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Appeal No. A-3-MRA-19-0034 &
Coastal Permit No. 9-20-0603

NOVEMBER 17, 2022

CORRESPONDENCE

From Elected Officials, Tribal Officials

and Organizations

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October 27, 2022

VIA EMAIL

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603 & Appeal No. A-3-MRA-19-0034: Impact on Customer Rates

Dear Tom:

This letter provides background details of how costs to construct and operate the Monterey Peninsula Water Supply Project Desalination Facilities, which include the source water wells, desalination treatment facility, and desalination conveyance pipelines ("Project"), could impact monthly water bills for average single-family residential customers in California American Water's ("CalAm") Monterey service area. In particular, we have focused on potential impacts to low income customers that qualify for CalAm's Customer Assistance Program ("CAP"). It is important to note that, as a regulated public utility, changes to CalAm's customer rates are subject to a public review and approval process before the California Public Utilities Commission ("CPUC"). Accordingly, the projections presented in this summary are estimates based on current available information, and have not been approved by the CPUC. The CPUC has remained committed to ensuring the affordability of water for low income customers of its regulated utilities, like CalAm, and as discussed below, CalAm is confident the CPUC will approve additional measures to increase water affordability associated with the Project.

I. RATE BACKGROUND

In order to provide future projections, it is first important to understand how CalAm's current base rate system is set up for residential customers. The rates for single-family residential customers fall into four pricing tiers. During each monthly billing period, household water use starts in the first tier, where the price per 100 gallons ("CGL") is the lowest. Each tier has a ceiling on the amount of water allocated to it; if a customer uses more water than the

ceiling in a particular tier, additional water consumption falls into the next higher-priced tier. Thus, the tiered rate system rewards customers who conserve water.

The below chart shows CalAm's current tiered rates for the Monterey service area:

Single Family Rates (As of March 4, 2022)		
Tier 1	For the first 29.9 CGL	$1.0475 per CGL
Tier 2	For the next 29.9 CGL	$1.5713 per CGL
Tier 3	For the next 54.5 CGL	$4.1901 per CGL
Tier 4	For all water over 114.3 CGL	$6.2851 per CGL

In addition to the tiered rate structure, all customer bills are subject to various monthly fees, including a monthly meter service charge, which is based on the size of the meter serving the residence, Monterey Peninsula Water Management District user fees, and other surcharges.[1] Based on existing bills, half of CalAm's single-family residential customers have an average monthly bill of approximately $82.85 or less.[2] This half of the customer base typically uses less than 29.9 CGL (i.e., Tier 1) of water on a monthly basis.

II. PROJECTED MONTHLY RATE INCREASE FOR AVERAGE CUSTOMER

In 2020, CalAm estimated to Coastal Commission staff that, based on current information at that time, the average single-family customer's monthly water bill would increase by approximately $37 to $40 as a result of the Project. Since that time, there have been numerous factors outside of CalAm's control that have resulted in further increases to these anticipated rates. For instance, as a result of inflation and other economic reasons, labor costs and materials costs have gone up, increasing overall Project construction costs. Similarly, operation and maintenance ("O&M") costs have increased by about 20% due to inflation (net of lower chemical, power and non-labor costs resulting from a smaller production capacity).

Based on current modeling, CalAm now estimates that the cost of Project construction and operation will result in a monthly rate increase of approximately $47 to $50 for the average single family customer in the Monterey service area.[3] This increase will occur when the Project is put into service.[4] This estimated average rate increase reflects the initial phase of the Project,

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[1] Most single-family residential customers in the Monterey service area are served by a 5/8-inch meter.

[2] To prepare the estimates in this summary, California American Water used customer bills from May 2022, which is historically the month of the year where water use best approximates an annual average.

[3] The Project's projected rate increase consists of three components: (1) a fixed monthly cost for financing construction of the Project using a State Revolving Fund ("SRF") loan; (2) capital expenditures for the Project, which are not financeable through a SRF loan; and (3) ongoing O&M costs for the Project.

[4] The Project is expected to come online in December 2026. This date assumes that if the Coastal Commission approves the Project's coastal development permits in November 2022, California American Water will take up to two years to clear all prior to construction conditions (including securing certain permits from other agencies), followed by 18 to 24 months of construction in the Coastal Zone.

which, as CalAm has proposed to Commission staff, would have a production capacity of 4.8 million gallons per day.

III. LOW INCOME ASSISTANCE PROGRAMS AND RATE RELIEF

CalAm's current CAP provides a 30% discount on monthly bills to qualifying customers.[5] Income guidelines for customer eligibility in the CAP are set forth below:

INCOME GUIDELINES / *REQUISITOS DE INGRESOS*
(Effective June 1, 2022 to May 31, 2023 /
Vigentes desde el 1 de junio de 2022 hasta el 31 de mayo de 2023)

Number of Persons in Household / *Cantidad de personas en el grupo familiar*	Total Combined Annual Income / *Ingreso anual combinado total*
1-2	$36,620
3	$46,060
4	$55,500
5	$64,940
6	$74,380
7	$83,820
8	$93,260
Each Additional Person, Add / *Cada Persona Adicional, Agregue*	$9,440

In CalAm's current General Rate Case that is pending at the CPUC, we have requested approval to increase this discount from 30% to 35%. Moreover, as we explained in our Low Income Rate Relief Proposals, which we previously provided to Coastal Commission staff, CalAm agreed to seek CPUC approval to raise that discount for the Monterey service area to 50% in connection with construction and implementation of the Project.

As of September 2022, approximately 3,700 customers were enrolled in the CAP in CalAm's Monterey service area. This represents a substantial increase in CAP enrollment as compared to 2020, when only 2,504 customers were enrolled in the program. Based on existing bills, the average CAP customer has a monthly bill of about $65.74 in 2022, inclusive of the current 30% CAP discount. As with all single-family residential customers, the average CAP customer uses less than 29.9 CGL (i.e., Tier 1) of water on a monthly basis.

In 2020, CalAm estimated that with the CPUC's approval of CalAm's proposed increase in the CAP discount to 50% per month, the average CAP customer would have a monthly rate increase of approximately $10 to $12 as a result of the Project. Based on CalAm's updated modeling, as described above, with the 50% CAP discount the average CAP customer would have a monthly rate increase of approximately $14 to $18 as a result of the Project. Notwithstanding that potential increase, and as expressed in our proposed Low Income Rate Relief Proposals, CalAm has committed to the goal of completely offsetting cost impacts from the Project to its low-income customers such that the average CAP customer would experience

[5] The discount applies to the monthly meter service charge on every bill as well to rate tiers 1 through 3 (up to 11,430 gallons per month).

no rate increase as a result of the Project. CalAm has proposed seven different programs that would achieve this goal, most of which would require CPUC approval. In addition, if the CAP discount were to be increased to 70%, the average CAP customer would pay no rate increase as a result of the Project (and may even pay less than they would otherwise pay in the absence of the Project and this increased discount).

CalAm understands that Coastal Commission staff is concerned that the CPUC may not approve one or more of CalAm's proposed Low Income Rate Relief Proposals before the Project comes online and rate increases occur. To address such concerns and ensure that increased rates from the cost of desalinated water do not adversely affect low income customers, CalAm has proposed the following Special Conditions for Commission staff's consideration, which (1) will increase the conservation of water for customers in the CAP program, thereby further reducing water consumption and lowering average monthly bill amounts; and (2) ensure that CAP customers are not unfairly burdened with substantial rate increases if the CPUC does not approve CalAm's Low Income Rate Relief Proposals before rate increases from the Project impact the bills of CAP customers:

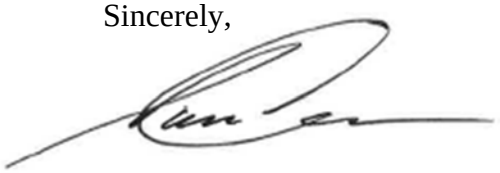
> **Water Conservation**. PRIOR TO THE COMMENCEMENT OF PROJECT OPERATIONS, the Permittee shall offer all customers enrolled in its Customer Assistance Program for the Monterey service area, including both single-family and multi-family residential customers, free installation of low-flow fixtures (sink and bathtub faucets, showerheads, and toilets) meeting all minimum California Energy Commission or any other applicable efficiency standards. If an eligible customer and the owner of the property in which the customer resides accepts such offer, the Permittee shall install or cause to be installed appropriate such low-flow fixtures in the customer's residence within six months. The Permittee shall submit a final report to the Executive Director that includes, at a minimum, evidence that such offer was made to eligible customers and statistics showing the number of customers who have accepted the offer and had the low-flow fixtures installed.
>
> **Low-Income Rate Assistance**. PRIOR TO THE COMMENCEMENT OF PROJECT OPERATIONS, the Permittee shall seek the California Public Utilities Commission's approval of one or more low income rate relief programs to minimize rate increases on low-income customers resulting from the Monterey Peninsula Water Supply Project Desalination Facilities, which include the source water wells, desalination treatment facility, and desalination conveyance pipelines ("Project"), with the goal of completely offsetting such rate increases for the average customer enrolled in Permittee's Customer Assistance Program. The Permittee shall ensure that, upon the commencement of the Project's deliveries of product water to Permittee's Monterey service area, customers enrolled in the Permittee's Customer Assistance Program shall not experience a rate increase resulting from the Project that exceeds $10 per month through 2030. Following permit issuance, the Permittee shall submit an annual report to the Executive Director demonstrating (i) the actions Permittee

has taken with the CPUC to secure low income rate relief program approvals; (ii) the CPUC's approval or denial of such programs; (iii) the impact all approved programs are having on the average customer enrolled in Permittee's Customer Assistance Program; and (iv) that Permittee has complied with the other requirements of this condition.

CalAm is confident that, based on its prior decisions and current rulemaking proceedings, the CPUC will support and approve measures to increase water affordability. Indeed, the CPUC is committed to ensuring that public utilities' water service is affordable and that low-income assistance programs are a means of promoting affordability, as demonstrated in the statements in various orders and decisions shown in Attachment A.

Please let me know if you have any questions about the information provided in this letter. We look forward to presenting the Project to the Coastal Commission in November 2022.

Sincerely,



Ian Crooks
California American Water Company

Attachment

cc: Kate Huckelbridge, California Coastal Commission
Noaki Schwartz, California Coastal Commission
Kathryn Horning, California-American Water Company
DJ Moore, Latham & Watkins LLP
Winston Stromberg, Latham & Watkins LLP

ATTACHMENT A

The following show that the CPUC is committed to ensuring water service is affordable and that low-income assistance programs are a means of promoting affordability.

Low-Income Ratepayer Assistance Rulemaking 17-06-024 (currently considering whether further improvements to water affordability are needed)

Decision and Order, issued September 3, 2020 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K225/346225800.PDF)

- Page 105, Conclusion of Law 10: Water utilities should provide analysis in their next GRC case to determine the appropriate Tier 1 breakpoint that aligns with the baseline amount of water for basic human needs for each ratemaking area.

- Ordering Paragraph 2: Water utilities shall provide analysis in their next general rate case applications to determine the appropriate Tier 1 breakpoint that is not less than the baseline amount of water for basic human needs for each ratemaking area.

Phase II Decision Continuing Suspension of Disconnections for Nonpayment of Water Utility Bills Accumulated During the Statewide Water Disconnection Moratorium and Improving Access to the Low-Income Water Rate Assistance Programs Statewide, issued July 20, 2021 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M394/K023/394023418.PDF)

- Page 18: Intentions to create statewide and national low-income water rate assistance programs have been announced. Today in California, only Commission-regulated water utilities uniformly offer the CAP program. In Phase II of this proceeding, we considered expansions and improvements to CAP, as an avenue for COVID relief.

- Page 27: Data exchanges have proven over the years to be the most effective enrollment method for water utility customers. We continue to focus on improving data exchanges to ease access to the CAP program for qualifying customers.

- Page 73, Findings of Fact 1: Water service is critical to public health.

- Page 75, Findings of Fact 22: Low-income water rate assistance programs are a means of promoting water affordability.

Assigned Commissioner and Administrative Law Judge's Third Amended Scoping Memo and Ruling, issued July 30, 2021 (https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M396/K193/396193387.PDF)

- Page 1: Since June 2017, R.17-06-024 has examined the various issues concerning affordability of clean, safe drinking water consistent with California's statutory recognition of the human right to water.

- Page 3: In Phases I and II of R.17-06-024, the Commission coordinated with the State Water Board to ensure that public water systems, regardless of their regulatory jurisdiction, meet the same standards for safe and reliable drinking water which is affordable to all.

- Page 6: The issues to be determined in Phase III of R.17-06-024 are: (a) How best to leverage the available relief funding? (b) Whether supplemental relief funding is needed; (c) What, if any, further improvements to water affordability are needed; and (d) Implementation issues, if any, relating to the new legislation affecting water affordability, including but not limited to SB 998, AB 401 and SB 139 enacted since R.17-06-024 was issued in 2017.

Affordability Rulemaking 18-07-006 (this rulemaking addresses affordability in general)

Order Instituting Rulemaking to Develop Methods to Assess the Affordability Impacts of Utility Rate Requests and Commission Proceedings, issued July 23, 2018 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M218/K186/218186836.PDF)

- Page 3: Californians rely on utility services, including electricity, gas, water, and telecommunications, to live and work. The Commission's commitment to ensuring these services remain affordable and accessible to Californians is articulated in Strategic Directive (SD) 04 on Rates and Affordability and SD 05 regarding Universal Access.

Decision Adopting Metrics and Methodologies for Assessing the Relative Affordability of Utility Service, issued July 7, 2020 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M344/K049/344049206.PDF)

- Page 3: While ensuring the affordability of utility services is a longstanding priority for the Commission, its importance has been magnified this year by COVID-19, which has placed great financial stress on millions of Californians.

- Page 94, Conclusion of Law 1: The Commission is generally charged with making certain levels of energy, water, and communications service affordable under various sections of the Public Utilities Code, including Section 739(d)(2), Section 382, Section 739.8(a), and Section 871.5.

- Page 95, Conclusion of Law 5: The Commission should define metrics to measure the relative affordability of essential utility services as this will allow Commission decisionmakers and stakeholders to consider the impact of Commission decisions on the relative affordability of these services, and help the Commission to meet statutory requirements to consider affordability as a goal when designing rates for essential utility services.

Decision Implementing the Affordability Metrics, issued August 9, 2022 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K428/496428621.PDF)

- Page 7: In D.20-07-032, the Commission concluded the metrics would help the Commission meet statutory requirements of Public Utilities Code (Pub. Util.) Code Section 739(d)(2), Section 382, Section 739.8(a), and Section 871.5 mandating affordable energy, gas and water, and of Section 709, Sections 280-281, and Section 275.6 assigning the Commission a significant role in preserving universal access to essential communications services.

- Pages 8-9: The Commission has the obligation to consider whether utility rates and charges are affordable while also enforcing the mandate of Pub. Util. Code Section 451 to ensure costs authorized and recovered from ratepayers are just and reasonable, consistent with safe and reliable service.16 Equally pertinent, Pub. Util. Code Section 45417 requires electric, gas, water, and telephone corporations to notify affected customers of proposed revenue changes that will impact their utility bill, by displaying rate impacts of the proposed revenue change in dollars and degree of change (percentage). Subsections (c) and (d) of Pub. Util. Code Section 454 express the legislative intent associated with notice requirements, and directs the Commission to consider both the utility proposal, together with the informed response of the people subject to the proposal, before taking action:

  (c) The commission may adopt rules it considers reasonable and proper for each class of public utility providing for the nature of the showing required to be made in support of proposed rate changes, the form and manner of the presentation of the showing, with or without a hearing, and the procedure to be followed in the consideration thereof. Rules applicable to common carriers may provide for the publication and filing of any proposed rate change together with a written showing in support thereof, giving notice of the filing and showing in support thereof to the public, granting an opportunity for protests thereto, and to the consideration of, and action on, the showing and any protests filed thereto by the commission, with or without hearing. [. . .] (d) The commission shall permit individual public utility customers and subscribers affected by a proposed rate change, and organizations formed to represent their interests, to testify at any hearing on the proposed rate change, [. . .]

- Page 79, Conclusion of Law 1: The Commission is generally charged with making certain levels of energy, water, and communications service affordable under various sections of the Public Utilities Code, including Section 739(d)(2), Section 382, Section 739.8(a), and Section 871.5.

- Page 80, Conclusion of Law 6: Introducing the affordability framework in individual proceedings facilitates examination of affordability impacts within the context of the individual proceeding and aids the Commission in fulfilling its statutory mandates.

- Page 80, Conclusion of Law 8: The Commission should enhance customer understanding of pending rate changes for utility service by regularly requiring water and energy

utilities to itemize, by proceeding, new revenues recently approved as well as revenues approved but not yet implemented, and revenues pending Commission consideration, relative to rates in effect.

- Page 82, Ordering Paragraph 2: Beginning 30 days after the issuance of this decision… California-American Water Company… shall [] submit quarterly the Water Cost and Rate Tracker (Water Tracker) to the Commission's Water Division and to the Commission's Public Advocate's Office on February 1, May 1, August 1 and November 1 of each year and shall work with staff during the next phases of this proceeding with respect to using the Water Tracker for evaluating affordability metrics' inputs and other ongoing support of the Commission's work. The Director of the Water Division may change the frequency, format, or content of the Water Tracker.

- Pages 85-87, Ordering Paragraphs 8-9:

  8. Beginning 30 days after the issuance of this decision, in any initial filing in any proceeding with a revenue increase estimated to exceed one percent of currently approved revenues systemwide, … California-American Water Company … shall introduce updated Affordability Ratio 20 (AR20) by ratemaking area, Affordability Ratio 50 (AR50) by ratemaking area, and Hours-at-Minimum-Wage (HM) for revenues in effect at the time of the filing, and shall also include:
    - Essential usage bills by ratemaking area; and
    - Average usage bills by ratemaking area and resulting AR20, AR50, and HM for average usage bills.
    - If the proceeding is a General Rate Case, concurrent with any modeling effort necessary to represent bill impacts of an authorized revenue requirement associated with a Proposed Decision, the same entity updating the rates associated with an authorized revenue requirement shall update the affordability metrics for production in the same Commission document that presents the rate impacts.

  9. Beginning 30 days after the issuance of this decision, in any initial Tier 3 Advice Letter (AL) filing requesting a revenue increase estimated to exceed one percent of currently approved revenues systemwide, … California-American Water Company…shall introduce changes in the Affordability Ratio 20 (AR20) by ratemaking area, Affordability Ratio 50 (AR50) by ratemaking area, and Hours-at-Minimum-Wage (HM) annually for each year in which new revenues are proposed, and shall also include changes by:
    - Essential usage bills by ratemaking area; and
    - Average usage bills by ratemaking area and resulting AR20, AR50, and HM for average usage bills.
    - If the filing is a General Rate Case, concurrent with any modeling effort necessary to represent bill impacts of an authorized revenue requirement associated with a Proposed Resolution, the same entity updating the rates associated with an authorized revenue requirement shall update the affordability metrics for production in the same Commission document that presents the rate impacts.

CPUC Environmental & Social Justice Action Plan, approved April 7, 2022 (cpuc.ca.gov/-/media/cpuc-website/divisions/news-and-outreach/documents/news-office/key-issues/esj/esj-action-plan-v2jw.pdf)

- Page 9: The CPUC is tasked with serving all Californians, and to do so equitably while reaching the state's climate goals, it must acknowledge that some populations in California face higher barriers to access to clean, safe, and affordable utility services.

- Page 10: In 2012, California officially passed the Human Right to Water Act, 13 providing that, "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." 14 The CPUC continues to act for all Californians to have access to clean, safe, and affordable water supplies.

- Page 38, Commission ESJ action item 3.2.2: Understanding and Acting on Affordability of Water Rates. Description: Given both the opportunity to utilize new affordability metrics and information from the Drinking Water Needs Assessment from the State Water Resources Control Board (SWRCB), continue to understand where ESJ customers are experiencing disproportionately high water rates. Tentative Work Plan: 1- Consider affordability metrics in water General Rate Cases (GRCs) 2- With the aid of information from the Drinking Water Needs Assessment, evaluate whether there are water systems within CPUC's jurisdiction where customers experience high rates that could be ameliorated with consolidation 3-Consider whether the CPUC should open an OIR on the subject of new standards for consolidation of water utility systems

CPUC Strategic Directives, Governance Process Policies, and Commission-Staff Linkage Policies, updated February 27, 2020 (https://www.cpuc.ca.gov/-/media/cpuc-website/transparency/commissioner-committees/finance-and-administration/2021/strategic-directives-and-governance-policies.pdf)

- Strategic Directive SD-04: The CPUC promotes policies and rules that provide customers access to and affordable essential services for energy, communications, water and transportation. Within its jurisdictional authority, the CPUC will… 2. Assure that essential services are available to all Californians at an affordable price;

State Water Resources Control Board

October 25, 2022

Mr. John Ainsworth
Executive Director
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

John.Ainsworth@coastal.ca.gov

Dear Mr. Ainsworth:

I write to express the State Water Resources Control Board's (State Water Board) interest in California American Water Company's (Cal-Am's) application for a coastal development permit for the Monterey Peninsula Water Supply Project (Project). We ask that the Coastal Commission give the Project a full, considered hearing. The State Water Board's interest is in permanently ending unauthorized diversions from the Carmel River, rather than any individual project. The State Water Board supports Cal-Am's and other regional efforts to develop permanent replacement water supplies that sustain only lawful diversions from the Carmel River.

Unlawful diversions have harmed the public trust resources of the Carmel River

As you are aware, after finding that Cal-Am has been diverting more than its entitled share from the Carmel River, the Board issued a cease and desist order requiring Cal-Am to drastically reduce its diversions. Doing so is critically important given that Cal-Am's excessive diversions adversely impacted the public trust resources of the Carmel River. The public trust resources of the Carmel River include the federally threatened South-Central California Coast Steelhead Distinct Population Segment, the federally threatened California red-legged frog, and the candidate western pond turtle, as well as coastal wetlands and riparian vegetative communities.

Protecting the fish, wildlife, and riparian habitat of the Carmel River depends on the development of a reliable replacement water supply that permanently ends unpermitted diversions. The Board has identified that Cal-Am's diversions "constitute the largest single impact to the instream beneficial uses of the river." (State Water Board Order 95-10, p. 25). Review of conditions 14 years later found that diversions from the Carmel River were continuing to have an adverse effect on the fish, wildlife, and riparian habitat,

including the threatened steelhead (State Water Board Order 2009-0060). Diversions from the river were directly contributing to drying out miles of the steelhead's critical habitat in the Carmel River for five to six months of the year.

The State Water Board's orders are still in effect

State Water Board Order 2016-0016 provides that the conditions of the State Water Board's orders remain in effect until "Cal-Am certifies, with supporting documentation, that it has obtained a permanent supply of water that has been substituted for the water illegally diverted from the Carmel River" and the Deputy Director of the State Water Board's Division of Water Rights concurs with the certification.

Cal-Am will not report its water use for Water Year 2021-2022 until February 1, 2023, and therefore the State Water Board is not yet able to determine whether Cal-Am is in compliance with their water rights (including permit terms such as maximum annual diversion limits). Because of the present uncertainty of Cal-Am's compliance, the State Water Board recently denied requests to modify or lift the cease-and-desist order (Eileen Sobeck, letter to David Stoldt, July 28, 2022). As California has just experienced its driest three-year period on record, continued unlawful diversions will cause even greater harm to the Carmel River's protected fish and wildlife.

Cal-Am's long-term water supply remains uncertain

Although Cal-Am and the Monterey Peninsula Water Management District (District) have implemented various measures to reduce diversions from the Carmel River, it is undisputed that Cal-Am has not yet secured a permanent replacement water supply. Cal-Am and the District have made efforts to reduce demand, including programs encouraging conservation by business and residential customers, water efficiency requirements, and tiered conservation rates, and to develop new supplies, such as the Sand City desalination plant, Pebble Beach water recycling facility, and new lawful rights in the Carmel River. Cal-Am currently relies on Pure Water Monterey to produce 3,500 acre-feet per year. The California Public Utilities Commission will consider whether to authorize Cal-Am to enter into a water purchase agreement for the Pure Water Monterey expansion project, which could provide an additional 2,250 acre-feet annually of treated water by 2024 or 2025.

The Pure Water Monterey expansion project may constitute an important component of a permanent replacement water supply, if it is developed and demonstrated to be a reliable, drought-resilient water source. However, based on regional housing needs, source reliability, and the effects of aridification on California's water supplies, the State Water Board believes it is prudent for Cal-Am to pursue additional sources of water that are sustainable and urges the Coastal Commission to consider the proposed desalination facility as a potentially vital municipal water supply that also could help to protect one of the region's most important environmental assets.

The water supply for the Monterey Peninsula remains precarious, and will continue to be so until a long-term, resilient replacement water supply is developed. The conditions of the State Water Board's orders remain in effect, including a prohibition on new water service connections served from the Carmel River. The State Water Board supports Cal-Am's efforts to develop a diverse and drought-resilient water supply portfolio. Desalination that is appropriately permitted and conditioned to protect the environment can be one part of a long-term water supply solution.[1]

We appreciate your consideration of these important issues, and State Water Board staff are available for further discussion.

Sincerely,

Eileen Sobeck, Executive Director
State Water Resources Control Board

cc: Julia Nick, Anna Naimark, Nefretiri Cooley, Jackie Carpenter, Jessica Bean, Craig Altare, Eric Oppenheimer

[1] These comments regard technical and legal matters that are within the State Water Board's purview and expertise. They should not be interpreted by the Coastal Commission or any other parties as support for or opposition to the Project or Pure Water Monterey expansion.. The Regional Water Quality Control Board, Central Coast Region (Central Coast Water Board) also has permitting authority over the Project, and will apply subdivision (b) of section 13142.5 of the Water Code and the California Ocean Plan in the exercise of that authority. These comments may not necessarily reflect the positions of the Central Coast Water Board

DEPARTMENT OF WATER RESOURCES
P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

October 24, 2022

Mr. John Ainsworth, Executive Director
California Coastal Commission
455 Market Street, Suite 300
San Francisco, California 94105

Subject: Cal Am's Monterey Peninsula Water Supply Project

Dear Mr. Ainsworth:

The California Department of Water Resources (DWR) is dedicated to clean and affordable water for all Californians, to thriving ecosystems, and to sustainable water management. DWR manages California-funded desalination grants for desalination projects located throughout the State. In 2019, DWR reviewed and awarded a $10M construction grant to Cal Am's Monterey Peninsula Water Supply Project application. DWR continues to support the project as a viable local water supply for the Region. This project is consistent with the 2015 Ocean Plan Amendment preferred intake method. If the Coastal Development Permit is approved by the Coastal Commission, the Monterey Peninsula Water Supply Project will receive $10M in Proposition 1 construction grant funds. DWR's Water Desalination Grant Program[1] encourages the Coastal Commission to **APPROVE** the Coastal Development Permit application to improve water supply reliability in the Monterey region. The Water Desalination Grant Program's support of this project is based on the finding of the Test Slant Well (TSW) and assessment of the regional supply needs.

Water supply diversity is a key element to sustainability as California faces climate change and the possibility of increased drought periods. The Monterey region is a global leader in the development of recycled water for agricultural benefits and more recently in support of its potable supply needs. However, recycled water is not drought proof. Recycled water production could be impacted by reductions in water use during droughts. Recycled water uses rely on wastewater facilities which have been shown[2] to be impacted during extended drought periods, as water use is curtailed and wastewater generation is reduced. The Monterey Peninsula Water Supply Project adds desalinated water to the water supply portfolio, which improves the region's water supply sustainability and reliability during increasingly uncertain climatic conditions.

[1] DWR's Water Desalination Grant Program acknowledges that its support of this project is based on its review of the project and water supply needs, and is not intended to, nor is it influenced by, any other pending proceedings or litigation involving this project. Also, DWR's Sustainable Groundwater Management Office and its regulatory oversight and actions regarding Sustainable Groundwater Management Act implementation in the 180/400 Aquifer basin has been and will remain separate and independent from the views and activities of the grant program.

[2] PPIC. California's Growing Demand for Recycled Water Has Ripple Effects - Public Policy Institute of California (ppic.org). May 28, 2019.

In 2015, TSW was constructed at the site of the proposed project slant wells. DWR provided a $1M grant (Proposition 50) in support of this test. A series of monitoring wells clusters were constructed to assess 180/400-foot water level groundwater basin and geochemical changes that could occur during testing of the TSW. The testing phase of the TSW occurred for 34 months at an average rate 2,050 gallons per minute (gpm) and was operated in compliance with all conditions stipulated in the California Coastal Commission Permit. This extended testing period, beyond what was originally planned, enabled collection of data under both wet and average hydrologic conditions.

Water level and geochemical monitoring showed that the TSW initially extracted groundwater, but over time increases in salinity at the TSW indicated inflow primarily from the ocean. Data collected during the testing were incorporated into the North Marina Groundwater Model, which was the basis for modeling used in the Environmental Impact Report to assess potential groundwater impacts during the full development of the Monterey Peninsula Water Supply project

Data collected during the TSW operation were analyzed and summarized by a team of local hydrogeological experts. This team's input provided technical credibility to the project findings. It was also a component of Cal Am's subsequent construction grant application.

The Water Desalination Grant Program provides grants for portable water projects to increase local and regional water supply and reliability benefits. Because of limited local water supplies, the Monterey region has been considering desalination since the 1990s. The local groundwater basins are directly connected to the ocean and are susceptible to seawater intrusion, and there are limited water supply resources, which are particularly vulnerable during extended drought periods. Water conservation is also implemented in the Monterey region. According to the 2020 Cal Am Urban Water Management Plan, the overall residential water usage in Cal Am's service area is 48 gallons per capita per day (gpcd). These factors were all taken into consideration during review of the construction application.

The lack of local surface water supplies has resulted in Cal Am's extracting additional water from the Carmel River during drought periods, exceeding Cal Am's water rights. The Monterey Peninsula Water Supply Project would enable Cal Am to reduce existing diversions from the Carmel River, thus restoring flows and protecting threatened species in the riparian and aquatic habitat along the Carmel River, including the steelhead trout and California red-legged frog.

This project also supports actions identified in the Governor's July 2020 Water Resilience Portfolio and the August 2022 water strategy document, "California's Water Supply Strategy, Adapting to a Hotter, Drier Future." The Portfolio noted, "Depending on local circumstances, desalination can be a viable supply sources, and desalting brackish groundwater can provide a safe supply and capacity for additional groundwater storage." The Portfolio directs state agencies to consider use of desalination

technology where it is cost effective and environmentally appropriate. The Strategy outlines a series of proposed actions to help replenish our state's water supply and make our system more resilient, which includes capturing stormwater and desalinating ocean and salty water to help diversify supplies.

DWR recognizes the importance of this project for local water supply reliability and resiliency and its contribution to desalination actions in the Governor's Water Supply Strategy and is supporting the implementation of this project.

Sincerely,

Karla A. Nemeth
Director
(916) 653-7007

MONTEREY COUNTY

WATER RESOURCES AGENCY

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BRENT BUCHE
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STREET ADDRESS
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SALINAS, CA 93901

September 27, 2022

Darcie L. Houck, Assigned Commissioner
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
Darcie.Houck@cpuc.ca.gov

Sent via First Class Mail and Email

Re: California-American Water Company's Application 21-11-024

Dear Ms. Houck,

The Monterey County Water Resources Agency ("MCWRA") writes this letter to express concerns over deposition testimony given in the California Public Utilities Commission proceeding over California-American Water Company's ("Cal-Am") Application 21-11-024. Cal-Am seeks approval to enter into the Amended and Restated Water Purchase Agreement ("Amended WPA") between Cal-Am, Monterey One Water ("M1W"), and Monterey Peninsula Water Management District ("MPWMD"). The Amended WPA would allow Cal-Am to purchase water from M1W and MPWMD from the Pure Water Monterey Expansion Project ("PWMx"). Cal-Am's application also seeks to update supply and demand estimates for the Monterey Peninsula Water Supply Project and cost recovery.

MCWRA has had a long collaborative relationship with M1W. This collaboration began with the construction and operation of the Castroville Seawater Intrusion Project ("CSIP") and the Salinas Valley Reclamation Project ("SVRP"), which have supplied and delivered recycled water to agriculture in the Castroville area for over 24 years. MCWRA supports this ongoing collaboration and the use of recycled water, but not at the expense of other projects. This letter provides background concerning relevant contractual water allotments between MCWRA, M1W and other parties, and details MCWRA's concerns over water supply statements at issue in Application 21-11-024. Importantly, MCWRA wants to highlight PWMx's potential impact on the Salinas Valley Groundwater Basin ("Basin") and CSIP.

Background

1. Amended and Restated Water Recycling Agreement

On November 3, 2015, MCWRA and M1W entered into an Amended and Restated Water Recycling Agreement ("ARWRA") which incorporates and reiterates agreements that had been developed over the years since the establishment of CSIP, the SVRP, and the Salinas River Diversion Facility ("SRDF"). The intent of the ARWRA was to compile all the information that pertains to the operations and maintenance of CSIP, SVRP and the SRDF, as well as the allocation of wastewater flowing into M1W's Regional Wastewater Treatment Plant.

a. New Source Waters

The ARWRA contemplated for the first time the identification and allocation of "New Source Waters". The New Source Waters are defined in the ARWRA as:

1. Agricultural Wash Water
2. Blanco Drain Water
3. Reclamation Ditch/Tembladero Slough Water
4. Monterey Storm Water
5. Salinas Storm Water

These New Sources Waters were to be dedicated to the Pure Water Monterey Groundwater Replenishment project ("PWM") and to potentially provide additional water supply to CSIP. The ARWRA also outlines the process in which the facilities to convey these new supplies to the Regional Treatment Plant would be financed and constructed. When the ARWRA was executed, the final water rights had not been obtained for the New Source Waters, nor had the Conditions Precedent for the financing of the New Source Water facilities been met (Section 16.15 of the ARWRA).

b. Blanco Drain, Reclamation Ditch/Tembladero Slough

MCWRA filed water rights applications with the State Water Resources Control Board for the drainage flows from Blanco Drain, the Reclamation Ditch, and Tembladero Slough in 2014. The applications were protested by various stakeholders and the subsequent negotiations, led by both M1W and MCWRA, resulted in much lower than expected flows. The final dismissal terms of the protests removed Tembladero Slough flows in its entirety from the portfolio, and outline stringent flow conditions on which water can be diverted from the Blanco Drain and Reclamation Ditch. The overall effect of the terms of the water rights is a large reduction in the yield available to use as New Source Waters, especially during dry year types. The ARWRA is based on outdated planning analysis which considered 6,500 acre feet per year ("AFY") of water from these two sources; however, operations over the past three seasons revealed there is significantly less than expected available water.

On June 9, 2022, MCWRA notified M1W that because the Conditions Precedent cannot be met, it was opting out of using water from Blanco Drain and the Reclamation Ditch due to the low water yields and lack of agreement for terms of use by the Regional Water Quality Control

Board. Also, per the ARWRA, the notification relieves MCWRA from any costs that have been expended by M1W on construction of the New Source Water Facilities.

c. Agricultural Wash Water

Per the ARWRA, the Agricultural Wash Water (aka, Salinas Industrial Wastewater) availability is to be determined by a separate agreement which is currently being negotiated by MCWRA, the City of Salinas, and M1W. As of now, MCWRA retains the right to utilize all the Agricultural Wash Water for CSIP. This past summer a pilot program was implemented to determine the actual amount of water that could be used from this source, which had been estimated at 3,000 AFY. Actual operations reveal this number to be close to 500 AFY by using a combination of direct diversion and the Salinas Industrial Wastewater Treatment Facility (aka, Pond 3 Facilities).

d. Salinas and Monterey Storm Water

Facilities have been constructed to capture a portion of Salinas' Storm Water and store it in the Salinas Industrial Wastewater Treatment Facility. This is currently a disposal facility. Over the past two winters an estimated 4 acre-ft of stormwater has been captured and due to loses in the system, 0 acre-ft has been available as a New Source Water. M1W incorrectly estimates 225 acre-ft to be available annually, because it only occurs in normal or wet years. This again reflects outdated planning estimates and has not yet been validated through the current operations. MCWRA is unaware of the status of the Monterey Storm Water.

2. Pure Water Monterey Water Purchase Agreement

On September 19, 2016, Cal-Am, M1W and MPWMD executed a Water Purchase Agreement ("Agreement") to provide for the sale of advanced treated recycled water ("ATW") from M1W to MPWMD, and from MPWMD to Cal-Am to serve Cal-Am's customers. This Agreement states:

- M1W will design, construct, operate and own facilities for the production and delivery of ATW for the PWM groundwater replenishment project.
- MPWMD will buy ATW and resell to Cal-Am.
- Performance Start Date is no later than January 1, 2020.
- M1W will inject 3,500 acre-ft of ATW into the Seaside Groundwater Basin every year.

According to M1W, as of September 15, 2022, approximately 7,900 acre-ft of ATW has been injected into the Seaside Groundwater Basin. For Fiscal Year 21-22, 3,500 acre-ft was delivered to Cal-Am and 173.4 acre-ft put into Seaside Basin operating reserves. This amount of delivered water takes approximately 4,320 acre-ft. of source water to be treated.

3. Pure Water Monterey Water Expansion Project

a. Draft Supplemental Environmental Impact Report

M1W published a Notice of Preparation ("NOP") of a Supplemental Environmental

Impact Report ("SEIR") for the PWMx project on May 15, 2019. The SEIR described changes to the PWM project, known as PMWx, that would increase project yield for Cal-Am from 3,500 AFY to 5,750 AFY. MCWRA recommended in response to the NOP that a thorough water balance analysis be completed to support the project recommendations for expansion of the PWM facilities. MCWRA also asserted that this analysis should be consistent with the ARWRA terms of water use priorities and allocations, as well as other contractual rights to source water.

On January 21, 2020, MCWRA provided extensive comments on the PWMx Draft SEIR including:

- The ARWRA contemplates the base PWM project, but does not include the additional water commitments necessary for PWMx.
- There are other reasonable and foreseeable projects that propose to use wastewater being utilized by M1W and those projects must be considered when determining sustainable yield for PWMx.
- The DSEIR lacks data on both source water quantities and origin.
- That data that was used may provide rough estimates of yield, but is not reliable enough to implement a project of this magnitude.
- The DSEIR uses the same sources of water as the PWM Final EIR with a demand increase of 2,250 AFY with no consideration to what this increase will do to peak demands on the entire system in the summer months.
- There is no verification that PWMx has a sustainable, reliable drought resistant water supply that does not impact the rights of MCWRA stakeholders.

On April 27, 2020, MCWRA wrote a letter to the M1W Board members detailing the numerous issues with the FSEIR, and PWMx's potential impact on the Salinas Groundwater Basin and stated it did not support certification of the Final SEIR for the PWMx. These comments were largely ignored by M1W and the Final EIR was certified on April 26, 2021, and the PWMx was conditionally approved.

b. Amended and Restated Water Purchase Agreement

The proposed Amended WPA defines the terms for the sale of water from the PWMx project to Cal-Am. The Public Utilities Commission must authorize the execution of the agreement prior to Cal-Am signing the Amended WPA, and Cal-Am filed its application on November 29, 2021. Since this date, there have been numerous documents filed with the Commission on this matter and the most recent include Phase II Testimony from Ian Crooks, Paul Sciuto, and David Stoldt. If PWMx is approved to supply an additional 2,250 acre-feet of water, it will need approximately 3,000 AFY of additional source water to generate the 2,250 acre-feet.

PUC Proceeding Testimony and Water Supply

Ian Crooks' Phase II testimony indicates that Cal-Am estimates that there is between 2,215 – 2,503 AFY of source water available for the PMWx project. Paul Sciuto's testimony estimates a range between 14,686 and 16,035 AFY. It is unclear how Mr. Sciuto differentiates between the PWM and PWMx, but he uses long-term averages and outdated assumptions from

the planning stages of PWM. Using averages in this situation is flawed since long-term water reliability and water planning decision-making should be based on times when supply is limited and not averages. There are no provisions in the Amended WPA that allow deliveries to stop if there is no source water available to M1W. In fact, the Amended WPA requires a steady commitment to supply recycled water at all times of the year.

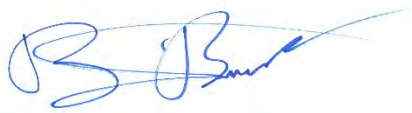
Based on the operational experiences of the past two years with the PWM project online, MCWRA's concerns regarding the availability of sufficient source waters for both the PWM and the PWMx projects are heightened, especially in dry/drought conditions. MCWRA estimates there is only 1,688 AFY of water available for the PWMx, mostly during the winter months.

The goals of CSIP are to reduce groundwater pumping and slow the rate of advancement of seawater intrusion. MCWRA observed that in the summer of 2021 and 2022, MCWRA's supplemental CSIP wells were pumped by M1W (who controls the system) excessively which is contributing to lower groundwater levels. The CSIP demands have been fairly consistent with previous years and yet the well use data (see Attachment 1), dating back from the first year CSIP was online, show that June and July 2022 are the highest two months of pumping. The previous highest months of well use was in 2003. Groundwater levels declined in the 180-Foot and 400-Foot Aquifers from August 2020 to August 2021. The greatest declines occurred in the 400-Foot Aquifer in areas near Castroville and Espinosa Lake, which is also the aquifer and geographic area where the most heavily used CSIP supplemental wells are located. Groundwater level data for the 2021-2022 period is still being analyzed, but based on the trends in extraction data from the supplemental wells during this period it is reasonable to expect that the downward trend in groundwater levels will continue. Persistent declines in groundwater levels will provide a mechanism for seawater intrusion. Even with most of the supplemental wells being pumped 24-hours a day, which is not desirable or common to historic system operations, there were two occurrences this summer where there was not enough water to serve CSIP. This has never occurred in the history of CSIP. M1W also encouraged growers to utilize their private standby wells for the first time in the history of CSIP.

MCWRA is concerned that M1W might be prioritizing wastewater use for PWM when it should be utilized for CSIP, and that this situation could worsen considerably with the PWMx project, especially if the drought continues. MCWRA is also concerned that there is not enough available source water to supply the PWMx's additional annual demand of approximately 3,000 AFY, especially when the current PWM annual demand of 4,320 AFY appears to be challenging to meet during this extended drought. MCWRA is committed to collaboration, but regional solutions, as PWMx purports to be, should not impact one basin for the benefit of another basin.

Therefore, MCWRA respectfully requests that the PUC either delay granting approval of the Amended WPA until such time that the amount of available source waters is better quantified, or include provisions that require the delivery of water to the Seaside Basin be reduced if there is no available unallocated source water for the PWMx project.

