

To: Santa Clara Valley Water District Board Members
5750 Almaden Expressway
San Jose, CA 95118

Dear Water Board member,

As a Santa Clara valley resident and native Californian I understand the economic value of new water capture systems and our long-term water supply challenges, but the proposed Pacheco Reservoir Expansion Project (Pacheco Dam project) will likely have many profound and significant negative environmental impacts, cause unconscionable damage to a region rich in Native American artifacts and human remains, and is simply unjustifiably expensive for the amount of water it could provide. In this letter I will submit the evidence to support those concerns.

One major, multi-faceted problem with the Draft Environmental Impact Report (DEIR) for this project is that it either minimizes or outright fails to disclose all the environmental impacts of the project. It acknowledges, for example, that some plant and animal species within the project area are “sensitive”, but fails to point out that the State of California recognizes a *rank* of sensitivity levels. [Table 3.5-1 from the 2021 DEIR is shown below.]

Table 3.5-1. Vegetation Alliances and Associations and Other Land Cover Types in the Project Study Area

Alliance ¹	Association ¹	Sensitive Natural Community	Acres ⁵
box-elder forest	<i>Acer negundo</i>	Yes	7.4
California buckeye groves	<i>Aesculus californica</i>	Yes	16.8
eucalyptus – tree of heaven – black locust groves	<i>Eucalyptus</i> (globulus, camaldulensis)	No	1.0
Hinds’s walnut and related stands	<i>Juglans hindsii</i>	Yes	3.4
foothill pine woodland	No Association	No	22.1
	<i>Pinus sabiniana</i> / <i>Adenostoma fasciculatum</i>	No	87.1
California sycamore woodlands	No Association	Yes	88.4
	<i>Platanus racemosa</i> – <i>Quercus agrifolia</i>	Yes	33.7
	<i>Platanus racemosa</i> – <i>Salix laevigata</i>	Yes	38.2
	<i>Platanus racemosa</i> / <i>Baccharis salicifolia</i>	Yes	5.3
	<i>Platanus racemosa</i> – <i>Quercus lobata</i>	Yes	7.6
black cottonwood forest	<i>Populus trichocarpa</i> – <i>Salix laevigata</i>	Yes	3.5

This rank distinction, however, is important, in that many species in the area have a state rank of **S1** (representing a “**Critically Imperiled**” species at very high risk of

extinction due to restricted range, few populations, steep declines, severe threats or “other factors”) and many others a state rank of **S2** (representing an **“Imperiled” species** also at high risk of extinction due to a fairly restricted range, relatively few populations, recent and widespread declines or “other factors”). [Table 2 below taken from Scott Cashen’s letter to the Calif. Dept. of Fish and Wildlife, Dec. 1, 2021] (1)

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
Arbutus Ranch jewelflower	S2	G3G4T2	Potentially “substantial portions of populations” ⁵²
Sycamore alluvial woodland ⁵³	S1	G1	Approximately 158.9 acres.

Since the state sensitivity rank ranges from S1 to S5 (where S5 is considered a “secure” species at relatively low risk of extinction), the simple designation in the

DEIR that a species is “sensitive” greatly obfuscates the level of imperilment of some species in the project area. I quote a section of Scott Cashen’s letter to the Calif. Dept. of Fish and Wildlife (1) concerning one such “sensitive” species and habitat below.

“Sycamore alluvial woodland is an extremely rare and threatened habitat type that supports numerous special-status species. (2). **By 1966, there were only 17 significant stands of Sycamore alluvial woodland (totally approximately 2000 acres) remaining in the state.** (3), and 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.** (4)

The project would directly (through removal or inundation) or indirectly (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. (5) This impact would be extremely significant and may not be mitigatable due to the difficulty in finding unhybridized seed sources, the limited number of sites that potentially could be acquired for compensatory mitigation, and the conflicts with the Santa Clara Valley Habitat Plan.”

