environmental impacts of renewable energy development. He has been involved in the environmental review process of over 100 solar, wind, biomass, and geothermal energy projects. Mr. Cashen's role in this capacity has encompassed all stages of the environmental review process, from initial document review through litigation support. Mr. Cashen provided expert witness testimony on several of the Department of the Interior's "fast-tracked" renewable energy projects. His testimony on those projects helped lead agencies develop project alternatives and mitigation measures to reduce environmental impacts associated with the projects.

Mr. Cashen was a member of the independent scientific review panel for the Quincy Library Group project, the largest community forestry project in the United States. As a member of the panel, Mr. Cashen was responsible for advising the U.S. Forest Service on its scientific monitoring program, and for preparing a final report to Congress describing the effectiveness of the Herger-Feinstein Forest Recovery Act of 1998.

AREAS OF EXPERTISE

- CEQA, NEPA, and Endangered Species Act compliance issues
- Comprehensive biological resource assessments
- Endangered species management
- Renewable energy development
- Scientific field studies, grant writing and technical editing

EDUCATION

M.S. Wildlife and Fisheries Science - The Pennsylvania State University (1998)

Thesis: *Avian Use of Restored Wetlands in Pennsylvania*

B.S. Resource Management - The University of California, Berkeley (1992)

PROFESSIONAL EXPERIENCE

Litigation Support / Expert Witness

Mr. Cashen has served as a biological resources expert for over 125 projects subject to environmental review under the California Environmental Quality Act (CEQA) and/or the National Environmental Policy Act (NEPA). As a biological resources expert, Mr. Cashen reviews CEQA/NEPA documents and provides his clients with an assessment of biological resource issues. He then submits formal comments on the scientific and legal adequacy of the project's environmental documents (e.g., Environmental Impact Report). If needed, Mr. Cashen conducts field studies to generate evidence for legal testimony, or he can obtain supplemental testimony from his deep network of species-specific experts. Mr. Cashen has provided written and oral testimony to the California Energy Commission, California Public Utilities Commission, and U.S. district courts. His clients have included law firms, non-profit organizations, and citizen groups.

REPRESENTATIVE EXPERIENCE

Solar Energy

- Abengoa Mojave Solar Project
- Avenal Energy Power Plant
- Beacon Solar Energy Project
- Blythe Solar Power Project
- Calico Solar Project
- California Flats Solar Project
- Calipatria Solar Farm II
- Carrizo Energy Solar Farm
- Catalina Renewable Energy
- Fink Road Solar Farm
- Genesis Solar Energy Project
- Heber Solar Energy Facility
- Imperial Valley Solar Project
- Ivanpah Solar Electric Generating
- Maricopa Sun Solar Complex
- McCoy Solar Project
- Mt. Signal and Calexico Solar
- Panoche Valley Solar
- San Joaquin Solar I & II
- San Luis Solar Project
- Stateline Solar Project
- Solar Gen II Projects
- SR Solis Oro Loma
- Vestal Solar Facilities
- Victorville 2 Power Project
- Willow Springs Solar

Geothermal Energy

- Casa Diablo IV Geothermal
- East Brawley Geothermal
- Mammoth Pacific 1 Replacement
- Orni 21 Geothermal Project
- Western GeoPower Plant

Wind Energy

- Catalina Renewable Energy
- Ocotillo Wind Energy Project
- SD County Wind Energy
- Searchlight Wind Project
- Shu'luuk Wind Project
- Tres Vaqueros Repowering Project
- Tule Wind Project
- Vasco Winds Relicensing Project

Biomass Facilities

- CA Ethanol Project
- Colusa Biomass Project
- Tracy Green Energy Project

Other Development Projects

- Cal-Am Desalination Project
- Carnegie SVRA Expansion Project
- Lakeview Substation Project
- Monterey Bay Shores Ecoresort
- Phillips 66 Rail Spur
- Valero Benecia Crude By Rail
- World Logistics Center

Project Management

Mr. Cashen has managed several large-scale wildlife, forestry, and natural resource management projects. Many of the projects have required hiring and training field crews, coordinating with other professionals, and communicating with project stakeholders. Mr. Cashen's experience in study design, data collection, and scientific writing make him an effective project manager, and his background in several different natural resource disciplines enable him to address the many facets of contemporary land management in a cost-effective manner.