Sincerely,



Brent Buche, PE
General Manager

Attachment 1: CSIP Supplemental Well Use from 1998 – 2022

cc: PUC Service List, attached here (email only)
Monterey County Water Resources Agency Board of Supervisors (email only)
Monterey County Water Resources Agency Board of Directors (email only)

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February 4, 2022

VIA EMAIL (Tom.Luster@coastal.ca.gov)

Mr. Tom Luster
Senior Environmental Scientist
California Coastal Commission
455 Market Street, Suite 300
San Francisco, CA 94105

Re: Notice of Incomplete Coastal Development Permit Application
CDP Application No. 9-20-0603 (MPWSP)

Dear Mr. Luster:

We submit this letter on behalf of the City of Marina ("City" or "Marina") to address the continuing incomplete status of the application of California-American Water Company ("CalAm") for a Coastal Development Permit ("CDP") for the Monterey Peninsula Water Supply Project ("Project" or "MPWSP").

INTRODUCTION

After withdrawing its earlier application for a CDP for the Project, CalAm is now attempting for a third time to have the California Coastal Commission ("Commission") determine that its latest CDP application is complete. Each of its two prior efforts to complete this application were unsuccessful. In the latest Notice of Incomplete Application dated June 18, 2021 ("Notice"), the Commission notified CalAm that its latest CDP application was incomplete for many important reasons. CalAm has now submitted a letter dated January 11, 2022 with attachments and exhibits (collectively "January 2022 Letter") in which it claims yet again that new information completes its application.

However, as explained in further detail below, CalAm's January 2022 Letter provides only two new items of information and otherwise simply recycles the same arguments that have already been rejected by the Commission and which are not in accordance with law. The new information regarding CalAm's hopes for agreement with Monterey One Water with its latest proposal for obtaining permits for and lining the outfall is overstated and not sufficient to complete the application. The second item of new information -- regarding the latest proceeding

before the California Public Utilities Commission ("CPUC") for approval of a Water Purchase Agreement for water from the Pure Water Monterey Expansion Project ("PWM Expansion") -- does not provide any information that furthers or completes this Commission application. Accordingly, the City requests that the Commission notify CalAm that it has failed to provide sufficient information for the CDP application to be deemed complete. Rather, it is clear that CalAm must provide further technical and factual information to complete its application before the Commission can move forward with consideration of the CDP under the Coastal Act.

In this letter, Marina will address the following categories of information: (1) outfall liner and diffuser design and process information; (2) slant well replacement information; (3) PWM Expansion water and its impact on this application; (4) information regarding Project impacts to wetlands and other Groundwater Dependent Ecosystems; and (5) environmental justice issues.

INCOMPLETE OUTFALL LINER AND DIFFUSER INFORMATION

CalAm has been chronically unable to supply the additional information requested by the Commission regarding its proposed modifications to the Monterey One Water ("M1W") outfall liner and diffuser. In its last two attempts, CalAm has stated that its proposal that a "spray liner" approach be used to line the outfall completes its application, but this proposal apparently was rejected as inadequate by M1W's technical consultant and M1W itself. In its January 2022 Letter, CalAm now retreats from this proposal, stating: "Based on discussions with M1W staff, Cal-Am is no longer proposing to spray line any portion of the outfall pipeline." *Id*., Attachment B at 9.

Instead, according to the January 2022 Letter, CalAm now touts its latest "proposal" to M1W that CalAm's slip-on outfall liner and diffuser work be combined with by M1W's other liner and outfall projects targeted for the 2026-28 time frame and that M1W apply for and obtain all permits for both the CalAm and M1W projects on an accelerated schedule. CalAm represents that "M1W Staff have concurred that submittal of CDP applications by M1W for this work, including slip lining the landward portion of the outfall, is appropriate." *Id*., Attachment A at 3. CalAm states that "the full scope" of the proposal "must still be determined by M1W" and appears to concede that the proposal has not been approved by the M1W Board. *Id*. Although CalAm is well aware that the City of Marina has Coastal Act jurisdiction over the CDP for CalAm's proposed combined project (including the CalAm portion) within Marina, CalAm ignores Marina and instead states that the Commission will be requested to issue a future CDP for this component of the Project.

Despite CalAm's announcement of its new proposal, there is much less to this supposed development than meets the eye. As with the prior doomed "spray liner" approach, CalAm is yet again offering only a "CalAm proposal," rather than an approved M1W agreement. This fact was revealed, after CalAm submitted the January 2022 letter, by the successive determinations by the M1W Recycled Water Committee (on January 20, 2022) and reportedly the M1W Board (on January 31, 2022) that M1W should not (Committee) and MW1 does not plan to (Board) consider this CalAm proposal until after the CPUC takes action on the Water Purchase Agreement for the PWM Expansion water, which may not occur for perhaps six months or more.

Indeed, it appears that M1W would be required to conduct California Environmental Quality Act ("CEQA") review before any such agreement could occur.

In sum, this proposal remains only a proposal and not an approved agreement, no matter how favorably CalAm believes M1W staff viewed the proposal. It is premature for the Commission to deem the application complete based on this partial information. Indeed, the Commission's experience with the earlier spray-on liner proposal illustrates why it is necessary to act on agreements, rather than simply on CalAm's hopes for proposals it has made. Had the Commission taken up the application on the basis of the spray-on liner, it would have wasted a great amount of time and expense on a proposal that never ripened into an agreement. The same cautious approach is needed here.

Despite its overly optimistic statements regarding its new proposal, CalAm's January 2022 Letter also specifically states that CalAm "continues to maintain that the potential outfall improvements are not functionally related to the Project because Cal-Am does not own the [M1W] outfall and cannot control the CDP application process for the improvements." *Id*., Letter at 1. As Marina has explained in prior comment letters on this incomplete application, this argument is both nonsensical and not consistent with past Commission precedent. We will address CalAm's latest attempt to distinguish this situation from the clear requirements of the Coastal Act.

First, CalAm's January 2022 Letter abandons CalAm's prior argument that the potential modifications to M1W's outfall diffusers are not "functionally related" to the Project because the diffuser modifications and the Project can operate and function separately from another. *Compare* January 2022 Letter *with* May 19, 2021 Letter from Latham & Watkins to Mr. Tom Luster ("May 2021 Letter"). As Marina explained in detail in its June 14, 2021 letter to Mr. Luster ("June 2021 Letter"), Commission precedent makes clear that development is not "functionally related" only when two development components can each "function independently without the completion of the [other component]."[1] Because the Project cannot proceed without the completion of modifications to both the outfall diffusers and the outfall liner, any modifications to the outfall diffusers and outfall liner are "functionally related" to the Project and must be included in CalAm's application. June 2021 Letter at 2-4. CalAm cannot escape this obligation by noting that it "has discussed with M1W staff the possibility of accelerating the outfall improvements, which would be the subject of separate CDP applications." January 2022 Letter, Attachment B at 9.

Next, CalAm repeats an argument made in its May 2021 Letter, arguing that outfall improvements are not "functionally related" to the Project because CalAm "does not own the M1W outfall." January 2022 Letter, Attachment A at 2. As Marina previously explained, this argument misstates both the applicable law and the applicable facts. Public Resources Code Section 30601.5 provides that an applicant who can demonstrate a legal right, interest, or other

[1] See Staff Report for App. No. 5-01-184, Agenda Item W 21b (Jan. 17, 2002), p. 10, available at: https://documents.coastal.ca.gov/reports/2002/2/W21b-2-2002.pdf.

entitlement to use a property for a proposed development is not required to join as a co-applicant the holder or owner of any superior interest in the property. *See also* Cal. Code Regs. tit. 14, § 13053.5(b) (requiring that an applicant provide a description and documentation of the applicant's legal interest in all the property upon which work would be performed). Since CalAm has a legal right to use the M1W outfall in connection with the Project (*see* Final EIR/EIS at 4.13-28 (March 2018) (acknowledging agreement to use the outfall for brine discharge in connection with the Project); Errata to March 2018 Final EIR/EIS at E-6 (Sept. 2018)), CalAm can (and, pursuant to the Final EIR/EIS, must) add its proposed modifications to the outfall diffuser and outfall liner to its current application before the application can be considered complete.

CalAm also argues that potential outfall improvements are not "functionally related" to the Project because CalAm "does not control the CDP application process for the outfall improvements" and "cannot itself perform the outfall improvements." January 2022 Letter, Attachment A at 2. Here, CalAm again ignores that pursuant to the Final EIR/EIS for the Project, "CalAm [not M1W] shall line the land segment of the outfall with a protective liner system." Final EIR/EIS at 4.13-29. Because CalAm must ensure that the modifications to the outfall liner and diffuser will occur, these activities must be the subject of a single permit application, even if M1W is involved with such modifications.

In Attachment B to its January 2022 Letter, CalAm repeats yet another misinterpretation of Commission precedent already debunked by Marina in its June 2021 Letter, arguing that "Commission precedent supports an interpretation of 'functionally related' focused on the interdependence of projects proposed by the *same applicant*." January 2022 Letter, Attachment B at 8. In support of this position, CalAm cites a portion of a 2001 Commission Staff Report regarding the Playa Vista project, arguing that it "demonstrates that disjointed ownership was a factor in determining whether the two projects should be considered under one CDP application." *Id.* The portion of the Commission Staff Report quoted by CalAm completely disproves CalAm's faulty interpretation of Commission precedent. Specifically, that Staff Report states that "[t]he two projects . . . are not functionally related developments because the Caltrans project is not required to mitigate traffic impacts of the Playa Vista Phase I development. "[2] While the Playa Vista project Staff Report referenced that the two projects discussed therein were not under the control of the applicant, that lack of control was not a factor cited by Commission Staff in determining that those two projects were not "functionally related."

CalAm also overstates the significance of common ownership in its description of a January 28, 1997 Staff Report regarding a Lechuza Villas West project. While that Staff Report did acknowledge that single ownership of 17 lots as one of multiple factors supporting the

[2] See Staff Report for App. No. 5-00-400, A-5-PLV-00-417 (Playa Capital), Agenda Item W23a & 23b (May 24, 2001) p. 5, available at https://documents.coastal.ca.gov/reports/2001/6/W23a,b-6-2001.pdf.

conclusion that sixteen permit applications were one "functionally related" project, it does not mandate that components of a project under common ownership be "functionally related." [3]

Thus, CalAm has yet again failed to establish that the proposed modifications to the outfall diffuser and the outfall lining work are not "functionally related" to the Project. Further, as Marina noted in its March 25, 2021 letter to the Commission ("March 25 Letter") and in its June 2021 Letter, CalAm would be engaging in prohibited segmentation of its Project if it attempts to move forward with its current CDP without having included the proposed outfall modifications within its consolidated CDP application. June 2021 Letter at 5. Until CalAm reaches an agreement with M1W regarding modifications to the outfall diffuser and installation of an outfall liner, and until CalAm includes this information within its Project description, the Commission cannot proceed forward in processing the CDP.

SLANT WELL REPLACEMENT AND MOVEMENT

CalAm's application also remains incomplete with respect to the issue of current and future proposed slant well locations. In prior letters, CalAm conceded that the slant wells would only have a 25-year operating life, but otherwise took the position that "it is speculative to assess how or where Cal-Am may replace or relocate the slant well network after its initial operating life, or whether well relocation will be necessary based on sea level rise and dune recession conditions at the time." March 5 Letter at 6. In its April 2, 2021 letter ("CCC April 2 Letter"), the Commission rightly rejected CalAm's attempt to completely avoid this critical issue of slant well replacement, advising CalAm that "[u]nless Cal-Am is now proposing just a 24-year operating life for its project, we will need the requested information [regarding future slant well protections and locations and impacts] to help us evaluate the reasonably foreseeable costal resources impacts that could occur due to future well locations."

CalAm now requests only a 25-year permit for the slant wells and significant associated industrial facilities that would be constructed in the sand dunes, beaches and other coastal ecosystems covered by the Coastal Act, while still requesting a 60-year permit for the desalination plant and other Project components and repeating its request for a "Special Condition" that CalAm merely apply for a permit amendment in 24 years to address slant well relocation. January 2022 Letter, Attachment B at 8-11. This is apparently based on CalAm's hope that sea level rise and dune recession will not proceed at the rates reflected in its own sea level rise studies.

CalAm's response remains factually and legally insufficient and must be rejected. As an initial matter, CalAm's apparent proposal to split the Project into components with separate 25 and 60 year terms constitutes prohibited segmentation of the Project. Further, CalAm's proposal defies the Commission's directive in its CCC April 2 Letter that CalAm provide it with information regarding future slant well locations unless CalAm is proposing just a 24-year

[3] See Staff Report for App. No. 5-90-839 (Lechuza Villas West), Agenda Item Tu9a (Jan. 28, 1997), p. 25, available at: https://documents.coastal.ca.gov/reports/1997/2/T9a-2-1997.pdf.

operating life for the Project (not just the slant wells). We acknowledge that the Commission stated in its June 18, 2021 letter that it would process a 25-year permit for the coastal portions of the Project with certain understandings, but we strongly believe that this approach is not legally appropriate as explained below.

By its own admission, the Commission has an obligation to "evaluate the reasonably foreseeable coastal resources impacts that could occur due to future well locations" before granting a CDP. CCC April 2 Letter. The "override" determination that CalAm is requesting here, under Coastal Act Section 30260, dictates stringent requirements, including that "adverse environmental impacts are mitigated to the maximum extent feasible" and "alternative locations are infeasible or more environmentally damaging."

CalAm's January 2022 Letter continues CalAm's pattern of failure to provide the Commission with necessary, requested information regarding available locations for slant well relocation, and information regarding the environmental impacts of relocation at those locations. CalAm's failure to provide this requested information regarding available locations for slant well relocation is particularly egregious where, as here, CalAm seeks to engage in the environmentally destructive installation of its slant well field, associated Project pipelines, and other components on approximately 35 acres of ESHA. Further exacerbating this environmental destruction is the fact that the best available science confirms that these slant wells will have to be relocated in the near future due to sea level rise and dune recession. Because such well relocation and reconstruction will likely be proposed in another sensitive area in the coastal zone, the Commission must carefully evaluate the well reconstruction information and associated impacts now.

The Commission must also evaluate slant well relocation possibilities now because CalAm is legally barred from relocating the Project slant wells to an alternative location on the CEMEX Property. CalAm holds no landward easement interest in the CEMEX Property where it could relocate the slant wells in the future, and Sections 6.2(A) and (B) and 23.2 of the settlement agreement concluding the Coastal Commission's CEMEX enforcement action preclude CalAm (or any other person or entity) from obtaining any further interest in the CEMEX Property after June 15, 2017. Yet, CalAm apparently has failed to take even the most basic of first steps to develop plans for the relocation of its slant wells, or undertake any scientific studies necessary to analyze the environmental impacts that will result from such future relocation.

CalAm cannot cure these deficiencies by proposing a deferred future condition or by seeking the improper segmentation of this Project into 25- and 60-year segments. CalAm must identify where its slant wells will be relocated, and study associated coastal zone impacts at the site of such relocation, in order for the Commission to evaluate or issue a CDP for the Project. Accordingly, we urge Commission Staff to continue to require CalAm to provide the information it requested regarding this issue. Without this information, CalAm's application should not move forward.

PWM EXPANSION WATER

On November 29, 2021, in conformance with a directive by a CPUC Administrative Law Judge, CalAm submitted an application to the CPUC for approval of a Water Purchase Agreement ("WPA") for 2,250 acre-feet per year ("afy") of water produced by the PWM Expansion Project. In its January 2022 Letter, CalAm takes the position that, if this new WPA is approved, "the PWM expansion does not eliminate the need for desalination." *Id*. at 2.

Although CalAm has tried to put the best "spin" possible on this important new water development for the Monterey Peninsula, the fact is that, if approved, this new WPA would not help complete CalAm's application and it strongly mitigates against Coastal Commission approval because it would conclusively demonstrate the existence of an alternative to the MPWSP that would be a significant impediment to a Coastal Commission override in favor of the Project pursuant to Coastal Act Section 30260 and would render the Project non-compliant with Section 30233.[4]

CalAm attempts to minimize the adverse impact of this development on the Project through several arguments. First, CalAm asserts a new argument that, although the Project would receive a total amount of 5,750 afy of water from the original PWM Project and the PWM Expansion, this amount should be reduced to "only 4,600" afy because the annual "water delivery guarantee" is only this amount. However, this is a specious argument. The proposed WPA is clear that, when added to the PWM obligation, the total water obligation is 5,750 afy. Although there is a lower "water delivery guarantee," this is not a number which realistically anticipates the amount of water that should be used for future projections.

CalAm also contends that this new large infusion of water would not alter the need for the MPWSP. However, this view is not shared by the Monterey Peninsula Water Management District ("MPWMD"), which was created by the Legislature in 1977 and granted the authority to regulate all local water systems, including the CalAm system. MPWMD is the agency with the mandate and expertise to analyze future water supply and demand for the Monterey Peninsula. In 2020, MPWMD undertook a comprehensive re-examination of water supply and demand, which resulted in release of its report entitled "Supply and Demand for Water on the Monterey Peninsula," dated May 18, 2020. In this Report, MPWMD determined that the PWM Expansion, added to current water supplies and without the desalination project, would meet the Peninsula's water demand for the next 24-30 years, based on a bounding analysis with moderate to very aggressive assumed growth forecasts. In a June 15, 2020 letter to the Commission regarding the

[4] One important requirement for a coastal-dependent industrial facility override under Section 30260 is that "alternative locations are infeasible or more environmentally damaging." Section 30233 similarly allows fill in coastal waters only "where there is no feasible less environmentally damaging alternative." As the Commission's Staff Reports on the prior (now withdrawn) CalAm MPWSP application have stated, the PWM Expansion Project appears to be a feasible and less damaging alternative to the MPWSP. *See, e.g.,* August 25, 2020 Staff Report.

Project, MPWMD stated that, based on this report, "PWM expansion provides a new water supply sufficient to meet the future needs of the Peninsula for the next 20 to 30 years."[5]

As the Commission is already aware from its own independent analyses reflected in its Staff Reports prepared for CalAm's MPWSP applications, the construction and operation of the PWM Expansion Project has far less adverse environmental impacts than the MPWSP and would not involve any new construction in the coastal zone. For this reason, it would avoid the severe, wide-ranging impacts of the MPWSP to the City of Marina, a community that would suffer most of the environmental, social, economic and environmental justice impacts of the Project, but not receive any of its water. It would also address the adverse environmental justice impacts of the Project on the ratepayers within CalAm's service area. As MPWMD stated in its June 15, 2020 letter to the Commission: "While both proposed water supply projects meet the current and future needs of the Peninsula, PWM expansion will save the ratepayers approximately $1 billion compared to desalination over a 30-year lifecycle."

Thus, CalAm's latest assertions in the January 2022 Letter regarding the continuing need for the MPWSP if the WPA for PWM Expansion water is approved are directly contrary to the findings of the agency for this area with the preeminent expertise to make the applicable water supply and demand projections for the Monterey Peninsula. In fact, it appears that the CPUC Administrative Law Judge may decide to conduct a second phase of proceedings to (among other things) analyze the water supply and demand needs of the Monterey Peninsula in the context of the MPWSP. More information on this possibility will be available when the ALJ issues further orders in this proceeding.

Given this context, how does the initiation of these WPA proceedings at the CPUC affect the incomplete status of CalAm's application for a CDP for the MPWMD? It certainly does not provide any new information that fills in any gaps in the existing CalAm application. To the contrary, since M1W apparently will not be taking action on approving or disapproving CalAm's outfall liner combination proposal until after the CPUC takes action on the WPA, this news strongly counsels in favor of finding the application is not complete now and revisiting the completeness of the application after the CPUC and M1W take action. Moreover, in examining the merits of the CDP application, a CPUC decision approving the PWM Expansion water would completely undermine the asserted need for the MPWSP and compel a finding that the PWM Expansion is a viable alternative that requires a denial of the Project CDPs pursuant to Coastal Act Sections 30260 and 30233.

PROTECTION OF WETLANDS AND GDES

As Marina explained in its prior letters to the Commission, Marina retained environmental consulting firm Formation Environmental ("Formation") to conduct peer review

[5] More recently, on May 4, 2021, MPWMD filed a Complaint against CalAm in the CPUC seeking an order compelling CalAm to enter into a WPA for the PWM Expansion water. In that Complaint (¶ 49), it stated that the PWM Expansion (without the desalination project) "can meet the needs of the region over the next 30 years."

of the limited data relating to the Armstrong Ranch vernal ponds collected by CalAm's consultant, Geoscience Support Services ("GSS"), and GSS's analysis of that data. Initially, Formation made three soil investigation recommendations and six groundwater investigation recommendations that GSS could implement to confirm whether the Armstrong Ranch ponds are Groundwater Dependent Ecosystems ("GDEs").

To date, GSS has not completed even one-third of these investigations. After CalAm submitted a May 12, 2021 GSS Report ("GSS May 2021 Report") to the Commission, Formation performed an independent peer review of the data collected by GSS, which is enclosed herewith as Exhibit 1 ("Formation Report"). Formation concluded that "[t]he GSS May 2021 Report provides no significant new information, suffers from all of the scientific flaws of its predecessor (the GSS Preliminary Summary), and fails to provide any basis to rebut the clear existing evidence that the groundwater in the Dune Sand Aquifer is hydraulically connected to the Armstrong Ranch Ponds." Formation Report at 2. In spite of these deficiencies identified and explained by Formation, CalAm's January 2022 Letter confirms that GSS has made no real changes to its data collection approach and continues to collect inadequate data that will not allow the Commission to determine whether the groundwater in the Dune Sand Aquifer ("DSA") is hydraulically connected to the Armstrong Ranch Ponds.

Seven sets of wetlands, vernal ponds, and other Groundwater GDEs, totaling about 25 acres, are located in and near the proposed slant well field and are sustained by groundwater in the DSA, the uppermost aquifer in which the slant wells would be constructed. Although CalAm and GSS contend that the data in the GSS May 2021 Report support the conclusion that the DSA is not hydraulically connected to the surface water that feeds these ponds, Formation's review of the limited data collected by GSS indicates that these ponds are indeed groundwater dependent and could be dramatically affected by future Project extraction activities.

Of the nine investigations recommended by Formation to confirm whether the Armstrong Ranch ponds are GDEs, GSS conducted only three (one only partially): collection of data over multiple seasons; collection of general chemistry data; and collection of stable isotope data. *Id.* at 3-4. Marina previously provided the following summaries of Formation's analyses of the GSS investigations:

- Regarding GSS's collection of groundwater level data over an extended period, Formation notes that "data from at least one full seasonal cycle would be required to characterize this system over a typical year." *Id.* at 9. The data collected by GSS, however, refutes GSS's finding of an "impermeable confining unit" in the area of the Armstrong Ranch ponds, as the "differing and changing groundwater flow directions observed are not consistent with the presence of an 'impermeable confining unit' in this area" as hypothesized by GSS. *Id.* at 11. Contrary to GSS's statement that "[w]ater levels in the [middle unit] do not show cyclic patterns from CEMEX pumping," (GSS May 2021 Report at 50), Formation concluded that "the observed hydrograph data are consistent with the effects of recharge and discharge processes through a continuous and connected hydrologic system from the GDE vegetation into

the DSA" and the "sawtooth drawdown and recovery pattern observed in MW-4S and PW-2A indicates that groundwater elevations in the uppermost DSA are being affected by nearby pumping in the 180-foot Aquifer, and would be expected to be affected by pumping for the MPWSP slant wells." Formation Report at 11 (emphasis added).

- The general chemistry data collected by GSS also support the conclusion that the Armstrong Ranch ponds are connected to the DSA. Specifically, Formation notes that the "salinity enrichment [observed by GSS] is typical of groundwater discharge areas" and that data from PZ-1A "is consistent with a general mineral content reflecting the influence of both seawater and local rainwater recharge." *Id.* at 12. Thus, Formation concludes that GSS's observations are "consistent with a hydrologic connection between the DSA and the GDE vegetation, and the upward discharge of groundwater through the shallow aquifer system." *Id.* (emphasis added).

- The isotope geochemistry data also indicate the presence of groundwater in the Armstrong Ranch ponds. For example, Formation notes that "data for MW-4S indicate that groundwater in this well becomes isotopically heavier and more similar to seawater as depth increases." *Id.* at 14. Thus, "the stable isotope and data reported by GSS appear to reflect effects of local recharge that decrease with depth and supports the interpretation that the shallow groundwater to which the GDEs are connected are part of a continuous hydrologic system in the uppermost DSA." *Id.* (emphasis added).

- Formation also concludes that the data presented by GSS regarding vegetation in the Armstrong Ranch ponds "support the interpretation that the Armstrong Ponds are a wetlands feature/GDE that is hydraulically connected to the DSA." *Id.* at 6. Formation reaches this conclusion because: (1) saltgrass, one of the principal vegetation species in the Armstrong Ranch ponds, has a documented rooting depth of at least six feet such that saltgrass can easily extend into and through gray sands identified by GSS; (2) hydrographs reported by GSS show daily fluctuations that are considered diagnostic of plant groundwater reliance; and (3) hydrograph patterns indicate that the ponds are affected by pumping of the CEMEX well. *Id.* As such, GSS's investigation did not confirm that vegetation in the Armstrong Ranch ponds does not depend on groundwater from the Dune Sand Aquifer. GSS May 2021 Report at 2. Although the data collected by GSS is incomplete, all available data suggests the opposite conclusion - that the wetlands do depend on DSA groundwater.

CalAm's January 2022 Letter does not include any new data or analyses to refute these analyses or Formation's conclusion that "the data presented by GSS actually support the interpretation that the Armstrong Ponds are a wetlands feature/GDE that is hydraulically connected to the DSA" that are affected by pumping. Formation Report at 6. Rather, CalAm stands by its position that the GSS May 2021 Report "confirmed[] groundwater in the Dune Sand Aquifer is hydraulically separate from the overlying shallow ponds" and will not affect

groundwater or ESHA in the Armstrong Ranch ponds. January 2022 Letter, Attachment A at 7. But, as explained above, the GSS May 2021 Report fails to confirm such unsupported hypotheses. Formation Report at 2 ("The investigations described in the GSS May 2021 Report remain inadequate to characterize the Armstrong Ponds and fail to protect the designated ESHA at the Armstrong Ponds from potential irreparable harm if the MPWSP were to proceed.").

Further, GSS has still not investigated the effect of pumping from the DSA on other vernal ponds and GDEs within the City of Marina. In December 2020, a consultant for CalAm, Balance Hydrologics, contacted the City to inquire about the procedures for receiving approval to install monitoring and other equipment in and near some GDEs in the City. On January 29, 2021, the City sent a letter to Balance Hydrologics outlining the procedures necessary to obtain a coastal development permit and right of entry to perform this monitoring activity within the City. CalAm and its consultants did not follow up with the City about performing such monitoring work until mid-October 2021, at which time Balance Hydrologics sought a Coastal Development Permit from the City's Planning Commission to allow the installation of surface water monitoring equipment and near-surface groundwater piezometers at five vernal ponds in the City for a period of one year. The City has engaged a CEQA consultant to perform the necessary CEQA analysis for this application and it will then be considered by the Planning Commission.

Thus, CalAm's CDP application before the Commission remains incomplete for failing to conduct or complete necessary studies or generate sufficient data to ensure that these vernal ponds and GDEs are protected from anticipated Project impacts. The Commission should direct CalAm to complete the necessary investigations outlined in the Formation Report. Formation Report at 15-16.

ENVIRONMENTAL JUSTICE ISSUES

CalAm has failed to provide the Commission with any new information on environmental justice issues in its January 2022 Letter, thus failing to address Marina's concerns regarding CalAm's discussion of how it plans to lessen the Project's cost burden on disadvantaged and low-income customers. As Marina previously noted, CalAm's suggested expansion of its customer assistance program discount has no benefit for disadvantaged and low-income communities located outside of CalAm's service territory that are adversely impacted by the Project. CalAm's proposed expanded discount does not benefit Marina residents, and it does nothing to address the wide range of social justice and economic impacts from the Project to Marina, since Marina's residents are not CalAm customers.

In its January 2022 Letter, CalAm does not identify any additional plans pursuant to which it intends to address these critical social justice and economic impacts of the Project on disadvantaged Marina residents. Until CalAm addresses these impacts to Marina and its residents, CalAm's application remains incomplete.

EXHIBIT 1

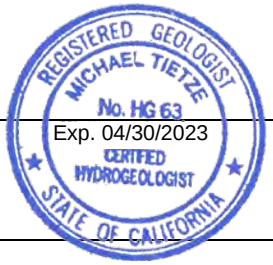
TECHNICAL MEMORANDUM

REVIEW OF THE ARMSTRONG RANCH POND EVALUATION REPORT IN THE CALIFORNIA-AMERICAN WATER COMPANY RESPONSE TO THE APRIL 2, 2021 LETTER RE: NOTICE OF INCOMPLETE APPLICATION FOR A COASTAL DEVELOPMENT PERMIT

PREPARED FOR: Layne Long, City Manager, City of Marina

PREPARED BY: Mike Tietze, PG, CHG, CEG, Stephen Carlton, PG, CHG, James Richards, PhD, and Emily Tozzi, CPSS

DATE: June 9, 2021



1. INTRODUCTION AND BACKGROUND

At your request, Formation Environmental, LLC (Formation) has reviewed Exhibit L to the May 19, 2021 letter from Latham Watkins LLP to the California Coastal Commission titled "*Consolidated Coastal Development Permit Application Response to April 2, 2021 Letter: re Notice of Incomplete Application submitted by California American Water Company (CalAm) for the Monterey Peninsula Water Supply Project (MPWSP)*". Exhibit L is titled "*Evaluation of Hydrogeologic Conditions - Armstrong Ranch Pond within the Caltrans Right-of-Way, Near the City of Marina, California*" and was prepared by Geoscience Support Services, Inc. (GSS) and is dated May 12, 2021 (GSS May 2021 Report).

The GSS May 2021 Report is intended to provide the Coastal Commission with further technical information regarding the impacts of the MPWSP on the nearby Armstrong Ranch vernal ponds and wetlands. The purpose of our review is to assess the accuracy of the GSS May 2021 Report analysis and the completeness of CalAm's application as it relates to characterizing and protecting these and other groundwater-dependent ecosystems (GDEs) in and surrounding the City of Marina. These wetland features are Environmentally Sensitive Habitat Areas (ESHA) protected under the California Coastal Act and other legal authorities. The Armstrong Ponds, which are located north of the City of Marina along Highway 1 just east of the CEMEX site, are the primary focus of the GSS May 2021 Report. Our findings are summarized below.

The GSS May 2021 Report presents the methods and results of field and laboratory investigations conducted by GSS from early October 2020 through early May 2021 near the Armstrong Ponds, and is a follow up to the "*Preliminary Summary of the Results of Evaluation of Hydrogeologic Conditions – Armstrong Ranch Ponds within the Caltrans Right-of-Way*," prepared GSS and dated November 5, 2020 (the GSS Preliminary Summary. The GSS Preliminary Summary incorrectly asserted that the Armstrong

Ponds are not hydraulically connected with the Dune Sand Aquifer (DSA) and therefore should not be considered a GDE.

Formation previously reviewed the GSS Preliminary Summary and provided comments in a November 30, 2020 Technical Memorandum (Formation Memorandum). This Memorandum determined that (1) the conclusions presented in the GSS Summary Letter were not supported by the data they presented, (2) some of the data were misinterpreted, and (3) the investigations reported in the GSS Preliminary Summary were incomplete and did not meet the ordinary standard of care to support decisions regarding the Armstrong Pond GDEs. Further, careful review revealed that the conclusions presented in the GSS Preliminary Summary were contradicted by the information presented, which were consistent with vertical groundwater discharge by evapo-transpiration (ET) through the soil profile known and widely reported to have been developed on the Old Dune Sand geologic unit in this area. Accordingly, the GSS Preliminary Summary presented an incomplete and inadequate basis to inform GDE characterization and management decisions.

The GSS May 2021 Report provides no significant new information, suffers from all of the scientific flaws of its predecessor (the GSS Preliminary Summary), and fails to provide any basis to rebut the clear existing evidence that the groundwater in the Dune Sand Aquifer is hydraulically connected to the Armstrong Ranch Ponds. The investigations described in the GSS May 2021 Report remain inadequate to characterize the Armstrong Ponds and fail to protect the designated ESHA at the Armstrong Ponds from potential irreparable harm if the MPWSP were to proceed. As such, the limited GDE data provided in the GSS Preliminary Summary and GSS May 2021 Report regarding GDEs are wholly insufficient to allow processing of the Consolidated Coastal Development Permit sought by CalAm. Rather, additional studies are needed to characterize GDEs and provide a basis for their protection before this permitting occurs.

Our specific conclusions in this Review of the GSS May 2021 Report are consistent with our comments on the GSS Preliminary Summary and include the following:

- **Soil Data:** The GSS conclusion that vegetation in the Armstrong Ponds is hydraulically separated from groundwater in the underlying DSA relies on an unsupported interpretation of the local soil stratigraphy that includes a surficial layer of modern dune sand, an underlying gray sand paleosol (ancient soil horizon), an inferred "impermeable confining layer" in the gray sand, and an underlying brown sand that represents the DSA. In the GSS May 2021 Report, GSS adds a new interpretation, without any supporting data, that the gray sand underlying the assumed paleosol consists of pond sediments. The basis for this interpretation is the logging of highly disturbed hand auger cuttings, in which it is difficult or impossible to observe soil structure or contacts, or to differentiate artificial fill from *in situ* native soils. Undisturbed soil samples or soil pits are typically needed to support this kind of investigation when correct interpretation of the field data is important. Contrary to GSS's conclusion, our review of the logs indicates no evidence to support the interpretation that an impermeable confining layer exists in the gray sand. In addition, no permeability tests of any kind were conducted.

It is important to note that GSS's elaborate interpretation of the local soil stratigraphy is not only unsupported by the data, but also unnecessary. A different and fully supported explanation for the observed soil sequence described is already provided in the available soil survey data from the Natural Resources Conservation Service (NRCS) regarding mollisol and entisol soil profiles documented on the Older Dune Sand geologic unit in this area. These soil sequences consist of a darker gray A-horizon containing organic materials, roots and some fines (i.e., silty sands), underlain by a somewhat weathered parent dune sand C-horizon (the gray sand) and unweathered parent dune sand (the brown sand). They are described as somewhat excessively drained to excessively drained, without identified impeding layers. These soil deposits are expected to occur at the ground surface throughout the area surrounding the Armstrong Ponds, and are locally buried by artificial fill along the highway where the hand auger borings were drilled.

- **Groundwater Level Data.** The conclusions regarding shallow groundwater hydrology presented in the GSS Preliminary Summary were based on a short period during what is typically the driest month of the year and do not consider more plausible explanations for the observed groundwater level differences between the gray sand and the underlying brown sand. The Nature Conservancy (TNC) has developed guidance for the characterization of GDE hydrology and groundwater dependence that emphasizes the importance of considering seasonal variability of GDE hydrology and groundwater conditions. In the GSS May 2021 Report, the period over which groundwater level data were collected has been extended by several months, but it is still insufficient to cover the full range of seasonal variability.

  GSS interprets differences in groundwater elevations between the gray and brown sands as requiring the existence of an impermeable barrier somewhere between the bottom of the "B" zone piezometer screen and the top of the "A" zone piezometer screen at each piezometer cluster. This is between 6.50 and 7.60 feet bgs at PZ-1, and 5.20 and 6.38 feet bgs at PZ-2, yet there are no data that support the existence of such a confining layer, even in GSS' own lithologic logs. Rather, the observed groundwater level differences are typical of those encountered in shallow soil profiles in groundwater discharge and recharge areas. The new data provided in the GSS May 2021 Report do, however, provide important new information regarding the groundwater hydrology in the shallow subsurface underlying the Armstrong Ponds: (a) a pattern of repeated drawdown and recovery is evident in monitoring well MW-4S and shallow piezometer PZ-2A that indicates groundwater levels in the uppermost DSA are being affected by pumping at the CEMEX site and can be affected by proposed pumping for the MPWSP; and (b) a pattern of diurnal (daily) groundwater level fluctuations is evident that is characteristic of the presence of groundwater-dependent vegetation.

- **Groundwater Quality Data** - The groundwater conductivity data indicate higher salinity in the gray sand (upper monitored zone) than in the brown sand (lower monitored zone), and in a westward direction in both the gray sand and the brown sand. GSS interprets that higher salinity at the water table in the gray sand necessarily indicate this is a separate aquifer system;

however, such a salinity change is expected in a vertical groundwater discharge area. Instead, the most likely explanation for the observed data is that solutes in water welling upwards from the DSA is discharged by ET, leaving salts behind. Additional salts could be leached to the uppermost groundwater from aerial deposition, which is common near the shore.

The new water quality data presented in the GSS May 2021 Report is consistent with these comments. Trends in major ion concentrations and stable isotopes are consistent with the effect of recharged rainwater. As expected, these effects are most prevalent in the shallow groundwater and decrease with depth, which is consistent with surface recharge percolation through GSS' C-, B- and A-zones into the DSA.

2. CONCLUSIONS REGARDING ADDITIONAL INVESTIGATIONS PRESENTED IN THE GSS MAY 2021 REPORT

Formation's November 2020 Technical Memorandum provided three soil investigation recommendations and six groundwater investigation recommendations that could be implemented to assure that the Armstrong Ponds are appropriately characterized and protected from potential adverse impacts by the MPWSP in accordance with the Coastal Act. In the GSS May 2021 Report, none of the soil investigation recommendations and only three of the six groundwater recommendations were addressed, and notably those were not conclusive regarding whether or not the Armstrong Ponds are hydraulically connected to the DSA. The table below provides a summary of the original Formation recommendations and compares them with the limited investigation results presented in the GSS May 2021 Report.

Table 1: Recommended Investigations, Work Implemented, and Data Adequacy Conclusions

Recommended Investigation	Work Completed ?	Data Adequacy Conclusion
Soil Investigation		
Collect undisturbed soil samples	No	No additional data have been collected to support important interpretations regarding the soil stratigraphy, permeability or existence of an "impermeable confining layer." The available data do not support the interpretations presented by GSS in the Letter Report.
Log soil pits	No	Shallow soil profiles and rooting conditions near the wetland area are not documented. The available data are consistent with the existence of excessively drained mollisols and entisols as documented in the NRCS surveys, and there is no evidence regarding the existence of a paleosol, or, as newly theorized in the GSS May 2021 Report, of pond sediments.

Recommended Investigation	Work Completed ?	Data Adequacy Conclusion
Collect soil samples over wider area and broader topographic locations	No	The data collected to date are limited and may not be representative or adequate to assess the potential impacts of the MPWSP. Investigations to assess groundwater interactions with vegetation in important ecosystems usually involve the collection of data from a variety of locations to assure the data are representative across the ecosystem and adequate to assess potential impacts.
Groundwater		
Collect data over multiple seasons	Partially	Groundwater level data have been collected over a longer period; however, the full range of seasonal fluctuations in shallow groundwater conditions has not yet been documented. Additional groundwater level data collection through the dry season is needed for adequate characterization of GDE-groundwater interaction.
Install nested piezometers at three locations around each pond	No	The existing piezometers are insufficient to characterize groundwater flow around the ponds (at least three points are needed to define the flow field), and may not provide adequate coverage for representative characterization to anticipate potential impacts of the MPWSP Project.
Conduct an aquifer pumping test	No	A long-term aquifer test is the single most definitive hydrogeologic tool to assess the potential effects of groundwater level drawdown in the shallow DSA on vegetation near the Armstrong Ponds, yet it has not been performed. Drawdown in pumped wells would need to be sustained for a sufficient amount of time to allow groundwater to drain from the overlying soil profile, which is estimated to be two to three weeks.
Install and sample lysimeters in the vadose zone	No	Groundwater quality data from vadose zone samples would be useful to assess the geochemical effect of recharge on the shallow groundwater system.
Collect general chemistry data	Yes	General chemistry and conductivity data were collected, but were generally ambiguous or reflected the geochemical influence of recharge water on the shallow aquifer system.
Collect stable isotope data	Yes	General chemistry and conductivity data were collected, but were generally ambiguous or reflected the geochemical influence of recharge water on the shallow aquifer system.

Contrary to the conclusions asserted in the GSS May 2021 Report that vegetation in the Armstrong Ponds is not reliant on the regional aquifer system, the data presented by GSS actually support the interpretation that the Armstrong Ponds are a wetlands feature/GDE that is hydraulically connected to the DSA. Specifically, the following data support this conclusion:

- One of the principal vegetation species in the Armstrong Ponds is saltgrass, for which the GSS May 2021 Report incorrectly asserts a maximum rooting depth of 28 inches. As discussed further in Section 3.4, the actual documented rooting depth of saltgrass is at least 6 feet, and may be deeper. Thus, saltgrass can easily extend into and through the gray sands identified by GSS. This is consistent with the observation that roots and plant debris were present in the gray sand at a depth of 5 to 5.5 feet bgs.

- The hydrographs reported for the shallow groundwater zones show diurnal (daily) fluctuations that are considered diagnostic of plant groundwater reliance. The amplitude of these fluctuations increases with increasing time after a recharge event and with increasing temperature, as would be expected in a GDE.

- As discussed in the GSS May 2021 Report, the hydrograph patterns for shallow monitoring well MW-4S and upper DSA piezometer PZ-2A near the Armstrong Ponds reflect that they are affected by pumping of the CEMEX well. This clearly demonstrates that groundwater in the uppermost DSA near the Armstrong Ponds is affected by pumping in the 180-Foot Aquifer on the CEMEX property, and would be affected by groundwater extraction from the MPWSP slant wells.

All of the potential GDEs identified in the vicinity of the City of Marina, including the Armstrong Ponds, must be carefully protected under the Coastal Act, the Sustainable Groundwater Management Act (SGMA) and other applicable laws and regulations. The data presented in the GSS May 2021 Report strengthen the conclusion that these requirements apply to the Armstrong Ponds, and must be supplemented with additional investigations to assure that the applicable regulatory requirements are met.

3. SPECIFIC COMMENTS REGARDING GSS MAY 2021 REPORT

In October 2020, GSS logged, installed and monitored shallow nested piezometers to depths between approximately 4 and 8 feet below ground surface (bgs) at two locations on both sides of Highway 1 in the Caltrans right of way north of the City of Marina. The purpose of the investigation was to assess whether vegetation in the Armstrong Ponds is dependent on groundwater in the Dune Sand Aquifer (DSA). No additional soil investigation, piezometer installation, or aquifer testing was conducted as part of the work documented in the GSS May 2021 Report. Rather, the additional data presented was focused on extending the groundwater level monitoring for a longer period of time and on collection and interpretation of water quality data. The investigations discussed in the GSS May 2021 Report were conducted from early October 2020 to early May 2021.