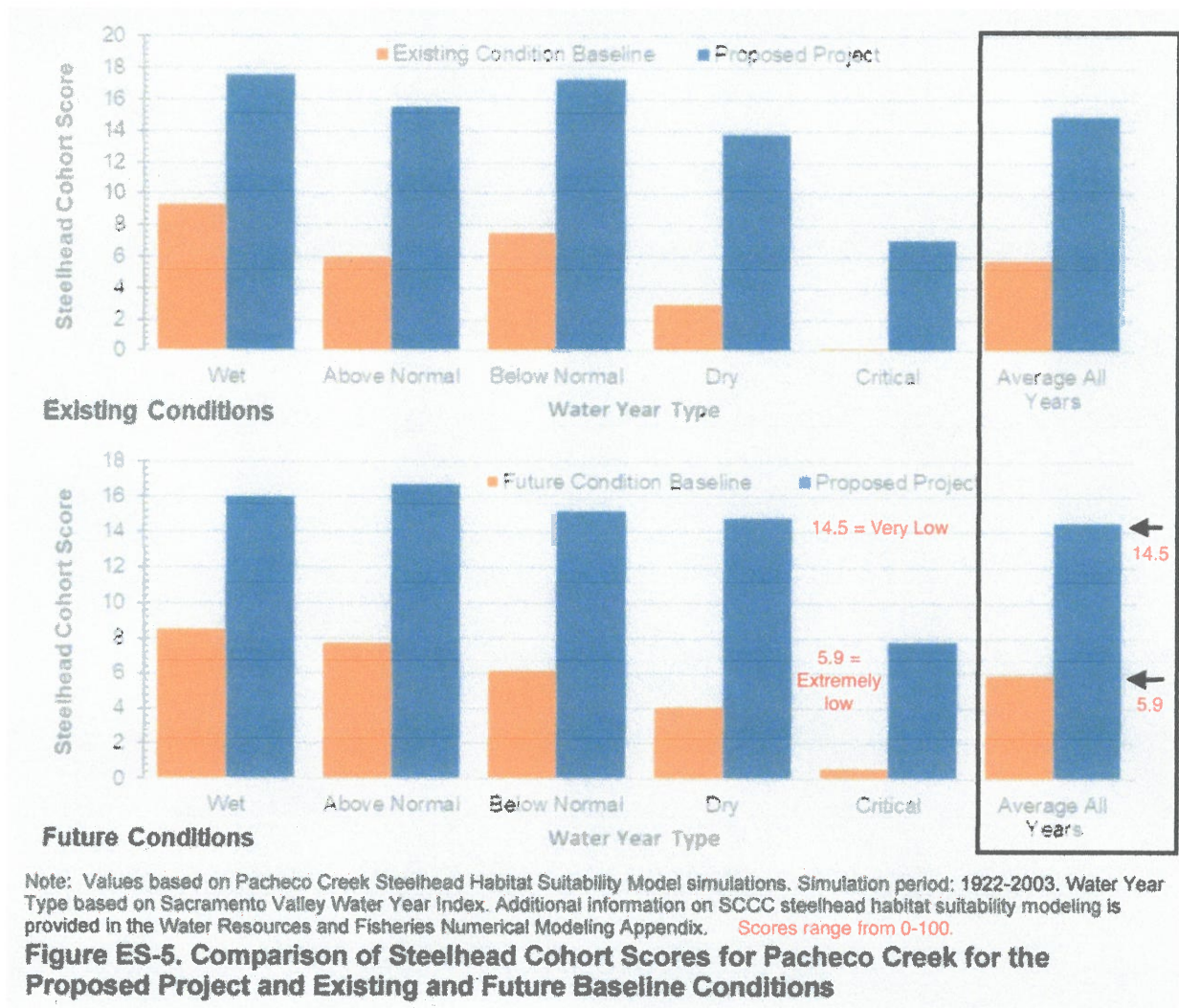
But this impact on an extremely rare and important stand of Sycamore Alluvial Woodland is not the only important ecological impact of the project. **The new dam would inundate approximately 1,500 acres of land along about 8.3 miles of creek** that supports sensitive natural communities and numerous special-status species. As presented in various Tables and Appendixes in the DEIR itself, the portions of the study area that were surveyed indicate that **the project would impact at least:**

- * **16 sensitive natural communities across 135.9 acres (beyond and excluding the 158.9 acres of Sycamore Alluvial Woodland),** (6)
 - * **1,057 acres of oak woodlands,** (7)
 - * **34 populations of 8 special-status plant species,** (8)
 - * **Habitat, or potential habitat, for 36 special-status animal species** (the San Joaquin kit fox, for example), many of which are federally or state listed, (9)
 - * **3 bald eagle territories and 3 golden eagle territories,** (10)
 - * **1,778 acres of critical habitat for the California red-legged frog,** (11)
- and
- * **1,778 acres of habitat for the California tiger salamander.** (12)

While **negative impacts are certain for animal and plant species inundated by the proposed reservoir or smashed and/or torn apart during the 44.8 miles of road construction, the 4.1 miles of new electrical transmission lines and the pumping station and associated 10,800 feet of 9.5 foot diameter pipeline proposed to run in parallel with (and often close to) the “recovered” creek**

downstream of the new dam... **it is far less certain that any *real* benefit to SCCC steelhead *populations* will actually occur** as a result of this proposed dam project.