REPRESENTATIVE EXPERIENCE

Wildlife Studies

- Peninsular Bighorn Sheep Resource Use and Behavior Study: (CA State Parks)
- "KV" Spotted Owl and Northern Goshawk Inventory: (USFS, Plumas NF)
- Amphibian Inventory Project: (USFS, Plumas NF)
- San Mateo Creek Steelhead Restoration Project: (Trout Unlimited and CA Coastal Conservancy, Orange County)
- Delta Meadows State Park Special-Status Species Inventory: (CA State Parks, Locke)

Natural Resources Management

- Mather Lake Resource Management Study and Plan – (Sacramento County)
- Placer County Vernal Pool Study – (Placer County)
- Weidemann Ranch Mitigation Project – (Toll Brothers, Inc., San Ramon)
- Ion Communities Biological Resource Assessments – (Ion Communities, Riverside and San Bernardino Counties)
- Del Rio Hills Biological Resource Assessment – (The Wyro Company, Rio Vista)

Forestry

- Forest Health Improvement Projects – (CalFire, SD and Riverside Counties)
- San Diego Bark Beetle Tree Removal Project – (SDG&E, San Diego Co.)
- San Diego Bark Beetle Tree Removal Project – (San Diego County/NRCS)
- Hillslope Monitoring Project – (CalFire, throughout California)

Biological Resources

Mr. Cashen has a diverse background with biological resources. He has conducted comprehensive biological resource assessments, habitat evaluations, species inventories, and scientific peer review. Mr. Cashen has led investigations on several special-status species, including ones focusing on the foothill yellow-legged frog, mountain yellow-legged frog, desert tortoise, steelhead, burrowing owl, California spotted owl, northern goshawk, willow flycatcher, Peninsular bighorn sheep, red panda, and forest carnivores.

REPRESENTATIVE EXPERIENCE

Biological Assessments/Biological Evaluations (“BA/BE”)

- Aquatic Species BA/BE – Reliable Power Project (*SFPUC*)
- Terrestrial Species BA/BE – Reliable Power Project (*SFPUC*)
- Management Indicator Species Report – Reliable Power Project (*SFPUC*)
- Migratory Bird Report – Reliable Power Project (*SFPUC*)
- Terrestrial and Aquatic Species BA – Lower Cherry Aqueduct (*SFPUC*)
- Terrestrial and Aquatic Species BE – Lower Cherry Aqueduct (*SFPUC*)
- Terrestrial and Aquatic Species BA/BE – Public Lands Lease Application (*Society for the Conservation of Bighorn Sheep*)
- Terrestrial and Aquatic Species BA/BE – Simon Newman Ranch (*The Nature Conservancy*)
- Draft EIR (Vegetation and Special-Status Plants) - Wildland Fire Resiliency Program (*Midpeninsula Regional Open Space District*)

Avian

- Study design and Lead Investigator - Delta Meadows State Park Special-Status Species Inventory (*CA State Parks: Locke*)
- Study design and lead bird surveyor - Placer County Vernal Pool Study (*Placer County: throughout Placer County*)
- Surveyor - Willow flycatcher habitat mapping (*USFS: Plumas NF*)
- Surveyor - Tolay Creek, Cullinan Ranch, and Guadacanal Village restoration projects (*Ducks Unlimited/USGS: San Pablo Bay*)
- Study design and Lead Investigator - Bird use of restored wetlands research (*Pennsylvania Game Commission: throughout Pennsylvania*)
- Study design and surveyor - Baseline inventory of bird species at a 400-acre site in Napa County (*HCV Associates: Napa*)
- Surveyor - Baseline inventory of bird abundance following diesel spill (*LFR Levine-Fricke: Suisun Bay*)

- Study design and lead bird surveyor - Green Valley Creek Riparian Restoration Site (*City of Fairfield: Fairfield, CA*)
- Surveyor - Burrowing owl relocation and monitoring (*US Navy: Dixon, CA*)
- Surveyor - Pre-construction burrowing owl surveys (*various clients: Livermore, San Ramon, Rio Vista, Napa, Victorville, Imperial County, San Diego County*)
- Surveyor - Backcountry bird inventory (*National Park Service: Eagle, Alaska*)
- Lead surveyor - Tidal salt marsh bird surveys (*Point Reyes Bird Observatory: throughout Bay Area*)
- Surveyor – Pre-construction surveys for nesting birds (*various clients and locations*)

Amphibian

- Crew Leader - Red-legged frog, foothill yellow-legged frog, and mountain yellow-legged frog surveys (*USFS: Plumas NF*)
- Surveyor - Foothill yellow-legged frog surveys (*PG&E: North Fork Feather River*)
- Surveyor - Mountain yellow-legged frog surveys (*El Dorado Irrigation District: Desolation Wilderness*)
- Crew Leader - Bullfrog eradication (*Trout Unlimited: Cleveland NF*)

Fish and Aquatic Resources

- Surveyor - Hardhead minnow and other fish surveys (*USFS: Plumas NF*)
- Surveyor - Weber Creek aquatic habitat mapping (*El Dorado Irrigation District: Placerville, CA*)
- Surveyor - Green Valley Creek aquatic habitat mapping (*City of Fairfield: Fairfield, CA*)
- GPS Specialist - Salmonid spawning habitat mapping (*CDFG: Sacramento River*)
- Surveyor - Fish composition and abundance study (*PG&E: Upper North Fork Feather River and Lake Almanor*)
- Crew Leader - Surveys of steelhead abundance and habitat use (*CA Coastal Conservancy: Gualala River estuary*)
- Crew Leader - Exotic species identification and eradication (*Trout Unlimited: Cleveland NF*)