The borings and piezometers from which data were collected are located in the CalTrans right-of-way near the toe of fill placed during construction of Highway 1 where it crosses the swale that contains the Armstrong Ponds. Due to access constraints, these piezometers are located near the current Armstrong Ponds closest to the highway, but remote from most of the pond area. They are are referred to in the GSS documents as the PZ-1 and PZ-2 piezometers, located east and west of the highway, respectively. The deepest screen bottoms of the piezometers are about 7 to 8 feet below ground surface (ft bgs), with "A" zone piezometers completed in a brown sand horizon, and "B" and "C" zone piezometers competed in an overlying grey sand horizon. The screen intervals are provided for reference below.

Table 2: Piezometer Completion Depths

Location	Screen Interval (ft bgs)
PZ-1A	7.60 - 8.14
PZ-1B	2.51 - 5.81
PZ-1B(r)	4.00 -6.50
PZ-1C	2.00 - 4.00
PZ-2A	6.38 -7.10
PZ-2B	2.20 -5.20
PZ-2C	1.24 - 3.24

Because these investigations were limited to two locations remote from the current Armstrong Ponds, construction of additional nested piezometers was recommended in Formation's November 2020 comment letter; however, no additional locations have been investigated.

In the following sections, we will separately analyze the investigation and results of the GSS May 2021 Report relating to soils, groundwater, geochemistry and vegetation. As we will demonstrate, the new data in fact fully confirm the conclusion that the Armstrong Ponds are hydraulically connected to the DSA. The contrary conclusion reached by GSS is wholly unsupported, speculative and directly contrary to the limited new data set GSS has developed.

3.1. Soils and Stratigraphy

No new soil investigation data are presented in the GSS May 2021 Report; rather, legible lithologic logs of the hand auger borings for the two deepest piezometers are included and additional interpretations or reinterpretations of the lithologic data presented in the GSS Summary Report are discussed. As such, our prior comments on this topic in the GSS Preliminary Summary remain valid and appropriate: the logging of hand auger borings at two locations near the ponds is insufficient to make detailed soil stratigraphic interpretations still apply. In addition, our previous comments that the the observed gray and brown sand deposits are consistent with entisol and mollisol soil profiles reported by NRCS to be developed on the Older Dune Sand geologic unit in the the vicinity of the Armstrong Ponds still apply.

Finally, the GSS hypothesis of an "impermeable confining unit," for which no lithologic field data or test data have been reported in either report, is still unsupported and unlikely. This key interpretation is inconsistent with published NRCS soil profile data, and extrapolating its existence beneath a wide area underlain by sensitive ecosystems does not meet the ordinary standard of care of hydrogeologic practice when characterizing GDEs. If the unit is too thin or too subtle to be noted in boring logs, it cannot be interpreted as laterally continuous or impermeable. A critique of the groundwater level data used to infer its existence is presented in Section 3.2 of this memorandum.

New stratigraphic and depositional interpretations are presented in the GSS May 2021 Report. Rather than interpreting the gray sediment unit that is alleged to contain the "impermeable confining unit" as a depositional unit that curves upward beneath the adjacent dune deposits, as was shown on cross sections in the GSS Summary Letter, it is re-interpreted in the GSS May 2021 Report as a flat-lying pond deposit. No new lithologic or soil structural data (e.g., evidence of laminations or organic silt typical of pond deposits), or boring logs at additional locations, are presented to support this interpretation. No lithologic data that would support the existence of pond deposits is noted in the boring logs for the piezometers. Since the observed sequence of gray and brown sands is consistent with the typical mollisol and entisol soil profiles reported in the NRCS soil survey data, this is a more reasonable interpretation for the data, and the data in the GSS documents are insufficient to support the alternative interpretation provided.

The GSS May 2021 Report states that livestock grazing can lead or contribute to the formation of hardpans, implying a potential contribution to the "impermeable confining unit" for which no actual data are provided. While it is agreed that livestock grazing can lead to soil compaction, the available literature indicates this effect is limited to the upper few inches of the soil profile (Hanselka *et al.* 1993). This is distinct from hardpans that form deeper in a soil profile and would not contribute to the "impermeable confining unit" that GSS has posited exists at the site, even though no logging data have confirmed its existence.

GSS added a rooting depth analysis to its interpretation of the field soil boring logs included in the GSS Preliminary Summary; however, this analysis did not include collection of any new data or further testing or existing soil samples to assess the extent of plant rooting. Methods for determining maximum rooting depth and root depth distribution are many, and are summarized in Böhm (1979). A more recent review of root depth in global ecosystems is presented in Jackson *et al.* 1996. Assessment of rooting depths in sensitive areas requires the collection of data from a variety of locations within and near documented plant communities. The locations, number of borings and logging procedures used in the GSS analysis of rooting depth are not adequate to characterize representative rooting depths. Careful sampling during soil coring in representative locations (*i.e.,* in moist and dry areas where the same species is present) is needed to provide information on relative rooting depth near a GDE. The samples must be carefully processed for fine and coarse root material (picked through gently and diligently with tweezers) and dry biomass determined for each core location and each coring interval. Root density can be calculated only if sampling is performed volumetrically by such a process. The logging procedure performed by GSS is not sufficient to support such an analysis.

Another indicator of rooting depth is to assess diurnal groundwater fluctuation in vegetated areas, as well as groundwater level responses to precipitation and evapotranspiration during the dry and wet seasons. As noted in Section 3.2, data to support such an evaluation were partially collected and reported in the GSS May 2021 Report. As discussed on Section 3.3, the the collected data identified diurnal fluctuations indicative of plant rooting to the aquifer depths monitored by the "C", "B" and "A" zone piezometers. A diurnal oscillation in these shallow aquifer zones indicates that rooting depths extend to these intervals.

3.2. Groundwater Levels

No new piezometers were installed or measured to support the groundwater level analysis in the GSS May 2021 Report; rather, the letter report includes groundwater level hydrograph data and interpretation for the previously installed piezometers for a longer period to assess seasonal groundwater level fluctuations and the response of the uppermost groundwater system to recharge events.

As such, our prior comments on the GSS Summary Report that groundwater monitoring at two locations remote from the current Armstrong Ponds is insufficient to characterize groundwater flow and level conditions beneath the ponds still apply; however, our comments that longer-term seasonal data collection and interpretation is needed has been partially addressed. Specifically, the GSS Summary Letter included groundwater level data for the "A" zone and "B" zone piezometers for an approximately three-week period in October 2020, and the GSS May 2021 Report presents an expanded dataset through early May 2021. During this time, groundwater levels rose into the shallowest ("C" zone) piezometers, and those data are also presented. While these data provide additional perspective on the nature of seasonal interactions between shallow groundwater and the GDEs in the Armstrong Ponds, data from at least one full seasonal cycle would be required to characterize this system over a typical year. For this reason, continued monitoring is required as the system transitions into the 2021 dry season.

The PZ-1 and PZ-2 nested well water data are shown on Figures 6-7 and 6-8 of the GSS May 2021 Report, respectively. Annotated versions of these figures are attached for reference. Groundwater level data are provided in these figures for the piezometers along with regional, deeper groundwater level data provided by monitoring wells MW-4S and MW-7S, completed in the DSA further to the northwest and northeast, respectively. Consistent with the regional lateral and vertical groundwater gradients in the DSA, groundwater levels in MW-7S are higher than in the piezometers, and groundwater levels for MW-4S are lower. This reflects a general seaward groundwater flow in the DSA as a result of local recharge.

The following observations can be made regarding groundwater levels in the piezometers and monitoring wells.

- The hydrograph traces for the PZ-2 cluster west of Highway 1 indicate the response of the uppermost groundwater system at this location to groundwater periods of recharge and discharge. As noted below, conditions prior to December 2020 are consistent with discharge by

vertical outflow through the soil surface, transition to a period of recharge in December and January, and then slowly transition to net discharge by vegetation ET by April and May.

  - Prior to December 2020, groundwater levels in PZ-2B are lower than groundwater levels in PZ-2A, which is consistent with upward groundwater discharge at or near the piezometer location. Several rainfall events during the fall temporarily increase groundwater levels in PZ-2B, but the water dissipates.

  - The zone monitored by piezometer PZ-2B appears to become fully saturated in mid-December 2020 after a series of rainfall events over a 5- or 6-day period. After these events, the hydrographs for both PZ-2A and PZ-2B coincide and show similar increasing trends, which is consistent with a transition to recharge conditions.

  - The zone monitored by PZ-2C appears to become fully saturated in late January 2021 after several rainfall events over a 10-to-12-day period and an abrupt rise in shallow groundwater levels. After this event, the traces for PZ-2B and PZ-2C slowly drop off while groundwater levels in PZ-2A continue to rise through January, which is consistent with recharge flowing vertically downwards from PZ-2C into PZ-2B and then PZ-2A.

  - Groundwater levels in PZ-2C and PZ-2B continue to decline until, by May 2021, they coincide with the groundwater levels in PZ-2A. The hydrograph traces for PZ-2B and PZ-2C are characterized by diurnal (daily) fluctuations that increase with temperature and time after rainfall events, which is consistent with groundwater use by nearby groundwater-reliant vegetation.

  - During this time, groundwater levels in PZ-2A level off in February and March, and then slowly begin to decline in April and early May. This is consistent with a decline in recharge percolating downward from the overlying soil layers into the DSA and an increase in ET discharge from the shallow DSA over time.

  - Based on these observations, the observed hydrograph data are consistent with the effects of recharge and discharge processes through a continuous and connected hydrologic system from the GDE vegetation into the the DSA.

- The hydrograph traces for the PZ-1 cluster east of Highway 1 also indicate the response of the uppermost groundwater system at this location to groundwater periods of recharge and discharge; however, the effects of recharge are less pronounced. The gradient between PZ-1A and PZ-1B is continually upwards, suggesting that net discharge occurred near this location throughout the period of record and that these piezometers are more remotely located from local recharge areas.

  - The zone monitored by PZ-1B appears to become fully saturated in mid-December 2020 after a series of precipitation events over a 5-to-6-day period in early December. After this time, groundwater levels in PZ-1A and PZ-1B are closely correlated, but

groundwater levels in PZ-1B always remain below those in PZ-1A. This is consistent with continual net groundwater discharge over time near this location.

- The zone monitored by PZ-1C appears to become fully saturated in late January 2021 after a series of rainfall events over a 10-to-12-day period. The gap in groundwater levels in PZ-1B PZ-1A narrows after this time, suggesting some local recharge to the "B" aquifer zone occurred near this location; however, the groundwater level difference still suggests upward groundwater discharge is dominant near this location.
- Similar to the two shallowest piezometers at the PZ-2 location, PZ-1B and PZ-1C show diurnal groundwater level fluctuations that are indicative of nearby ET discharge from groundwater dependent vegetation.
- Similar to the PZ-2 cluster, the observed hydrograph data are consistent with the effects of recharge and discharge processes through a continuous and connected hydrologic system from the GDE vegetation into the the DSA.

- The GSS letter report notes a multi-day, cyclical fluctuation in the groundwater levels in PZ-2A and MW-4S and attributes this patter to the influence of pumping the nearby CEMEX well. The pattern for MW-4S is a typical sawtooth pattern that would result from pumping of a nearby well for three to four days, followed by 4- to 5-day recovery periods. A muted pattern following the same frequency is visible in the hydrograph for PZ-2A, and to a lesser extent in the hydrograph for PZ-1A. The cyclic pattern of groundwater level changes at MW-4S and PZ-2A in response to pumping at the CEMEX well indicates that a production well pumping at 350 gallons per minute, screened from 200 to 630 ft bgs in the 180-Foot Aquifer and 400-Foot Aquifer, has an impact on the water table in the uppermost DSA near the Armstrong Ponds as measured in a 7-foot deep well.

In summary, the groundwater level trends reported in the GSS May 2021 Report are completely consistent with the local effects of groundwater recharge from precipitation and groundwater discharge by ET from nearby groundwater-dependent vegetation. Groundwater level differences between the different zones monitored by the piezometer clusters are consistent with these effects and with flow impedance in finer-grained sediments typical of upper soil horizons of the soil profile developed on the Older Dune Sand geologic unit in this area.

The differing and changing groundwater flow directions observed are not consistent with the presence of an "impermeable confining unit" in this area hypothesized by GSS. Rather, the observed diurnal fluctuations in groundwater levels in the upper piezometers are diagnostic of the presence of nearby groundwater-dependent vegetation. Finally, the sawtooth drawdown and recovery pattern observed in MW-4S and PW-2A indicates that groundwater elevations in the uppermost DSA are being affected by nearby pumping in the 180-Foot Aquifer, and would be expected to be affected by pumping for the MPWSP slant wells.

3.3. Geochemistry

3.3.1. Electrical Conductivity and General Chemistry

GSS installed transducers in the PZ-1 and PZ-2 nested piezometers that provide continual measurement of electrical conductivity (EC). EC provides screening level information regarding the salinity of the shallow groundwater. EC data for the nested piezometers are presented together with data from MW-4S and MW-7S in Figures 6-11 and 6-12 of the GSS May 2021 Report for the PZ1 and PZ-2 piezometer clusters, respectively. The following conclusions may be drawn from these graphs:

- Groundwater EC for the monitoring wells ranges from 800 to 900 micro-Siemens per centimeter (µS/cm) at MW-7S to 1,200 to 1,300 µS/cm at MW-4S. This is consistent with MW-4S being located near the seaward edge of a freshwater lens developed as a result of recharge in the DSA.

- Groundwater EC for the deeper piezometers ranges from about 400 to 600 µS/cm at PZ-1A to about 800 to 900 at PZ-2A. These values are generally consistent with the above results for the monitoring wells and reflect the presence of a freshwater lens within the DSA.

- Groundwater EC for the shallower piezometers are higher, and range from about 1,900 to 2,500 µS/cm at PZ-1B, 1,300 to 1,600 µS/cm at PZ-1C, 4,200 to 5,600 µS/cm in PZ-2B, and about 6,400 to 7,800 µS/cm in PZ-2C. GSS concludes that this must necessarily indicate the shallow groundwater in these piezometers is part of a separate, perched groundwater system that is hydraulically disconnected from the deeper groundwater monitored by PZ-1A and PZ-2A. We disagree with this conclusion because this kind of salinity enrichment is typical of groundwater discharge areas. We note that the EC trends in PZ-1A, PZ-1B, PZ-1C and PZ-2C show increasing EC during the same time periods that the hydrograph traces show diurnal fluctuations that are indicative of ET discharge from groundwater-dependent vegetation. This observation is consistent with a hydrologic connection between the DSA and the GDE vegetation, and the upward discharge of groundwater through the shallow aquifer system.

Data regarding the major cation and anion chemistry of the groundwater was collected by GSS to assess potential differences in groundwater chemistry between the groundwater sampled from the different piezometers. These data can be useful in determining the potential sources of salinity in the groundwater, such as seawater or rainwater recharge, with seawater generally being characterized by higher chloride concentrations and rainwater by bicarbonate. As with the water level data, GSS provided EC data for nearby wells MW-4S and MW-7S plus collected general minerals data from these two wells. General minerals data are plotted on a Trilinear Diagram (Figure 6-10), and anion and cation data are provided in Stiff Diagrams (Figure 6-14 to 6-18). These data indicate that the major ion chemistry of the shallowest piezometers is different from the major ion chemistry of the deeper piezometers (PZ-1A and PZ-2A) and monitoring wells. GSS concludes from the data that the shallow aquifer consists of two hydraulically-separate aquifer units in a very narrow vertical interval. To the

contrary, the data are actually more consistent with the varying effect of rainwater recharge on groundwater at different depths in a hydraulically-continuous aquifer system with a very shallow water table. We note the following:

- The groundwater from MW-4S and MW-7s would be classified as a sodium chloride water, which is consistent with a predominant seawater influence on the general mineral content of this groundwater.
- The groundwater from PZ-1A has roughly equal parts chloride and bicarbonate, and therefore would be classified as a sodium chloride/bicarbonate water. This is consistent with a general mineral content reflecting the influence of both seawater and local rainwater recharge. Groundwater from PZ-1B would be classified as sodium bicarbonate water, which suggests a decreasing influence of seawater as one approaches the ground surface.
- The groundwater from PZ-2A and PZ-2B would be classified as sodium bicarbonate water, which is consistent with a dominant rainwater recharge influence on the general mineral content at this location.

GSS also collected samples of ponded water at the ground surface near the PZ-1 and PZ-2 locations and analyzed them for major anions and cations. Field EC data were also collected. The pond water was, in general, lower in EC and total dissolved solids (TDS) than the underlying groundwater. The PZ-2 pond had lower EC and total dissolved solids than the PZ-1 pond. GSS attributes the lower EC and cation/anion concentrations at PZ-2 pond to more surface water runoff. This is a reasonable explanation but difficult to prove. Both samples contained similar proportions of chloride and bicarbonate and would be classified at sodium chloride/bicarbonate waters, suggesting a combined influence from seawater and local recharge. It may be the the pond at PZ-1 contained more dissolved solids derived from the underlying soil.

In summary, the EC and major ion data reflect an influence from local groundwater recharge in the shallow groundwater that decreases with depth, and an accumulation of salts in the shallow aquifer zones due to solute enrichment by ET. Both processes occur in the uppermost portion of a continuous hydrologic system in the uppermost portion of the DSA that is connected to the Armstrong Pond GDEs.

3.3.2. Isotope Geochemistry

GSS collected stable isotope data to assist in the groundwater flow analysis, including oxygen-16/18, oxygen-18, hydrogen/deuterium, and tritium. The oxygen-18 and deuterium concentrations in water reflect the influence of seawater, atmospheric water and evaporation enrichment on a water sample, and can therefore be used to provide insight into potential recharge sources. Tritium data can be used as a tracer of water exposed to the atmosphere during above-ground testing of nuclear weapons and can provide insight into the relative recharge age of a water sample.

Oxygen-16 (O_{16}) and oxygen-18 (O_{18}), hydrogen (H), and deuterium (D) samples were collected for PZ-1A, PZ-2A, and PZ-2B along with samples from MW-4S, MW-7S. The data are provided on Figure 6-19 of

the GSS May 2021 Report. According to GSS the data are contradictory; however, the following contrary conclusions are more appropriately drawn:

- The data for MW-4S indicate that groundwater in this well becomes isotopically heavier and more similar to seawater as depth increases, which is consistent with the available data regarding seawater intrusion and the presence of a freshwater lens in this area.
- The data for PZ-1A and PZ-2A indicate this water is isotopically lighter than the other samples suggesting the effect of relatively rapid recharge through the dune sand that has not undergone much evaporation.
- Groundwater from PZ-2B is isotopically heavier than groundwater from PZ-2A, which is consistent with a greater amount of groundwater discharge by ET from this depth.

Tritium data was collected at PZ-1A, PZ-1B, PZ-1 Pond, PZ-2A, PZ-2B, and PZ-2 Pond along with samples from MW-4S, MW-7S, and the exploratory CX borehole. The data are provided on Figure 6-20 of the GSS May 2021 Report. The tritium data are difficult to explain in that "older water" is present in the PZ-1B and PZ-2B wells compared to the deeper PZ-1A and PZ-2A wells. GSS did not provide an interpretation of this ambiguous dataset.

In summary, the stable isotope and data reported by GSS appear to reflect effects of local recharge that decrease with depth and supports the interpretation that the shallow groundwater to which the GDEs are connected are part of a continuous hydrologic system in the uppermost DSA. The tritium data are ambiguous and do not provide any useful information to inform management of the Armstrong Ponds.

3.4. Vegetation and Rooting Depths

Two dominant wetland plant species are identified in the GSS May 2021 Report as being present in the Armstrong Ponds: Baltic rush (*Juncus balticus*) and saltgrass (*Distichlis spicata*). The maximum rooting depth for Baltic rush is reported by GSS as 15.7 inches and the maximum rooting depth for saltgrass is reported as 28 inches, based on Owens Lake literature data. Based on these assumed limited rooting depths, GSS concludes that *"[t]he maximum root depth is … several feet above the local confining layer which separates the gray sand and brown dune sand aquifer*." Baltic rush does tend to be fairly shallow rooted and will die back during drier periods, but will typically resprout when soil moisture conditions are supportive of growth. However, GSS's information regarding the maximum rooting depth of saltgrass is incorrect as noted below. The maximum rooting depth of saltgrass is actually at least 6 feet, well within the range of the contact between the gray and brown sands described by GSS at the piezometer locations. In addition, since the ground surface elevations are actually lower in many portions of the Armstrong Ponds than they are at the piezometers, this maximum rooting depth may not be needed for the saltgrass in the ponds to rely on groundwater.

Formation's lead botanist, Dr. Jim Richards, has performed decades of research at Mono and Owens Lake in California, working particularly with saltgrass and desert shrub communities, and is an author of the study from which the purported rooting depth of 28 inches is derived. Based on the studies performed by Dr. Richards, we offer the following information.

- The rooting depth value of 28 inches (in) (70 centimeters [cm]) for saltgrass comes from a single site at a spring mound in the Owens (dry) Lake playa. This site was part of a larger study of the distribution of vegetation in relation to soil and groundwater chemistry (Dahlgren, R.A., Richards, J.H., and Yu, Z. 1997). At that particular site, rooting depth was reported as being constrained by extremely anoxic, alkaline, saline soil conditions beginning at 23.6 in (60 cm) depth with groundwater at 35.4 to 37.4 in (90-95 cm) deep. Anoxic conditions were indicated by black soils, amorphous iron sulfide coatings, and a strong scent of hydrogen sulfide gas as well as measurements of redox potentials (E_h) ranging from -73 to -240 millivolts (mV). The soils were extremely alkaline (pH ranging from 9.69-10.00) and had high salinity (up to 41.7 deci-Siemens per meter (dS/m) electrical conductivity [EC]). Thus, the example cited by GSS as being definitive of the maximum rooting depth is related to unusual and isolated conditions. Using this single value of 28 in for an absolute maximum rooting depth of saltgrass is not appropriate for any site except the site that was sampled. Rooting depth at that site was soil and groundwater constrained and does not represent the potential rooting depths at any other site.

- A follow up study at Owens Lake examined saltgrass growth on 60 locations including sand and clay soils, as well as natural (47) and planted stands (13). At each location three sub-sites were sampled: an area of <u>good</u> saltgrass growth, an adjacent (within 5-10 m) area of <u>poor</u> growth, and an area with <u>zero</u> saltgrass (within 5-10 m). Even where there was no saltgrass vegetation (zero sub-sites) roots were found in 14 cases. Rootzone depth averaged more than 31.5 in (80 cm) at good sites and more than 27.6 in (70 cm) at poor sites. At both subsite types 25 percent of sites (15 of the 60) had roots deeper than the maximum sampling depth of 35.7 in (90.6 cm). This information indicates that rooting depth is site dependent and for saltgrass can clearly be greater than 35.7 in (90.6 cm) if site conditions allow.

- A current study at Owens Lake included a rooting depth investigations and piezometer installation in an area with saltgrass cover and groundwater depths of 6.6 to 5.2 feet (ft) below ground surface (December 2020 to February 2021). Because of the low precipitation in this area (approximately 3”-5” per year) and the consumptive demand of saltgrass being greater than 24” per year, saltgrass is clearly groundwater dependent in this location. The data from this study demonstrate that the maximum rooting depth of saltgrass is at least 6 ft, and it probably has the capability to extend somewhat deeper when soil and groundwater conditions allow.

4. RECOMMENDATIONS

In order to adequately characterize GDEs in the area of influence of the MPWSP and assess potentially adverse impacts to GDEs, additional investigations are needed. Without this necessary scientific information, it is not possible to evaluate, avoid or address the potential impacts of the MPWSP slant well pumping on these GDEs.

<u>Soil Investigation</u> - The Formation recommendations for soil investigations are the same as stated in the November 30, 2020 Technical Memorandum.

Root Zone Evaluation - A rigorous root zone investigation, using similar methods to those cited in the Böhm (1979) and described in this memorandum, should be conducted under the supervision of a botanist, agronomist or soil scientist with expertise in phreatophyte root zone depth assessment.

Groundwater Investigation - Groundwater investigations are needed to assess shallow groundwater conditions at and in the vicinity of the vernal ponds and other GDEs that could be affected by pumping of the slant wells for the MPWSP. The objective of these investigations would be to characterize the hydraulic connection and interaction of the regional DSA with the uppermost portion of the aquifer that interacts with the GDEs. The GSS investigations conducted at the Armstrong Ponds were very limited in scope and further investigations are needed at the Armstrong Ponds and other vernal ponds and GDEs in the area as described below.

- **Continue Transducer Study** – Continue monitoring the PZ-1 and PZ-2 nested piezometers using the water level and EC transducers. The monitoring should continue at least through the fall of 2021 and until the next recharge cycle is observed to begin.

- **Conduct aquifer pumping tests -** At the Armstrong Ponds, a comparison of groundwater levels in the gray sand and underlying brown sand of the shallow soil profile was used by GSS to infer the presence of an "impermeable confining layer" (although no lithologic evidence for such a layer was observed). To the contrary, the observed groundwater level difference is more consistent with groundwater discharge by evapotranspiration and a slight impedance of vertical flow in the shallow soil profile, meaning that the DSA and GDEs are hydraulically connected. GSS has noted that the "A" zone wells produce 5 gpm and recovery rapidly after sampling. Initially, aquifer testing could be attempted in the existing "A" zone wells at both PZ-1 and PZ-2; however, it may be necessary to construct a slightly deeper and larger diameter piezometer at one of the Armstrong Ranch piezometer clusters and pump it for an extended period (e.g., at least two to three weeks) to sufficiently stress the aquifer for a conclusive test. Groundwater levels should be monitored using recording pressure transducers in all of the piezometers with observable groundwater. The test should be conducted for sufficient amount of time to observe the effects of groundwater drainage from the shallow soil profile, estimated to be up to two to three weeks. Evaluation of the results could be used to more conclusively determine the level of hydraulic connection between the DSA and the soil profile on which the Armstrong Ponds are developed.

- **Install and monitor nested piezometers -** Characterization of lateral, vertical and temporal variability in groundwater levels, flow and quality is needed to develop an adequate understanding of GDE hydrology and the role of regional and local aquifers in maintaining GDE habitat value. Shallow nested piezometers should be installed and monitored at three locations near each vernal pond or group of vernal ponds in order to allow assessment of vertical and horizontal groundwater flow in the vicinity of the ponds. Continuous groundwater level and conductivity data should be collected using dedicated recording pressure transducers and data should be collected for period of one year to allow assessment of seasonal variability.

5. REFERENCES

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Dahlgren, R.A., Richards, J.H., and Yu, Z. 1997. Soil and groundwater chemistry and vegetation distribution in a desert playa, Owens Lake, California. *Arid Soil Research and Rehabilitation 11: 221-244*.

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GSS Figure 6-7 Annotations

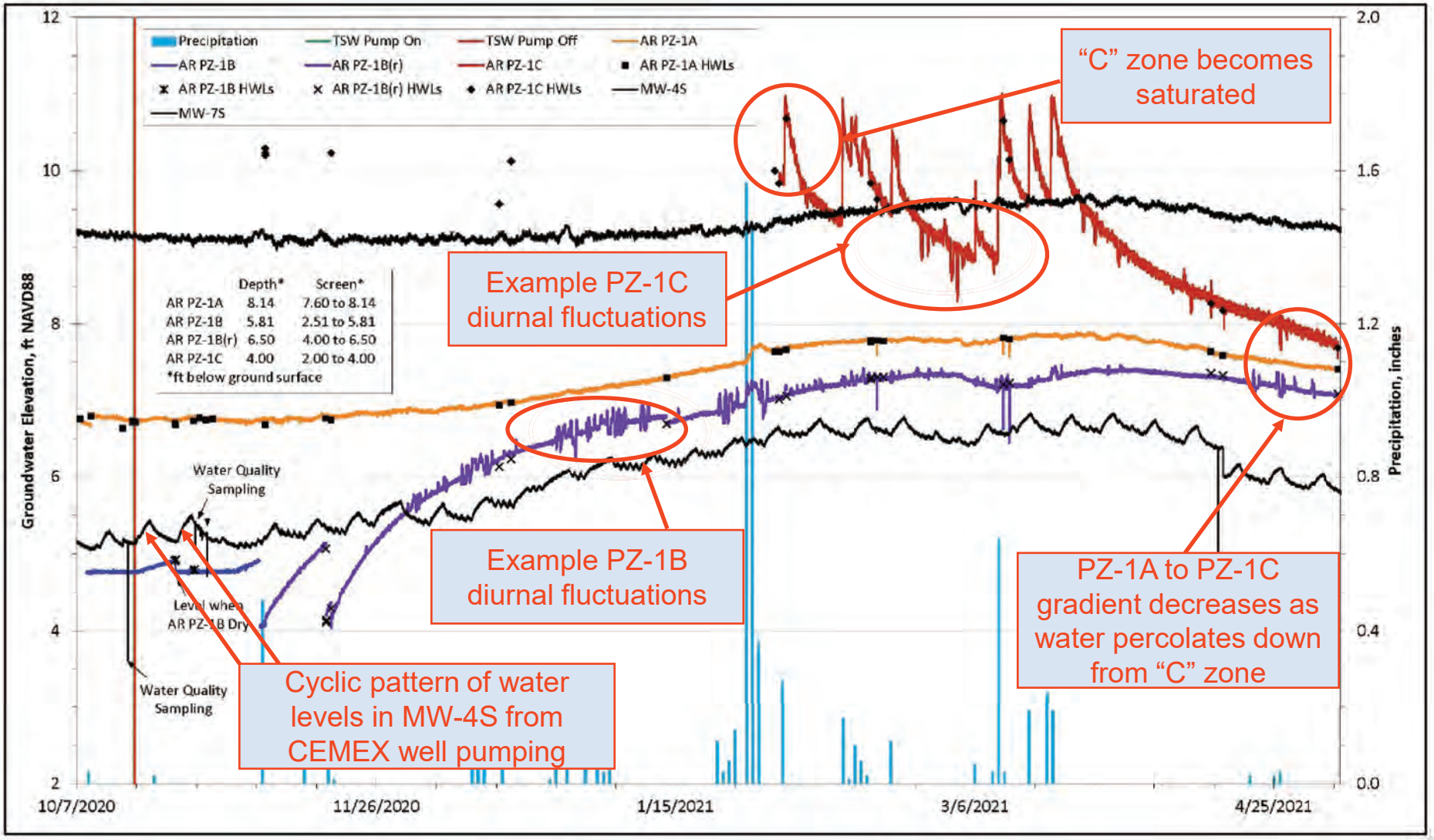

*Figure 6-7. Groundwater Elevations in PZ-1 Cluster, MW-4S, and MW-7S** *Larger Version Attached*

GSS Figure 6-8 Annotations

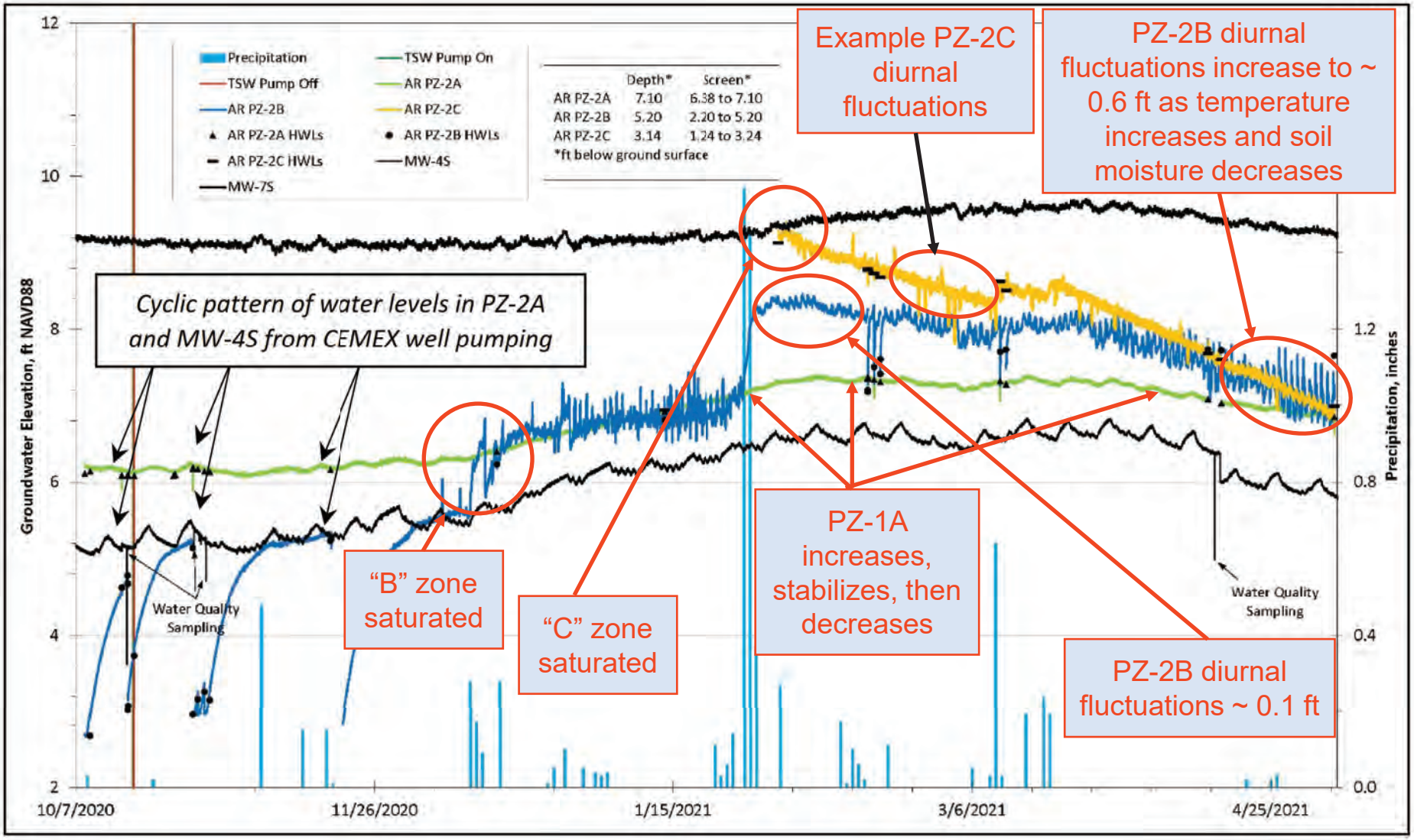

*Figure 6-8. Groundwater Elevations in PZ-2 Cluster, MW-4S, and MW-7S** *Larger Version Attached*

Ohlone/Costanoan-Esselen Nation

Previously acknowledged as
The San Carlos Band of Mission Indians
The Monterey Band
And known as
O.C.E.N. or Esselen Nation
P.O. Box 1301
Monterey, CA 93942

www.ohlonecostanoanesselennation.org.

October 27, 2022

Noaki Schwartz
California Coastal Commission

Re: California American Water Desalination Project

Saleki Atsa,

Ohlone/Costanoan-Esselen Nation is an historically documented previously recognized tribe. OCEN is the legal tribal government representative for over 600 enrolled members of Esselen, Carmeleno, Monterey Band, Rumsen, Chalon, Soledad Mission, San Carlos Mission and/or Costanoan Mission Indian descent of Monterey County.

Ohlone/Costanoan-Esselen Nation does not support the CAL AM Desalination Project. Ohlone/Costanoan-Esselen Nation does not support any desalinization plant that could destroy the life in the Monterey Bay. OCEN ask that all-natural water supplies to be protected. OCEN's creation story acknowledges the river now called the Salinas River, we call for its and all natural waters to be protected.

Many of our people still gather seaweed as part of their diet. Other Indigenous people call to ask for permission to gather seaweed on OCEN's traditional homelands. It is one of many cultural traditions carried forward. Families are teaching our young people to gather and prepare. Our traditional homelands should be protected as we work to return our culture and life that was taken from us.

Our traditional homeland was damaged with the excess removal of sand from Cemex. Now the excess salt is put back into the sea, creating a brine that sinks to the bottom. Likely to change ecological health and cleaning chemicals can washout into the sea polluting the ocean. Killing, or deforming life in the ocean, carrying illness to all who eat fish.

Where do we stop? Will each town or business need their own desalination plant? We ask that all of us protect the complete Monterey Bay, our Ancestors were buried within the bay and coast for its beauty and sacredness. Let's not disturb their cemeteries because we can. Let Ka Lai, Let Cha'a.

OCEN TRIBAL GOVERNMENT REQUEST AB52/SB18 CONSULTATION WITH LEAD AGENCIES.

Sincerely and Respectfully Yours,

Louise J. Miranda Ramirez
Tribal Chairwoman
Ohlone/Costanoan-Esselen Nation
(408) 629-5189

Cc: OCEN Tribal Council

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October 31, 2022

Honorable Donne Brownsey, Chair
California Coastal Commission
455 Market Street, Suite 300
San Francisco, CA 94105
(via email to: ExecutiveStaff@Coastal.CA.gov &
CalAmMonterey@Coastal.CA.gov)

SUBJECT: Monterey Peninsula Water Supply Project - Application No. 9-20-0603 – SUPPORT

Dear Chair Brownsey:

Mesa Water District (Mesa Water®) strongly urges the California Coastal Commission (Commission) to support Application No. 9-20-0603 during the Commission's November 17, 2022 hearing to advance the Monterey Peninsula Water Supply Project through the Commission's permitting process and towards construction of this essential water resilience project.

Mesa Water is an independent special district that serves safe, affordable, and 100 percent local reliable groundwater to businesses and 110,000 residents in an 18-square-mile service area of Orange County that includes most of Costa Mesa, a portion of Newport Beach, and John Wayne Airport. Mesa Water supports the development of cost-effective and environmentally-sensitive sources of water -- including recycling, groundwater clean-up, conservation, and desalination -- which includes support for the Monterey Peninsula Water Supply Project as it can provide a new, reliable, quality water supply that is appropriately priced.

Monterey Peninsula Water Supply Project is an essential water resilience project and an important step toward ensuring that water resiliency is advanced statewide, and toward insulating the region's community and economy from the devastating impacts of prolonged and ongoing drought.

Produced locally, desalinated water provides new, high-quality water, and is resilient to both climate change and drought. Desalination can transform inland brackish water as well as coastal seawater into a drinkable supply. Desalination's ability to generate new water supplies in the face of an unrelenting drought is a valuable attribute that should be a strong component in our state's efforts to improve drought resiliency and water sustainability.

California is experiencing increasingly extreme weather conditions, with less predictable precipitation patterns, followed by longer and more frequent dry and hot periods. Climate change is reducing the reliability of the state's precipitation and snowpack. Now in the third consecutive year of drought, the state's reservoirs are depleted and we are experiencing water shortages both from California's supply in the Sierra Nevada Mountains, as well as the entire western United States with reduced flows in the Colorado River.

Your consideration of action on Application 9-20-0603 on November 17, 2022 is critical to protecting the quality of life and economy within the Monterey region that will benefit from the Monterey Peninsula Water Supply Project. The Monterey Peninsula Water Supply Project will provide up to 4.8 MGD of reliable, locally-controlled water supplies for the region, using technology that is environmentally protective of ocean resources and marine life. The Monterey Peninsula Water Supply Project will use advanced slant wells that protect marine life by using subsurface water intake technology. This project will advance environmentally protective technologies, and will be valuable in providing much-needed relief from decades of drought that have created an unprecedented water crisis in the Monterey region.

Governor Newsom and his Administration have provided clear signals -- through the state's document entitled "California's Water Supply Strategy" and in many other venues -- that diversifying the state's water portfolio through an "All of the Above" approach to water supply sustainability includes desalination as an important water resilience strategy. Furthermore, the state has acknowledged that it must embrace the ongoing development of new water supplies, such as desalination.

The stark reality is that California's ongoing and persistent drought conditions may be a new way of life for our state. Nonetheless, the good news is that the Commission has the ability to decide to approve Monterey Peninsula Water Supply Project to help one region of the state move forward in the pursuit of a water-resilient future that helps sustain quality of life and the regional economy.

It is a pleasure to express Mesa Water's support of the California Coastal Commission's consideration and approval of Application No. 9-20-0603 at your November 17, 2022 hearing. We appreciate your consideration of this request and, if you have any questions or need additional information about our comments on these matters, please feel free to contact me, or Mesa Water's General Manager, Paul E. Shoenberger, P.E., at PaulS@MesaWater.org or 949.631.1206, or Mesa Water's Water Policy Manager, Stacy Taylor, at StacyT@MesaWater.org or 714.791.0848.

Thank you for your ongoing commitment to, and efforts on behalf of, our residents, businesses, and the region's resources.

Sincerely,

Marice H. DePasquale
Mesa Water Board President
MariceD@MesaWater.org

c: Members, California Coastal Commission
Mr. Jack Ainsworth, Executive Director, California Coastal Commission
Ms. Elizabeth Moore, Executive Assistant, California Coastal Commission
CalDesal
Ian Crooks, California American Water
Mesa Water Board of Directors
Paul E. Shoenberger, P.E., Mesa Water General Manager

November 1, 2022

Mr. John Ainsworth
Executive Director
California Coastal Commission
455 Market Street
San Francisco, CA 94105

Via Email

RE: Cal-Am's CDP Application #9-20-0603

Dear Mr. Ainsworth:

On September 6, 2022 I notified you that the California American Water Company's (Cal-Am) CDP Application #9-20-0603 was not ripe for Coastal Commission consideration due to an on-going California Public Utilities Commission (CPUC) proceeding.

We understand that you have waived 14 Cal. Code Regs. § 13052, which states "a permit application shall not be accepted for filing by the Executive Director unless all such governmental agencies have granted at a minimum their preliminary approvals for said development, except as provided in section 13053." However, at this time we count at least nine unresolved or incomplete regulatory issues:

- Cal-Am's Monterey County permits were revoked subject to additional environmental review. This issue is in the Superior Court and many months from resolution;
- Cal-Am's exclusive negotiating agreement with Monterey One Water for use of their outfall has expired, an additional party has expressed desire to also utilize the outfall, and no agreement is in place with either party;
- The State Lands Commission has not agreed to a lease for the project's intake wells;
- On October 3, 2022 the State Water Board removed Cal-Am its Intended Use Plan for state revolving loan funding of $279.2 million due to a "lack of progress";
- Cal-Am has not applied for an amendment to its Water Distribution System permit through our District (see Resolution attached);
- Marina Coast Water District contends that Cal-Am has no rights to take water from the CEMEX site and water extractions there are limited by an agreement with CEMEX's predecessor Lonestar Cement. That case is currently being heard in Superior Court.
- The CPUC has on-going proceedings regarding supply and demand for additional water supplies that are expected to continue into March 2023;
- The CPUC has previously approved only a 6.4 MGD plant and specifically discouraged the 4.8 MGD plant as little to no ratepayer savings, less water, no contingency, increased environmental impacts, and so on. Cal-Am would likely need to revisit its CPUC permission to build the plant to pursue a phased approach;

and

- The CPUC's cost cap for the project is $279.1 million. To expend funds that Cal-Am intends to recover from ratepayers beyond the capital cost cap, Cal-Am must file a petition to modify the CPUC decision. The Construction Cost Index since the last estimate would imply costs for the project far in excess of the CPUC cost cap.