As pointed out by Dr. Jeffrey Michaels in his Nov. 29, 2021 analysis of the Pacheco Dam project (13), the Feasibility Documentation provides no evidence that habitat improvements, per se, will create a steelhead population in Pacheco Creek, especially considering the rather **meager increase in habitat suitability** the project proposes to provide. Consider the Figure ES-5 (below) from the DEIR.



Note that for all the many millions of dollars the project proposes to spend on SCCC steelhead stream flow and habitat improvement, by their own DEIR data the **"Steelhead Cohort Score" (which they propose is a measure of habitat suitability) is increased only from 5.9 out of 100 (extremely low habitat suitability) to 14.5 out of 100 (a very low habitat suitability)**. As an engineer colleague commented, "This looks like and increase from *terrible* to *merely*

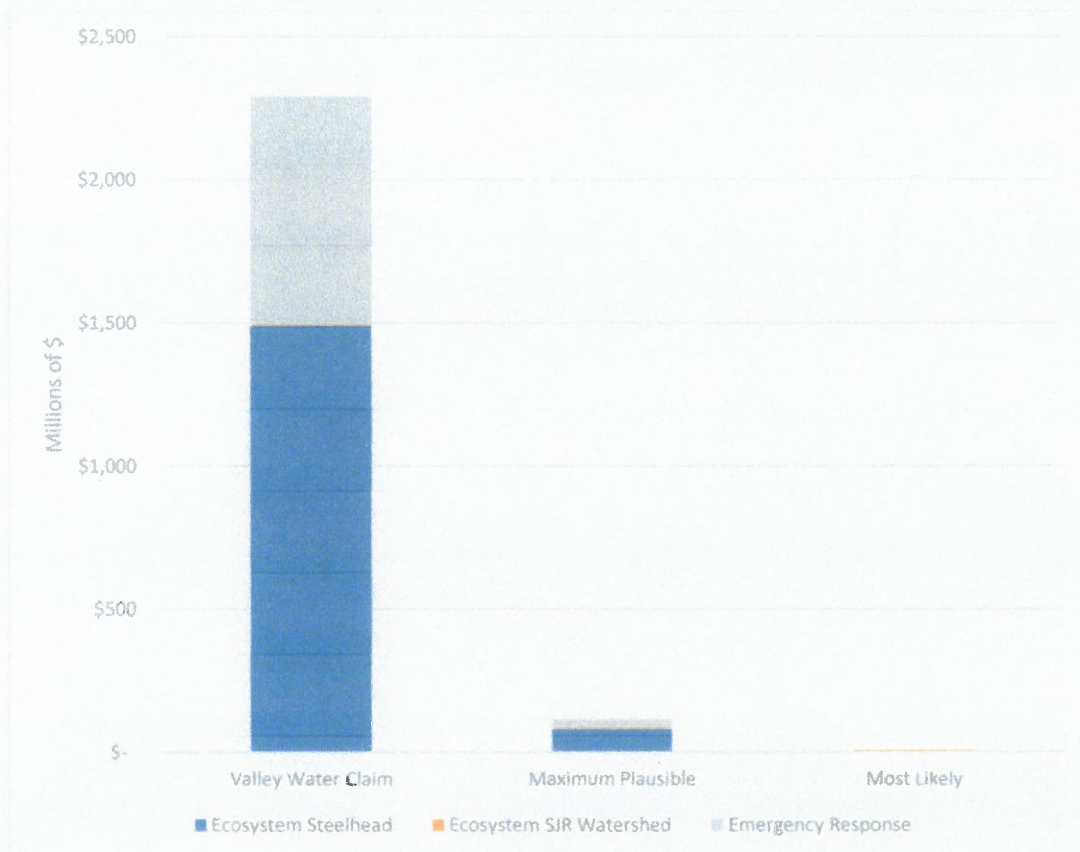
pathetic". Finally, even if the project does provide *marginally* "improved steam flow conditions", it is **irrelevant unless** the SCCC steelhead re-inhabits the stream *and* shows **increased occupancy, and increased survival and reproduction** of the steelhead population in that stream.