Mammals

- Principal Investigator – Peninsular bighorn sheep resource use and behavior study (*California State Parks: Freeman Properties*)

- Scientific Advisor – Study on red panda occupancy and abundance in eastern Nepal (*The Red Panda Network: CA and Nepal*)
- Surveyor - Forest carnivore surveys (*University of CA: Tahoe NF*)
- Surveyor - Relocation and monitoring of salt marsh harvest mice and other small mammals (*US Navy: Skagg's Island, CA*)
- Surveyor – Surveys for Monterey dusky-footed woodrat. Relocation of woodrat houses (*Touré Associates: Prunedale*)

Natural Resource Investigations / Multiple Species Studies

- Scientific Review Team Member – Member of the scientific review team assessing the effectiveness of the US Forest Service's implementation of the Herger-Feinstein Quincy Library Group Act.
- Lead Consultant - Baseline biological resource assessments and habitat mapping for CDF management units (*CDF: San Diego, San Bernardino, and Riverside Counties*)
- Biological Resources Expert – Peer review of CEQA/NEPA documents (*various law firms, non-profit organizations, and citizen groups*)
- Lead Consultant - Pre- and post-harvest biological resource assessments of tree removal sites (*SDG&E: San Diego County*)
- Crew Leader - T&E species habitat evaluations for Biological Assessment in support of a steelhead restoration plan (*Trout Unlimited: Cleveland NF*)
- Lead Investigator - Resource Management Study and Plan for Mather Lake Regional Park (*County of Sacramento: Sacramento, CA*)
- Lead Investigator - Biological Resources Assessment for 1,070-acre Alfaro Ranch property (*Yuba County, CA*)
- Lead Investigator - Wildlife Strike Hazard Management Plan (*HCV Associates: Napa*)
- Lead Investigator - Del Rio Hills Biological Resource Assessment (*The Wyro Company: Rio Vista, CA*)
- Lead Investigator – Ion Communities project sites (*Ion Communities: Riverside and San Bernardino Counties*)
- Surveyor – Tahoe Pilot Project: Validation of California's Wildlife Habitat Relationships (CWHR) Model (*University of California: Tahoe NF*)

Forestry

Mr. Cashen has five years of experience working as a consulting forester on projects throughout California. Mr. Cashen has consulted with landowners and timber operators on forest management practices; and he has worked on a variety of forestry tasks including selective tree marking, forest inventory, harvest layout, erosion control, and supervision of logging operations. Mr. Cashen's experience with many different natural resources enable him to provide a holistic approach to forest management, rather than just management of timber resources.

REPRESENTATIVE EXPERIENCE

- Lead Consultant - CalFire fuels treatment projects (*SD and Riverside Counties*)
- Lead Consultant and supervisor of harvest activities – San Diego Gas and Electric Bark Beetle Tree Removal Project (*San Diego*)
- Crew Leader - Hillslope Monitoring Program (*CalFire: throughout California*)
- Consulting Forester – Forest inventories and timber harvest projects (*various clients throughout California*)

Grant Writing and Technical Editing

Mr. Cashen has prepared and submitted over 50 proposals and grant applications. Many of the projects listed herein were acquired through proposals he wrote. Mr. Cashen's clients and colleagues have recognized his strong scientific writing skills and ability to generate technically superior proposal packages. Consequently, he routinely prepares funding applications and conducts technical editing for various clients.

PERMITS

U.S. Fish and Wildlife Service Section 10(a)(1)(A) Recovery Permit for the Peninsular bighorn sheep

PROFESSIONAL ORGANIZATIONS / ASSOCIATIONS

The Wildlife Society

Cal Alumni Foresters

Mt. Diablo Audubon Society

OTHER AFFILIATIONS

Scientific Advisor and Grant Writer – *The Red Panda Network*

Scientific Advisor – *Mt. Diablo Audubon Society*

Grant Writer – *American Conservation Experience*

TEACHING EXPERIENCE

Instructor: Wildlife Management - The Pennsylvania State University, 1998

Teaching Assistant: Ornithology - The Pennsylvania State University, 1996-1997

PUBLICATIONS

Gutiérrez RJ, AS Cheng, DR Becker, S Cashen, et al. 2015. Legislated collaboration in a conservation conflict: a case study of the Quincy Library group in California, USA. Chapter 19 *in*: Redpath SR, et al. (eds). *Conflicts in Conservation: Navigating Towards Solutions*. Cambridge Univ. Press, Cambridge, UK.

Cheng AS, RJ Gutiérrez RJ, S Cashen, et al. 2016. Is There a Place for Legislating Place-Based Collaborative Forestry Proposals?: Examining the Herger-Feinstein Quincy Library Group Forest Recovery Act Pilot Project. *Journal of Forestry*.