We hope the Coastal Commission will defer action on CDP Application #9-20-0603. Given the number of unresolved issues, there is a significant likelihood that the project will need to come back before you.

Sincerely,

David J. Stoldt
General Manager

cc: Dan Carl, Coastal Commission
Tom Luster, Coastal Commission
Zita Kline, CPUC
Kenneth Foster, State Lands Commission
Charles McKee, Monterey County
Layne Long, City of Marina
Rem Scherzinger, Marina Coast Water District
Paul Sciuto, Monterey One Water

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Final

RESOLUTION NO. 2022-31

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE MONTEREY PENINSULA WATER MANAGEMENT DISTRICT CONFIRMING DISTRICT PERMIT AUTHORITY ASSOCIATED WITH RECEIPT OF DESAL PLANT PRODUCT WATER INTO THE CALIFORNIA AMERICAN WATER COMPANY WATER DISTRIBUTION SYSTEM

WHEREAS, The Monterey Peninsula Water Management District ("District") is organized and exists under the Monterey Peninsula Water Management District Law (Chapter 527 of the Statutes of 1977, and published at Water Code Appendix, Section 118-1, et seq.) ("District Law"); and

WHEREAS, Pursuant to Section 325 of the District Law, and except as otherwise limited by the District Law, the District has the power to do any and every lawful act necessary in order that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants within the District, including, but not limited to, irrigation, domestic, fire protection, municipal, commercial, industrial, recreational, and all other beneficial uses and purposes; and

WHEREAS, Pursuant to Section 328 of the District Law, the District has the power, among other things, (e) To commence, maintain, intervene in, defend or compromise, in the name of the district on behalf of the landowners therein, or otherwise, and to assume the costs and expenses of any action or proceeding involving or affecting the ownership or use of waters or water rights, within or without the district, used or useful for any purpose of the district or of common benefit to any land situated therein, or involving the wasteful use of water therein. (f) To commence, maintain, intervene in, defend, and compromise and to assume the cost and expenses of any and all actions and proceedings now or hereafter begun. (g) To prevent interference with or diminution of, or to declare rights in, the natural flow of any stream or surface or subterranean supply of waters used or useful for any purpose of the district or of common benefit to the lands within the district or to its inhabitants; and

WHEREAS, Pursuant to Section 325.5 of the District Law, to the extent feasible, District policy shall require development of the water sources within the District boundaries before utilizing water originating outside its boundaries. The proposed Monterey Peninsula Water Supply Project desalination facility is proposed as a Source of Supply and a Water Gathering Device to be developed outside the District boundaries, for delivery and use of that water within the District boundaries, warranting regulatory interest and review by the District under said Section 325.5; and

WHEREAS, Pursuant to Section 363 of the District Law, no person, owner, or operator shall establish, extend, expand, or create a water distribution system unless and until the approval of the board is first obtained in writing. For the purposes of such approval, the board may adopt such rules and regulations and establish such forms for such applications as are necessary and proper; and

WHEREAS, Pursuant to Section 341 of the District Law, the District shall encourage the coordination and integration of ground water supplies with surface water supplies; and

WHEREAS, Pursuant to Section 256 of the District Law, the District Board may by ordinance adopt reasonable rules and regulations to carry out its powers and duties not inconsistent with District Law and any other law, and violation of a District ordinance is a misdemeanor punishable by law; and

WHEREAS, Pursuant to District Ordinance No.1 (February 11, 1980) amended by District Ordinance No.96 (March 19, 2001) "Water Distribution System" is defined to mean all works within the District used for the collection, storage, transmission or distribution of water from the Source of Supply to the Connection of a system providing water service to any Connection including all Water-Gathering Facilities and Water-Measuring Devices. In systems where there is a water meter at the point of Connection, the term "Water Distribution System" shall not refer to the User's piping; in systems where there is no water meter at the point of Connection, the term "Water Distribution System" shall refer to the User's piping; and

WHEREAS, Pursuant to District Rule 20.A., adopted by District Ordinance No. 1 (February 11, 1980 and as amended from time-to-time by District Ordinance), an Owner or Operator of a Water Distribution System shall not modify, add to or change his/her Source of Supply, location of uses, change the System Capacity (if applicable) or Expansion Capacity Limit (if applicable), or expand the Service Area unless that Person first files an application to do so with the District and receives an amended creation/establishment permit or written Confirmation of Exemption. Action on such an application for a permit to create or amend a Water Distribution System shall also conform to the process set forth in District Rules 21 and 22.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Monterey Peninsula Water Management District does hereby resolve as follows:

1. That prior to initiating construction of facilities designed to deliver water from the Monterey Peninsula Water Supply Project to the California American Water Distribution System, and prior to receipt of waters from that Source of Supply, Cal-Am shall first obtain approval by the District Board of an application to amend its Water Distribution System permit pursuant to District Rules 21.C. and 22.E.

2. That prior to importing, distributing or using desal product water from the Monterey Peninsula Water Supply Project into any surface or groundwater source within the District, Cal-Am shall first seek and obtain approval from the District in accord with Article 2 of the District Law, Sections 341 to 366, inclusive.

3. The District's General Manager, or designee, is hereby authorized and directed to ensure that Cal-Am shall make its application pursuant to District Rules 22.E. and 21.C., shall comply with each Rule therein, shall seek authorization to integrate imported waters into District ground water supplies as contemplated by District Law, and these efforts shall be investigated, considered, determined, and acted upon on the same terms and conditions as provided for the approval, conditional approval, or denial of a permit, in accord with District Rules.

4. The District's General Manager, or designee, is hereby directed to notify other public regulators with permit authority over the Monterey Peninsula Water Supply Project, including, but not limited to, the California Public Utilities Commission, California Coastal Commission, California State Lands Commission, the County of Monterey, and the City of Marina that Cal-Am has not yet applied for, nor received approval of, an amendment to its Water Distribution System by the District, and has not yet received approval of efforts to include introduction of desal product water into District ground water supplies.

PASSED AND ADOPTED on this 17th day of October 2022 on a motion by Director Riley with a second by Director Edwards by the following vote, to wit:

AYES: Director Edwards, Riley, Malek, Paull, Anderson, Adams and Roberson

NOES: None

ABSENT: None

I, David J. Stoldt, Secretary to the Board of Directors of the Monterey Peninsula Water Management District, hereby certify the foregoing is a resolution adopted on 17th day of October 2022.

Dated: October 18, 2022

David J. Stoldt,
Secretary to the Board of Directors

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Water Plus

24 February 2022

Kate McKenna
Executive Officer
Monterey LAFCO

Dear Ms. McKenna:

Please include the three attachments, along with this message, in support of LAFCO's grant of latent powers to MPWMD. If LAFCO does not do that, the ensuing court action could cost both ratepayers and taxpayers a good deal of unnecessary expense. It's too bad that the commissioners who are causing that court action, along with Cal Am shareholders, are not bearing that expense. They should.

The attachments are new to this decision process. The first shows that Cal Am' s proposed MPWSP would have the same deleterious effect on the Salinas River that the company's over-pumping has had on the Carmel River. The second is a report by a renowned hydrogeologist that supports the first attachment. The third is an article by me published last November by the American Statistical Association journal *Chance* that shows that the EIR for the MPWSP is statistical garbage tantamount to fraud. Cal Am supports the fraud. The choice is between Cal Am and MPWMD. The correct choice is clear.

Most respectfully,

Ron Weitzman
President, Water Ratepayers Association of the Monterey Peninsula (aka Water Plus)

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Tuning a Model in Climatology and Calibrating One in Hydrogeology: An Informative Comparison

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Abstract: A November 2021 article in the journal *Chance* on a misuse of statistics by hydrogeologists in their modeling of water levels below ground raises the question of whether climatologists might be committing the same statistical errors in their modeling of global warming above ground. In seeking to answer that question, the research reported in this article finds the answer to be, yes, both research communities corrupt data by altering values of independent variables to reduce error variation or to achieve particular model results. That data alteration not only creates an impermissible negative correlation between estimates and errors but also creates model estimates that exaggerate trends in the observations. The exaggerated trends occur regardless of the nature or the intent of the data alteration. For that reason, use of trends in model estimates resulting from data alteration as a guide to future research or as a basis for conclusions may lead researchers astray. This article suggests an alternative research strategy consisting of random sampling of observation zones which, by limiting a study to thousands rather than millions of zones, could enable researchers to obtain sufficiently accurate input data to make the alteration of data unnecessary. Use of this procedure could also help avoid exaggerated and misleading predictions from models.

Keywords: Tuning, Calibration, Linear Model, Estimation, Prediction, Error, Global Warming

1. Introduction

Does tuning a model in climatology have the same meaning as calibrating a model in hydrogeology? That is an interesting question because in a November 2021 *Chance* article that took a forensic look at the misuse of statistics in hydrogeology the villain turned out to be model calibration [14]. To find the answer, a good place for someone who is not a climatologist to begin is the recent book *Unsettled: What Climate Science Tells Us, What It Doesn't, and Why It Matters* by physicist Steven E. Koonin [7], with particular attention to Chapter 4 on modeling. The short answer there is, yes, the two have the same meaning. This article is about the rest of the story.

Except for books like Koonin's (e.g., [8, 13]), much of the literature cited here dates prior to 2020. The reason is that, unlike weather (which changes from day to day), climate varies over decades, and the world's climatology community has organized its research on climate change accordingly, beginning with the First Assessment Report of the Intergovernmental Panel on Climate Change (AR1) in 1990. The most recent complete report, AR5, was issued in 2014, with most of the literature cited here centering on that date. To say that the study of global temperature is a hot topic would be a gross understatement. Like Koonin's, a number of the books published recently on climate change are critiques of AR5 and its predecessors. Differing from these books, in which tuning is considered (if at all) as only one of a number of concerns, this article focuses on tuning, identifies specific and consequential statistical problems with the practice, and suggests a statistical alternative that could avoid those problems. The presentation will being with a description of the modeling used in both fields,

In each zone of a layered checkerboard of zones, which in climatology covers the whole earth upward in the atmosphere and downward in the oceans, the models involved break down an observed measurement—of water level in hydrogeology and temperature in climatology—into estimate and error components. In that breakdown, the estimate is a weighted sum of values of independent variables, like well-pumping rate in hydrogeology and number of parts per million of airborne carbon dioxide (CO_2) molecules in

climatology. Like the observed measurements, values of the independent variables can vary over time and from zone to zone while the weights remain constant over time and all zones. In model development, based on the observed measurement and the independent-variable values in every zone, the weights are determined to minimize the error variation while keeping the average error and the correlation between estimates and errors equal to zero.

Often, to reduce the error variation even further, hydrogeologists calibrate and climatologists tune their models by adjusting unreliably-determined values of independent variables.

2. Calibration in Hydrogeology

As shown in the *Chance* article [14], this process can create a negative correlation between estimates and errors because movement of the error component of a measurement toward zero moves its estimate component equally in the opposite direction to avoid changing the observed measurement, which is the sum of its error and estimate components. As Figure 1 shows, that is in fact what happened in a project involving the modeling of water levels by hydrogeologists. The question now is whether the same thing has occurred in the modeling of temperatures by climatologists.

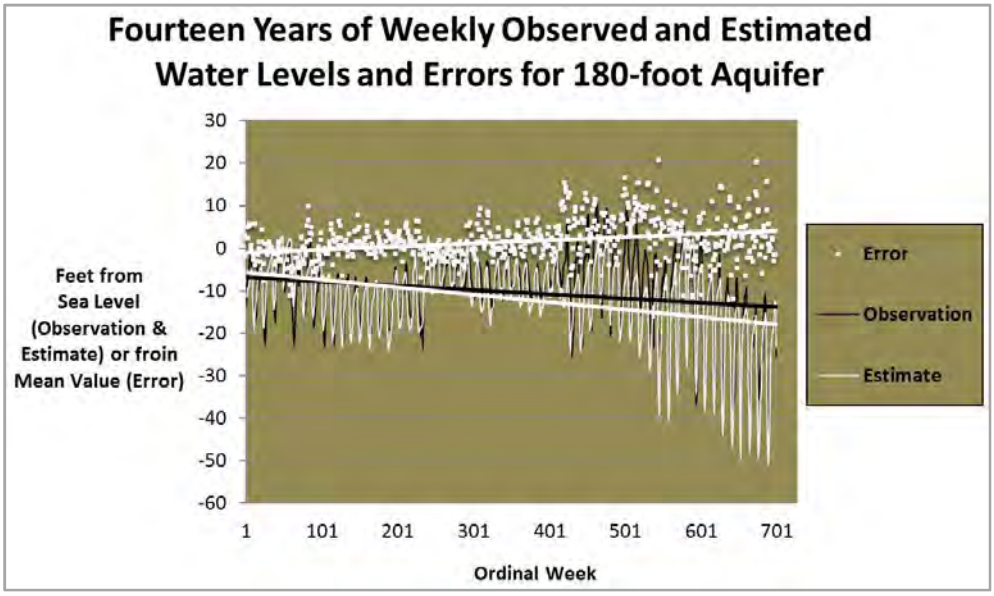

Figure 1. *Calibrated model estimates (white line) of observed water levels (black line) with errors (filled circle) and corresponding trendlines over time.*

Exploration of the answer to that question can benefit from a corresponding exploration of Figure 1, which shows that errors go up (from negative to positive) as water levels go down over time. Because errors, by definition, should not be predictable, the non-zero correlation between errors and water levels was so troubling that the project abandoned the use of the model to estimate water levels. The hydrogeologist making that decision based it on the belief that the observed change in water level over time was too fast for the model to catch up. If that were true, the model would be overestimating water levels when, as shown in Figure 1, it is underestimating them: The bottom trendline (estimates) is lower than the middle trend line (observations). So, what is the real problem?

Though based on virtually the same data, Figure 1 is not the figure shown in the report of the project. The figure in the report shows the errors trending downward rather than upward. That is because the hydrogeologist who created the figure in the report determined errors by subtracting observations from estimates rather than vice versa, which is the correct way to do it and which is the way the errors shown in Figure 1 were determined. That mistake was not trivial. It prevented the hydrogeologist from discerning the actual cause of the non-zero correlation between errors and declining water levels over time.

A sufficient cause for the rise of errors with the decline of water levels is that when water levels go down, estimates follow them down, as shown by the bottom two trendlines in Figure 1. Meanwhile, as shown by the top trendline there, errors—being negatively correlated with estimates, as a result of calibration—go up. The cause, at least the demonstrated cause, of the worrisome non-zero correlation is not the model; the cause, at least the sufficient cause, is the calibration of the model. The hydrogeologist, not the model, is the real problem...

3. Tuning in Climatology

Can the same be said about at least some climatologists in their modeling of world temperature over time? Figure 2, which is a copy of the figure on page 91 in *Unsettled* [7], shows rising observed and estimated mean-global-surface-temperature "anomalies" over time for 26 different models, where the anomalies are departures from the mean global surface temperature between 1880 and 1910. (Koonin in *Unsettled* cites the original source of Figure 2, [11], which is

the source of the copy shown here.) Each plotted point is an eleven-year average. The four dark black lines represent separate sets of observations, and the 26 light black lines represent the 26 model estimates, which more or less follow the observations. Among other things, the models generally vary in their tuning practices.

The apparent grey swath weaving around the dark lines and encompassing the bulk of the model estimates represents them as a group, whereas the substantial variation of the model estimates provides some credence for Koonin's choice of the title for his book, *Unsettled*.

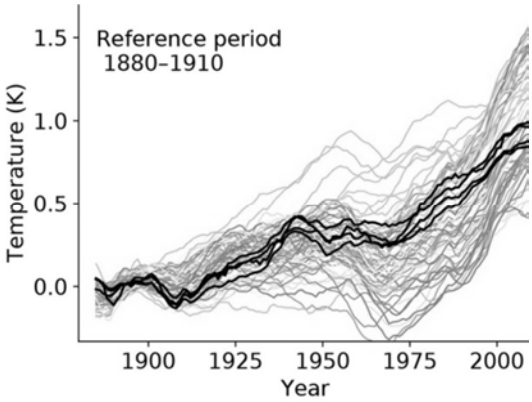

Figure 2. *Tuned model estimates (26 grey lines) of observed temperatures (4 black lines) with the apparent grey swath showing the trend of the bulk of the estimates over time.*

4. Global Warming

From about 1970, both the observations and the estimates in Figure 2 show a rather steep rise in mean global surface temperature, now popularly identified as "global warming." As the use of tuning might predict, the rise is steeper for the estimates than for the observations: Just as calibration resulted in underestimation of falling water levels, so here tuning results in overestimation of rising temperatures. How much is that overestimation? Koonin toward the end of Chapter 4 in [7] provides information that may suggest an answer to that question. In a so-called "budget analysis," he compared the mean global temperature rise over the past 140 years with total human and natural forcings (measured in Watts per square meter) that occurred during the same period and, after some correction of the data, showed that model tuning may have led to overestimating the effect of human influences on global warming by a factor as high as two.

5. Sensitivities

Terminology varies among statisticians and users of statistics in different fields. That variation can obscure the occurrence of mistakes in the use of statistics by non-statisticians. Terms used for the weights in estimates consisting of weighted sums provide an apt example. Some simply refer to the weights as constants. Statisticians call them parameters, and that could lead a statistician to misinterpret the term "parameter adjustment" when used by hydrogeologists and climatologists. The statistician might think that term meant the development of a new model, with new weights, to reduce error variation. The reason for that misinterpretation is that hydrogeologists and climatologists understand the word "parameter" to mean not a weight but the value of the independent variable to which the weight applies. By "parameter adjustment," they mean adjustment of variables, not constants—in other words, the adjustment of data. So, what terms do hydrogeologists and climatologists use to identify a model's weights? Interestingly, they both use the same term: "sensitivities."

The sensitivity that is of particular interest in the study of global warming is the weight that applies to the concentration of CO_2 in the atmosphere. The modelers producing the estimates shown in Figure 2 generally agree that the "equilibrium" value (Equilibrium Model Sensitivity, or EMS) of that sensitivity should be equal to about 3.0 degrees Centigrade (C). That means that doubling the concentration of CO_2 in the atmosphere from its value prior to the use of fossil fuels would increase the mean global temperature by about 3.0°C, provided no other influences, which climatologists call "forcings," were affecting it. As noted earlier, reflecting the different slopes of the curves for the estimated and observed surface temperatures in Figure 2, that number might be too high, perhaps by a factor of two.

In support of this possibility, the actual sensitivity for CO_2 concentration in climatology models (Transient Climate Response, or TCR) over the years has tended to hover around 1.5°C, half the 3.0°C EMS (e.g., Nijsse et al. [11] and Koonin [7]). Climatologists generally believe that the EMS is the correct long-term value for that sensitivity because transient conditions in zones might tend to lower the steepness of observation curves. Typical among those conditions are changing cloud formations, decreasing aerosol emissions, and melting icebergs. Perhaps even more to improve the fit of their models to data, climatologists use tuning to help guide their development of models having TSR values which are increasingly close to the EMS. Nijsse et al. [11] provides examples of that practice.

6. Uneasiness of Climatologists with Tuning

Although almost all the models cited in the 113 pages of the Fiato & Marotzke et al. [3] chapter in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (AR5) employ tuning, the word "tuning" appears there only 14 times. That number includes once in the table of contents and once in the reference list. Of the chapter's 1,423 references, only one [9] contains the word "tuning" in its title! Contrast that with the number of appearances in that chapter of the word "cloud" or "clouds" (165), "aerosol" (120), "ice" (333), and "ocean" or "oceans" (638). Although AR6 is not yet complete, neither the word "model" or "models" nor the word "tuning" appears in the title of any of the report's 12 listed chapters.

Interpreting such information to be indicative of a deliberate lack of transparency, the 15 authors of Hourdin et al. [5] ascribe it to an uneasiness within the climatology community over its use of tuning, especially since 22 of the 23 modeling centers contacted in a survey reported in the article said their models had used tuning, and all responded that they believed tuning to be important in model development. Climatologists evidently have two minds about tuning.

According to Hourdin et al. [5], its title being "The Art and Science of Climate Model Tuning," the practice of tuning is partly subjective and partly objective. Uneasy about the subjective part, the article's authors cite as authoritative support for the use of tuning an article by the highly-respected statistician R. A. Fisher [4] identifying "parameter estimation" as one of three steps comprising the process of model development. As noted earlier, to those authors, but not to Fisher, parameter estimation meant the partially subjective process of estimating an independent variable. To Fisher, it meant an entirely objective process of estimating the weights in a weighted sum of independent variables, commonly to minimize error variation. So, the citation of Fisher was hardly authoritative support for the subjective part of tuning. To the extent that subjectivity plays a part in it, climatologists have every reason to be uneasy about tuning.

Subjectivity-objectivity, however, is not the correct scale to use in evaluating the practice of tuning. As the next section will show, the correct scale to use is the right-wrong one, and on this scale, regardless of the extent of subjectivity or objectivity involved in the practice, tuning is simply wrong. "Parameters" as the term is used by both hydrogeologists and climatologists are data, and Fisher in [4] was not endorsing the adjustment of data.

Whether tuning or calibration, the adjustment of the value of any independent variable during model development, regardless of whether it is an increase or a decrease, will produce trends in estimates that are steeper than the trends in their corresponding observations. Interpretation of those exaggerated trends as forecasts of the future or as corrections of data have no more validity than the reading of tea leaves.

Simply the alteration of an independent variable's value itself, however, does not constitute tuning or calibration. An alteration made to use a model to estimate a future event when the value of the independent variable may differ from its current value is prediction, not tuning or calibration. The difference is that in tuning and calibration the observations being estimated remain unchanged throughout the process whereas in prediction those observations are free to vary.

Hydrogeologists and climatologists have a notable difference in their evaluation of the results of "parameter" adjustment. Whereas the hydrogeologists cited in Weitzman [14] blamed their calibrated models for being too slow to catch up with the data, climatologists have tended to blame the data for being too slow to catch up with their tuned models. Neither the models nor the data are to blame, however. The blame belongs entirely to the practice of "parameter" adjustment itself.

7. What Is Wrong with Tuning

By exaggerating upward or downward tendencies of observations over time, tuning corrupts data. When it is done to improve the appearance of a model or to help produce desired model predictions, it descends to the level of cheating. It is like using a cheat sheet to answer questions you would otherwise get wrong on a test. On the binary scale of right and wrong, regardless if the motivation, it is simply wrong.

Why? Every useful independent variable in a model uniquely increases the predictable portion of each observed measurement the model has been developed to estimate while simultaneously reducing the measurement's unpredictable portion, in other words, its error. So, error, by definition, is unpredictable. By creating a negative correlation between model estimates and errors, however, tuning, like calibration, makes errors predictable. That, as noted by Weitzman [14], is an oxymoron, which should be anathema to every member of any research **c**ommunity.

A mindset that allows tuning to help a model achieve a desired purpose can allow not only its extreme use but also the use of other forms of such motivated data manipulation. In Chapter 4 of *Unsettled* [7], Koonin cites a glaring example. Global warming being a United Nations concern, the models described in Figure 2 come from countries all over the world. To correct for a prediction of over twice as much global warming as was actually observed, some highly-regarded German climatologists [10] tuned one of their independent variables by a factor of ten from its initial value in their model-improvement process. Not to be outdone, a hydrogeologist cited in Weitzman [14] adjusted an independent-variable value without supporting data to be seven orders of magnitude lower than its initial value in zones crossed by a river to show that no aquifer beneath the river could possibly get any water from it. For the purpose of achieving a sensitivity of 3.0°C for CO_2 concentration, a modeler could avoid tuning altogether simply by fixing the sensitivity for CO_2 concentration at 3.0°C while allowing data to determine the sensitivities for the other independent variables in model development. Such blatant fudging of results should sound an alarm in every research community, not only climatology, to avoid the practice of data manipulation by any means to help achieve a desired purpose.

8. Yet More to the Story

In addition to the steep rise in mean global surface temperature from about 1970 onward, Figure 2 also shows an equally steep rise earlier, between about 1900 and 1940, prior to the steep rise in the use of fossil fuels. As shown by the grey swath in the figure, however, the model estimates rise about twice as steeply for the later than for the earlier period, a difference noted with concern by Koonin (in [7]). Koonin feared that the models were not sensitive enough to natural conditions, like a burst of unrecorded volcanic activity beneath the sea (author's, not Koonin's, example), causing the earlier rise that might also, possibly together with CO_2, be the cause of the later rise. Tuning might also help explain the difference.

Prior to tuning, the model estimates tracked the observations with mostly randomly-occurring under- and overestimations. That tendency applied to both the earlier and the later periods of steep observation rise, but only during the later period did the measured concentration of CO_2 rise precipitously. So, prior to tuning, the models could better, likely much better, account for the rise in that later period than for the rise in the earlier period. By exaggerating both rises, tuning improved the performance appearance of the models during the earlier period while having the opposite effect during the later period of steep observation rise.

9. What to Do Now

The United Nations' studies of global warming have employed enormous resources involving the use of many computers working in concert for months to analyze data from all the defined zones above the surface of the land and below the surface of the oceans throughout the world. Because of the enormity of the undertaking, much of the data collected is either unreliable or just an expert guess, a condition that invites and may, in some minds, even justify tuning. Some hydrogeologists who are aware of the problems resulting from their calibration of a model have in each instance resolved them by developing a new model based on the adjusted data in the calibrated one. Climatologists have done likewise, now in their sixth iteration (AR6), with increasingly unsatisfactory results motivating more rather than less tuning and showing increased divergence among modelers from iteration to iteration, duly noted by Koonin in *Unsettled* [7].

Perhaps in an excess of hutzpah, a statistician who is not a climatologist might offer the following possible solution to the tuning problem in climatology: Analyze the data obtained from a random sample of zones that is large enough to yield results having an acceptable margin of error and small enough for researchers to collect reliable data from all the zones in the sample. As observed by Hourdin et al. [5], a number of climatologists have already led the way, some via classical statistical methods (Bellprat et al. [1], Yang et al. [17], Zou et al. [19], and Zhang et al. [18]) and some via Bayesian ones (Rougier [12], Jackson et al. [6], Edwards et al. [2], and Williamson et al. [16]). Rather than being an exception, random sampling should become the norm. The number of zones needed to do that would be in the low thousands rather than the millions now under study.

Of the two statistical methods, the Bayesian one should require smaller samples. The difference could be considerable. In the field of survey methodology, Weitzman [15] provides this example: To achieve a .03 margin of error in a two-choice case, a survey which requires a sample of 1.067 using classical methods would require a sample of only 522 using Bayesian methods. What a .03 margin of error might mean in a sampling study of climate change is that the sample estimate of mean global surface temperature should differ from the population (all zones sampled from) mean global surface temperature by no more than .03 with odds of 20 to 1. Use of a Bayesian method could achieve error margins of .02 or even less with tractable sample sizes.

10. Conclusion

The planet is going through an interglacial period of global warming. Carbon dioxide fills little holes in the blanket of water vapor in the sky that helps keep the earth warm. Human activity that varies the production of CO_2 can somewhat affect the rate but cannot stop the occurrence of global warming. Despite what the cock might believe, the sun will continue to rise even if he stops crowing before daybreak. Guided by research in climatology, with due respect for Mother Nature, human beings in this century should plan for steadily rising seas resulting from melting glaciers and icebergs—along with other daunting challenges—created by increasingly warm nights. The name of the effort could be Project Noah. It has happened before.

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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates.	A.12-04-019 (Filed April 23, 2012)

CERTIFICATE OF SERVICE

I certify that I have today served a copy of **MOTION TO DISQUALITYALJ HAGA FROM MAKING FURTHER DECSIONS ON MOTIONS AND PETITIONS BY WATER PLUS IN THE PROCEEDING ON THE MONTEREY PENINSULA WATER SUPPLY PROJECT** in A.12-04-019 to all parties on the Service List of A.12-04-019 this date via email.

Executed on September 12, 2022, in Carmel, California.

Respectfully submitted,

WATER PLUS

By:

/s/*Ron Weitzman*
Signature

Ron Weitzman
President, Water Plus

CALIFORNIA PUBLIC UTILITIES COMMISSION
Service Lists

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FILER: CALIFORNIA-AMERICAN WATER COMPANY
LIST NAME: LIST
LAST CHANGED: AUGUST 18, 2022

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From Divining Rods to Statistics: A Forensic Analysis of the Misuse of Statistics in the Estimation of Environmental Impact

R. A. Weitzman

Abstract

Shortly after my retirement, I became involved in local water issues and learned that I could be of especial use in work on those issues because of my background in statistics. What I am reporting here is a minimally-technical account of the experience I had using statistics as a forensic tool to unearth what appears to have been a misuse of statistics in the modeling of the environmental impact of a proposed desalination project to provide water for the community where I reside. Of potential interest to statisticians is how statistics can be useful in detective work.

From Divining Rods to Statistics: A Forensic Analysis of the Misuse of Statistics in the Estimation of Environmental Impact

R. A. Weitzman

Most experts who search for underground water no longer use divining rods—they use statistics to estimate the water levels in aquifers below specific sites on the ground. Unfortunately, users of statistics can also misuse them, sometimes with costly consequences. This is the story of how statistics were applied as a forensic tool to identify misuse in estimating the impact of a proposed public project on groundwater levels.

The Monterey Peninsula in California has been over-drafting the Carmel River groundwater basin for years. In 2012, after two decades of fits and starts seeking water elsewhere, all faithfully documented in the *Monterey Herald* newspaper, the Monterey district of the privately owned water utility California-American Water filed an application with the California Public Utilities Commission (CPUC) to build a desalination plant on the coastline of the Monterey Bay in the city of Marina, about eight miles north of the Monterey Peninsula.

A number of parties joined the proceeding on the application, which also included recycling and storage components, in a total package called the Monterey Peninsula Water Supply Project (MPWSP). The Water Ratepayers Association of the Monterey Peninsula (Water Plus) was one of those parties. The proceeding lasted six years, until 2018, when the CPUC certified the project and the Environmental Impact Report (EIR) on its desalination component, which is the focus of this story.

A critical part of the EIR was modeling the impact of the operation of the project's coastal wells on nearby groundwater levels and seawater intrusion, which occurs when groundwater levels go below sea level. Stochastic and linear modeling being one of my strongest interests in statistics, that aspect of the project particularly caught my attention. What I learned and reported to the CPUC about the EIR's treatment of modeling had not only great interest for me, but also substantial impact on the fate of the project.

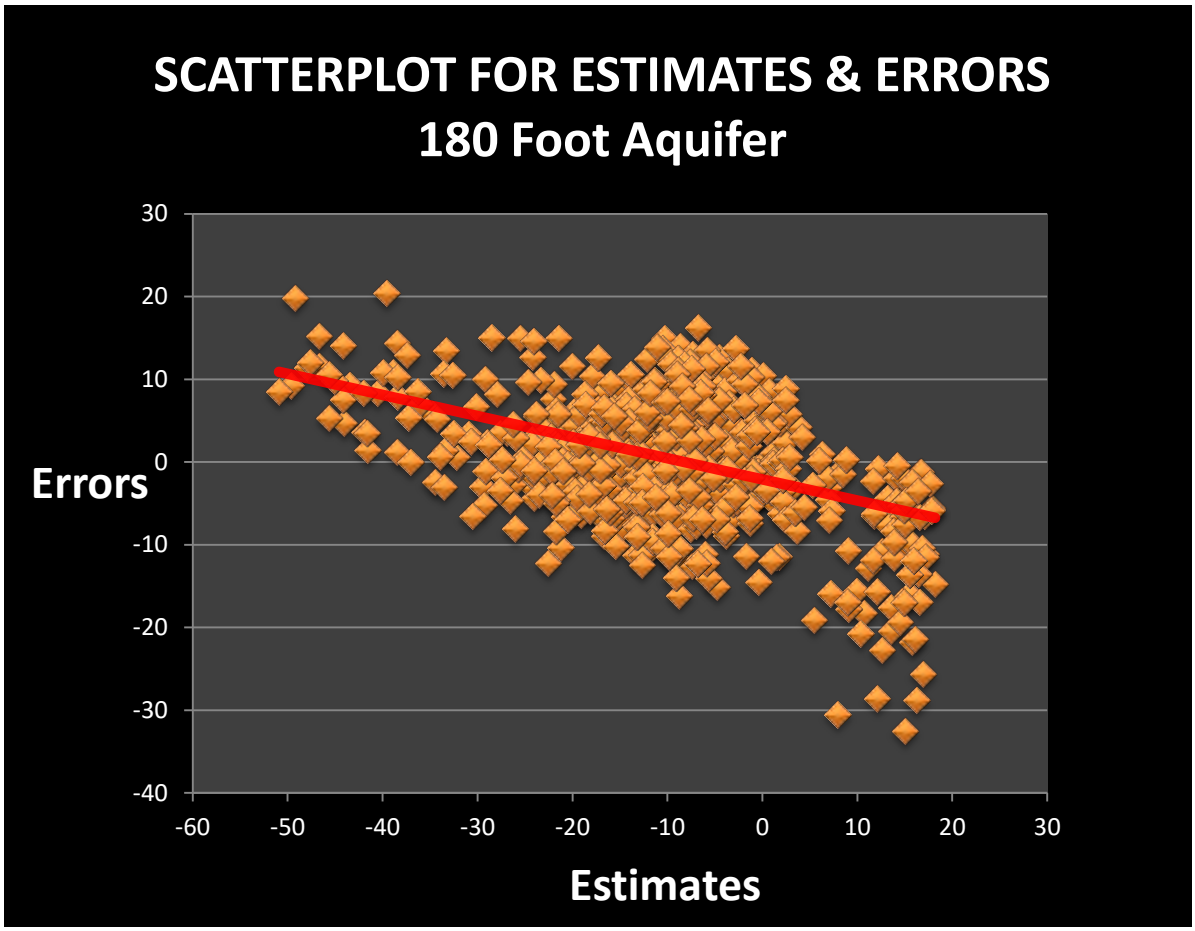
Modeling Groundwater Levels

The CPUC circulated three versions of the EIR: a first draft in 2015, a second draft in 2017, and a final version in 2018. Expert 1, the modeling consultant for the first draft, used a linear model to estimate groundwater levels over time in a checkerboard of zones covering an inland region around the proposed project wells. The model divided each water-level measurement into two components: an estimate and an error component. The estimate component was a weighted sum of independent variables that could vary in value over time and zones.

To evaluate the model's accuracy, Expert 1 used a statistic called "the relative error" that measured the extent to which the error components varied from zero: the smaller the variation, the more accurate the model. In hydrogeology, the relative error, expressed as a percent, is equal to 100 times the decimal fraction, consisting of the standard deviation of errors divided by the range of observed measurements; in this case, water levels.

Considering a model to have satisfactory accuracy if its relative error was below 10.0 percent, Expert 1 computed the relative error of the model applied to combined data from three aquifers and, finding the relative error to be 9.5%, concluded that the model's accuracy was satisfactory. That result might have marked the successful end of the proceeding on the project if not for a number of events that occurred at the time.

Figure 1. Graph of data showing highly negative correlation, equal to −0.45, in slope of straight red trend line.



One of those events was the result of my curiosity. The project was to draw its water from two aquifers, but only one of them—the 180-foot aquifer—was among the three to which Expert 1 applied the model in testing it.

Because I wondered what the results might be if the model were applied only to the 180-foot aquifer, I requested and received data from the CPUC to find out. What I found out and reported in filed comments on the first draft EIR is that the relative error for the 180-foot aquifer was 11.2%, indicating a less-than-satisfactory evaluation of the model when applied to data for that aquifer.

Snooping around further, I also found and reported for that particular data set, consisting of 993 water-level observations, that errors and estimates were highly correlated: Estimates above average tended to have errors below average (zero) and vice versa. See Fig. 1. That is a no-no in modeling and made me wonder what might be the cause of it..

That is the kind of slope likely to describe the relationship between estimates of water elevation in a well and the well's pumping activity, with high estimates corresponding to low pumping activity, but not between estimates and errors. Water elevation should be predictable from pumping activity but, by definition, errors are unpredictable. Prediction of errors is an oxymoron. The straight trend

line describing the relationship between estimates and errors should be horizontal to reflect unpredictability, with a zero correlation between them. Any other straight-line trend indicates data that have somehow become corrupted.

The CPUC managed these events by replacing Expert 1 with Expert 2 to respond to the Water Plus critique of the modeling by Expert 1 that supported the project. In the resulting second draft EIR, Expert 2 confirmed that the relative error for the 180-foot aquifer was larger than 10.0% and that the correlation of errors with estimates was far from zero—but provided different interpretations of those numbers to help support the project.

For the relative error, Expert 2 raised the threshold for a satisfactory model from 10.0% to 15.0% despite that for a normal distribution having a practical range of six standard deviations, 15.0 is 90% of the highest possible value for the statistic—16.7% (one-sixth of the range), representing a model having virtually zero predictive power.

No less questionably, Expert 2 attributed the non-zero correlation between errors and estimates to model “bias” due to other non-zero correlations with error that Expert 2 discovered, including one in which errors moved up (from negative to positive) while estimates moved down over time.

Finding these biases intractable, Expert 2 replaced the model, which had not done well on its tests, with an untested one that applied the replaced model (with the same weights and independent-variable values), to estimate periodic changes in water levels and, by adding the estimated changes over time, to predict the project’s impact on aquifer water levels and seawater intrusion. The untested application of a model developed to predict one thing to predict something else, with no known relationship between the two, can only produce results that have zero credibility. The final version of the EIR made no further modeling changes.

The data for the 180-foot aquifer were, no doubt, corrupted. The question was whether the cause of the corruption was inherent model bias in the estimation of water levels, as Expert 2 claimed without verification, or something perhaps more sinister had occurred, such as manipulation of the data. The evidence supports the second answer.

Common practice among hydrogeologists in model “calibration” is to “adjust” values of unreliably measured independent variables (such as directional groundwater flow rates) in the estimation equation to reduce the relative error. Reducing the relative error by this means not only moves errors toward zero, but also moves estimates equally in the opposite direction to avoid altering the sum of each estimate and error, which is equal to an observed water level.

The movement of errors and estimates in opposite directions is what created the negative correlation between them that I observed as a sign of data

tampering. The model itself, having been developed to have minimal error variation with zero estimate-error correlation, was not responsible for that bias; by tampering with data in their model calibration, Expert 1 and Expert 2 were sufficiently, if not solely, responsible. As Pogo observed, “We have met the enemy and he is us.”

Neither was the model itself responsible for other biases observed by Expert 2. Errors went up as estimates went down over time, for example, because during that time, water levels were going down. When they go down, estimates follow them down while, being negatively correlated with estimates, error go up. Other biases observed by Expert 2 were likely also due to the negative correlation between errors and estimates caused by model calibration.

Model calibration may be acceptable in hydrogeology if the altered data are subjected to a weight-estimating process like the one that created the model in the first place and produced water-elevation estimates that were uncorrelated with errors. Subjecting the altered data to that process probably would have erased the biases that led Expert 2 to replace a tested and improvable model with one having implausible and untested applicability to make predictions of project impacts. Inexplicably and unfortunately, both Expert 1 and Expert 2 failed to do that, although that process today constitutes standard practice in hydrogeological modeling.

Epilogue

In addition to CPUC certification, the MPWSP needs a number of permits enabling its development. The most critical of these is a coastal development permit from the California Coastal Commission. In 2019, aware of project problems identified by Water Plus and others, including their own hydrogeological consultant, commission staff members recommended that it reject the utility’s application for the permit. Commission action remains pending.

This story is only an example. Statistics may have widespread use as a forensic tool, even in the legal world itself, where an amateur sleuth like me might turn out to be an actual one.

Additional information

Notes on contributors

R. A. Weitzman

Ron Weitzman received his BA and MA from Stanford and his PhD from Princeton. He has received a Stanford Honors Fellowship; Psychometric Fellowship of Princeton and the Educational Testing Service; and two post-

doctoral fellowships, from the National Science Foundation and the United States Public Health Service. He has served on university faculties in the United States, the United Kingdom, and Israel. His specialty areas are mental tests and survey statistics, and he has dozens of publications and two patents in those fields (one patent in each). He is a United States Army veteran.

Evaluation of the Ground Water Modeling for the Cal Am Monterey Peninsula Water Supply Project

Prepared for Dr. Ron Weitzman, President
of the
Water Ratepayers Association of the Monterey Peninsula

Prepared by Barbara Ford, PE*, GeoHydroScience llc

August 10, 2019

*CO

1.0 Introduction

1.1 GeoHydroScience Objective

Modeling is essential for accurate prediction of the environmental impact of proposed slant well pumping in the California-American Water Company (Cal Am) Monterey Peninsula Water Supply Project (MPWSP). That project underwent two draft environmental impact reports (EIRs), one in 2015 and one in 2017.[1] Each report contained an appendix on modeling identified as Appendix E2. The first was prepared by Geoscience Support Services, Inc. (Geoscience) and the second by HydroFocus Inc. (HydroFocus), collectively referred to as the consultants. I have been informed by Dr. Weitzman of the following:[2]

> The second (H-E2) was created at least partly in response to critical comments on the first (G-E2) by Dr. Ron Weitzman, president of Water Plus, a party to the proceeding on MPWSP. The final project EIR contained H-E2 and a chapter (Chapter 6) consisting of responses to critical comments on the second draft, including comments by Dr. Weitzman on H-E2. According to Dr. Weitzman, the California Public Utilities Commission has not held any evidentiary hearings on the second draft or the Chapter 6 responses in the final EIR. Because Dr. Weitzman considers the EIR modeling to be seriously inadequate, as well as professionally uncontested, he has filed a lawsuit challenging the usefulness of the EIR to determine the environmental impact of MPWSP.

Under these circumstances, for assistance in that suit, Dr. Ron Weitzman has hired Barbara Ford, PE[3] of GeoHydroScience llc, as an expert in hydrogeology and modeling to review both G-E2 and H-E2, and write a report.

1.2 Information Reviewed

Because of the short timeframe as a consequence of Dr. Weitzman's communicated difficulty in acquiring assistance in California as a consequence of conflicts of interest, my review was necessarily limited to only the documents identified below:

- Water Ratepayers Association of the Monterey Peninsula and the State of California Amended Complaint for Damages and Civil Penalty and Demand for Jury Trial, Case No.:16CV001561, Draft April 12, 2019.

[1] Communication with Dr. Weitzman on August 8, 2019.
[2] Ibid.
[3] Barbara Ford, author of this report is a licensed Professional Engineer in Colorado and Arizona.