Another impact the DEIR minimizes is the **unconscionable inundation and/or destruction of Native American artifact sites in the project area**. In 1993 archeologist Mark Hylkema documented for the journal *Society for California Archaeological Proceedings* **at least eight different Native American sites on the property, dating from 1000 B.C to 500 A.D.** He documented **abundant artifacts** (scrapers, drills, blades, flake tools, projectile points, pestles, milling slabs, handstones, numerous boulders with mortar holes and examples of cupule rock art as etched circles on serpentine boulders throughout the stream bed), **as well as signs of human burial, as evidenced by both adult and juvenile human bones** along the creek banks. (14) Note that there are likely more than just the 8 sites Hylkema documented, since an article published by the **Amah Mutsun Tribal Band** indicated that **at least 42 cultural sites would be disturbed by the construction of the Pacheco Dam**. (15) The inundation of these ancient Native American sites and artifacts alone is by itself unconscionable and totally unacceptable, and when coupled with the negative environmental impacts discussed previously **should be enough to halt this project forever**.

That said, and as Dr. Jeffery Michael has so clearly explained in his review of the Pacheco Dam project (13), **the vast majority of the "monetized benefits" ascribed to the Pacheco Dam project are unsupported and severely overstated, and potential alternative projects could provide cheaper water and far more in the way of ecosystem benefits** than the Pacheco Dam project will ever provide. In his paper he painstakingly examines the values of the "public benefits" claimed in the DEIR by Valley Water and ascribed to the Pacheco Dam, compared to the much more probable estimated values following WSIP guidance. To quote his findings:

"It is apparent that an accurate benefit-cost analysis is not even close to supporting the \$2.12 billion cost to Valley Water ratepayers and the State of California, and the public benefits are far too low to justify the nearly \$500 million award Valley Water seeks from the WSIP. As shown in Figure 1 (below), Valley Water's claimed public benefits are more that twenty times the maximum plausible value of public benefits."

Figure 1. Net Present Value of Claimed Public Benefits from Pacheco Dam as Compared to Estimated Values Following WSIP Guidance



Note: Ecosystem SJ Watershed included for illustration only. These claimed values were not reviewed in this report.

Dr. Michael presents a very clear cost-accounting to support the graphs in Figure 1 above, very logically debunking the hyperinflated monetary “public benefits” claimed by Valley Water. His analysis of the claimed “public benefits” resulting from changes to SCCS steelhead habit in the project are, for example, compared to other steelhead projects in California and among a group of Western states in the USA. The West Coast Region of the National Marine Fisheries Service (NMFS), for example, also has a recovery plan for SCCC steelhead population located in the watersheds from the Pajaro River south to Arroyo Grande Creek. NMFS estimates the recovery cost for the SCCC steelhead population will be \$560 million borne over the next 80 to 100 years, with the benefits of the myriad projects proposed far outweighing the benefits of the improvement in habitat on Pacheco Creek. Most tellingly, **the benefit estimate Valley Water has placed on the habitat improvement from the Pacheco Dam project is nearly *three times* the estimated cost for the NMSF project that will substantially improve steelhead habitat throughout the *entire range of the species*!**

In another example, Dr. Michael compares the estimate of benefits of habitat improvements in Pacheco Creek (as a result of the Pacheco Dam project) to money spent from the **Pacific Coastal Salmon Recovery Fund** to reverse declines in Pacific salmon and steelhead. This program was established by Congress in 2000 and as of October 2019 has awarded **\$1.4 billion** for salmon and steelhead restoration in Alaska, Washington, Oregon, California and Idaho and supported **13,700 projects restoring 1.1 million acres of spawning and rearing habit**. It is thus interesting that **Valley Water claims the benefits of Pacheco Dam to steelhead are about \$1.5 billion** (the blue portion of the bar in Figure 1 above), but the *actual, small benefits to Pacheco Creek* the Pacheco Dam project is *expected* to supply to steelhead habitat (recall that the Steelhead Cohort score was only raised from 5.9 out of 100 to 14.5 out of 100) renders Valley Water's claim of \$1.5 billion in ecosystem benefits absurd.

In yet another example, Dr. Michael compares the estimate of benefits for habitat improvements in Pacheco Creek to those in the **Battle Creek Salmon and Steelhead Restoration Project** (a twenty-year project located in Shasta and Tehama Counties). That **\$162 million project restored 42 miles of habitat on Battle Creek and an additional 6 miles of tributaries. In addition, the project reduced fish migration barriers at hydroelectric facilities (including the removal of multiple dams, the creation of a mile-long bypass canal, and the construction of fish ladders)**. That project is arguably the largest salmon and steelhead project in the state of California, **and its ecological benefits far surpass those expected for the Pacheco Dam project... at about one tenth the \$1.5 billion benefits estimate for the Pacheco Dam**.