- Geoscience Support Services, Inc. April 17, 2015. Appendix E2 Monterey Peninsula Water Supply Project Groundwater Modeling and Analysis. Prepared for California American Water and Environmental Science Associates. It includes Appendix A - Luhdorff and Scalmanini, Consulting Engineers, March 2015. Monterey Peninsula Water Supply Project Using the Salinas Valley Integrated Ground and Surface Water Model. Prepared for Geoscience.
- HydroFocus, Inc., August 31, 2017. Appendix E2 North Marina Groundwater Model Review,Revision, and Implementation for Slant Well Pumping Scenarios. Prepared for Cal Am Monterey Peninsula Water Supply Project.

1.3 Information Not Reviewed

Of significance to this review, there is additional information that has not been reviewed for the reason stated. The following is a partial list of items not reviewed.

- Data and data analysis reports
- Source data
- Model files
- CEMEX model report and files
- Responses to Comments to the Final Environmental Impact Report

Accordingly, my report can only assess the model based on the information reviewed, and weighing that information across the reports and against standard modeling practice as appropriate.

The last item in the list, Responses to Comments was made available to me on July 26, late in my review and only just prior to report preparation. While time did not allow for sufficient review of that document, I was able to identify that some concerns by other reviewers similar to my own were addressed to an unknown extent by the consultants (because of my limited time not allowing for a comprehensive review). To the extent that the consultants comments have not adequately addressed, mitigated or corrected each of the items described in this report, my opinions on that particular item remain relevant.

2.0 Model

2.1 Reliance on Salinas Valley Integrated Ground and Surface Water model (SVIGSM)

The Geoscience modeling relied on an updated calibration of the SVIGSM model by its subcontractor, Luhdorff and Scalmanani, Consulting Engineers (LSCE). Geoscience extracted a portion of the area of the SVIGSM model to construct the North Marina Ground Water Model (NMGWM) and adapted it to estimate the drawdown impacts to the aquifer system resulting from proposed slant well pumping along the coast at the CEMEX site and the Potrero Road site. HydroFocus adopted the Geoscience model, adjusted parameter values among other revisions to produce a calibrated model, concluded that the NMGWM boundary conditions, pumping and recharge were in error and instead relied on superposition to predict drawdown from proposed slant well pumping.

The LSCE focus was as follows (excerpt from LSCE, p.1):

> This report focuses on documenting the extension and recalibration of the SVIGSM along with the predictive scenario results of the MPWSP generated by the SVIGSM with a focus on the influence the MPWSP has on Salinas River streamflow and interaction with underlying groundwater aquifers in the Pressure and East Side subareas of the Salinas Valley.

2.2 Limitations in SVIGSM Calibration

LSCE identified the methodology employed to update the SVIGSM calibration. Of significance, primarily because of the subsequent reliance on SVIGSM water levels for assignment of boundary conditions in NMGWM, the LSCE calibration was necessarily limited to only revising and updating system stresses including aquifer recharge and discharge, but excluded updating of the aquifer properties[4] because elements of the existing SVIGSM were inaccessible (see excerpt below, LSCE pg.2):

> The intent of the recalibration effort was to retain the existing model framework and aquifer properties as originally conceptualized by Water Resource and Information Management Engineering, Inc. (WRIME) and MCWRA due to the inability to obtain the SVIGSM source modeling code.

Also from LSCE (pg. 11; underline added for emphasis):

[4] such as hydraulic conductivity (K)/transmissivity(T), and specific storage(Ss)/storage coefficient (S); T and S reflect the K and Ss across the aquifer thickness.

> The intent of the model extension and recalibration effort was to retain the existing modeling framework and aquifer properties and <u>any adjustments that were necessary to recalibrate the model focused on recharge and discharge input values</u>.

Presumably LSCE would have chosen to update aquifer properties to capitalize on the new data available since the last SVIGSM calibration. LSCE provided the following SVIGSM output for the NMGWM model (excerpt, pg. 13):

> SVIGSM calibration outputs were provided to Geosciences for incorporation into the NMGWM. These outputs included monthly output of groundwater levels at SVIGSM nodes located along the edge of the NMGWM domain, groundwater pumping by element, deep percolation by element, and streambed infiltration by stream node. These data were incorporated into the NMGWM for use in model calibration.

LSCE modified the pumping in each model layer based on observed water level data, as described in the following excerpt (LSCE pg. 11):

> During the model calibration, the vertical distribution of groundwater pumping was adjusted to more closely simulate the observed conditions within all three (3) model layers based on water levels at calibration wells. Groundwater levels in each calibration well individually reflect conditions in distinct depth intervals corresponding with different model layers. Accordingly, the hydrographs of simulated and observed water levels for calibration wells were used as guidance in making adjustments to the vertical distribution of pumping for different time periods during the updated model calibration period.

While much of the LSCE data preparation for the model update was reasonable, this re-allocation of pumping during the calibration is problematic. It is not clear that this practice was done model-wide or only for select wells as the report did not provide sufficient information. If the justification for this application was for only wells which spanned multiple aquifers (multi-completion wells), a more defensible approach would have been to employ an equivalent method as that available in the Modflow multimode package which dynamically allocates pumping depending on the layer water level (head), the transmissivity and the storage characteristics (if a transient model). Reallocation by using only the observed water level, presumes the aquifer properties are known and correct in the model. If not, the pumping reallocation based on the observed water level as the guidance, is incorrect. Because the NMGWM calibration would subsequently revise aquifer properties, while retaining the SVIGSM pumping allocation, but also in accordance with the observed water levels, the pumping allocation would be erroneous. Not only that, the calibrated aquifer properties would also be potentially erroneous, because of their dependence on the erroneous stress.

LSCE presented no stream gain-loss data in its report to support its estimation of the streambed infiltration used in the calibrated model, but like the pumping, it was a calibration parameter. But because stream gain-loss data was not presented, it is indeterminate if the calibrated recharge distribution was accurate. Sensitivity analysis of calibrated values was not presented, so the uncertainty is unquantified.

2.3 SVIGSM and NMGWM Inconsistencies

NMGWM is reliant on the recharge and discharge distributions from the updated SVIGSM calibration. Geoscience explicitly states adoption of those stresses, consistent with the LSCE report as follows (excerpt from Geoscience report pg. 27):

> Monthly data for deep percolation from precipitation, stream recharge and groundwater pumping in the NMGWM area as well as the water levels assigned for the general head boundaries during the calibration period were obtained from the SVIGSM.

Geoscience describes the following calibration process (excerpt pg. 28):

> The calibration process involved adjusting model parameters until the model provided a reasonable match between the simulated and measured parameters. These aquifer parameters included horizontal hydraulic conductivity, vertical hydraulic conductivity, effective porosity, and the storage coefficient.

A side-by-side comparison of the aquifer properties in the two models (SVIGSM and NMGWM) is not presented by Geoscience or HydroFocus and because LSCE did not present the aquifer properties in SVIGSM, I am unable to identify and evaluate the differences.

The properties are presumably different between SVIGSM and NMGWM as a consequence of subsequent parameter revisions during calibration by Geoscience and HydroFocus. Because of inadequate documentation in the Geoscience report however, the extent to which a feedback loop between Geoscience and LSCE existed is not evident. It is possible that such feedback was used and the water levels assigned at the NMGWM boundaries were consistent with the SVIGSM output, but if employed, that process may have led to other errors, potentially of great relevance to the reliability of the model results. Only because HydroFocus included water level data in the southern area of the model (south of the Salinas River), was a major discrepancy revealed between the SVIGSM calculated water level elevations and those assigned by Geoscience along the boundary condition. HydroFocus identified the error but did not correct it, and chose instead to abandon use of the calibrated head model for predictions of drawdown from slant well pumping, and employ superposition in its place.

2.3.1 Boundary Conditions

The consultants relied on the updated SVIGSM model-calculated water level distributions associated with an unknown set[5] of SVIGSM aquifer property values in order to assign the water level elevations along the general head boundaries (GHB) in the NMGWM model.

The GHB includes assignment of water levels and conductance terms to perimeter boundary cells and its function is simulation of a head distribution and prevailing gradient at the NMGWM model boundary. Accurate representation of the GHB ensures that the water level elevations in the aquifer layers are equivalent between the parent SVIGSM and NMGWM models at the boundaries. But the consultants do not report the water level elevations at the GHB. LSCE included figures of the simulated potentiometric surface showing contours of the model-calculated spatial water level elevation in the 180-ft aquifer and the 400-ft aquifer, but did not include the Dune Sand/A Aquifer/Salinas Valley aquitard potentiometric surface (SVIGSM model layer 1a). Geoscience and HydroFocus included no figures of the interpreted or simulated potentiometric surfaces for any aquifer in NMGWM so the head assigned along the boundaries could not be determined. The failure to include these interpretations is contrary to standard model (conceptual and numerical) reporting.[6] Also contrary to standard model reporting was the absence of a conceptual water budget, how well the model adhered to that budget, and definition of the method used to calculate the GHB conductance terms.

Subsequent to boundary assignment using the SVIGSM results, Geoscience and HydroFocus[7] revised the aquifer properties inside of the model area, including along the boundaries. This likely resulted in a disparity between the water level elevation assigned at the boundary per SVIGSM, and that inside of the NMGWM. But the disparity at the boundary would result in erroneous flow rates at the boundaries and to an unquantified extent, erroneous water levels inside the boundary. HydroFocus concluded the error was significant, and rather than correct the erroneous boundaries, abandoned the NMGWM physically-based head model in favor of a superposition

[5] not included in the LSCE report appended to the Geoscience report

[6] Anderson, MP, WW Woessner and RJ Hunt 2015. Applied Groundwater Modeling Simulation of Flow and Advective Transport. Elsevier/Academic Press.

[7] It is assumed Geoscience altered the parameter values after importing the SVIGSM boundary water levels because the report does not distinguish otherwise. HydroFocus did alter the Geoscience NMGWM parameter values.

model, where only the change to the water level (not the water level elevation or head) is calculated. The predictive modeling is described in Section 4.0 of this report.

Pumping

The errors in pumping introduced during SVIGSM calibration described in the previous section, were compounded in the Geoscience and HydroFocus calibrations.

Recharge

In order to accurately quantify the impacts during predictive modeling, there must first be an understanding of the stream-aquifer interaction for the conceptual model based on gain-loss data, followed by estimation of the stream-aquifer parameter values during calibration using that data, and finally, quantification of the uncertainty in the calibrated parameter values based on sensitivity analysis. But the consultants do not present this data and analysis.

Stream gain-loss estimates were not presented in the Geoscience or HydroFocus reports. The reports do not present adequate information for the conceptual model pertaining to the stream aquifer interaction, nor where or how SVIGSM stream infiltration is assigned in the NMGWM model, and how well the NMGWM represents that relationship.

It appears[8] that historic gaged flow data along the Salinas River within the SVIGSM and NMGWM areas is available, but an explanation as why gain-loss estimates have not been estimated and utilized in calibration of the respective ground water models was not provided. If such data are available, it is of high value because it reduces uncertainty in the estimated parameter values and reduces the non-uniqueness commonly confounding optimization. Nonuniqueness occurs when different combinations of parameter values match the observations equally well.[9] Furthermore, the predictions of drawdown from slant well pumping and the impact to the stream gain-loss is of critical interest as identified in both the Geoscience and HydroFocus reports. The Geoscience and HydroFocus reports did not include a demonstration that the models accurately simulate the stream-aquifer interaction.

2.3.2 Model Layering

[8] on only a cursory review of USGS online data
[9] Hill, MC and CR Tiedeman 2007. Effective Groundwater Model Calibration. John Wiley & Sons, Inc.

NMGWM includes a layer for the Dune Sand/Aquifer A aquifer[10] (layer 2), and a layer (layer 3) representing the Salinas Valley aquitard, where present. In contrast, SVIGSM combines the typically highly transmissive Dune Sand/Aquifer A unit and the very low permeability aquitard into only one layer (1a), even where both occur vertically in the project area. Because LSCE did not present the aquifer properties of this lumped layer, the disparity in the SVIGSM and NMGWM cannot be evaluated.[11] Accurate representation of this uppermost aquifer layer including the Dune Sand/A Aquifer unit is critical to the calibration and predictions made using the model, including subsequent superposition modeling. The uppermost layer has expectedly the most (if not all) interaction with the recharge stresses, including stream gains and losses, precipitation recharge and other deep percolation.[12] Because SVIGSM revised the recharge distribution in its calibration, it is not evident that the inconsistent representation of the uppermost aquifer unit did not result in inaccurate representation of the recharge distribution. This may be another reason HydroFocus concluded the recharge distribution was erroneous, but this was not specified in its conclusion.

Geoscience and LSCE presented no calibration data for the Dune Sand/A Aquifer unit, although Geoscience was apparently aware of the existence of this data as shown in its Figure 96. Because Geoscience and LSCE did not include any calibration data in the Dune Sand/A Aquifer unit, the level of error remains unquantified.

3.0 Model Calibration

The description of the methodology employed for model calibration in the Geoscience and HydroFocus reports is incomplete. It is not possible to determine if Modflow 2000 was used for parameter estimation using inverse techniques, or was instead used deterministically. Parameter estimation using inverse techniques includes minimization of the objective function, representing the sum of the squared residual values in order to optimize the independent variables, the parameters. The residual is the difference between the observed and calculated value.

[10] Layer 2 also houses Perched Aquifer, the Perched "A" Aquifer, the 35-ft Aquifer and the -2 ft Aquifer (HydroFocus report pg. 9) but in this report I will refer to the "Dune Sand/A Aquifer unit" for simplicity.
[11] LSCE presented no information on the aquifer property values in the SVIGSM model so that a comparison could be made with that presented in the Geoscience and HydroFocus reports.
[12] Based on HydroFocus figures, however, there may be stream infiltration to the 180-ft aquifer, although there was inadequate information in the report to make a conclusion.

Modflow 2000 can be used for either approach. Parameter estimation is the calibration process which adjusts aquifer and stress variables (typically including the aquifer hydraulic conductivity, transmissivity, storage properties and recharge, among others) within reasonable ranges, to minimize the residuals in the observed and calculated response variables (i.e. the water level, also referred to as the head, and flux/flow). Industry standard calibration was historically done deterministically but, for approximately the past 15 years, inverse techniques have become more commonly employed because of the benefits of the inverse methodology, including quantification of the parameter uncertainty and sensitivities (coefficients calculated during parameter estimation to reduce the difference between the observed and calculated values[13]) , as well as quantification of the uncertainty in predictions, among other documented benefits.[14]

Neither consultant states which of the two, or whether a combination of the two was used to calibrate the models, critical to my review. It would have been assumed that the models were calibrated using inverse techniques in that the model is expectedly amenable to inversion.[15] The absence of enormous amounts of information generated by inverse modeling from the reports suggests that perhaps only deterministic methods were employed, sacrificing a valuable opportunity to better define the system through parameter optimization and uncertainty analysis. At a minimum, the identification of which calibration method was employed, and if not employed, a legitimate reason for not using inverse methods should have been included in the report.

The objective of the NMGWM model stated in the Geoscience report (pg.8) was to "evaluate the impacts of the proposed MPWSP on the Salinas Valley Groundwater Basin. Groundwater modeling was conducted to assess the impacts of MPWSP on the groundwater levels and the seawater intrusion".

Geoscience identified the following tasks to be completed in its scope of work (pg. 8):

- Collecting and analyzing historical geohydrologic data,
- Updating and recalibrating the North Marina Groundwater Model (NMGWM), including data gathered during the exploratory borehole work (GEOSCIENCE, 2014),
- Updating and recalibrating the Salinas Valley Integrated Ground and Surface Water Model (SVIGSM; see Appendix A)
- Developing a focused CEMEX Model for the CEMEX Site,
- Developing and running various MPWSP scenarios, and

[13] Doherty, J. 2015. PEST Calibration and Uncertainty Analysis for Complex Environmental Models, pg. 62.
[14] Hill, MC and CR Tiedeman 2007. Effective Groundwater Model Calibration. John Wiley & Sons, Inc.
[15] Dry cells in modeling can present difficulties for inverse modeling, but this model expectedly did not incur this difficulty to the extent that inverse methods would have been rejected *a priori*.

- Preparing the modeling report.

3.1 Data Deficiencies and Exclusion

While additional data collection was part of the task, Geoscience included no water level data for the Dune Sand/A Aquifer unit across the entire model area. But the Dune Sand/A Aquifer unit is one of the two primary units intended for pumping in the MPWSP. Geoscience did identify the existence of well data at Fort Ord (Figure 96), but excluded it from the calibration results in the model report. Because the expanse of this unit as represented in model layer 2 excluded water level data, the Geoscience NMGWM calibration for the Dune Sand/A Aquifer unit is associated with significant uncertainty, and predictions relying on the Geoscience calibrated model are concluded to be unreliable. Model bias is also evident in the 180-ft aquifer. Only when HydroFocus included the water level data (but only in the Fort Ord area south of the Salinas River), a poor calibration was revealed. But the calibration may be poor across other areas of the model where no water level data was available to inform the calibration. HydroFocus is correct in its assertion that the model in its current condition was unacceptable for its intended objective.

Geoscience described the CEMEX modeling in its report (April 17, 2015) but monitoring and testing of the CEMEX wells was initiated at nearly the same time as the report in early to mid-April 2015. It is unfortunate that the Geoscience CEMEX modeling was not delayed until after the testing which presumably would provide significantly better data for the model.[16] Because this data was not yet available, Geoscience relied on lower quality information from sediment texture curves, which included significant and untested assumptions, to derive the aquifer parameter starting values for calibration. But equipped with no water level data and no stream gain-loss data for calibration, the model representation of the Dune Sand/A Aquifer unit remained uncalibrated, so the presumably highly uncertain values used as initial values reasonably remained equivalent or nearly so to the final values.

HydroFocus presented calibration results using the CEMEX testing in which observed and calculated drawdown were presented for its model, the Geoscience model and the CEMEX model. But HydroFocus did not report the CEMEX test estimates of hydraulic conductivity (K); horizontal (Kh) or vertical (Kv)) or the estimated specific yield/storage estimate (sy/S), or that the model used those values.[17] The model K and S values for

[16] I am unfamiliar with potential constraints on the project schedule but the nearly contemporaneous report submittal and data acquisition is noted.
[17] See Figure 3.3d

either the HydroFocus model or the Geoscience model are not compared with the valuable test-derived estimates. Of the three models, the CEMEX model most accurately simulated the test drawdown, which HydroFocus attributed to the better resolution in the CEMEX model.

The source data was not included in the reports. Neither consultant posted actual K or storage values from testing in their parameter zone maps. While HydroFocus did prepare a list of sources for its basis in the model parameter zone values, those sources are most often other modeling efforts. It is not known if the source K values are model-estimated or estimates from testing. Model-derived estimates of K through calibration, for instance, are of less reliability than a hydraulic conductivity (K) value derived from pumping tests. The consultants require that the reviewer must gather and review all source documents to extract the information that should be reported in the model report. Standard model reporting includes a description of the method used to estimate each aquifer parameter[18], which is absent in the reports.

3.2 Parameter Adjustment During Calibration

HydroFocus and Geoscience adjusted parameter values to minimize the difference between the observed and model-calculated water levels during calibration. This minimization of the objective function (water level or head residuals (errors)) is but one measure of many in determination of the calibration quality and whether the model is a sufficiently accurate representation of the aquifer system. Calibration quality assessing only the error in the water level residuals, considers only a portion of the error information, and in this case likely a small portion of the error information. The NMGWM objective function is dependent on the water level data available, and as described in previous sections, insufficient data was acquired, utilized and presented for the NMGWM model calibrations. Furthermore, the calibration process must only adjust parameters within reasonable ranges based on available data, and quantify the uncertainty in those parameter estimates during the sensitivity analysis.

But the NMGWM calibration is concluded to have significant errors besides those already presented, and they include unreasonable parameter values, insufficient data, and inadequate sensitivity analysis.

[18] Anderson, MP, WW Woessner and RJ Hunt 2015. Applied Groundwater Modeling Simulation of Flow and Advective Transport. Elsevier/Academic Press.

Because of these errors, the model is not concluded to be representative of the aquifer system. The model will be unreliable for predictions of impacts from slant well pumping, regardless of its ability to minimize the objective function.

3.2.1 Hydraulic Conductivity

Sensitivity analysis and confidence intervals for the calibrated parameter values are not reported in the consultants reports. The uncertainty in the calibrated parameter estimates is not quantified.

Geoscience updated the CEMEX model subsequently in 2016, prior to the HydroFocus NMGWM calibration (2017), and presumably reflective of the high quality data from the pumping test performed in April 2015.[19] But HydroFocus did not identify the CEMEX aquifer test estimates of the horizontal (Kh) and vertical hydraulic conductivity (Kv) values in the report, and instead relied on other (often older) reports which appear to include predominantly modeling estimates of Kh and Kv.[20] The CEMEX monitoring well network for the test appears to have been particularly well suited for determination of Kh and Kv values.

In the CEMEX and Potrero Road sites, the Geoscience initial estimates of Kh and Kv were based on an assumed relationship between sediment texture and horizontal and vertical hydraulic conductivity. The method assumptions were not subsequently validated with the CEMEX aquifer test parameter estimates. Had the assumptions been subsequently validated, an opportunity would have existed to extend that demonstrated correlative relationship to other areas of the model. HydroFocus did not provide a post-audit of the validity of the approach and assumptions, or appear to rely on that method.

In the model area primarily east, south and southeast of CEMEX, the Kh and Kv values in the Geoscience and HydroFocus models are substantially different for the Dune Sand/A Aquifer unit, the Salinas Valley aquitard (SVA), and the 180-ft aquifer. The Kv changes include up to seven orders of magnitude reduction in the newly-interpreted low conductivity material in the HydroFocus model in layer 3.

The mapped SVA (Salinas Valley aquitard) north of the Salinas River has a Kv value five orders of magnitude larger than this anomalous low Kv zone south of the river. Because this change was not associated with a defined lithologic reinterpretation in the HydroFocus report, the value appears to be unreasonable. The Kh and Kv of the Dune Sand/A Aquifer unit are also generally lower in this anomalous zone, although the Kh

[19] The pumping test at CEMEX is concluded to have been performed in April 2015 based on the hydrographs presented in the HydroFocus report.
[20] See Figure 3.3d

value is identical between the Dune Sand unit and the low conductivity zone, also potentially reflecting an unreasonable Kh value if it is permeable material.

This area is partially traversed and bordered by the Salinas River.[21] The low Kh and Kv will limit the hydrologic connection between the river and the aquifer. Because the stream-aquifer interaction along the Salinas River may be affected by the erroneous model values, and because stream gain-loss data were not presented for the calibration, the predicted impact to the River from slant well pumping is unreliable. HydroFocus excluded explicit representation of a portion of the Salinas River in this area of the model in its predictive modeling as will be described in Section 4.0.

The Kh and Kv values in the 180-ft aquifer were also revised between the Geoscience and HydroFocus models significantly south of the Salinas River and near the southern boundary. The Geoscience Kh of 160 feet per day (ft/d) was revised to 50 ft/d (western half) and 425 ft/d (eastern half) so that a much higher Kh value is assigned inland as compared to the coast. The Kv was increased more than an order of magnitude above the Geoscience model values. HydroFocus did not post/identify the specific K values used to support this set of values, so it is not possible to make a conclusion about its accuracy.

HydroFocus incorporated more water level data along the southern boundary than Geoscience which allowed for better calibration in this area of the model. However, calibration must also reflect reasonable aquifer properties, while also minimizing the residuals between observed and calculated water levels. Some of the significant parameter changes made in the HydroFocus model may have been to compensate for anomalous boundary and initial water levels prior to the evident conclusion that the water levels were erroneous and disregarded in subsequent superposition modeling.

3.2.2 Storage Values

Only a cursory review of the model storage properties has been accomplished. I did not identify any source data values in the reports to which I can compare the model values. HydroFocus referred primarily to SVIGSM, but the LSCE model report did not include S estimates. HydroFocus had not included estimates from the CEMEX aquifer test so a comparison with model values could be made.[22]

[21] Because Geoscience and HydroFocus do not show the Salinas River on its respective parameter zone maps, I can only estimate based on a comparison across multiple figures.

[22] It is unknown whether the CEMEX testing yielded an estimate of specific yield and storage coefficient because the CEMEX report was not reviewed, and HydroFocus did not identify the values in its model report.

Accurate representation of the specific yield (effective porosity) and the storage coefficient is required for accurate predictions of the drawdown distribution and seawater intrusion. The HydroFocus values of specific storage (representing the storage coefficient divided by the aquifer thickness) as presented in Figure 3.3c appear to indicate an average model value of 0.001/ft which seems high for a confined aquifer where that exists.[23] Without any independent estimates made available by the consultants, it is not possible to conclude that the model storage values are reasonable. The model reports did not present interpreted or calculated potentiometric surface maps so areas where aquifers are confined or unconfined could not be distinguished and weighed against the storage estimates. The potentiometric surface is an imaginary surface passing through all points to which water will rise in wells penetrating a confined aquifer, and the surface is described by a series of contour lines along which the potential head is equal. The ground water flow direction is perpendicular to the contours. For an unconfined aquifer, the potentiometric surface is referred to as the water table, which defines the surface upon which the water pressure is equal to atmospheric pressure[24]. Definition of the potentiometric surface/water table is integral to understanding the hydrogeologic system.

3.2.3 Model Budget

The NMGSM hydrographs show that the initial model heads and heads at the boundaries were inaccurate for a significant portion of the simulation period.[25] The HydroFocus model flow budget presented in Figure 4.5 is inaccurate because it appears to use an average based on the inaccurate heads, as well as the erroneous pumping and recharge components. The model flow budget represents the model balance of each flow component simulated explicitly in the model, with some of the components positive (water into model area), precipitation recharge for example, and the others negative (water out of model area), including pumping as an example. Modflow numerically balances the positive and negative components with a balanced model showing a near zero difference between the two. Unbalanced or excessive flow budget error would be an indication that the flow components are not balanced, and the model is not concluded to be numerically precise. A model flow budget for the Geoscience model calibration is not included in the report. It is standard modeling practice to compare the model budget with that estimated independently depending on available

[23] Without review of source data, it is indeterminate whether 0.001/ft is an accurate value for the aquifer specific storage.
[24] McWhorter, DB and DK Sunada 1977. Ground-Water Hydrology and Hydraulics. Water Resources Publications, LLC.
[25] See HydroFocus Figure 4.1A layer 2 hydrographs.

historic data. LSCE had provided a detailed basis for some components, but the consultants did not incorporate this as part of the model calibration evaluation.

3.3 Sensitivity Analysis

HydroFocus stated the objective of its sensitivity analysis (pg. 42):

> The objective of the sensitivity analysis is to address the question: "If the assumptions adopted in developing the model were changed, would the model predictions change so as to change the conclusions regarding proposed slant well operation?"

For its sensitivity analysis, the HydroFocus report included an evaluation of the changes in drawdown in the predictive scenarios with alteration of five of nearly 50 conductivity model parameter zones.[26,27] Evaluation of the predictive uncertainty is valuable but not without an evaluation of the uncertainty in the parameter values estimated in calibration, upon which predictive uncertainty also depends. Standard reporting includes reporting the parameter sensitivity for all parameters, not only 10 percent, and from the calibration, not only from the predictive scenarios. While it was not made clear in either report whether inverse modeling was used for parameter estimation, Modflow 2000 allows for calculation of the sensitivities, as do other freely-available, coupled softwares to Modflow. Corroboration of the methodology and software is not possible without more information.

3.4 Analysis of the Residual Error

Geoscience and HydroFocus presented various report figures describing the residual error between the observed and model-calculated water level (head) values. The following observations are made based on my review of the report figures.

Dune Sand/A Aquifer unit

Of the eight wells, seven show that the model underestimates the observed water levels in the Dune Sand/A Aquifer unit. The model shows a biased low water level distribution.

[26] HydroFocus report Figure 6.1.

[27] Sensitivity is defined as the change in the model calculated response variable (for NMGWM, the water level, or derived drawdown) associated with the change in the parameter value (i.e. K; Anderson, MP, WW Woessner and RJ Hunt 2015. Applied Groundwater Modeling Simulation of Flow and Advective Transport. Elsevier/Academic Press.). Although typically in inverse modeling, perturbation of the parameter value over a small range more accurately reflects the parameter sensitivity because the parameter sensitivity is not always linear (Hill, MC and CR Tiedeman 2007. Effective Groundwater Model Calibration. John Wiley & Sons, Inc.). HydroFocus changes to the parameter values were large, assuming linearity, and done to demonstrate only the change in extent of drawdown away from the slant pumping.

Four of the wells[28] show that the starting head in the model was as great as 70 to 80 ft in error, as compared to the observed values. While there is convergence of the observed and simulated water levels late in the simulation period at three of the wells, it is not evident that error magnitude is not increasing with time,[29] or that application of an extremely low and likely unreasonable Kv is justified and has not been applied to specifically to reduce the residuals.

At monitoring wells MW-OU2-29-A and MW-BW-01-A, the erroneous starting head is shown to rise more than 70 ft during the simulation period at the (latter) well farther in from the boundary, and 35 ft at the (former) well more proximal to the boundary, possibly distinguishing error contributions.[30] Despite the significant rise in model water levels, concluded in the report to be erroneous, the observed water levels range similarly between the wells over a 10-15-ft interval. Rather than a localized perched condition as HydroFocus concludes without presentation of adequate data[31], the four wells collectively support instead a laterally extensive (of a few miles at least) saturated unit possibly above the Dune Sand/A Aquifer unit. It is possible that an additional aquifer above or within the Dune Sand/A Aquifer unit is present south of the Salinas River and is not the seemingly insignificant localized perched zone HydroFocus concludes. Additional data should have been collected to determine if this apparent upper aquifer unit is in hydrologic connection to the Dune Sand/A Aquifer unit. If it is, the evident vertical gradient warranted better vertical resolution (increased layering). This, among other expanses of model layer2 where the absence of water level data could not allow for similar revelation, may be an indication that the layering is too coarse for accurate representation of the uppermost aquifer units, including the Dune Sand/A Aquifer unit, thereby preventing evaluation of the full impacts from slant well pumping. Because the consultants provided no interpretation of the potentiometric surface, or the model-simulated potentiometric surface for any aquifer in their reports, contrary to model reporting standards, the extent to which this area may be in hydrologic communication with the Dune Sand unit at CEMEX has not been investigated

[28] MW-OU2-07-A, MW-BW-31-A, MW-OU2-29-A and MW-BW-01-A

[29] MW-OU2-07-A hydrograph Figure 4.1a shows an approximate 90% increase in the error between the beginning and end of the correlated portion of the record. MW-BW-31-A observed values show an anomalous step in the record which prevents a determination of the change in errors before the simulation period ends in Sept 2011.

[30] Errors in starting head and errors in the boundary conditions represent different error impacts in the model.

[31] Review of lithologic logs and interpretation of the potentiometric surface would have helped to distinguish whether the area may be in hydrologic communication with the aquifer or is perched, but Geoscience excluded the water level data, and HydroFocus concluded, in my opinion without adequate analysis completed, that the area was likely perched and that Modflow limitations prevented accurate representation of the water levels. Both consultants failed to adequately characterize this area, among others in NMGWM as a consequence of not collecting additional data in the uppermost unit.

or described by the consultants. The model does not allow for this communication as evidenced in the calibration results.

The extremely low Kv applied to the Dune Sand/A Aquifer unit, and particularly in the underlying layer 3[32] appears to have resulted in eventually reducing the residual at three of the wells. The extremely low Kv was applied to reduce the residuals at the wells, but because the value seems unreasonable, its use as a mechanism (prop up the head in layer 2) to improve the appearance of the calibration, instead reduces the confidence in the calibration.

Geoscience included no data for calibration of this unit. Because of the errors revealed in the HydroFocus calibration and report, the Geoscience calibration is expectedly also poor, as likely would have been concluded had the data been included.

For the CEMEX modeling as presented in Figure 4.2, the comparison between the observed and model-calculated values indicates low error in the water level residuals. However, the basis provided by HydroFocus on its improvement to well MS-5S[33] consists of the changes made to the SVA Kv. The Kv changes are described above and are considered unreasonable but applied as a mechanism to prop up the head in the model. An acceptable calibration achieves low magnitude, spatially and temporally random error, using reasonable parameter values. Because a sensitivity analysis of the calibrated parameter values was not presented in the report, the influence of the low Kv on the CEMEX area model-calculated water levels is unknown. The extent to which the model water level distribution in the Dune Sand/A-Aquifer unit in the CEMEX area depends on the seemingly unreasonable low Kv value of the nearby underlying SVA has not been assessed due to the consultants not including a sensitivity analysis of the calibrated parameter values.

The calibration is poor for the Dune Sand/A Aquifer unit and is affected to an unquantified extent by erroneous boundary conditions, erroneous starting heads, unreasonable parameter values and insufficient data. Based on the reports, the interpretation is also insufficient and fails to characterize the impact of these errors on the accuracy of the calibrated parameter values. Model predictions relying on a model with these errors are unreliable.

180-ft Aquifer

[32] as described in Section 3.2.1

[33] The CEMEX test was simulated in the Geoscience and HydroFocus NMGWM, but MW-5S available for monitoring and calibration during the slant well testing was excluded from Figure 4.6 without explanation.

The HydroFocus calibration included 10 wells with time-series data. The match between the observed and calibrated water levels at six of the wells is excellent in both timing and magnitude. However, five of the six wells are proximal to rivers (streams slough, etc; unlabeled in the HydroFocus report). It cannot be concluded that aquifer property values are accurate because the good fit between observed and calculated values may be a consequence of the unreported streamflow infiltration values provided by SVIGSM. It is not even clear from the reports if streamflow infiltration is applied in layer 3. Furthermore, because a sensitivity analysis was not presented for the calibrated parameter values, the sensitivity of these observations to recharge is unknown.

Two of the model-calculated water level hydrographs exhibit too much variability in the model response as compared to the observed response, and the remaining two show too little variability in the magnitude as compared to the observed values. But the extent to which this is significant depends on the problematic LSCE treatment of pumping in its calibration as described in Section 2.2 of this report. The LSCE calibration included allocation of pumping rates vertically across the aquifers based on observed water level data; water level data also used in the subsequent Geoscience and HydroFocus calibrations.[34] The LSCE practice resulted in what may be considered a contamination of the independence of the water level dataset because of the explicit correlation made between water levels and pumping in SVIGSM. If the pumping is inaccurate (as concluded by HydroFocus and this review), but a reasonable fit between observed and calculated water levels has been achieved due to parameter (K,S) adjustment, as is shown to be the case to an extent in the consultants respective calibrations, then the aquifer properties are likely inaccurate also. Use of the observed water levels to allocate pumping results in lower confidence in the aquifer parameter values.

The calibration results indicating low error are not an indication that the underlying parameter values are reasonable, only that they have compensated for unquantified error in pumping, recharge, boundary conditions and initial heads. The extremely low Kv values are a demonstration of exactly this. The confidence in the calibrated model is low, and reliable predictions of drawdown cannot be calculated.

Geoscience presented only four hydrographs for the 180-ft aquifer, and nine for the 400-ft aquifer, even though the 180-ft aquifer is of prime interest, and more data was available. LSCE presented seven hydrographs for the 180-ft aquifer. HydroFocus presented 10 hydrographs. Why the available data was excluded was not addressed in

[34] Approximately the same datasets, as Geoscience only presented four of the wells in its report with its appended LSCE report showing only seven as compared to HydroFocus presenting 10 hydrographs.

the Geoscience report. The Geoscience 180-ft aquifer residuals range from low magnitude to as high as approximately 18 ft. The two remaining wells show an acceptable match to observations, but this statement is qualified in the preceding paragraphs. Even where low residuals have been calculated, there is low confidence in the calibrated aquifer parameters.

The CEMEX modeling based on the Geoscience and HydroFocus calibrated models, shows low magnitude error but a bias in the model-calculated water levels indicating that the model cannot reproduce the variability exhibited in the observed values. HydroFocus did not provide an explanation for this effect.[35]

Another anomaly in the HydroFocus and Geoscience calibrations was the ambiguous placement of observation well 14S/2E-14L01 which according to the Monterey County Water Resources Agency is a 180-ft aquifer monitoring well. But because of seemingly similar water levels, was instead placed in the 400-ft aquifer layer. Sufficient information was not presented to discern that the consultants assigned the well to the correct aquifer. The well construction details were apparently not reviewed although that review may have resolved the ambiguous placement with more confidence. HydroFocus did not identify that Geoscience undertook this effort either.[36]

400-ft Aquifer

The HydroFocus model generally underestimates the observed response in this aquifer, and generally simulates too high a head compared to the observations. The Geoscience model achieved a poor calibration over most of the 400-ft aquifer with the largest residuals calculated along the eastern and northern boundaries. Residuals of greater than 50 ft are prevalent in proximity to the eastern boundary. This result shows that the eastern boundary water levels were significantly erroneous and influenced the water level distribution inside the model, including expectedly, the predictions of drawdown made by Geoscience from slant well pumping. No observations near the southern boundary were included so the extent to which the southern boundary water levels were erroneous cannot be determined.

For the CEMEX modeling as presented in Figure 4.2, evident bias is shown for the 400-ft aquifer with all simulated water levels higher than the corresponding observed values. This indicates that the model underestimated the impact to the 400-ft aquifer during

[35] Although the report does identify that pumping and recharge changed after September 2011, but also identified that hydrologic conditions have not likely changed substantially between the model timeframe and the water level data period.

[36] Geoscience prepared a communication for HydroFocus on the matter but I have not reviewed that document.

CEMEX pumping from the overlying aquifers. It is not evident from the report, if the calibration sought to resolve this. If not, the predicted impact to this aquifer will be underestimated for the MPWSP.

900-ft Aquifer

During half of the simulated period, the observed water level response at all of the monitoring wells varies over a narrow range of approximately two feet. The model simulates a 10-ft range.

3.5 Analysis of the Model Error

Insufficient data was used for model calibration as described. The error evaluated by the consultants only reflects as much error as the calibration dataset allows, which is limited most notably in the Dune Sand/A Aquifer unit, a primary aquifer targeted for slant well pumping, as well as by the absence of stream gain-loss data. Error along model boundaries is largely unquantified owing to limited data in those areas. The impact of this error on calculated water levels across the model is unquantified. Because sensitivity analysis of the calibrated values and parameter uncertainty analysis were not performed, the model error has not been thoroughly evaluated for calibration or prediction.

The structural error due to elements including layering and zonation has not been evaluated. It is possible that an additional aquifer above or within the Dune Sand/A Aquifer unit is present south of the Salinas River and is not the (insignificant) localized perched zone HydroFocus concludes. This, among other expanses of model layer2 where the absence of water level data could not allow for similar revelation, may be an indication that the layering is too coarse for accurate representation of the upper aquifer unit, thereby preventing evaluation of the full impacts from slant well pumping.

But model error in the form of bias is evident in the calibration results. Model error is reflected in the non-randomness of the residuals as demonstrated by the correlation between residual error and calculated water levels, and non-randomness in space, and to the extent it could be determined, unreasonable parameter values.[37] Sensitivity analysis of calibrated parameter values, and of the SVIGSM-adopted errors in pumping and recharge was not accomplished. Without this, the uncertainty in the parameter values is unknown.

[37] Because specific values of K and S from aquifer testing were not reported, the extent to which the model values adhered to reasonable values as determined independently of the model cannot be determined. In some cases however, the calibrated values do not appear to be reasonable based on other indicators.

Rather than rectify the model bias error, HydroFocus employed superposition to predict the drawdown associated with proposed slant well pumping. But the model error, the revelation of which was limited by the dataset, was inherent in the calibration, and superposition relied on the calibrated parameter values. So the error was transferred and potentially compounded for the superposition modeling.

Geoscience and HydroFocus present other error measures in their respective reports including the relative error, concluded by HydroFocus to be acceptable based on the following excerpt (pg. E-1):

> The relative error calculated from the standard deviation of the model errors and range of measured water levels in the model meets calibration criteria and ensures that model errors are only a small part of the overall model response.
>
> The results provide confidence that the model calculations are reliable estimates of the groundwater response to pumping, which was confirmed by simulating measured drawdown during test slant well pumping.

The statements are ambiguous, but importantly, HydroFocus correctly concludes that other model measures, including the identified bias, renders the calibrated head model unacceptable for use in predictions of drawdown from slant well pumping. This set of conclusions, that the residual error is low, but the model bias is significant and the calibrated model cannot accomplish what it was designed for, is a good demonstration that an acceptable calibration must consider bias as an integral measure of model utility. Geoscience did not include sufficient data or analysis to make the correct conclusion that HydroFocus was able to make. The model was not calibrated to an acceptable standard, but instead of improving the calibration, admittedly not a simple undertaking in this case, HydroFocus employed superposition for predictive modeling.

4.0 Predictive Modeling

4.1 Uncertainty in Calibrated Parameter Values

HydroFocus and Geoscience did not evaluate the uncertainty in the calibrated parameter estimates, and its impact on the calculated water levels. HydroFocus evaluated only the sensitivity of a few parameters near CEMEX and Potrero Road sites during predictive modeling. From its limited sensitivity analysis for predictions, HydroFocus concluded (pg. 42):

> Increasing the anisotropy (increasing horizontal conductivity and decreasing vertical conductivity) minimizes the area of the cone of depression. Conversely, decreasing the anisotropy (decreasing horizontal conductivity and increasing vertical conductivity) maximizes the area of the cone of depression.".[38]

Hydraulic conductivity often exhibits characteristic anisotropy, meaning that it is directionally dependent[39] and in the NMGWM, anisotropy is used to reflect that Kh is not equal to Kv.[40] The HydroFocus conclusion stated above regarding the effect of anisotropy on the drawdown cone extent is counterintuitive to the expected result. For clarification, higher anisotropy indicates that the Kh is *much* larger than the Kv. For such a situation, among other variables[41], one would expect a laterally extensive drawdown in the horizontal direction (high Kh) and limited drawdown vertically (low Kv). The conclusion HydroFocus derived based on its modeling does not make sense.[42] Reducing the anisotropy (making Kh and Kv less dissimilar, or more equivalent in magnitude), and allowing for increased vertical flow should result in a cone of depression that is less laterally extensive. The HydroFocus model calibration included apparently unreasonable values of Kh and Kv east and south of the CEMEX site, and the remainder of the model includes parameter values of unquantified uncertainty because of inadequate sensitivity analysis.

HydroFocus presented three scenarios varying the pumping allocation between the Dune Sand/A Aquifer unit and the 180-ft aquifer. However, HydroFocus elects to present results for the scenario which is apparently not based on the most likely allocation between the two aquifers. Based on the CEMEX model calibration, more of the pumping is derived from the Dune Sand as opposed to the 180-ft aquifer (worse-case scenario?). While it is unclear why HydroFocus presented the results of this apparently less likely scenario, it may be that increased pumping from Dune Sand would have calculated a greater drawdown extent and increased leakage from the Salinas River and other modeled surface water drainages.[43]

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[38] Pg 42 in HydroFocus report

[39] Anisotropy is defined as a property that varies with direction (Driscoll, FG 1986. Groundwater and Wells. Johnson Filtration Systems, Inc.)

[40] Kh can also be directionally dependent along the x and y tensors. But NMGWM does not reflect this particular anisotropy.

[41] Storage characteristics, transmissivity values, well completion, initial head and head differences across layers, boundary effects, etc.

[42] Because I do not have access to the model files, I cannot confirm that this is accurate. It is possible that sufficient numerical precision was not achieved, or the flow budget was associated with excess error. Or it is possible that the statement is correct but not intuitive.

[43] However, this can only be surmised without access to the model files.

HydroFocus adapted the NMGWM superposition model to include explicit representation of a portion of the Salinas River and Tembladero Slough/Reclamation Ditch using the Modflow river package so that the stream-aquifer interaction along these drainages is represented in order to quantify the impacts from slant well pumping. A large reach of the Salinas River and several other streams are not included in the analysis. No explanation for this is provided.

Because the calibration does not incorporate evaluation of stream gain-loss data, and the conceptual model does not include adequate information or analysis of the stream-aquifer interaction, the superposition model-predicted depletion impacts to the surface water system are concluded to be unreliable. The uncertain MPSWP predicted impacts to the streams may exceed allowable limits of established minimum streamflow standards. The results did not address this possibility.

4.2 Superposition

HydroFocus abandoned use of the calibrated head model, and instead relied on superposition to quantify the drawdown impacts from slant well pumping. But superposition relied on a set of calibrated parameter values which are concluded to also range from unreasonable to exhibiting significant but unquantified uncertainty. As a consequence, the superposition modeling produced unreliable predictions of drawdown from slant well pumping.

Superposition requires that the model be linear[44], or nearly so. But the degree of potential nonlinearity was not investigated by HydroFocus. It is not concluded that the thinning and unconfined Dune Sand/A Aquifer, or the reduction in transmissivity from slant well pumping or the boundary conditions did not present significant nonlinearities in the system causing the application of superposition to calculate erroneous drawdown values. This same criticism may be applicable to the Salinas Valley Aquitard where it may become unconfined during predictive simulations.

Superposition, as applied in the HydroFocus work, did not include dynamic updating of the boundaries which may have incurred drawdown, although the presentation style of reporting only drawdown greater than one foot does not show the full drawdown extent.[45] The zero/near zero drawdown contour should have been included in the Geoscience and HydroFocus analyses and figures to identify areas where the boundaries affected the model-calculated drawdown extent. The boundary inflow with and without

[44] Reilly TE, OL Franke, and GD Bennett, 1984. The Principle of Superposition and its Application in Ground-Water Hydraulics, U. S. Geological Survey Open-File Report 84-459.
[45] This was the presentation form in both the Geoscience and HydroFocus reports.

slant well pumping should have been presented to discern any changes in inflow mitigating drawdown. A prevailing gradient is simulated at the General Head Boundary (GHB). If pumping inside the model results in drawdown reaching the GHB, inflow at the boundary will continue at a biased high rate resulting in an erroneous calculation of the drawdown extent. Insufficient analysis and reporting does not demonstrate that this was not a factor.

Application of superposition to isolate the impact from only the slant well pumping may be inconsistent with the model purpose as defined by Geoscience (pg. 8):

> The purpose of this study was to evaluate the impacts of the proposed MPWSP on the Salinas Valley Groundwater Basin. Groundwater modeling was conducted to assess the impacts of MPWSP on the groundwater levels and the seawater intrusion.

The Salinas Groundwater Basin includes multiple complex variables (recharge and discharge) changing in time and space which affect the groundwater levels and rate and extent of seawater intrusion. The success of the slant well pumping to expectedly not exceed seawater intrusion thresholds, among other measures, is dependent on the effects from these other complex and dynamic stresses. In the superposition analysis, these other relevant stresses are omitted, thereby making system response predictions unreliable. It is insufficient to predict only slant well pumping impacts in a dynamic system integrally defined by many other complex impacts which in turn, affect the slant well pumping.

The application of superposition, intended by HydroFocus to diminish the error and uncertainty in many aspects of the calibrated head model, did not alleviate the errors or quantitatively demonstrate a reduction in error, and possibly introduced new and different errors in that aspects of the superposition model were not calibrated (i.e. stream gain-loss; boundary inflow, etc.).

4.3 Slant Wells Designed to Replace Freshwater with Saltwater

Dr. Weitzman indicated that according to his understanding of the project objective, that the slant wells would not cause additional seawater intrusion and requested that if available, I include information from the consultants reports which did not support this understanding.

Review of the consultants reports identifies that seawater intrusion would increase. The increase in inland extent due to creation of a cone of depression from pumping was not reliably determined in the consultants model. But the slant well pumping is designed to replace freshwater in the Dune Sand/A Aquifer unit and 180-ft aquifer with seawater

over some unreliably quantified aquifer volume and timeframe based on the HydroFocus report excerpt presented below (pg. 36):

> A capture zone refers to the three-dimensional volume of aquifer that contributes the water extracted by the wells. When the pumps are turned on, the wells initially extract the existing ambient mix of native groundwater in storage, but as pumping continues the wells extract increasing proportions of infiltrating recharge from the ocean. The ocean recharge gradually replaces the ambient water within the capture zone, and moves within the capture zone toward the well but does not spread beyond the capture zone. In map view, the capture zone is a 2-dimensional surface that delineates the underlying aquifer volume where ocean water replaces ambient groundwater and ultimately becomes the primary water source to the wells.

Because the slant well pumping is designed to replace aquifer freshwater with seawater, the pumping necessarily results in an increase in seawater intrusion into aquifer areas still containing freshwater.

5.0 Conclusions

The MPWSP proposes slant well pumping to replace freshwater aquifers with seawater as a supply for the desalination plant. A calibrated model was needed to make accurate predictions of drawdown and seawater intrusion resulting from slant well pumping. To accomplish this, the existing SVIGSM model was updated. The model results were adapted for use in the better resolution NMGWM. Geoscience calibrated the NMGWM as described in its 2015 report. HydroFocus provided an alternate calibration starting with the Geoscience model as described in its 2016 report, and used superposition for its predictions of drawdown.

Based on my review of the reports, it is concluded that:

- Insufficient data was collected/evaluated for the model calibrations:
    - including, but not limited to, inadequate (to no) water level data in particular for the Dune Sand/A Aquifer unit, one of two primary units targeted for slant well pumping,
    - and stream gain-loss data which would have improved the model and aided in parameter optimization.

- SVIGSM produced unreliable estimates of the pumping, recharge and initial water levels for use in NMGWM.

- NMGWM calibration included adjustment of model parameters based on unreliable values from SVIGSM.
- Geoscience was aware of Dune Sand/A Aquifer unit data but excluded it from the calibration without explanation. Geoscience also excluded water level data available for the 180-ft aquifer, also without explanation.
- Inadequate information was presented in the reports contrary to standard model report documentation and included:
    - Interpretations of the potentiometric surface for each aquifer in the NMGWM area were not included in the reports.[46] Recall that the potentiometric surface is described by a series of contour lines along which the potential head is equal. The ground water flow direction is perpendicular to the contours. Standard model reporting includes representation of the interpreted and model-simulated surfaces to show that the model is consistent with the hydrogeologic understanding of head and flow directions derived from the conceptual model. No such demonstration was made in either consultant's report for the NMGWM area.
    - Simulated potentiometric surface maps from the NMGWM area were not presented in the consultants' reports.
        - It is possible that an additional aquifer above or within the Dune Sand/A Aquifer unit is present south of the Salinas River and is not the (insignificant) localized perched zone HydroFocus concluded. This, among other expanses of model layer2 where the absence of water level data could not allow for similar revelation, may be an indication that the layering is too coarse for accurate representation of the uppermost aquifer units, including the Dune Sand/A Aquifer unit, thereby preventing evaluation of the full impacts from slant well pumping. Because the consultants provided no interpretation of the potentiometric surface, or the model-simulated potentiometric surface for any aquifer in their reports, contrary to model reporting standards, the extent to which this area may be in hydrologic communication with the Dune Sand unit at CEMEX, for example, has not been adequately investigated or described by the consultants. The model does not allow for this communication as evidenced in the calibration results.

[46] although the Geoscience model report did append the LSCE interpretations and simulations from SVIGSM of the 180-ft and 400-ft aquifers

- Inadequate specific information was reported for the source data including K and S values that were relied upon for parameter adjustment.
- Inadequate explanation was provided for the recharge distribution, including the characteristics associated with streamflow infiltration rates along unnamed rivers in NMGWM.
- HydroFocus did not report the K and S values estimated from the CEMEX testing and, without explanation, did not rely on those for calibration of NMGWM (Figure 3.3d).
- The Geoscience model report did not include an interpreted model water budget or a simulated water budget. HydroFocus presented a simulated budget but it is concluded to be incorrect for many reasons described in this report.
- A comparison between the SVIGSM aquifer properties and model calculated heads upon which NMGWM relied was not presented in the Geoscience model report. Evaluation of evident model bias was not included in the report, and therefore could not be used to improve the model. Because of this, erroneous initial heads and erroneous heads along the boundaries were not revealed until the HydroFocus report, which included data for the Dune Sand/A Aquifer unit and additional data in the 180-ft aquifer. The Geoscience model was considered a poorly calibrated model despite the calibration results presented which showed a low error in the residuals.
- The HydroFocus report revealed the existence of unacceptable error from model pumping, model recharge, initial model heads, and model boundary heads, but failed to provide detailed information to support its conclusions. Instead of correcting these errors (probably a major undertaking), HydroFocus subsequently relied on superposition for prediction of drawdown impacts from slant well pumping so that some of the identified error was eliminated to improve accuracy in the predictions.
- HydroFocus simulated stream-aquifer interaction with the Modflow river package but did not provide an explanation why some NMGWM area streams/rivers were excluded from the predictive analysis.
- HydroFocus did not present a comparison of model-calculated gain-loss estimates against estimated values and therefore did not demonstrate that their assumptions and assigned properties were accurate.

- It was indeterminate whether the model calibration was accomplished using inverse methods, considered an industry standard at this time[47], or was accomplished deterministically. At a minimum, an explanation for not using inverse techniques should have been included in the report.
- HydroFocus and Geoscience did not include the NMGWM calibrated parameter sensitivity and parameter uncertainty. Sensitivity analysis is considered an industry standard. If inverse modeling was done, enormous information generated by that process was excluded from the reports, including among other output:
  - Sensitivity of parameters
  - Sensitivity of water level observations
  - Sensitivity of boundaries
  - Parameter correlation
  - Parameter confidence intervals
  - Degree of nonlinearity

- Because of inadequate data, analysis, reporting and the use of parameter values ranging from unreasonable to unquantified uncertainty, and known and unknown error, the NMGWM is concluded to be poorly calibrated and not representative of the aquifer system.
- HydroFocus, in recognition of some of these elements, rejected use of the NMGWM head model and instead used superposition based on NMGWM calibrated parameter values to predict drawdown from slant well pumping.
- Because superposition relies on parameters from a poorly calibrated model with known and unknown/unquantified errors, the error in the parameter estimates contributes unquantified error to the predictions.
- Superposition did not produce reliable estimates of drawdown from slant well pumping, and is not concluded to have been the appropriate methodology to employ to meet the Project goals.

[47] My opinion stating that inverse modeling is the industry standard for approximately 15 years now is based on the techniques in model calibration presented at the Colorado School of Mines Integrated Ground Water Modeling Center's biannual conference (over the past 20 years) with inverse modeling being the most common approach among modelers presenting at the conference. Also at least three public domain codes are available for use. All models are not necessarily amenable to inverse modeling if dry cells are calculated but because NMGWM did not incur this effect according to the absence of information in the reports, it should have been calibrated using this standard technique.

Guest commentary

Desal impact on Salinas River

While protecting the Carmel River, the MPWSP would endanger the Salinas River.

By Ron Weitzman

The time has come for the Monterey One Water board to proceed with the extension of its recycling project, currently opposed by Salinas Valley members of the board. Perhaps those board members will end their opposition when they realize that Cal Am's project, while protecting the Carmel River, would have the opposite impact on the Salinas River.

What is that impact? A little tutorial is necessary to answer that question.

Particularly affecting the freshwater Dune Sand aquifers underlying the Salinas River, the impact is twofold: a drop in water levels and seawater intrusion, which occurs when the water level in an aquifer falls below sea level. In the model used in the Monterey Peninsula Water Supply Project's environmental impact report to estimate that impact — which is "Water Level = Estimate + Error" — the estimate is a weighted sum of observable variables that can vary in value over time and from zone to zone in a checkerboard of zones covering the North Marina area surrounding the CEMEX site of the MPWSP.

The variables include, among others, vertical water flow rate to or from an aquifer, horizontal water flow rate in an aquifer, rate of well pumping, and availability of surface water such as rain and river water. The weights are constants that do not vary over zones or with time. Computer programs determine the weights in a so-called "inversion" process in which the weights become the variables and the erstwhile variables, together with the actual water levels, become the constants. The determined weights are the ones that minimize the variation of the errors around the estimates in all zones and time periods.

A calibrated model is a model created by an inversion process and then modified by altering questionable values of some of its variables to reduce the

error variation even further. The North Marina model used to estimate the impact of the MPWSP on water levels and seawater intrusion in Salinas Valley aquifers is a calibrated model.

The Water Ratepayers Association of the Monterey Peninsula (WRAMP) hired a hydrogeologist who is an expert in modeling to evaluate the modeling in the EIR. Here are excerpts of what she had to say in her 28-page report to WRAMP about the impact of the MPWSP on streams in the Salinas Valley, including the Salinas River.

"The uppermost layer [Dune Sand aquifers] has expectedly the most (if not all) interaction with . . . stream gains and losses, precipitation recharge and other deep percolation" (p. 8).

"The extremely low [vertical water flow rate] applied [in calibration] to the Dune Sand . . . unit, and particularly in the underlying [aquitard] . . . seems unreasonable" (p. 17).

"Because the [predicted] stream-aquifer interaction along the Salinas River may be affected by the erroneous model values, <u>and because stream gain-loss data were not presented for the calibration</u>, the predicted impact to the River from slant well pumping is unreliable" (p. 13).

"The uncertain MPSWP predicted impacts to the streams may exceed allowable limits of established minimum streamflow standards" (p. 23).

The MPWSP modeling is incorrect, according to that hydrogeologist [and according to reality]. Water in the freshwater Dune Sand aquifers flows downward to the sea [even during drought years]. The water in the aquifers must come from somewhere. Where other more than from the Salinas River?

While protecting the Carmel River, the MPWSP would endanger the Salinas River and could seriously diminish the capacity of the river's rubber dam supplying irrigation water to valley growers

Ron Weitzman is president of the Water Ratepayers Association of the Monterey Peninsula.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates.	A.12-04-019 (Filed April 23, 2012)

MOTION TO DISQUALITYALJ HAGA FROM MAKING FURTHER DECSIONS ON MOTIONS AND PETITIONS BY WATER PLUS IN THE PROCEEDING ON THE MONTEREY PENINSULA WATER SUPPLY PROJECT

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Date: 12 September 2022

Table of Contents

I. MOTION TO DISQUALIFY

Pursuant to Rule 9.5 of the Commission's Rules of Practice and Procedure, in behalf of Water Plus, I file this motion to disqualify Administrative Law Judge ("ALJ") Robert W. Haga for reasons of bias from making further decisions on motions and petitions by Water Plus in the proceeding on the Monterey Peninsula Water Supply Project ("MPWSP" or "the project"). On 5 August 2022, Water Plus filed a petition to modify D.18-09-017 ("the petition") based on failure to meet requirements of the California Environmental Quality Act ("CEQA"). Within the required 30-day period, California American Water ("Cal Am") responded to the petition, and on 6 September, in behalf of Water Plus, I requested by email permission from ALJ Haga to file a reply to that response. The reply, with permission by the ALJ, must be filed within 10 days of 6 September, no later than .16 September. It is now 12 September, near the end of the day, and I have not received any reply—yea or nay or anything in between—from ALJ Haga. I could ignore this failure to reply as simply an innocent oversight if a similar incident had not occurred earlier. On 28 September 2020, while the proceeding on the MPWSP had been reopened, I submitted by email the following request to ALJ Haga:

> Dear ALJ Robert W. Haga:
>
> I just learned today that Cal Am had responded on September 23 to the Water Plus Motion to Dismiss filed on September 21. Now, I ask your permission to file a reply to **RESPONSE OF CALIFORNIA-AMERICAN WATER COMPANY TO THE WATER PLUS MOTION TO DISMISS, filed on September 23, 2020.**
>
> Respectfully,
>
> Ron Weitzman
> President, Water Plus

On the same day, ALJ Haga made this reply, also by email:

> Mr. Weitzman,
>
> Proceeding A.12-04-019 is closed.
>
> Accordingly, your request to file a reply to the response of California-American Water Company must be denied.
>
> Robert Haga
> Administrative Law Judge, CPUC

Now, with the proceeding on the MPWSP again reopened, that 21 September 2020 Water Plus motion to dismiss remains pending, with no further action by ALJ Haga on my timely request to tile a reply.

That makes two strikes. To avoid a third, Water Plus requests the Commission to grant this motion to disqualify.

> Ronald Weitzman declares under penalty of perjury that he represents a party (Water Plus) to the above-captioned rate-setting proceeding. That Ronald Weitzman believes that he cannot have a fair hearing before Administrative Law Judge Robert W. Haga. That Ronald Weitzman or the party he represents has not filed, pursuant to Rule 9.5, any prior motion for reassignment on peremptory challenge in the proceeding.
>
> Dated 12 September 2022, at Monterey, California.

II. WHO IS RESPONSIBLE FOR ENFORCING CEQA?

In response to an inquiry about the enforcement of CEQA, particularly about who is responsible for enforcing it, I received this reply from the California Environmental Protection Agency ("CalEPA"):

> CalEPA is not authorized to enforce CEQA's requirements, nor can it compel another public agency to perform CEQA differently. For this reason, inquiries and complaints regarding CEQA compliance for a proposed project and/or failure to prepare an Environmental Impact Report must be made directly to the public agency responsible for the project.

For a project requiring approval of one or more agencies, that means each of those agencies is responsible for enforcing the CEQA conditions that the project is required to satisfy. In the case of the MPWSP, that means that the Commission, as the lead agency for the project's required Environmental Impact Report ("EIR"), has the primary responsibility for ensuring that the project's EIR is credible and complete.

The petition at issue here, bolstered by the following sections originally intended under Rule 16.4(g) of the Commission's Rules of Practice and Procedure to constitute a reply to the Cal Am response to the petition, shows that the project's EIR is anything but credible in its modeling of the project's environmental impact, and for that reason the Commission should grant the petition.

III. CALIBRATION IS THE VILLAIN

Cal Am claims that Water Plus has failed to identify any act of data tampering. I intentionally tried to avoid the use of the word "tampering" in the petition because

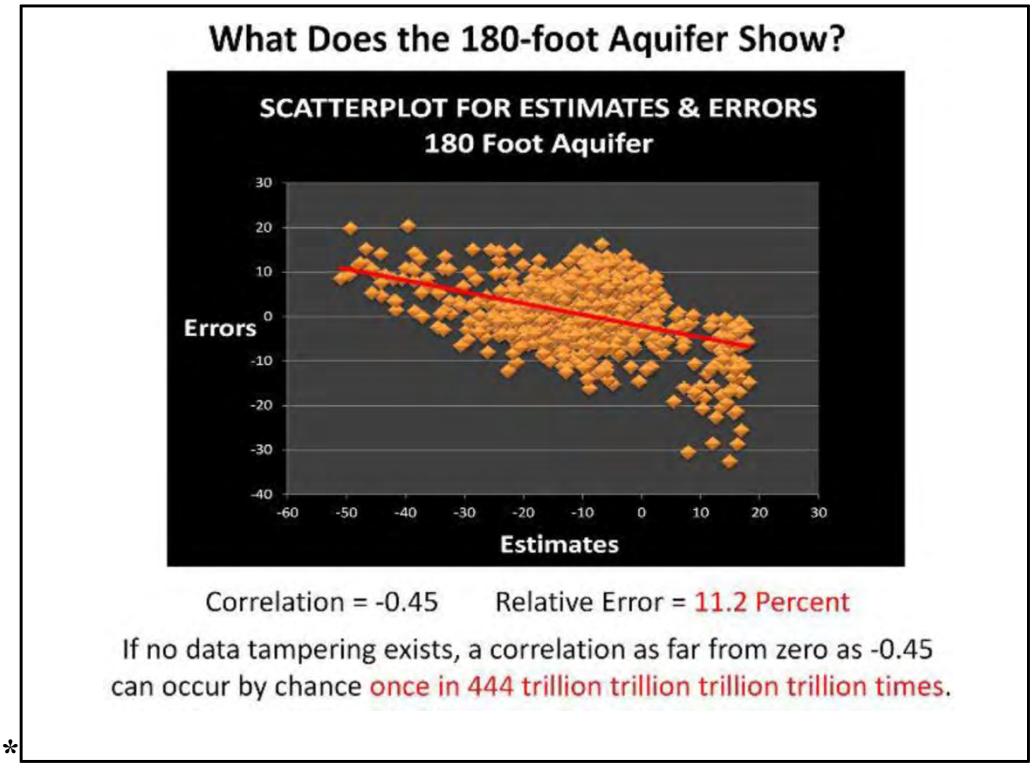
being pejorative was not necessary to support my claim that in the act of calibration both Geoscience and HydroFocus corrupted the data by creating an impermissible negative correlation between model estimates and errors. Cal Am did not question the use of calibration by those two modeling consultants. In fact, Cal Am did not use the word "calibration" at all in its response to the petition.

As I indicated in the petition, I learned that calibration involved the adjustment of data from hydrogeologist Barbara Ford. Prior to that, I had thought that it meant the creation of a new model with new weights because Geoscience and HydroFocus referred to calibration in the E2 appendices of the EIR as the adjustment of "parameters," a word which to a statistician means weights in a model's prediction equation consisting of a weighted sum of values of predictor variables. What I learned specifically from Barbara Ford is that the word "parameters" to hydrogeologists does not mean weights but means the values of the variables to which the weights apply in the model's prediction equation. In other words, what I learned from Barbara Ford is that the adjustment of parameters to hydrogeologists means the adjustment of data.

Although I learned a lot more about hydrogeology from Barbara Ford, the fact that calibration means the adjustment of data was the only one of those things that was relevant to the Water Plus claim in the petition that Geoscience and HydroFocus had adjusted data to improve the appearance of the models they used to predict the environmental impact of the MPWSP. Yet, in its response, Cal Am questioned Barbara Ford's credentials. So, I must state here that her credentials are beyond question. Barbara Ford is a licensed professional engineer in Colorado and Arizona. She has a master's degree in hydrogeology from the Colorado School of Mines. She is an expert on modeling in her field and has coauthored publications

in it with at least one university professor of hydrogeology, who in fact was the person who recommended her to me.

The modeling consultants Geoscience and HydroFocus used calibration—the adjustment (tampering?) of predictor data—to reduce error variation to an acceptable range. As I have indicated in filed comments on the EIR as early as 2015, Geoscience failed in that attempt with the 180-foot aquifer: The relative error for that aquifer was 11.2%, outside the acceptable range of zero to 10. See the figure below.

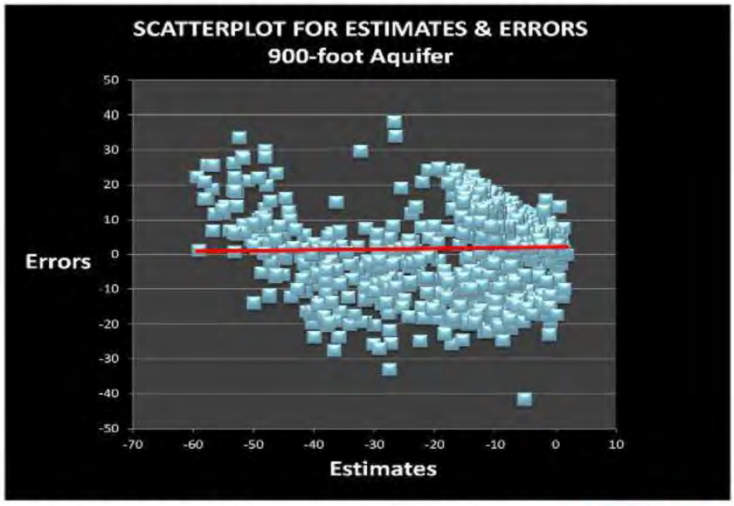


*

HydroFocus dealt with that problem by raising the upper limit of the acceptable range from 10 to 15 though for a bell-shaped error distribution 15 is 90 percent of the highest practical value (16.7%) for the relative error, a value indicating zero model predictive power.

What would the relative error for the 180-foot aquifer be without calibration? The data for the 900-foot aquifer suggest an answer to that question. The non-negative, near-zero (0.02) correlation between estimates and errors for the 900-foot aquifer indicates that the consultants did not engage in calibration for that aquifer. As shown in the figure below, the relative error for the 900-foot aquifer was 14.6%, indicative of near-zero model predictive power in the absence of calibration.

The 900-foot Aquifer Shows No Data Tampering



Correlation = 0.02 Relative Error = 14.6 Percent

Note. Hydrogeologists consider a model to be good if the Relative Error is less than 10.0 Percent.

In response to the question, "Does tuning a model in climatology have the same meaning as calibrating a model in hydrogeology?", the first paragraph of the second article to which the petition provides a link continues with, "That is an interesting question because in a November 2021 *Chance* article that took a forensic look at the misuse of statistics in hydrogeology the villain turned out to be model calibration." To repeat, calibration is the villain.

IV. WHY CALIBRATION CREATES A NEGATIVE CORRELATION BETWEEN ESTIMATES AND ERRORS

As the petition indicates, model calibration that moves the error component of an observed water-level measurement closer to zero must move the predictor component equally in the opposite direction to avoid changing the observed measurement. A simple example should make that clear. Suppose the calibration moved the error two units closer to zero. If the error component was positive, that would require decreasing it by two units and, correspondingly, increasing the predictor component by two units. If the error component was negative, that would require increasing it by two units and, correspondingly, decreasing the predictor component by two units. That movement of the two components in opposite directions is what creates the negative correlation between them in the process of model calibration.

V. THE JOURNAL *CHANCE* AND *THE JOURNAL OF THEORETICAL AND APPLIED STATISTICS*

Cal Am claims the two articles to which the petition provides links are merely online one-way communications. The earlier of these articles is in the journal *Chance*. This journal is not an online communication. Supported by the American Statistical Association, it is a peer-reviewed journal that comes out in print four times a year and is accessible online only by payment. Articles in *Chance* are written in non-technical language to communicate with people outside statistics what of interest or importance to them might be going on inside it.

The reviewers of an article submitted for publication in *Chance* are experts in the subject-matter of the article, and both the reviewers and the authors are blind to each other. How many reviewers did the *Chance* article have? The comments of

reviewers on the submitted version were identified by different colors, and the four different colors of comments on that version indicated that it had four different independent reviewers.

The American Journal of Theoretical and Applied Statistics is also a peer-reviewed journal. Different from *Chance*, however, it is an open-access journal. That means articles in it are accessible online without charge. I submitted the article to that journal because I thought the subject-matter should have wide accessibility. So far, the article has had 317 views and 56 downloads.

Far from being merely a one-way online communication vehicle, as Cal Am contends, publication in these two peer-reviewed journals provides strong support for the claim that the misuse of statistics in the practice of model calibration is so severe that it causes any calibrated-model predictions of environmental impact to have zero credibility. All predictions of environmental impact reported in the EIR were predictions by calibrated models.

VI. WHY THE COMMISSION SHOULD MAKE A DECISION NOW DIFFERENT FROM ITS PREVIOUS ONES

Citing a string of prior decisions to deny attempts by Water Plus to terminate the MPWSP, Cal Am contends that the petition is based on no new information that is sufficiently strong for the Commission to make a different decision now. As I indicated in the petition, all prior attempts involving data tampering were based on the Water Plus finding of an impermissible negative correlation between model estimates and errors for the 180-foot aquifer without the identification of any specific act of data tampering that could have produced that correlation. The petition identifies that act in the Geoscience and HydroFocus practice of model calibration used to improve the appearance of model predictive power which, in

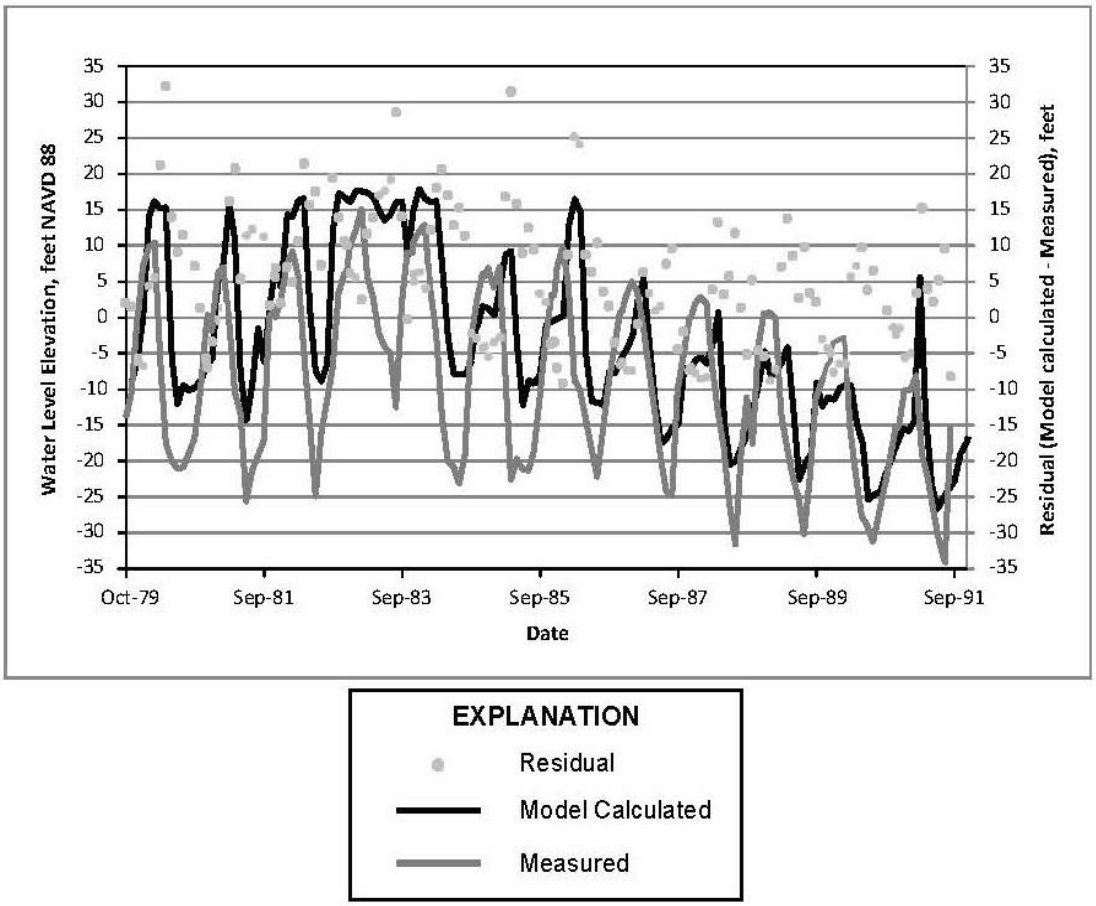
the absence of that practice, would be—and is, even with calibration—unacceptably low for the 180-foot aquifer. The identification of that act is more than sufficient reason now for the Commission to terminate the MPWSP.

Prior to the identification of that act, the Commission was faced with two competing explanations of the impermissible non-zero correlation between estimates and errors. HydroFocus contended that it was due to the inability of its model to catch up with the data when water levels were falling. Water Plus contended that the opposite was true: The correlation of errors with both falling water levels and their correspondingly falling model estimates was due to the non-zero correlation between estimates and errors—now, but not previously, known to be caused by model calibration. The Commission decided in favor of HydroFocus, likely because, if for no other reason, to do otherwise would be so costly that it would appear to be irresponsibly arbitrary. With the identification of the cause of the -0.45 estimate-error correlation in model calibration, that problem no longer exists. The Commission has every reason now to terminate the MPWSP by granting the petition of Water Plus.

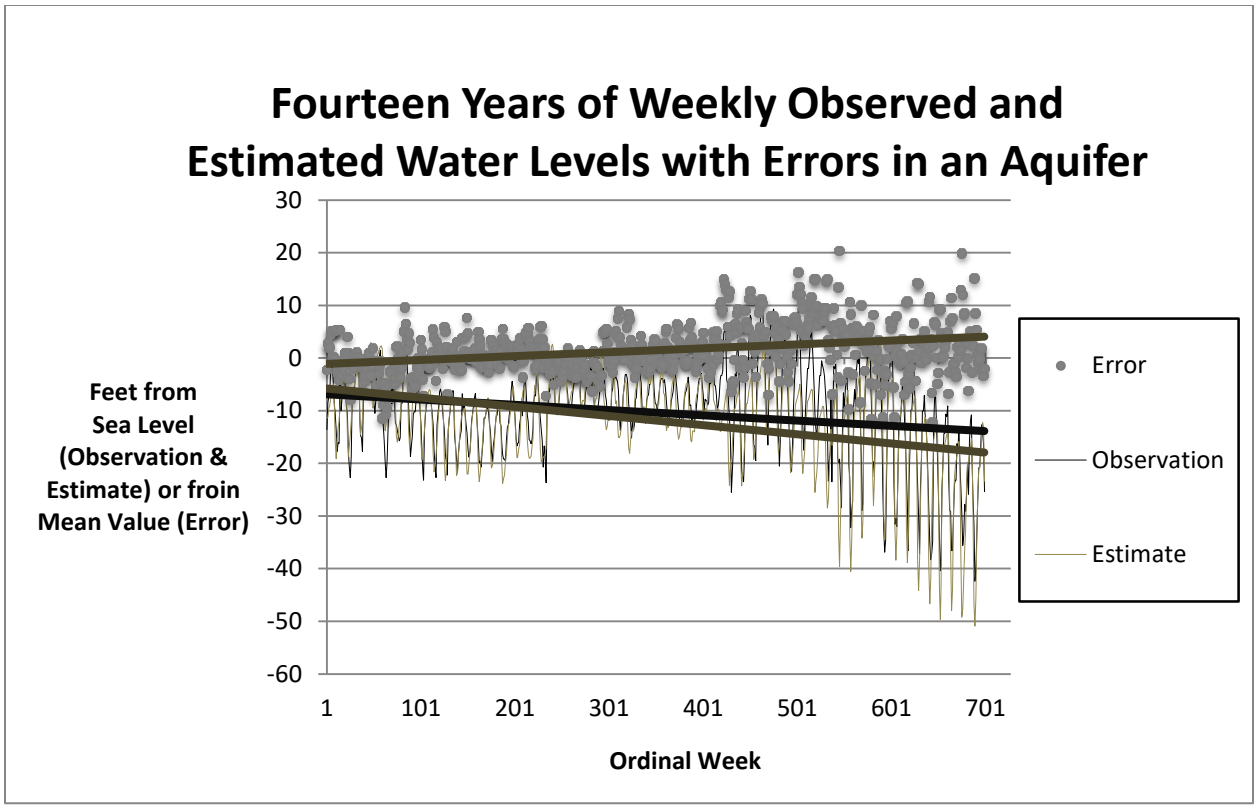
VII. THE HYDROFOCUS EXPLANATION OF THE NON-ZERO CORRELATION BETWEEN ESTIMATES AND ERRORS: A CLOSER LOOK

In evaluating my draft submission to *Chance*, its editor (Amanda Peterson-Plunkett) was so careful that she sent the draft to the Commission and to both Geoscience and HydroFocus and invited them all to comment on the draft. Only HydroFocus responded, a follows: "The issues discussed in the article were addressed during the EIR process." That was it, and so it is worth a closer look now.

HydroFocus used the following graph (Figure 4.3d in Appendix E2 of the 2017 EIR) to illustrate its contention that the non-zero correlation between estimates and errors was caused by the model's inability to catch up with falling water levels:



This graph shows water-level measurements (grey line) and their estimates (black line) trending downward over time while errors (open circles) trend downward, as well, from positive to negative, showing a positive correlation between errors and both the observed measurements and their estimates. How could that be when the actual correlation is negative (-0.45), suggesting an upward error trend, as shown in the graph below, which is the first figure in the second linked article in the petition?



Here, appropriately, the errors trend upward while both the water-level observations and their estimates trend downward, correctly reflecting the negative error-estimate and observation-estimate correlations.

So, what explains the discrepancy between the two graphs? The description of the vertical scale for errors (residuals) on the right side of the HydroFocus graph suggests the answer: "Model-calculated - Measured." That is the opposite of what it should be, as shown in the equation below:

Measured water level = Model-calculated [Estimate] + Residual [Error]

What it should be is, "Measured - Model-calculated." HydroFocus determined errors incorrectly. What it described as positive errors should be negative errors and vice versa. The errors in its graph should be rising rather than falling. What HydroFocus described as a positive correlation between estimates and errors and

between measured water levels and errors over time should be a negative correlation. What its graph should show—instead of a model that was too slow to catch up with the data—is a model whose predictions are ahead of the data, a prescient model which, to believe it as an explanation of the non-zero correlation between estimates and errors, would require a return to the old days of divining rods.

Cal Am claims that Water Plus failed to supply an affidavit supporting the assertion central to the petition that calibration causes a negative correlation between estimates and errors. That calibration creates a negative correlation between estimates and errors is a demonstrated fact, not merely a claim or a contention. It does not need an affidavit.

VIII. CONCLUSION

For reasons provided in Section 1 herein, in behalf of Water Plus, I request that the Commission grant this motion to disqualify ALJ Haga for reasons of bias from making further decisions on motions and petitions by Water Plus in the proceeding on the MPWSP, particularly on the pending 5 August 2022 petition by Water Plus to modify D.18-09-017.

Dated 12 September 2022

Respectfully submitted and verified,

Ron Weitzman, Ph.D.

President, Water Plus

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates.	A.12-04-019 (Filed April 23, 2012)

PETITION TO MODIFY DECISION 18-09-017 WITH NOTICE OF SUPPORTING FACTS

RON WEITZMAN, Ph.D.

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President, Water Plus

Date: 5 August 2022

Table of Contents

I. PETITION

Pursuant to Rule 16.4 of the Rules of Practice and Procedure, on behalf of Water Plus, I submit this Petition to Modify D.18-09-017, as follows:

Ordering Paragraph 1: In view of new information presented and noticed by Water Plus identifying a misuse of statistics in the Final Environmental Impact Report of the Monterey Peninsula Water Supply Project (Alternative 5a) so severe that it causes any model prediction of project impact on the environment to have zero credibility, the Final Environmental Impact Report is hereby decertified for the Monterey Peninsula Water Supply Project (Alternative 5a), and is decertified for use by responsible agencies in considering subsequent approvals.

Ordering Paragraph 2: Because of the decertification of the Final Environmental Impact Report of the Monterey Peninsula Water Supply Project (Alternative 5a) and consequent failure to meet the requirements of the California Environmental Quality Act, California-American Water Company's grant of a Certification of Public Convenience and Necessity for the Monterey Peninsula Water Supply Project (Alternative 5a) is hereby withdrawn.

Remainder of Decision: Delete.

II. MISUSE OF STATISITCS

All the models used in the work described by the Environmental Impact Report ("EIR") of the Monterey Peninsula Water Supply Project ("MPWSP" or "project") break down an observed measurement (in this case, water level in an aquifer) into two components: a predicted component, called an estimate, and an error component, which could be positive or negative, if not zero. In that breakdown, for each zone in a checkerboard of zones surrounding the project's intake wells, the estimate is a weighted sum of values of predictor variables, like the-pumping rate of a well or the rate of water flow to an aquifer from a source above it. The observed measurements and the values of the predictor variables are called data. Although the data can vary over time and from zone to zone, the weights remain constant over time and all zones. In model development, based on the observed measurement and the predictor-variable values in every zone, the weights are determined to minimize the error variation while keeping the average error and the correlation between estimates and errors appropriately equal to zero.

In all three drafts of the EIR, I found and, for Water Plus, reported to the Commission in the following documents that the estimate-error correlation was not equal to zero but was in fact equal to -0.45 for the 180-foot aquifer, which was one of the two source-water aquifers for the project: four Motions

to Dismiss (13 October 2915, 30 March 2016, 1 June 2017, and 21 September 2020), the 6 March 2020 Comments on the Denial of Intervenor Compensation to Water Plus recommended by ALJ Robert W. Haga, and the denied 26 May 2020 Application for a Rehearing on the Denial of Intervenor Compensation to Water Plus, all included here by reference.

In all of these documents, I also indicated that the non-zero correlation between estimates and errors raised questions of data tampering. Prior to 2019, however, I could not identify any specific act of data tampering that could have produced the non-aero correlation. In the second draft and final version of the EIR, HydroFocus concurred that the error-estimate correlation differed from zero but attributed that difference to model inability to catch up with the data when water levels were declining. Although that explanation, which reflected a non-zero correlation between errors and both water levels and their estimates, satisfied the Commission, it troubled me so much that in 2019 I hired a hydrogeologist who specialized in modeling to help me find the actual source.

What I learned from her (Barbara Ford) is that when hydrogeologists evaluate error variation to be unacceptably large, they typically adjust unreliably-determined values of predictor variables in a process called model

calibration to reduce the unacceptable error variation. That is what both Geoscience and HydroFocus did in all the models they used in their EIR work. That is also a misuse of statistics so severe that it invalidates all the EIR's model predictions of the environmental impact of the MPWSP. Here is why.

Movement of the error component of a measurement toward zero moves its estimate component equally in the opposite direction to avoid changing the observed measurement, which is the sum of its error and estimate components, and it is that movement in opposite directions of the predictor and error components of a measurement that creates an impermissible negative correlation between them in the process of model calibration. To circumvent that misuse of statistics, standard practice today in hydrogeology is to follow calibration by using the revised data to create a new model with new weights and a zero correlation between estimates and errors. Both Geoscience and HydroFocus, however, failed to do that.