Table 1. Potential Alternatives Projects to Value Ecosystem Benefits to Pacheco Creek (Net Present Value in \$2021)

Physical Benefit	Total Cost
Valley Water Claim – Cost of Smaller Pacheco Dam that Dedicates All Water Supply to Steelhead Benefits⁷	\$1,491.5 million
Large projects with more benefits than Pacheco Dam	
Restore salmon and steelhead habitat in Battle Creek – 48 miles of riparian and stream restoration, multiple dam removals, canal	\$162 million
Steelhead Recovery Plan for Pajaro River and Salinas River Core 1 Population (Pacheco Creek is part of the Pajaro River complex) ⁸	\$117 million (NPV)
Potential alternative benefit estimates (\$2021)	
Purchase 4,300 AF/yr of Agricultural water at \$316-\$749/AF over time ⁹	\$81.5 million (NPV)
Purchase 4,300 AF/yr of M&I water at \$761-929/AF over time ¹⁰	\$105.8 million (NPV)

Table 2. Alternative Estimate of Ecosystem Benefits for the Pacheco Dam Project

	Valley Water Claim	Maximum Plausible Value	Most Likely Value
Estimated Benefits (\$M)	\$1,491.5	\$81.5	\$0

It is not just the monetary value of the “ecosystem benefits” that are overinflated. Dr. Michael does another detailed analysis to show that the estimated value of \$792 million for the “emergency water supply benefits” are similarly inflated.

Table 3. Value of Emergency Water Supply (Net Present Value \$2021)

	Valley Water Claim	Maximum Plausible Value	Most Likely Value
Estimated Benefits (\$M)	\$792.2	\$26	\$0

Which in turn gives rise to his Figure 1 and Table 4 below.

Table 4. Alternative Estimate of the Net Present Value of Benefits of the Pacheco Dam Project

Category	Valley Water Claim (\$M)	Maximum Plausible (\$M)	Most Likely Benefits (\$M)
Public Benefits			
Ecosystem Improvement in Pacheco Creek	\$1,491.5	\$81.5	\$0
Ecosystem Improvement in San Joaquin River Watershed	\$6.4	\$6.4 ¹	\$6.4 ¹
Emergency Response	\$792.2	\$26	\$0
Non-Public Benefits			
M&I Water Supply	\$142.5	\$142.5 ¹	\$142.5 ¹
M&I Water Quality	\$125.4	\$125.4 ¹	\$125.4 ¹
Total Benefits	\$2,558	\$381.8	\$274.3
Total Costs	\$2,120	\$2,120	\$2,120
Benefit Cost Ratio	1.18	0.18	0.13

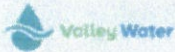
¹Directly from Pacheco Reservoir Feasibility Documentation (Valley Water 2021)

It is also critically important to note then that other, **less expensive and less ecologically and culturally detrimental alternatives are available.**

Approximate Storage Project Cost Comparison

	Pacheco Reservoir Expansion	Los Vaqueros Expansion and Transfer Bethany Pipeline ¹	Sisk Dam Raise ²	McMullin 'Aquaterra' Groundwater Bank ³	AVER 'High Desert' Groundwater Bank ⁴
Total Capital Cost	~\$2,520 Million	~\$951 Million	~\$1,292 Million	~\$344 Million	~\$159 Million
Total Storage Capacity	134 TAF	115 TAF	130 TAF	800 TAF	280 TAF
\$/AF of storage capacity	\$18,800/AF	\$8,300/AF	\$9,900/AF	\$400/AF	\$600/AF

1. WE Total Project Cost based on WE Expansion Proforma Financial Model Version 5.0 Total Capital Cost, which includes the Transfer Bethany Pipeline cost.
2. Sisk Total Project Cost based on Sisk Dam final feasibility report dated December 2020, which was converted to an inflated cost projection using 4% inflation assumption.
3. McMullin Total Project Cost based on 2020 preliminary estimate (to be revised) which was converted to an inflated cost projection using 4% inflation assumption.
4. AVER Total Project Cost based on Phase 1 Project Cost (similar size/scope), which was converted to an inflated cost projection using 4% inflation assumption.