Without any prior testing of its validity, what HydroFocus did do to cope with the impermissible non-zero correlations with error, is to apply a model considered to be too slow to predict declining water levels to predict changes in water levels instead. That was no solution to the problem. Especially with no prior historical testing, the HydroFocus application of a model developed

and calibrated to predict one thing to predict something else with no knowledge of the relationship between them resulted in predictions that could have no more credibility than the model's original predictions.

III. REASON FOR DELAY AND NOTICE OF SUPPORTING FACTS

This petition is filed later than a year following the issue of D.18-09-017 because I learned only in 2019 that the process of model calibration involves the alteration of data, rather than the determination of new model weights, and because until this year I did not have independent confirmation that such data alternation in model development constitutes a misuse of statistics which results in predictions having zero credibility. With the publication of two peer-reviewed articles in different statistical journals providing that confirmation, I am now in a position to submit this petition. As a notice of supporting facts, these articles are available here and here, respectively.

IV. CONCLUSION

The MPWSP has involved an enormous amount of work which, to date, has incurred a cost of $191,490,000. Fully aware of these facts, I file this petition, based on the new and compelling evidence disclosed in the preceding paragraphs, to decertify the EIR for the MPWSP and to withdraw the project's grant of certification.

Dated 5 August 2022

Respectfully submitted and verified,

Ron Weitzman, Ph.D.

President, Water Plus

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of California-American Water Company (U210W) for Approval of the Monterey Peninsula Water Supply Project and Authorization to Recover All Present and Future Costs in Rates.	A.12-04-019 (Filed April 23, 2012)

REVISED
MOTION TO DISQUALIFY ALJ HAGA FROM MAKING FURTHER DECISIONS ON MOTIONS AND PETITIONS BY WATER PLUS IN THE PROCEEDING ON THE MONTEREY PENINSULA WATER SUPPLY PROJECT

RON WEITZMAN, Ph.D.

23910 Fairfield Place
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Facsimile: (none)
Email: ronweitzman@redshift.com
President, Water Plus

Date: 19 September 2022

Table of Contents

I. REVISED MOTION TO DISQUALIFY

As directed by Chief Administrative Law Judge Anne E. Simon on 19 September 2022, pursuant to Rule 9.4(b) of the Commission's Rules of Practice and Procedure, I file this revision of the motion to disqualify, filed by me in behalf of Water Plus on 12 September 2022, to include within the required declaration the factual basis for the motion.

I, Ronald Weitzman, declare under penalty of perjury that I represent a party, Water Plus, to the above-captioned rate-setting proceeding.

That I, Ronald Weitzman, believe that I cannot have a fair hearing before Administrative Law Judge Robert W. Haga and move pursuant to Rule 9.4 for his disqualification from making any further decisions on motions and petitions by Water Plus in the proceeding on the Monterey Peninsula Water Supply Project ("MPWSP" or "the project") on the basis of the following facts: On 5 August 2022 (re-service date, 8 August 2022), Water Plus filed a petition to modify D.18-09-017 ("the petition") based on failure to meet requirements of the California Environmental Quality Act ("CEQA"). On 6 September 2022, California American Water ("Cal Am") timely responded to the petition, and on the same day, in behalf of Water Plus, I requested by email permission from ALJ Haga to file a reply to that response. The reply, with permission by the ALJ, must be filed within 10 days of 6 September, no later than 16 September. It was then (at the time I filed the motion) 12 September, near the end of the day, and I had not received any reply from ALJ Haga. I could ignore this failure to reply as simply an innocent oversight if a similar incident had not occurred earlier. On 28 September 2020, while the proceeding on the MPWSP had been reopened, I submitted by email the following request to ALJ Haga:

Dear ALJ Robert W. Haga:

I just learned today that Cal Am had responded on September 23 to the Water Plus Motion to Dismiss filed on September 21. Now, I ask your permission to file a reply to **RESPONSE OF CALIFORNIA-AMERICAN WATER COMPANY TO THE WATER PLUS MOTION TO DISMISS, filed on September 23, 2020.**

Respectfully,

Ron Weitzman
President, Water Plus

On the same day, ALJ Haga made this reply, also by email:

Mr. Weitzman,

Proceeding A.12-04-019 is closed.

Accordingly, your request to file a reply to the response of California-American Water Company must be denied.

Robert Haga
Administrative Law Judge, CPUC

Now, with the proceeding on the MPWSP again reopened, that 21 September 2020 Water Plus motion to dismiss remains pending, with no further action by ALJ Haga on the motion or my timely request to tile a reply.

That I, Ronald Weitzman, or the party I represent has not filed, pursuant to Rule 9.4, any prior motion for reassignment on peremptory challenge in the proceeding.

Dated 19 September 2022, at Monterey, California.

II. WHO IS RESPONSIBLE FOR ENFORCING CEQA?

In response to an inquiry about the enforcement of CEQA, particularly about who is responsible for enforcing it, I received this reply from the California Environmental Protection Agency ("CalEPA"):

> CalEPA is not authorized to enforce CEQA's requirements, nor can it compel another public agency to perform CEQA differently. For this reason, inquiries and complaints regarding CEQA compliance for a proposed project and/or failure to prepare an Environmental Impact Report must be made directly to the public agency responsible for the project.

For a project requiring approval of one or more agencies, that means each of those agencies is responsible for enforcing the CEQA conditions that the project is required to satisfy. In the case of the MPWSP, that means that the Commission, as the lead agency for the project's required Environmental Impact Report ("EIR"), has the primary responsibility for ensuring that the project's EIR is credible and complete.

The petition at issue here, bolstered by the following sections originally intended under Rule 16.4(g) of the Commission's Rules of Practice and Procedure to constitute a reply to the Cal Am response to the petition, shows that the project's EIR is anything but credible in its modeling of the project's environmental impact, and for that reason the Commission should grant the petition.

III. CALIBRATION IS THE VILLAIN

Cal Am claims that Water Plus has failed to identify any act of data tampering. I intentionally tried to avoid the use of the word "tampering" in the petition because

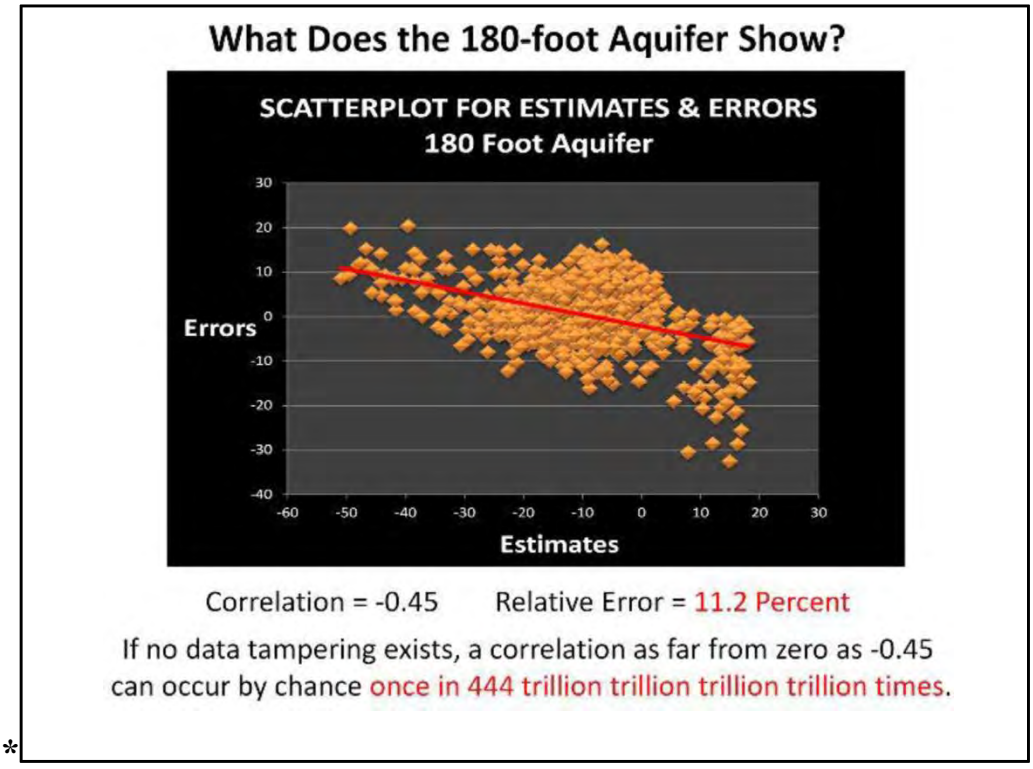
being pejorative was not necessary to support my claim that in the act of calibration both Geoscience and HydroFocus corrupted the data by creating an impermissible negative correlation between model estimates and errors. Cal Am did not question the use of calibration by those two modeling consultants. In fact, Cal Am did not use the word "calibration" at all in its response to the petition.

As I indicated in the petition, I learned that calibration involved the adjustment of data from hydrogeologist Barbara Ford. Prior to that, I had thought that it meant the creation of a new model with new weights because Geoscience and HydroFocus referred to calibration in the E2 appendices of the EIR as the adjustment of "parameters," a word which to a statistician means weights in a model's prediction equation consisting of a weighted sum of values of predictor variables. What I learned specifically from Barbara Ford is that the word "parameters" to hydrogeologists does not mean weights but means the values of the variables to which the weights apply in the model's prediction equation. In other words, what I learned from Barbara Ford is that the adjustment of parameters to hydrogeologists means the adjustment of data.

Although I learned a lot more about hydrogeology from Barbara Ford, the fact that calibration means the adjustment of data was the only one of those things that was relevant to the Water Plus claim in the petition that Geoscience and HydroFocus had adjusted data to improve the appearance of the models they used to predict the environmental impact of the MPWSP. Yet, in its response, Cal Am questioned Barbara Ford's credentials. So, I must state here that her credentials are beyond question. Barbara Ford is a licensed professional engineer in Colorado and Arizona. She has a master's degree in hydrogeology from the Colorado School of Mines. She is an expert on modeling in her field and has coauthored publications

in it with at least one university professor of hydrogeology, who in fact was the person who recommended her to me.

The modeling consultants Geoscience and HydroFocus used calibration—the adjustment (tampering?) of predictor data—to reduce error variation to an acceptable range. As I have indicated in filed comments on the EIR as early as 2015, Geoscience failed in that attempt with the 180-foot aquifer: The relative error for that aquifer was 11.2%, outside the acceptable range of zero to 10. See the figure below.

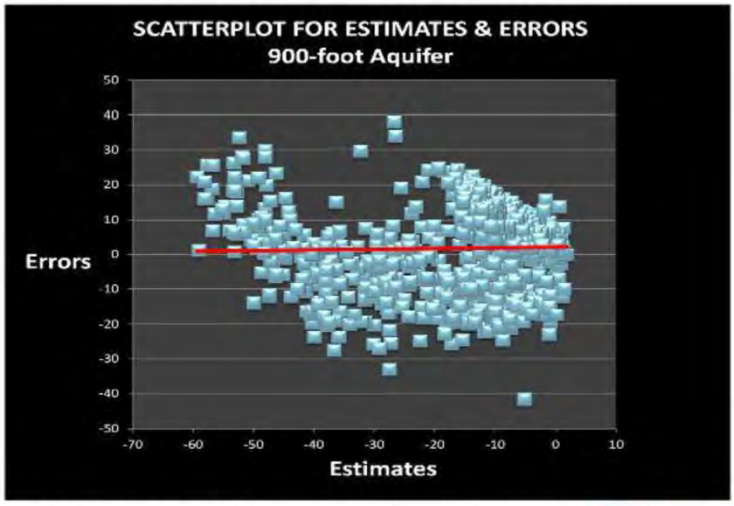


*

HydroFocus dealt with that problem by raising the upper limit of the acceptable range from 10 to 15 though for a bell-shaped error distribution 15 is 90 percent of the highest practical value (16.7%) for the relative error, a value indicating zero model predictive power.

What would the relative error for the 180-foot aquifer be without calibration? The data for the 900-foot aquifer suggest an answer to that question. The non-negative, near-zero (0.02) correlation between estimates and errors for the 900-foot aquifer indicates that the consultants did not engage in calibration for that aquifer. As shown in the figure below, the relative error for the 900-foot aquifer was 14.6%, indicative of near-zero model predictive power in the absence of calibration.

The 900-foot Aquifer Shows No Data Tampering



Correlation = 0.02 Relative Error = 14.6 Percent

Note. Hydrogeologists consider a model to be good if the Relative Error is less than 10.0 Percent.

In response to the question, "Does tuning a model in climatology have the same meaning as calibrating a model in hydrogeology?", the first paragraph of the second article to which the petition provides a link continues with, "That is an interesting question because in a November 2021 *Chance* article that took a forensic look at the misuse of statistics in hydrogeology the villain turned out to be model calibration." To repeat, calibration is the villain.

IV. WHY CALIBRATION CREATES A NEGATIVE CORRELATION BETWEEN ESTIMATES AND ERRORS

As the petition indicates, model calibration that moves the error component of an observed water-level measurement closer to zero must move the predictor component equally in the opposite direction to avoid changing the observed measurement. A simple example should make that clear. Suppose the calibration moved the error two units closer to zero. If the error component was positive, that would require decreasing it by two units and, correspondingly, increasing the predictor component by two units. If the error component was negative, that would require increasing it by two units and, correspondingly, decreasing the predictor component by two units. That movement of the two components in opposite directions is what creates the negative correlation between them in the process of model calibration.

V. THE JOURNAL *CHANCE* AND *THE JOURNAL OF THEORETICAL AND APPLIED STATISTICS*

Cal Am claims the two articles to which the petition provides links are merely online one-way communications. The earlier of these articles is in the journal *Chance*. This journal is not an online communication. Supported by the American Statistical Association, it is a peer-reviewed journal that comes out in print four times a year and is accessible online only by payment. Articles in *Chance* are written in non-technical language to communicate with people outside statistics what of interest or importance to them might be going on inside it.

The reviewers of an article submitted for publication in *Chance* are experts in the subject-matter of the article, and both the reviewers and the authors are blind to each other. How many reviewers did the *Chance* article have? The comments of

reviewers on the submitted version were identified by different colors, and the four different colors of comments on that version indicated that it had four different independent reviewers.

The American Journal of Theoretical and Applied Statistics is also a peer-reviewed journal. Different from *Chance*, however, it is an open-access journal. That means articles in it are accessible online without charge. I submitted the article to that journal because I thought the subject-matter should have wide accessibility. So far, the article has had 317 views and 56 downloads.

Far from being merely a one-way online communication vehicle, as Cal Am contends, publication in these two peer-reviewed journals provides strong support for the claim that the misuse of statistics in the practice of model calibration is so severe that it causes any calibrated-model predictions of environmental impact to have zero credibility. All predictions of environmental impact reported in the EIR were predictions by calibrated models.

VI. WHY THE COMMISSION SHOULD MAKE A DECISION NOW DIFFERENT FROM ITS PREVIOUS ONES

Citing a string of prior decisions to deny attempts by Water Plus to terminate the MPWSP, Cal Am contends that the petition is based on no new information that is sufficiently strong for the Commission to make a different decision now. As I indicated in the petition, all prior attempts involving data tampering were based on the Water Plus finding of an impermissible negative correlation between model estimates and errors for the 180-foot aquifer without the identification of any specific act of data tampering that could have produced that correlation. The petition identifies that act in the Geoscience and HydroFocus practice of model calibration used to improve the appearance of model predictive power which, in

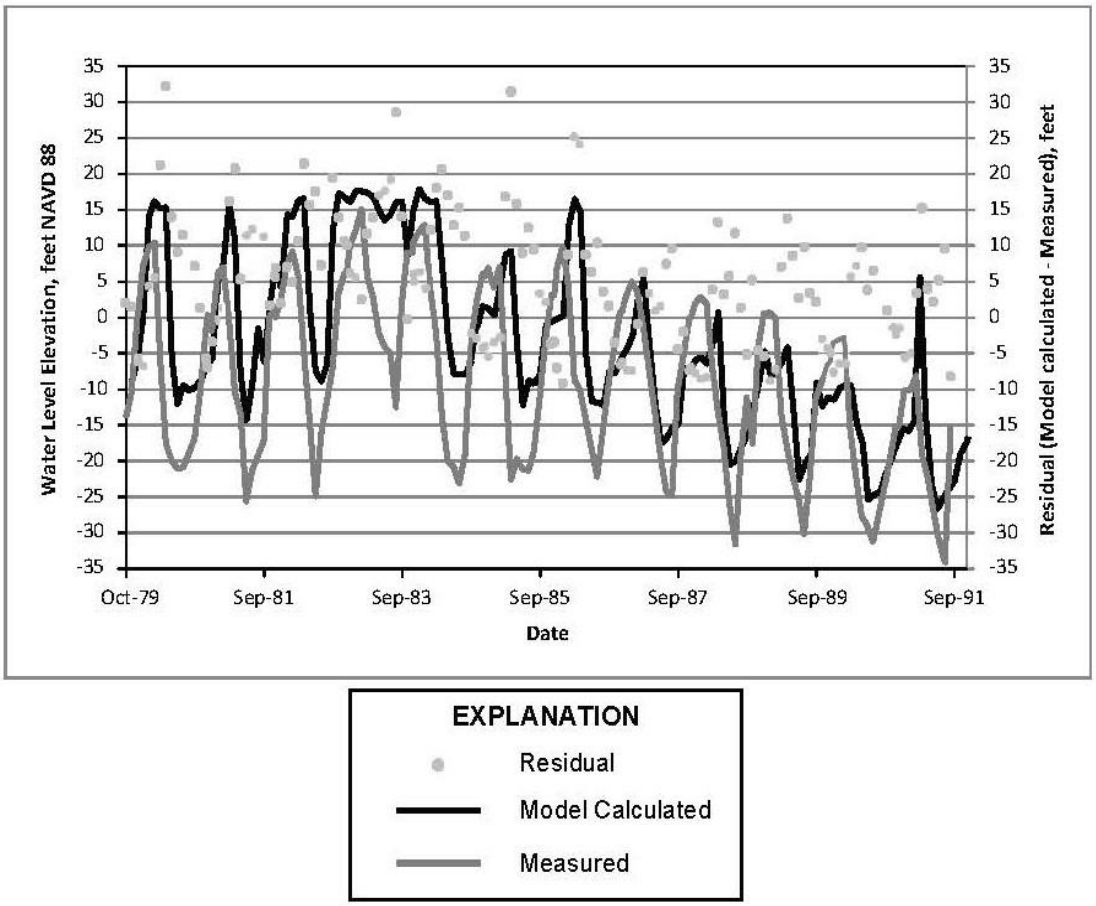
the absence of that practice, would be—and is, even with calibration—unacceptably low for the 180-foot aquifer. The identification of that act is more than sufficient reason now for the Commission to terminate the MPWSP.

Prior to the identification of that act, the Commission was faced with two competing explanations of the impermissible non-zero correlation between estimates and errors. HydroFocus contended that it was due to the inability of its model to catch up with the data when water levels were falling. Water Plus contended that the opposite was true: The correlation of errors with both falling water levels and their correspondingly falling model estimates was due to the non-zero correlation between estimates and errors—now, but not previously, known to be caused by model calibration. The Commission decided in favor of HydroFocus, likely because, if for no other reason, to do otherwise would be so costly that it would appear to be irresponsibly arbitrary. With the identification of the cause of the -0.45 estimate-error correlation in model calibration, that problem no longer exists. The Commission has every reason now to terminate the MPWSP by granting the petition of Water Plus.

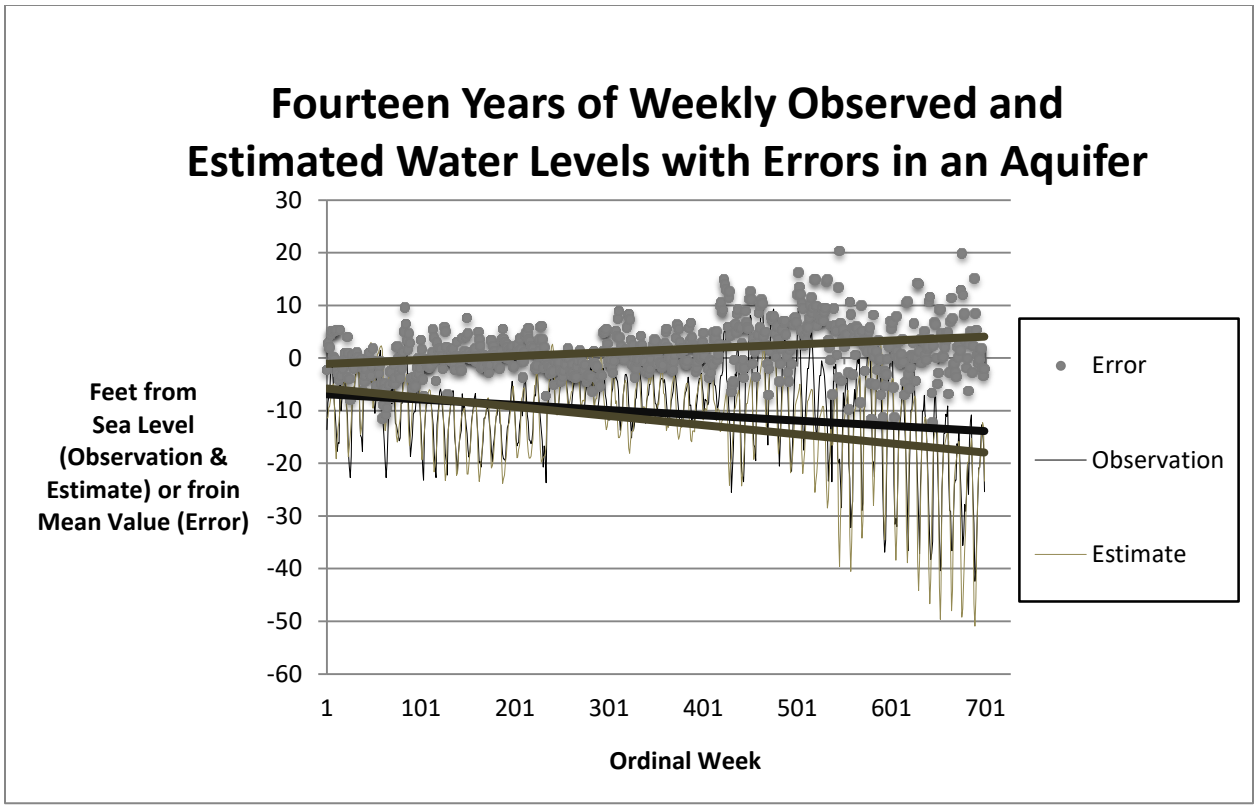
VII. THE HYDROFOCUS EXPLANATION OF THE NON-ZERO CORRELATION BETWEEN ESTIMATES AND ERRORS: A CLOSER LOOK

In evaluating my draft submission to *Chance*, its editor (Amanda Peterson-Plunkett) was so careful that she sent the draft to the Commission and to both Geoscience and HydroFocus and invited them all to comment on the draft. Only HydroFocus responded, a follows: "The issues discussed in the article were addressed during the EIR process." That was it, and so it is worth a closer look now.

HydroFocus used the following graph (Figure 4.3d in Appendix E2 of the 2017 EIR) to illustrate its contention that the non-zero correlation between estimates and errors was caused by the model's inability to catch up with falling water levels:



This graph shows water-level measurements (grey line) and their estimates (black line) trending downward over time while errors (open circles) trend downward, as well, from positive to negative, showing a positive correlation between errors and both the observed measurements and their estimates. How could that be when the actual correlation is negative (-0.45), suggesting an upward error trend, as shown in the graph below, which is the first figure in the second linked article in the petition?



Here, appropriately, the errors trend upward while both the water-level observations and their estimates trend downward, correctly reflecting the negative error-estimate and error-observation correlations.

So, what explains the discrepancy between the two graphs? The description of the vertical scale for errors (residuals) on the right side of the HydroFocus graph suggests the answer: "Model-calculated - Measured." That is the opposite of what it should be, as shown in the equation below:

Measured water level = Model-calculated [Estimate] + Residual [Error]

What it should be is, "Measured - Model-calculated." HydroFocus determined errors incorrectly. What it described as positive errors should be negative errors and vice versa. The errors in its graph should be rising rather than falling. What HydroFocus described as a positive correlation between estimates and errors and

between measured water levels and errors over time should be a negative correlation. What its graph should show—instead of a model that was too slow to catch up with the data—is a model whose predictions are ahead of the data, a prescient model which, to believe it as an explanation of the non-zero correlation between estimates and errors, would require a return to the old days of divining rods.

Cal Am claims that Water Plus failed to supply an affidavit supporting the assertion central to the petition that calibration causes a negative correlation between estimates and errors. That calibration creates a negative correlation between estimates and errors is a demonstrated fact, not merely a claim or a contention. It does not need an affidavit.

VIII. CONCLUSION

For reasons provided in Section 1 herein, in behalf of Water Plus, I request that the Commission grant this motion to disqualify ALJ Haga for reasons of bias from making further decisions on motions and petitions by Water Plus in the proceeding on the MPWSP, particularly on the pending petition by Water Plus filed on 5 August 2022 to modify D.18-09-017.

Dated 19 September 2022

Respectfully submitted and verified,

Ron Weitzman, Ph.D.

President, Water Plus

225 CROSSROADS
BLVD. SUITE 322
CARMEL, CA 93923

CARMEL RIVER
WATERSHED
CONSERVANCY

November 1, 2022
Mr. John Ainsworth, Executive Director
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Mr. Ainsworth:

I am the Executive Director of the Carmel River Watershed Conservancy, which was established as a 501c3 in 2000 to address the unhealthy condition of the Carmel River and its watershed. Our highest priority from day one has been to advocate for a reliable alternative to the overuse of the Carmel River (and aquifer) water for the benefit of residents and businesses on the Monterey Peninsula.

Since that time the only truly reliable, drought-proof alternative water source has been the efforts of California American Water to develop a three-pronged solution that includes Aquifer Storage and Recovery (ASR), Groundwater Replenishment (GWR, aka wastewater Recycling), and a Desalination Plant (Desal Plant). The first two components are less expensive than the Desal Plant, but are not "reliable" in that they depend on adequate rainfall in the Monterey Peninsula region. Several years or even a decade of drought conditions would render both ASR and GWR inadequate to supply the needs of all the current water users; thus a Desal Plant is the only one of the three "prongs" that would be truly "reliable" given those minimal rainfall years and the increasing impacts of climate change, which are predicated to create more severe weather conditions. Additionally, ASR has been meeting only a fraction (around 6%) of expected supply and is critical to the Monterey Peninsula Water Management District's calculation detailing how to meet the Peninsula's need without a Desal Plant. It should also be noted that MPWMD's water demand forecast does not include growth through 2055.

Our Conservancy has recently adopted an emerging best practice called the "watershed report card" that identifies the key indicators of watershed health and relies on verifiable scientific data to track progress on each of the key indicators. The key indicator of "water quantity" in the river and tributaries has been lagging behind the progress being made on most of the other key indicators. Water quantity is directly affected by the amount of rainfall and the amount of pumping from the river and aquifer by water users or suppliers. For the past several decades, since the "cease and desist" order in 1995, the water quantity in our watershed has been woefully inadequate to create healthy conditions for the threatened species residing in the watershed.

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CARMEL RIVER
WATERSHED
CONSERVANCY

The California State Water Resources Control Board (SWRCB) recently reinforced the necessity for a Desal Plant when they stated "The State Water Board supports Cal Am's efforts to develop a diverse and drought-resilient water supply portfolio. Desalination that is appropriately permitted and conditioned to protect the environment can be one part of a long-term water supply solution." "…the State Water Board believes it is prudent for Cal-Am to pursue additional sources of water that are sustainable and urges the Coastal Commission to consider the proposed desalination facility as a potentially vital water supply that also could help to protect one of the region's most important environmental assets." (Sobeck, Letter dated October 25, 2022) Their conclusion that only a Desal Plant (supplementing ASR and GWR) could be considered a "drought resilient" solution to over-pumping the river and aquifer is a strong affirmation on behalf of CalAm's Desal Plant. While opponents of the Desal Plant cite high costs and impacts to disadvantaged communities in Marina, they fail to consider that over-pumping the Carmel River impacts disadvantaged communities deep in Carmel Valley, and inadequate water supply creates far fewer options for building new or affordable housing.

Our Conservancy also chairs the Carmel River Task Force, which was established in 2007 and includes all the governmental and nonprofit organizations working to improve conditions in the Carmel River and especially the conditions conducive to reestablishing healthy populations of threatened species including the South-Central Steelhead and the California Red-Legged Frogs. This Task Force has regularly made recommendations to the State Coastal Conservancy (SCC) on how the Cal Am Settlement Funds that SCC manages ought to be directed. Many of the CRTF members will be joining us in writing letters of support for the Cal Am Desal Plant.

Finally, in recent weeks the Governor of California Gavin Newsome has strongly advocated for the construction of additional desalination plants along the California coast as a drought-resistant solution to the state's periodic water scarcity. Desalination would complement other initiatives that include wastewater recycling and increased water storage facilities. His approach mirrors that being pursued by Cal Am in its Water Supply Project.

Thank you for your attention and consideration,

Abbie Beane
CRWC Executive Director
carmelriverorg@gmail.com, 503-320-4975

Carmel River Steelhead Association
501 (c) (3) TIN 77 - 0093979
P.O. Box 1183
Monterey, CA 93942

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, California 94101

RE: Monterey Peninsula Water Supply Project CDP Application Number 9-20-0603

SENT: Via Email

October 14, 2022

Dear Mr. Luster,

The Carmel River Steelhead Association (CRSA) supports Cal Am's Monterey Peninsula Water Supply Project (Project). CRSA believes this project, in combination with other projects, is the only way to secure a long-term drought-proof water supply and provide the Carmel River with relief from illegal water diversions. Illegal water diversion from the Carmel River is the primary factor contributing to steelhead decline. A reliable water system not dependent on withdrawals from the Carmel River will have huge benefits for this unique steelhead population.

For over one hundred years, the Carmel River has been the main water source for the Monterey Peninsula. As a result of this reliance, the Carmel River surface water and subsurface aquifer are depleted annually causing the lower 12 miles or so of river to go completely dry most years. The steelhead population in this river, requiring this water for survival has been decimated as a result. The current population is roughly 5% or less of its historic population and at significant risk of extirpation or extinction. Reducing water withdrawals is a goal outlined in the South Central Coast Steelhead Recovery Plan and will have huge benefits to steelhead.

Our organization has several issues with the Project alternatives put forth by the Monterey Peninsula Water District and Water One. First off , we are not confident that the alternatives to the Project are reliable. There are too many moving pieces which are apt to fail as a result of their fragility and contractual agreements. We see issues with projected water storage forecasts and aren't confident in the Distracts estimates. Simply put, Pure Water Monterey water sources will not stand up to the test. They are not "fail safe". If a desalination plant is built, then and only then, will there be a dependable water source for the Monterey Peninsula - the Pacific Ocean, which continues to grow in volume as a result of climate change/global

warming. Furthermore, CRSA does not believe that even with Pure Water Monterey Phase II the peninsula will have enough water for the future.

MPWMD in their “Supply and Demand” analysis used the best possible (but unachievable) outcome for available water, when for 20 years we have not produced what MPWMD has projected. An example of that is MPWMD claims 1,300 AF of water from ASR when the 20-year average is under 650 AF and considering we are predicted to continue with drought conditions even 650 AF may not be achieved. The Monterey Peninsula cannot base water needs on the best possible events we must plan for realistic events if not the worst possible events.

We have seen the loss of coastal rivers like the Carmel in Southern California. These were once flashy coastal river systems teaming with Steelhead winter runs. Those rivers, for the most part, are long gone and not coming back. This cannot be the fate of the Carmel River. If the other water sources fail and they will, then the Carmel River will once again be the water source, again going beyond its legal diversion limit due to health and safety mandates.

THIS CANNOT BE THE FATE OF THE CARMEL RIVER! CRSA implores you and your fellow commissioners to put an end to decades worth of searching for a water source for the Monterey Peninsula. The Monterey Water Supply Project is the only new water source for the Monterey Peninsula that will directly benefit the Carmel River and its iconic Steelhead.

CRSA asks also for the California Coastal Commiswsion’s staff approval on this matter.

Sincerely,

Steve Park
President CRSA

Carmel River Steelhead Association
501 (c) (3) TIN 77 - 0093979
P.O. Box 1183
Monterey, CA 93942

David Stoldt, General Manager
Monterey Peninsula Water Management District
5 Harris Court Bld G,
Monterey, CA 93940

October 10, 2022

Mr. Stoldt,

The Carmel River Steelhead Association (CRSA) recently learned of the Monterey Peninsula Water Management Districts (MPWMD) intent to remodel the rearing channel at the Sleepy Hollow Steelhead Rearing Facility (SHSRF). CRSA requests that this project be put on hold until watershed stakeholders, local regulators, and government affiliated science groups have had the opportunity to discuss this project.

In 2017 MPWMD asked CRSA to support an upgrade project to the SHSRF. CRSA hired a hatchery engineer and fish culturist to review the SHSRF current design and the proposed upgrade in an effort to educate our group on SHSRF's design and performance. In the report generated during this evaluation (Attachment A), it was found that "the particular usage of the simulated natural rearing channel, should be re-assessed using currently accepted fisheries engineering designs". The report went on to propose an alternative design that was based around circular tanks with a closed re-use system with ultraviolet water treatment. CRSA ultimately supported the SHSRF upgrade (Attachment B) but strongly urged the MPWMD to move away from the current rearing channel and pond configuration and implement circular tanks with a closed re-use system. CRSA later reiterated our concerns with the SHSRF rearing channel and proposed circular tanks with a closed re-use system in our comments to the MPWMD's Rescue and Rearing Management Plan (Attachment C).

CRSA has concerns about the SHSRF's design and performance. We believe the facility, as a whole, needs to be evaluated before any new upgrades occur.

Sincerely,

Steve Park
President CRSA

Attachment A

Fisheries & Environmental Consulting, LLC

2001 Woods Rd SE
Port Orchard, WA 98366
fishproed@gmail.com
(360) 710-6741

Carmel River Steelhead Association

Sleepy Hollow Steelhead Rearing Facility Upgrade

Assessment

October 10, 2017

Brian LeNeve
Carmel River Steelhead Association
P.O. Box 1183
Monterey, CA 93942

The Carmel River Steelhead Association asked for an assessment of the proposed modifications to the Monterey Peninsula Water Management District (MPWMD) Sleepy Hollow Steelhead Rearing Facility (SHSRF). Below is that assessment.

Introduction

This letter report is a review of the Monterey Peninsula Water Management District (MPWMD) Sleepy Hollow Steelhead Rearing Facility (SHSRF) in Carmel Valley, CA and proposed facility upgrades sought by the MPWMD. The SHSRF and proposed upgrades were compared with modern fisheries engineering designs and aquaculture technologies.

Based on publicly available data and information provided by the MPWMD, it is our opinion that the existing SHSRF is outdated and the proposed upgrades, in particular usage of the simulated natural rearing channel, should be re-assessed using currently accepted fisheries engineering designs. This professional recommendation is based on practical examination of the current SHSRF and proposed upgrades using the *Sleepy Hollow Steelhead Rearing Facility Raw Water Intake and Water Supply System Upgrade Basis of Design Report*, a presentation on the SHSRF upgrades presented by MPWMD on September 19, 2017, publicly available data, personal communications with qualified fish culturists, and design experience from comparable projects.

Based on our analysis, it appears that circular tanks that utilize a water reuse and conservation system that incorporate the appropriate fish handling infra-structure, should be considered in place of upgrading the simulated natural rearing channel that is currently utilized at the SHSRF. This option

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would decrease fish mortality, reduce reliance on the river as a water source, reduce initial capital output, decrease operational costs, improve fish fitness, and most importantly, provide a dependable and healthy fish rearing environment for the targeted Endangered Species Act (ESA) listed steelhead trout (*Oncorhynchus mykiss*).

Design and History of Simulated Natural Rearing Channels

The theory behind enriched hatchery environments, such as simulated natural rearing channels, was that by mimicking naturally occurring conditions in a stream, captive fish would exhibit behaviors more consistent to fish in the wild, which would in turn increase survival after release. Multiple conservation oriented production projects have constructed and operated simulated natural rearing channels with this concept goal. Typically, inadequate sanitation and unpredictable environmental control issues resulted in fish health concerns and diminished overall fish quality. Consistently over time, these facilities that constructed simulated natural rearing channels for fish production have shifted to circular tanks or raceways; in all cases using the current accepted biological rearing parameters as the basis of design. In the *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries Annual Report to Bonneville Power Administration* the Integrated Hatchery Operations Team stated,

> *Fish populations, whether cultured or free-swimming, are exposed to pathogens. Under certain conditions, these pathogens can cause disease outbreaks that lead to fish mortality. This can ultimately result in a significant impact on the fishery resource. Consequently, it is important that managers of a watershed, river, or hatchery facility be constantly aware of disease problems or the potential for disease occurrences" (IHOT 1995).*

Simulated natural rearing channels experience elevated incidence of disease outbreaks and fish mortality to difficulties associated with properly withdrawing waste and sediment from the setting. In rearing facilities that use circular tanks, water re-use systems are utilized to reduce this risk. However, water re-use systems applied to linear rearing facilities, such as the SHSRF, have a history of failure due to poor water quality (Tetra Tech 2015). Additionally, the risk of cross contamination, fish stress, and population loss due to predation is also problematic in simulated natural rearing channels.

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A partial list of fish rearing facilities in the Pacific North West that once implemented a simulated natural rearing channel program but have since switched to conventional fish rearing vessels includes, but is not limited to:

- Washington State Department of Fish and Wildlife; Dungeness Hatchery. Sequim, Washington.
- Douglas County Public Utility District; Wells Hatchery. Pateros, Washington.
- Chelan County Public Utility District; Eastbank Hatchery. Wenatchee, Washington.
- Nez Perce Department of Natural Resources; Nez Perce Tribal Hatchery. Julietta, Idaho

New Research on Enriched Fish Rearing Environments

The concept of raising salmonids in enriched fish rearing environments including simulated natural rearing channels is well-studied and documented. In September of 2001 National Oceanographic and Atmospheric Administration (NOAA) released the 1996-1998 Progress Report on development of a natural rearing enhancement system (aka. NATURES). The goal of the study was to increase hatchery salmon and steelhead survival post-release and to produce fish with more wild like behavior, physiology, and morphology prior to release. Experiments were conducted evaluating subsurface feeders, natural diets, exercise systems, and predator avoidance conditioning. The results of the study showed that enriched fish rearing environments did not substantially increase post-release survival. The 1996-1998 Progress Report on development of a natural rearing enhancement system states:

> *Automatic subsurface feed delivery systems did not affect Chinook salmon depth distribution or vulnerability to avian predators. Live-food diets only marginally improved the ability of chinook salmon to capture prey in stream enclosures"… "A prototype exercise system that can be retrofitted to raceways was developed; however, initial testing indicated that severe amounts of exercise may increase in-culture mortality (Maynard et al. 2001).*

In 2009 researchers at NOAA and the United States Geological Survey (USGS) investigated the post release growth, survival, habitat use, and spatial distribution of hatchery steelhead fry reared in a conventional hatchery setting (circular tanks and raceways) versus an enriched hatchery environment setting (an isolated section of stream) and compared their performance to wild steelhead fry in *Growth, Survival, and Habitat Use of Naturally Reared and Hatchery Steelhead Fry in Streams: Effects of an Enriched Hatchery Rearing Environment*. This study concluded that (1) hatchery steelhead fry released

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into streams grow as well as wild fry but do not survive as well, (2) enriched hatchery environments do not improve post-release growth or survival, and (3) upon release, fry raised in enriched hatchery environments affect the growth and survival of naturally reared fry in much the same way as fry reared in conventional hatchery environments (Tarara et al. 2015).

These findings show that enriched hatchery environments, such as the simulated natural rearing channel at SHSRF, provide no substantial benefit in juvenile salmonid behavior, growth, or survival when compared to conventional rearing environments. Therefore, using conventional fish rearing vessels are preferred because they:

- require less water
- are easier to clean and remove solid waste
- achieve better water quality more consistently
- reduce risk of disease outbreaks
- are easier to maintain
- provide a dependable and healthy fish rearing environment

Alternative Design

Circular tanks with a closed re-use system and ultraviolet treatment will eliminate unaccounted for fish loss, achieve less mortality from disease, provide better pollution control, improved fish care, and reliable water quality. Based on this alternative, the continued use of the existing simulated natural rearing channel and proposed upgrades is not the preferred option for this location in our opinion.

The SHSRF currently experiences 33% unaccounted for loss in its captivity reared steelhead. This phenomenon stems from the inability to get the same ration of food to all fish in the setting. As a result, some fish grow larger than others which leads to mortality from predation. This phenomenon is referred to as being “left behind” in the fish aquaculture industry. In addition to fish mortality through predation, pre-smolt steelhead can become stunted residents that won’t out-migrate. This 33% unaccounted for fish loss will not be resolved at SHSRF with the proposed upgrades; however, this loss would be effectively reduced to 0% with the addition of circular tanks because of their ability to more evenly distribute food throughout the setting.

The SHSRF currently experiences 24% mortality in its captively reared steelhead. The primary cause of this mortality is from disease outbreaks such as Flavobacterium columnare and Ichthyophthirius multifiliis (Ich). The proposed upgrades to SHSRF, in particular the 50% recirculation and ultraviolet treatment facility, should reduce fish mortality from these disease outbreaks’; however, ultraviolet

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treatment on circular tanks with a closed re-use system will provide better management of disease outbreaks and will achieve less mortality than the current system with proposed upgrades. This is because circular tanks provide:

- Better water quality due to the ability to clean the setting, remove waste, and reduced toxins in the juvenile's rearing environment
- Better water quality decreases fish stress and improves the fishes natural ability to resist disease
- Allows for better control over the rearing environment
- Allows for better emergency system response monitoring
- Provides improved ability to treat disease outbreaks

Circular flow, only achieved in circular tanks, enhances juvenile exercise and fitness. Circular tanks, with their dual drain design, can also potentially reduce staffing requirements because the vessel is essentially self-cleaning. Water re-use systems provide the operator with a predictable initial cost and operating expenses. In addition to the above benefits and decreased captive fish loss, other recognized benefits of circular tanks with a closed re-use system compared to the simulated natural rearing channel and proposed upgrades include:

- Better water recycling rate; 90 to 99% versus 50% in the proposed system
- Rotation of water ensures consistent velocities and oxygen saturation
- Reduced effluent discharge
- Pollution controlled effluent discharge
- Eliminates uncontrolled natural event jeopardy (river flooding and periods of low water)
- "Plug and play" components; scalable to project, provide the potential to expand modules or remove modules.
- Ability to create a fish population growth curve via simulating natural seasonal water temperatures
- Simplified handling procedures e.g. juveniles are accessible for sampling and data collection during rearing cycle.
- Lower feed costs; increase ration presentation, decrease wasted feed.
- Better visual access to fish

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Summary and Conclusions

In summary, it appears that retrofitting the natural rearing channel at SHSRF is not the best approach in improving the rearing environment for steelhead salvaged from the Carmel River by MPWMD. Based on our analysis of the proposed upgrades to SHSRF combined with our experience in fisheries engineering and fish aquaculture, it is our opinion that mortality in captivity will be reduced, fish health will be improved, better water quality will be achieved, and facility reliability will be improved by abandoning the existing rearing channel and switching to circular tanks with a closed re-use system and ultraviolet treatment , as described above. It is recommended that a comparative analysis be completed to consider the long term performance between a closed re-use system using all circular tanks and the current simulated natural rearing channel with proposed upgrades.