Attachment 1
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Project	District Lifecycle Cost (present value, 2017)	Unit Cost
California WaterFix	\$620 million	\$600/AF
Dry Year Options/Transfers	\$100 million	\$1,400/AF
Groundwater Banking	\$170 million	\$3,900/AF
Groundwater Recharge	\$20 million - \$50 million	\$400/AF - \$1,300/AF
Lexington Pipeline	\$90 million	\$1,000/AF
Los Vaqueros ¹	\$40 million	\$400/AF
Pacheco Reservoir ¹	\$450 million	\$2,700/AF
Potable Reuse - Ford Pond	\$190 million	\$2,500/AF
Potable Reuse - Injection Wells	\$290 million - \$860 million	\$2,000/AF
Potable Reuse - Los Gatos Ponds	\$990 million	\$1,700/AF
Sites Reservoir ¹	\$170 million	\$800/AF
Water Contract Purchase	\$360 million	\$800/AF

1. Assumes Prop 1 Water Storage Investment Program funding. Costs would roughly double without funding.

[Attachment 4 of Valley Water's September 19, 2017 Meeting Agenda Item 7.1, available at:

<https://scvwd.legistar.com/LegislationDetail.aspx?ID=3157741&GUID=695A0E8D-A16E-480F-AEAA-8D19D1EB70E3&Options=&Search=J>

Simply put, the Pacheco Dam project makes no sense economically, creates a whole host of significant negative environmental impacts for a number of sensitive species of animals and plants, inundates rare woodlands, creates over 40 miles of needless roads and pipeline excavations and inundates and/or destroys forever culturally priceless Native American artifacts and sites. **Other alternatives exist, like continued water conservation efforts, "wastewater to potable water" purification technologies and stormwater recapture**, that could together provide the water needed without the destruction that will be caused by this proposed overpriced Pacheco Reservoir Expansion Project. Equally important is the fact that the water provided by alternative approaches like wastewater purification (as demonstrated by the Orange County wastewater purification plant, for example) is infinitely reuseable and will be consistently available in known quantity... unlike the reliance on water from the Delta that is so heavily dependent on unpredictable rainfall in the face of global climate change. **The Pacheco Reservoir project is infeasible on financial, environmental and cultural heritage grounds, and should be abandoned in favor of some of the better alternatives presented above.** Sincerely and respectfully,

Dr. Steven White, Ph.D.
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San Jose State University
San Jose, CA 95192

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References.

- (1) Scott Cashen, M.S., Senior Wildlife Biologist. Letter to Charlton H. Bonham, Director, Calif. Dept. of Fish and Wildlife. "Negative Biological Resource Effects of the Pacheco Dam Project", Dec. 1, 2021.
- (2) San Francisco Estuary Institute-Aquatic Science Center and H.T. Harvey & Associates, 2017. Sycamore Alluvial Woodland: Habitat Mapping and Regeneration Study. Prepared for the Calif. Dept. of Fish and Wildlife Local Assistance Grant Program. A Report of SFEI-ASC's Resilient Landscapes Program and H.T. Harvery & Associates, Publication #816, San Francisco Estuary Institute, Richmond, CA.
- (3) Ibid. Significant stand was defined as an occurrence covering at least 10 acres.
- (4) Grossinger RM, Beller EE, Salomon MN, Wipple 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 #588, San Francisco Estuary Institute, Oakland, CA. p.83.
- (5) DEIR, Table 3.5-7, pp. 3.5-68 and -69, and Biological Resources-Botanical/Wildlife Appendix, Attachment B, Table 3-1.
- (6) DEIR, Table 3.5-6,
- (7) DEIR, Table 3.5-6 and p. 3.5-71.
- (8) DEIR, p. 3.5-79.
- (9) DEIR, Biological Resources-Botanical/Wildlife Appendix, Attachment A, p.2-4 and Exhibit E, Table 4-1.
- (10) DEIR, Biological Resources-Botanical/Wildlife Appendix, Attachment D, p.3-2.
- (11) DEIR, p. 3.5-86.
- (12) Ibid. (DEIR, p. 3.5-86).
- (13) Dr. Jeffrey Michaels, "*Review of the Pacheco Dam Feasibility Documentation: New Pacheco Dam is Economically and Financially Infeasible*", Nov. 29, 2021.
- (14) *Pacheco Creek: Native American remains, artifacts found at proposed dam site.* East Bay Times article by Lisa M. Krieger, Aug. 16, 2017.
- (15) *Four Current Threats to Sacred Lands of the Amah Mutsun Tribal Band.* <http://www.protectjuristac.org>. See also <https://amahmutsun.org>.

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