Additionally, we recommend that SHSRF staff revisit facility procedures.

References

Integrated Hatchery Operations Team (IHOT), 1995. Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries. Annual Report to Bonneville Power Administration, Contract No. 1992B160629, Project No. 199204300, 119 electronic pages (BPA Report DOE/BPA-60629

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Tatara, Christopher, Stephen riley, Julie Scheurer, 2009. Growth, Survival, and Habitat Use of Naturally Reared and Hatchery Steelhead Fry in Streams: Effects of an Enriched Hatchery Rearing Environment. Transactions of the American Fisheries Society 138:441–457

Tetratek.2015. Sleepy Hollow Steelhead Rearing Facility Raw Water Intake and Water Supply System Upgrade Basis of Design Report. http://www.mpwmd.net/wp-content/uploads/SHSRF-BasisOfDesign-Report_Final-2015-10-19.pdf. Accessed Oct 10, 2017.

Attachment B

Carmel River Steelhead Association
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Mr. Doug Bosco, Chair
State Coastal Conservancy
1515 Clay Street, Suite 1000
Oakland, CA 94612

November 21, 2017

RE: Upgrade for the Carmel River Sleepy Hollow Steelhead Rearing Facility

Dear Mr. Bosco:

The Carmel River Steelhead Association (CRSA) is the largest and oldest stakeholder specifically dedicated to steelhead on the Carmel River. Since 1974 our non-profit organization has advocated for steelhead, worked on obtaining sufficient water for steelhead, and completed numerous projects to improve habitat and fish passage for steelhead. Because of this we were asked to write a letter of support for the Monterey Peninsula Water Management District's (MPWMD) request for a grant to upgrade the water intake system for the Sleepy Hollow Steelhead Rearing Facility (SHSRF).

The CRSA board authorized me to write a letter in support of this grant, express some concerns about the existing facility, and propose solutions to those concerns.

CRSA supports the award of funding from the Cal-Am settlement funds to improve the water intake, filtration, and delivery system for the SHSRF. However, we have a number of concerns about the infrastructure and operation of the facility.

In 2014 CRSA wrote a letter (copy attached) opposing the granting of funds for both the SHSRF Intake Improvement Planning and the SHSRF Intake Improvement Construction. At that time, CRSA had many concerns about the simulated rearing channel and water supply system, and suggested that modern circular tanks be considered. Most of our concerns about the water system have been resolved; however, we believe several issues still exist. These include:

- The placement of the pump intake in-channel as opposed to off-channel
- The water supply system's use of a cone screen versus a more streamlined design
- The water supply system's ability to cope with the large amounts of sand now migrating through the upper watershed from the San Clemente Dam Removal Project
- How a constantly changing substrate regime in the river will affect the intake placement

It is the opinion of CRSA that, until habitat conditions improve and adult steelhead return numbers increase to the point where the run is once again self-sustaining, a rearing facility is imperative both to mitigate for Cal-Am's impacts on the river and to advance species recovery objectives as described in the 2012 federal Recovery Plan for the SCC-DPS of steelhead. Since the SHSRF water intake system improvement project will definitely improve the existing facility, the

Board of Directors for CRSA supports upgrading the water intake system and the granting of settlement funds for this purpose.

Our support for this project notwithstanding, CRSA remains skeptical that SHSRF can be operated at a level of efficiency that will improve key metrics for success, especially fish mortality, without additional improvements in best practices and infrastructure.

For example, while the water intake upgrade will improve the reliability of the water supply to the facility, we do not believe this upgrade will improve "unaccounted for' fish loss (presently at 33.5%). It would be helpful to have the Water Management District explain how, if at all, the new water system will improve fish mortality results from disease (presently at 24%) or other factors.

The MPWMD Water Allocation EIR requires a facility to rear 63,000 fish. As currently designed and operated, it is our understanding that SHSRF only has the capacity to rear 34,000 fish, and the proposed upgrades will not increase this capacity. Therefore, the facility will remain out of compliance with the mandate of the Water Allocation EIR.

It is also our understanding that the existing facility has never been officially permitted by the National Marine Fisheries Service. At a recent tour of SHSRF, NMFS representatives stated that this permitting would be undertaken within the next six months to one year. The evaluation of alternatives conducted as part of the NEPA process which will be required for this permitting decision could result in the need for significant changes to the facility. Major changes to facility operations or equipment may render the water intake upgrade unnecessary, or reduce its effectiveness.

CRSA has conducted research (including retention of consulting expert Ed Donahue with Fisheries & Environmental Consulting; his report is attached) on the question of whether the natural channel structure can be better operated to improve fish rearing success at Sleepy Hollow, or whether inclusion of circular tanks in the operation of the facility is desirable. Modern-day circular tanks have a much superior survival rate and cost less to construct and operate than the current system, especially when factoring in the proposed water delivery system upgrades.

We therefore suggest that circular tanks be purchased, installed, and operated in conjunction with the simulated rearing channel, contemporaneous with the water system upgrade project. Information could then be recorded on which system returns the most fish to the river and whether there is any difference in survival rate once the reared fish are returned to the river. In addition, the tanks would provide an economical way to conform to the MPWMD Water Allocation EIR's requirement, and would better mitigate for steelhead losses due to illegal water diversions.

Thus, in addition to funds being allocated for the water intake system, CRSA recommends that additional funds be granted to pay for the purchase and installation of sufficient new 12 ft. diameter or larger circular tanks to rear the additional 29,000 fish required under the MPWMD Water Allocation EIR and to make SHSRF a more reliable and efficient fish rearing environment.

CRSA would be more than willing to participate in whatever is necessary to get additional funds allocated for this project.

Sincerely;

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Brian LeNeve
President CRSA

Attachment C

Carmel River Steelhead Association
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California Coastal Office NMFS
c/o Erin Seghesio
777 Sonoma Avenue, Room 325
Santa Rosa, CA 95404

July 4, 2018

RE: Comment on Permit 14741

Dear Ms. Seghesio:

The Carmel River Steelhead Association (CRSA) commends all involved in the development of the Monterey Peninsula Water Management District's (District) Rescue and Rearing Management Plan (RRMP). Our organization believes that a proper RRMP is essential in Carmel River steelhead recovery. We hope our comments are seen as constructive and with the intent to strengthen the RRMP making it more effective for species recovery.

The District states on page 153 that the RRMP "…was never designed to be the primary action responsible for the recovery of the whole Carmel River run." CRSA agrees with that statement but we also believe the RRMP should make every effort to recover the steelhead population in the Carmel River and actually lead in that effort. Most or our comments have that recovery in mind.

CRSA also believes collectively what we have been doing on the Carmel River has probably prevented the species from dropping to even more depressed numbers if not from going extinct, but collectively we have not recovered the species and in fact the number of returning adults, the number of fall juveniles and the number of rescued fish have gone down over the years. The numbers show that we all need to think "outside the box" to make headway toward recovery. Included in our comments are thinking outside the box suggestions.

We have made several comments regarding modern-day circular tanks. CRSA firmly believes in this approach and is willing to work with all parties in fundraising to purchase and install such tanks.

While this RRMP is a good start, it is missing several key elements that CRSA views as vital to the District's operations, those missing elements need to be added to the RRMP. In addition, the RRMP contains some performance measures that do not satisfy the indicator they measure.
The missing elements include:

- Development of triggers and protocols for emergencies such as equipment failure or unsuitable water intake conditions requiring the evacuation of all fish.
- Implementation of a disease monitoring program of wild fish in Carmel River.

- The RRMP appears to have been written before the District applied for and received a grant to upgrade the water intake system at the Facility. The planned upgrade changed specific items written into the RRMP which need to be addressed.
- A testing period for newly retrofitted equipment and evaluation of equipment performance prior to stocking wild fish.
- Most of the statistical data provided ends in 2012. While we can accept a year of data missing, five to six years is unacceptable.

This RRMP is incomplete and should be revised to address the issues stated above and resubmitted for public comment so that missing components can be evaluated. People and organizations not familiar with the District or the Facility have no idea on what the missing data will show, how the Facility was changed in the water upgrade grant and they should be able to evaluate the missing components of the RRMP.

General Plan Comments

1: This RRMP is a requirement of the Water Allocation EIR and subsequent 5-Year Mitigation Plan (EIR). The mitigation measures defined in the EIR should match measures stated in this RRMP if it is to satisfy the CEQA responsibilities of the District. Listed below are some of the inconsistencies between the RRMP and the EIR.

A: The original mitigation plan calls for a rearing facility to raise a maximum of 64,000 fish yet this document states in many places that a maximum of 47,000 fish will be placed in the rearing facility. As the basis of the permit is the EIR, and if this permit is to fully mitigate for the EIR, then the size of the facility needs to be increased.

B: The original 5-Year Mitigation Plan states "the District would construct a facility to hold and rear wild juvenile steelhead below San Clemente Dam, near the Sleepy Hollow Weir. The preliminary design consists of several holding pools and an artificial stream channel. The facility could hold and rear a maximum of 64,000 fish to a weight of 13 grams, equivalent to the size of fish reared under natural conditions in the Carmel River." Yet several places in the RRMP (in particular page 6 **Table 1-1** performance indicator **1.11.3.2**) states "Maximize survival rates in the Facility as much as possible. With the goal of matching or exceeding in-river survival rates in habitats with continuous summer flows in similar geographic areas." That wording was not in the original EIR or 5-Year Mitigation Plan and has been added to this document. To be consistent and to meet the CEQA requirements, the RRMP must eliminate any references to the match or exceed in-river survival rates.

2: The maximum rearing capacities cited in the EIR is 64,000, the maximum rearing capacity cited in the RRMP is 47,00 and the maximum rearing capacity cited in the Rearing Facility Water Intake Upgrade Grant is 34,000. These figures are inconsistent, the Facility should be capable of rearing the number of fish specified in the EIR (64,000).

3: Targeted testing assessing the Facilities effluent as a point source for the spread of disease to the river should occur. Similar to testing that occurring inside the facility should also occur periodically in the river upstream and downstream of the Facility and should be detailed in this plan.

4: Triggers requiring the emergency evacuation of fish and a standard protocol for doing so should be outlined in this plan. Under no circumstances should diseased fish or recently diseased fish be released back into the river. This action could be catastrophic to the greater Carmel River steelhead population. Instead, the fish should be transported to an alternate facility under quarantine, treated, and held until the end of the season before being released.

5: There seems to be a lot of concern about having a high rate of juvenile survival in the Facility compared to the non-captive wild population. This might be a valid concern for fish of hatchery origin; however, being that these are wild fish, CRSA does not understand what impacts to the population can occur from increased wild juvenile survival. The bigger concern should be too few fish and genetic bottlenecking from maintaining a small population for such a long period of time. Furthermore, the time captive juveniles spend in the river after release with non-captive fish is a relatively short period of time and more habitat is available. Most of the released fish will only be in the river for a few months before they smolt and go to sea. The release of captive fish in theory occurs after fall or winter storms and in sections of the river that have been recently rewetted and likely are not densely inhabited with non-captive wild fish. Cooler water temps occurring during this period allows for slower fish metabolism and less metabolic needs, and thus less competition for food resources between wild and released fish. The rewetted portions of the river connecting to the lagoon, and the increased flow, exponentially increase the amount of available habitat for both released captive and wild fish. Also, any competition between wild and released captive fish could be eliminated completely by holding fish until they are smolted. CRSA believes the overall goal of the RRMP should be to increase adult returns.

6: In conjunction with comment number 4, the concern seems to be that wild reared fish may outcompete the wild non-reared fish when placed together. A simple cure for this would be to rear a sub-set of captured fish until they are fully smolted and then release those fish to the river. This would allow fewer reared fish originally released to compete with those non-reared fish yet still allow for an increase in adult numbers. CRSA recommends keeping at least 2,000 fish until they are fully smolted and release those fish at Sleepy Hollow. Release at Sleepy Hollow would not only give fish an upstream homing path, it would match the intent of the original EIR.

7: Several places in the RRMP, in particular page 5, **1.10 List of Rescue and Rearing program mandatory "Performance Standards"** states, "Mandatory Performance Standards for this RRMP are derived directly from Northwest Power Planning Council (NWPPC) 2001.They are designed to achieve the program's goal of optimally rescuing and rearing as many naturally-born juvenile steelhead (*Oncorhynchus mykiss*) as possible, with the objective of assisting the restoration, conservation, and maintenance of the steelhead population at long-term viable levels." Because of the severely depressed state of the Carmel River Steelhead population, "maintenance" is not an acceptable performance standard. The performance standard needs to be "enhancement," otherwise this RRMP maintains a near remnant steelhead population. Furthermore, CRSA does not believe the Cal Am ratepayers would accept a program that spent $1,217,045 in Fiscal Year 2012-2013 and

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will spent at least that much in every year of this plan, only to maintain the current depressed adult numbers. All reference to maintenance should be changed to increase adult numbers.

8: The Facility has been plagued by "unaccounted for" fish loss (33%) and disease (24%). Total overall survival at the Facility is only 43%. CRSA hired an experienced fish hatchery engineer to review the Facility setup who concluded that high mortality was likely do to the outdated fish rearing vessels and that the vessels (troughs, round pounds, and rearing channel) should be replaced with modern vessels such as circular tanks. Attachment 1 provides the detailed report from the fish hatchery engineer provided to CRSA in 2017. (See attachment 1.) This claim is supported by 2013 survival results between fish initially reared at the Facility (42 % survival) that were later taken to the South West Fisheries Science Center and placed in circular tanks (95 % survival). A commitment by the District to update the fish rearing vessels should be obtained prior to issuance of this RRMP.

9: In several places (page 1, **1.4 Purpose (Goal) of Program**) the RRMP states the mitigation is for the "lower twenty-four miles of the mainstem Carmel River and subunits of the Carmel Valley Alluvial Aquifer" In CRSA's reading of the original EIR and from being part of the whole process from the beginning, CRSA believes the mitigation required under the EIR and further defined in Water Order 95-10 is the impacts of Cal Am water withdrawals from the lower nine miles of the mainstem Carmel River. CRSA would support a new EIR that addressed the impacts of overall water withdrawals, but at this time the RRMP must conform to what it was intended to do.

10: There appears to be a concern that too many returning adults could come from the fish rescued in the lower nine miles of the river. CRSA suggests to minimize this problem, fish rescued from Cachagua and Finch Creeks should be placed in the Facility, reared and then released below Los Padres Dam. This would place fish with upper river homing instincts back in the upper river and spread the adult rearing-facility-raised-fish to more river. This would require keeping these fish separate from the lower river raised fish, but the Facility has a number of different tanks and if the Facility is to meet the CEQA requirements of the EIR extra tanks would be needed. CRSA suggests MPWMD purchase some modern-day circular tanks for this purpose.

11. There is concern that in the release phase there could be a problem with large Facility fish outcompeting non-Facility fish. CRSA suggest that some of the Facility fish be released into Los Padres Reservoir which when full (which it should be if the river is running) is some of the best upstream habitat. Not only would some fish be placed in excellent habitat, it would also increase the homing instinct of those fish and possibly result in more fish migrating over Los Padres Dam in future years. Current scientific thinking is that resident rainbow trout are extremely important, if not critical, to maintaining all life forms of *Oncorhynchus mykiss,* so CRSA does not object to a subset of reared fish being resident size.

Specific Changes Needed

1: On page 1, under **1.4 Purpose (Goal) of Program:** it states: "The primary goal of this program is to rescue and rear naturally-born juvenile steelhead (*Oncorhynchus mykiss*) with the objective of assisting the restoration, conservation, and maintenance of the steelhead population at viable levels in the Carmel River Basin."

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- CRSA Comment: CRSA believes that do to the severely depressed state of the Carmel River Steelhead population, “maintenance” is not an exactable performance standard. The performance standard needs to be “enhancement”.

2: On page 2, under **1.4 Purpose (Goal) of Program:** it states "The primary goal of the rearing phase of the program is to maximize survival of Facility reared fish and to meet or exceed the condition and growth rates of fish reared in nearby extant sections of the Carmel River."

- CRSA Comment: CRSA agrees with this goal and believes other stated goals, or goals stated in a different way should be removed.

3: On page 4, under **1.7 Other Agencies, Co-Operators, or Organizations Involved, Including Contractors, and Extent of Involvement in the Program:** item 3) states "The Carmel River Steelhead Association (CRSA) has conducted ancillary rescues of steelhead stranded in mainstem Carmel River in the past, sometimes in cooperation with the District, but mostly autonomously. CRSA has autonomously conducted its own annual rescues in selected tributaries in the past, including Cachagua Creek, Hitchcock Canyon, Garzas Creek, Robinson Canyon, and Potrero Creek at the discretion of the CDFW and NMFS. These rescues are conducted predominantly outside District boundaries and jurisdiction."

- CRSA Comment: CRSA has performed 134 rescues on the mainstem Carmel River over nine different years and rescued 72,326 steelhead. The rescues on Hitchcock Canyon, Garzas Creek, Robinson Canyon, and Potrero Creek were mostly within the District's boundaries and jurisdiction. Rescues on Cachagua Creek were partially within the District's boundaries and jurisdiction. The RRMP should change this wording to reflect this information. Amend text.

4: On page 5, under **1.10 List of Rescue and Rearing Program Mandatory "Performance Standards"** it states "They are designed to achieve the program's goal of optimally rescuing and rearing as many naturally-born juvenile steelhead (*Oncorhynchus mykiss*) as possible with the objective of assisting the restoration, conservation, and maintenance of the steelhead population at long-term viable levels in the Carmel River Basin…"

- CRSA Comment: CRSA agrees with the goal of rescuing and rearing as many naturally-born steelhead as possible. To meet this goal CRSA would like to see a "Performance Standard" that compares the Facilities performance to that of other fish rearing facilities. This would also require an additional column under **Benefits and Risks Associated with Each performance Indicator.**

5. On page 6, under **1.10.8** Operation of the Rearing Facility: it states "Effluent from the Facility does not detrimentally affect local populations."

- CRSA Comment: Please detail how this determination was made? Has focused monitoring occurred examining the effects of disease in Facility effluent on the local fish population? If so, please detail.

6. On page 6, in **Table 1.1 Annual Performance Standards and the Performance Indicators Used to Demonstrate Compliance With Each of the Standards 1.11.3.2** it states "Maximize survival rates in the Facility as much as possible, with a goal of matching or exceeding in-river survival rates in habitats with continuous summer flows in similar geographical areas"

- CRSA Comment: This is inconsistent with stated goals of section **1.4 Purpose (Goals) of Program** and needs to be changed to maximize survival of Facility reared fish.

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7. On page 8, in **Table 1-2 Benefits and Risks Associated With Each Performance Indicator**

1.11.3.2 Risk: it states "If survival greatly exceeds that in the wild, could affect composition of the run"

- CRSA Comment: Define what is meant by "composition of the run." List what the current composition is and how does it compare to the historic composition. Define what is the target run composition and why. Aren't these all wild fish from the same watershed? Too many surviving wild juveniles in a severely depressed population seems like a fictitious concern. The greater risk is maintaining a remnant population and genetic bottlenecking. Less concern should be placed on excessive survival.

8. On page 9 in **Table 1-2 Benefits and Risks Associated With Each Performance Indicator 1.11.3.13 Risk:** it states "None. SHSRF effluent has never violated nay standards and is often better than its inflow"

- CRSA Comment: See General Comment 3 above.

9. On page 9, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance indicator 1.11.3.1* it states "…As part of this RRMP, District staff will begin regular surveys of the "leftover" juvenile population in specific reaches."

- CRSA Comment: CRSA believes it could be a conflict of interest for those performing mitigation activities to also be in charge of evaluating their own effectiveness. Also, not surveying for leftover fish will allow the District to focus on rescues and fish rearing. When the river starts drying it is very difficult to monitor each riffle on the river and the District has acknowledged that monitoring under these conditions would be difficult. CRSA believes an agency or independent consultant should be hired to determine rescue efficiency.

10. On page 10, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.2* **–** states Maximize survival rates in the Facility as much as possible, with a goal of matching or exceeding in-river survival rates in habitats with continuous summer flows in similar geographical areas

- CRSA Comment: See general comment 1: B

11. On page 10, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.2* - Maximize survival rates in the Facility as much as possible, with a goal of matching or exceeding in-river survival rates in habitats with continuous summer flows in similar geographical areas goes on to say "Survival rates of fish reared in the Facility have varied considerably since 1996. Overall annual survival ranges from 14 to 86 percent, averaging an annual mean of 53 percent, with a combined survival for all fish ever reared of 43 percent…"

- CRSA Comment: This survival rate (43 %) is alarmingly low. CRSA recommends an audit of the Facility and established practices by a fish culturist and testing to determine if this one of a kind facility performs comparably to other facilities that hold salmonids in captivity.

12. On page 10, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.2* - Maximize survival rates in the Facility as much as possible, with a

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goal of matching or exceeding in-river survival rates in habitats with continuous summer flows in similar geographical areas further goes on to say:" For perspective, Satterthwaite, et al. (2009) estimated for their life history model that wild survival for juvenile steelhead in general on the

Central California Coast, for periods similar to when the District rescues and rears them, was 39.3% for May–October, and 29.6% for May-December. Thus the average performance of the SHSRF already exceeds the only available theoretical in- river survival rates for California coastal steelhead."

- CRSA Comment: CRSA has already stated that the EIR and general recovery goals do not allow Facility fish survival only to be as good as what would occur in the wild but should be as good as possible. Regardless, CRSA believes that stating the rearing facility has a 43% survival efficiency is not accurate because it only considers fish actually rescued. and the requirement of the EIR is to mitigate for all fish left stranded in the lower 9 miles of the river. In reality we must consider the number of fish in the river available for capture. If there were 100 fish in the river and 82% were rescued the facility would stock 82 fish. If we apply the 43% survival rate to those 82 fish only 35 would be left at the time of release so survival rate is now 35%. If 1% is sacrificed for disease testing prior to release another 3 fish are removed resulting in 32% of the fish returning to the river. Further, fish are counted when they are placed in the transport truck and not when placed in the river. It is illogical to assume no mortalities occur when fish are transported, placed in an unfamiliar environment and acclimated to new surroundings. Average performance for SHSRF needs to take in to consideration all of these factors.

  Secondly, survival in the Facility is artificial selection and not natural selection which is occurring in non-captive fish. These processes are vastly different and not comparable. For example, fish in the facility are protected from predators but are more susceptible to disease likely resulting in a fish that is less adapted to coping with predators but perhaps more resistant to disease than their solely wild counterparts. The two processes can't be assumed to produce the same quality of fish and number of survivors. For these reasons, the goal of the Facility should only be maximum survival and not meeting or exceeding wild survival.

  Lastly, Satterthwaite et al. 2009 uses 0+ survival rates of 50% or greater for a central coast steelhead life history model based on older studies from the CA north coast, which may not be the best comparison. If you look at the distribution of data from Grantham et al 2012, many habitats produce far greater survival rates (up to 75%). Based on the Grantham et al. study, the upper quartile of the distribution (approximately 45-50%) would be a more relevant comparison. Data from Grantham et al. should be included.

13. On page 11, in **Table 1-4** SLEEPY HOLLOW STEELHEAD REARING FACILITY: Operation and Fish Rearing Summary - 1996 to 2012

- CRSA Comment: The data from the chart in Table 1-4 shows the Facility survival seems to drop significantly as number of fish stocked increases. Whenever less than 10,000 fish are placed in the Facility the survival rate is a minimum of 61%. This further calls into the question current Facilities design, in particular its ability to rear fish at its stated capacity. Fish survival should be consistent up the capacity point. Furthermore, judging from the number of fish stocked vs release numbers, it doesn't appear that the Facility can handle more than 15,000 fish. The Facility's stated fish

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capacity of 34,000 to 47,000 should be reviewed by a hatchery engineer and fish culturist.

14. On page 12, **1.11.3 Detailed Description of the "Performance Indicators":**
Performance Indicator 1.11.3.2 - Maximize survival rates in the Facility as much as possible, with a goal of matching or exceeding in-river survival rates in habitats with continuous summer flows in similar geographical areas further goes on to say "A quantitative juvenile survival estimate will be developed through the cooperative development of a NMFS-SWFSC life history model specific to the Carmel River. Individual annual survival estimates cannot be developed in the open-channel, main-stem habitat upstream of RM 9 to compare to the SHSRF, since the necessary assumptions for any annual mark recapture effort would be stymied by the ability of marked fish to leave the sampling area, and for unmarked fish to migrate into it in a single season between sampling events…"

- CRSA Comment: Is it possible to consider radio tags and tracking using radio telemetry? Could a comparison of steelhead densities between rescue periods and release periods be done? CRSA would like to be included in the cooperative development process of the life history model.

15. On page12, under **1.11.3 Detailed Description of the "Performance Indicators":**
Performance Indicator 1.11.3.4 - Sustain and potentially increase annual recruitment of steelhead YOY from reaches that annually dry up below the Esquiline Road Bridge at RM 14.5 states "The District's experience with rearing steelhead indicates that this objective is problematic, in that attempts to achieve it require restricting feeding rates. Doing so is likely to reduce annual survival of fish reared at the SHSRF (*Performance Indicator 1.11.3.2*), by encouraging the highly cannibalistic nature of steelhead. Thus, achieving *Performance Indicator 1.11.3.6* is inherently in conflict with achieving *Performance Indicator 1.11.3.2.* The District attempts to balance both objectives by: a) feeding the fish more heavily early in the season when needed to support their transition to pelleted feed, and an adequate ration to meet the steelhead's metabolic demand during higher water temperatures; then b) tapering off to a lesser level once water temperatures drop below 60' F/15.5' C in the late fall and winter."

- CRSA Comment: CRSA feels this characterization does not seem accurate. Provide reference for the "highly cannibalistic nature of steelhead." Further, CRSA also believes that in conventional hatcheries, cannibalism is rare but does occur when an uneven distribution of food amongst the captive fish can't be achieved. The cannibalism experience at the facility may be more likely attributed to the design rather than feeding rates. For example, in 2013 the Facility experienced nearly 12% mortality due to cannibalism and an overall survival rate of 43%. 1,051 fish were taken from SHSRF to the SWFSC and held for a similar period of time. The cannibalism rate while in circular tanks, which evenly distributes the food with circular flow, was far lower and total survival was 95%. True, the fish were larger during their time at the SWFSC Facility and may have experienced greater survival because of this fact, but equally plausible was that the rearing environment was superior which led to better survivorship. CRSA recommends an independent review of the Facility by a fish culturist and testing of the facility to see if cannibalism issues are related to design.

16. On Page 15, under **1.11.3 Detailed Description of the "Performance Indicators":**
Performance Indicator 1.11.3.6 - *Produce rescued-and-reared juvenile steelhead which have a size range appropriate for healthy wild fish in the Carmel River* states "The purpose of rearing YOY

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to a similar length as natural fish is twofold: first, it is appropriate as a way to help ensure that rescued fish do not outcompete or prey on the non-rescued fish; second, abnormally accelerated freshwater growth of steelhead reduces age at maturity and first returns (Tipping 1991, Wagner

1967, and Ward et al. 1989). In some cases, accelerated growth may obviate seaward migration and encourage freshwater residence. These life history patterns and phenotypes reflect a strong genetic variability and heritability but should not be overly encouraged or manipulated. Therefore, maintaining growth rates similar to natural levels is the most conservative way to encourage anadromous behavior and promote a wide diversity of life history patterns. The District's experience with rearing steelhead indicates that this objective is problematic, in that attempts to achieve it require restricting feeding rates. Doing so is likely to reduce annual survival of fish reared at the SHSRF (*Performance Indicator 1.11.3.2*), by encouraging the highly cannibalistic nature of steelhead. Thus, achieving *Performance Indicator 1.11.3.6* is inherently in conflict with achieving *Performance Indicator 1.11.3.2*. The District attempts to balance both objectives by: a) feeding the fish more heavily early in the season when needed to support their transition to pelleted feed, and an adequate ration to meet the steelhead's metabolic demand during higher water temperatures; then b) tapering off to a lesser level once water temperatures drop below 60' F/15.5' C in the late fall and winter."

- CRSA Comment: Restrictive feeding is commonly done in hatcheries without occurrence of cannibalism. The cannibalism experienced is related to an uneven distribution of food in the vessels or varied rates of fish adapting to feeding in captivity causing some fish to grow faster than others. Varied growth along with an inability to grade fish once this problem occurs because of the Facility's design leads to larger fish in proximity to smaller fish and then cannibalism. Fish that are the same size can't eat one another. An experienced fish culturist should be consulted regarding this issue. Also, provide reference for the "highly cannibalistic nature of steelhead." This characterization does not seem accurate for steelhead.

17. On page 16, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.9* – Estimate the percent of the annual steelhead run composed of wild river-reared, wild rescued-and-relocated then river-reared, and wild rescued-and-reared at the SHSRF in the annual run states "This estimate will be developed from total DIDSON counts, and PIT tag returns as adults from the latter two groups of fish."

- CRSA Comment: According to communications with Kevan Urquhart, the DIDSON is not able to distinguish between striped bass and steelhead. With that being said, how can accurate estimates be made using the DIDSON? Remove DIDSON counts as a performance indicator and replace with a viable option.

18. On page 17, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.13* – Monitor effluent from the Facility to document that it meets all receiving water quality standards and does not impair local steelhead populations

- CRSA Comment: Water quality testing should be conducted by an entity other than the District.

19. On page 17, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.14* – Ensure that releases of wild rescue-reared fish do not introduce pathogens to the indigenous wild river-reared population. it states "SHSRF fish are almost always, except for emergency releases, placed downstream of the majority of the indigenous population of

steelhead in habitat that has only recently re-wetted. Therefore, there is not a large amount of initial overlap or mixing of our wild rescue-reared fish with the indigenous wild-river reared fish."

- CRSA Comment: Not specifying triggers for emergency fish evacuation procedures, protocols, and subsequent monitoring is a major short fall of this RRMP. The Carmel River Lagoon, which is perhaps the most important habitat in the watershed, is downstream of all emergency release sites. Under no circumstances should diseased fish be put back into the watershed, emergency or not. In the event of an emergency diseased fish should be trucked to an alternate facility, treated, monitored, and released at the end of the season.

20. On Page 17, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.14* – Ensure that releases of wild rescue-reared fish do not introduce pathogens to the indigenous wild river-reared population. it states "SHSRF fish are almost always, except for emergency releases, placed downstream of the majority of the indigenous population of steelhead in habitat that has only recently re-wetted. Therefore, there is not a large amount of initial overlap or mixing of our wild rescue-reared fish with the indigenous wild-river reared fish. As required by State Fish and Game Code for all aquaculture facilities, the SHSRF has always operated under the oversight of and consultation with the CDFW's Fish Health Lab in Rancho Cordova."

- CRSA Comment: Fish are placed in the river two weeks after the river has rewetted giving indigenous fish time to move into those reaches and Facility fish can migrate upstream very fast. Also downstream is the Lagoon where countless wild fish could be. These measures don't fulfill the Performance Indicator 1.11.3.14.

21. On page 18, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance Indicator 1.11.3.14* – Ensure that releases of wild rescue-reared fish do not introduce pathogens to the indigenous wild river-reared population. it states "The SHSRF is subject to periodic random inspections, and whenever there is a disease outbreak MPWMD consults with the lab and they can choose whether to make a site visit, or staff overnight mails them fresh specimens for necropsy. Over the 15 out of 19 consecutive years of SHSRF operation there has never been a disease problem observed in released fish, thus CDFW rarely makes annual pre-release inspections. MPWMD will commit to providing either the CDFW-Fish Health Lab, or any other USFWS or NMFS fish pathology lab we are referred to by NMFS, with two fresh-killed juvenile steelhead from each of the 14 rearing reaches, and any Quarantine Tanks or circular Rearing Tanks where we may be rearing fish, up to an annual total of 30 fish, for their disease evaluation before a release event. The District has contracted with a local veterinarian, trained and qualified in fish diseases, to conduct inspections of the Facility when requested by NMFS or during the infrequent disease outbreaks, and to make one annual pre-release inspection of the SHSRF fish, to ensure there is no microscopic evidence of disease prior to the release of steelhead to the lower river. If any problems are observed by the veterinarian, they will consult with the CDFW Fish Pathology Lab, and send any fresh necropsy samples they may request for analysis by overnight mail. Alternatively, any fish pathologist approved and directed by NMFS may inspect the Facility prior to fish being released."

- CRSA Comment: According to a presentation given to CRSA by the District on September 19, 2017, overall total mortality from disease was 54,330/ 228,425 or 24% of the total number of the fish placed into the Facility. This seems like a bigger issue than the RRMP is eluding to. More rigid testing should be required. The sentence "Over

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the 15 out of 19 consecutive years of SHSRF operation there has never been a disease problem observed in released fish, thus CDFW rarely makes annual pre-release

inspections" is peculiar. What happened during the other 4 years or 21% of the time? Methods for observing disease in released fish should be included in this RRMP. Agency pre-release inspections need to be mandatory! Fresh killed juvenile steelhead up and downstream of the Facility effluent should be periodically tested to determine if Facility effluent is contributing to outbreaks of disease or a similar method should be developed.

22. On page 20, under **1.11.3 Detailed Description of the "Performance Indicators":** *Performance indicator 1.11.3.17*: Quantify the percentage of rescued fish delivered to and reared in the SHSRF which exhibit any common symptoms of electrofishing stress, and modify operations if necessary to keep the percentage below 1% states "While the percentage of fish rescued by electrofishing versus minnow seines varies widely, and it is not feasible to precisely quantify as both methods are often used in conjunction with one another in the same reach or on the same day, field staff believe it is about 50 percent."

- CRSA Comment: How about indicating on a data sheet the number of fish rescued by seining vs electrofishing and tracking those numbers separately.

23. On page 26, under **1.16 Watersheds Targeted by Program:** It states "While allowed by the 1990 Water Allocation Program FEIR, the District is willing to rescue fish from tributaries within District boundaries, if requested to do so by NMFS or CDFW. This includes Portrero, Robinson, Las Garzas, Hitchcock, Tularcitos, San Clemente, and Cachagua Creeks."

- CRSA Comment: We cannot find such language in the FEIR. Please reference exact portions of the 1990 Water Allocation FEIR.

24. On Page 49, **Appendix 2-A: Annual Carmel River Juvenile Steelhead Population Survey.**

- CRSA Comment: Only data from 1990 to 2012 is presented. Include data out to 2016. This is also true for at least Figure 1-1, Table 1-3, Table 1-4, Figure 1-2 and Table 1-5. The RRMP needs to update data to include all published data for all years.

25. On Page 74, under **4.1.6 Existing Quality of Water Available for the Facility:** It states "The quantity of water available in the Carmel River is adequate to supply the Facility in all but severely Critically Dry Water Year Types, or second and further years of consecutive drought."

- CRSA Comment: Circular tanks require less water and would likely allow for Facility operation in severely dry water years.

26. On Page 136, under **5.6 Rearing Tanks;** it states "The Facility includes two large above ground circular rearing tanks (22-foot or 30-foot diameters) (**Figure 5-12**). Valve-controlled water and air flows independently to these tanks and each tank is fitted with a central overflow standpipe to control water volume. Currently, these tanks cannot be run effectively if the rearing channel, quarantine tanks and rearing troughs are running at full flow, as the Facility inflow is insufficient for concurrent use of all the rearing containers."

- CRSA Comment: These are not circular tanks, they are round ponds. Round ponds are different from circular tanks in that they don't have circular flow inside the vessel. Amend text.

References:

Theodore E. Grantham, David A. Newburn, Michael A. McCarthy & Adina M. Merenlender (2012) The Role of Streamflow and Land Use in Limiting Oversummer Survival of Juvenile Steelhead in California Streams, Transactions of the American Fisheries Society, 141:3, 585-598, DOI: 10.1080/00028487.2012.683472

As stated at the beginning of this comment letter, the Carmel River Steelhead Association believes the proposed plan is a great start and with a few modifications could be very beneficial to recovery of steelhead in the Carmel River. With the suggested modifications, this is a plan CRSA could endorse and support.

Sincerely,

Brian LeNeve
Carmel River Steelhead Association, Conservation Chair

AG LAND TRUST
Preserving Farm Land Since 1984

www.AgLandTrust.org
Location: 1263 Padre Drive | Salinas, CA
Mail Address: P.O. Box 1731 | Salinas, CA 93902
Tel.: 831.422.5868

DRAFT NOTICE OF USE OF RECLAIMED WASTEWATER
FOR CONSERVATION OF POTABLE GROUNDWATER RESOURCES

DATE: **June 17, 2021**

TO: **California State Water Resources Control Board (SWRCB), CA State Water Resources Control Board, Division of Water Rights**

FROM: **Ag Land Trust – formerly known as Monterey County Agricultural and Historic Land Conservancy (MCAHLC)**

RE: **Notice of Conserved Groundwater and Groundwater Rights pursuant to California Water Code SEC. 1010**

Dear Chairman Esquivel and SWRCB Board Members,

This letter is being forwarded to you for the purposes of providing **notice** to the SWRCB, pursuant to the provisions of **California Water Code Section 1010 et seq.,** of our use of reclaimed water on our "Armstrong Ranch" which is located in Monterey County. The Assessor's Parcel Numbers for this parcel are 203-011-010, -011, -013, -014.

Our use of reclaimed water (pursuant to **California Water Code Section 1010**) for irrigation purposes of our documented prime coastal zone farmland (Armstrong Ranch) is and has been expressly to preserve and protect our existing groundwater resources and expressly to preserve and protect our existing overlying groundwater rights in the Salinas Valley Percolated Groundwater Basin. This prime and massively productive coastal farmland, and its necessary supplies of irrigation waters, have been recognized in both federal and CA. statutes and administrative regulations as "protected" natural resources within the Coastal Zone and have been acquired with both state and federal grant funds expressly to guarantee the preservation of the resource's productivity.

A summary of our actions to preserve and protect our groundwater and groundwater rights follows. Although notices provided pursuant to **California Water Code Section 1010** are generally indicating supplemental reclaimed water use in lieu of surface water appropriations and appropriative rights, Ag Land Trust is submitting this notice in reliance upon the express statutory language of Sec. 1010 that refers to "the use of water under ANY existing right".

Ag Land Trust is a 501(c)(3) NON-PROFIT CORPORATION organized pursuant to IRS regulations in 1984 for the purposes of owning, protecting, and permanently preserving prime and productive agricultural lands in Monterey County and within the California Coastal Zone. It is now the largest and most successful farmland preservation trust in the State of California, and it owns, either "in fee" or through permanent conservation easements, well over 46,000 acres of prime farmlands and productive coastal agricultural lands throughout Monterey County and the Central Coast of the state. Further, and of more particular importance, Ag Land Trust has been the farmland conservancy that the California Department of Conservation, the California Resources Agency, the United States Department of Agriculture, the National Guard Bureau, the United States Department of Defense, and the California Coastal Commission has sought out to receive grants and to accept the dedications of prime and productive coastal farmlands in the Central Coast area to insure the permanent preservation of those recognized, protected, and irreplaceable state and federal agricultural resources.

Ag Land Trust owns, in fee, the prime and productive coastal farmland (the Armstrong Ranch), and all of the overlying percolated groundwater rights thereunder, that is located immediately adjacent to the CEMEX property, a closed sand mining facility. Our irrigated Armstrong Ranch has been in cultivation since the 1970's producing a minimum of at least two crops of vegetables per year. Our property is in the unincorporated area of Monterey County. Our ranch lies within, and is subject to, the policies and regulations of the state (CA. Coastal Commission) certified North Monterey County Local Coastal Plan, California Natural Resources Code provisions, and federal laws which mandate the protection of our farmlands and the overlying groundwater rights and supplies thereto due to its rare and important productivity values as a prime national and state coastal agricultural resource.

Our ranch was acquired between 1995-1998 with grant funds from the State of California (Natural Resources Agency), the Packard Foundation and the United States (USDA) expressly to permanently preserve its protected (pursuant to federal and state regulations and statutes) and irreplaceable prime and productive coastal farmland (including its groundwater resources) from development or exploitation. We have over 160 acres under cultivation at the Armstrong Ranch, and regularly use reclaimed wastewater as herein described (and our groundwater wells as necessary) for irrigation water.

In 1996, the Monterey County Water Resources Agency (MCWRA) and the Monterey Regional Water Pollution Control Agency (MRWPCA, now known as Monterey OneWater) entered into contracts to build a major regional wastewater reclamation project expressly to provide supplemental irrigation water supplies to the Castroville/Marina coastal area of Monterey County so as to protect existing potable percolated groundwater supplies from advancing seawater intrusion caused by excessive pumping in the basin. The area to be benefitted by this supplemental supply of reclaimed wastewater was, and is approximately 12,000 acres of prime, actively cultivated coastal farmlands. The entirety of the 12,000 acres in the "benefitted area" all hold unimpaired, percolated overlying groundwater rights in the non-adjudicated Salinas Valley Groundwater Basin. The reclaimed wastewater project was funded by USEPA, in part, to address the protection of potable groundwater supplies and the protection and enhancement of productivity of protected coastal farmlands in the basin. This federal funding from USEPA was provided to advance the adopted U.S. Congressional directives to insure the permanent preservation of the productivity of prime coastal farmlands for the protection of the national food supply.

The reclaimed wastewater project is now known as MCWRA Zone 2B, or the "purple valve project", started delivering reclaimed water in 1998. That was the year that Ag Land Trust began to use the reclaimed wastewater so as to conserve our potable groundwater resources. A large portion of the reclamation and piping project was built with assessment district funds voluntarily paid for by the landowners that hold senior, overlying groundwater rights within the 12,000 acre area of benefit.

At the time of the initiation of the wastewater reclamation project construction, the overlying landowners within the assessment area had voluntarily subscribed to 97% of the reclaimed water that was to be produced, expressly to protect their existing wells and senior potable groundwater supplies from seawater intrusion. All of the "subscription contracts" to receive reclaimed wastewater between the MCWRA and the overlying land owners (of which Ag Land Trust is one) expressly acknowledged that the use of the reclaimed wastewater was not intended to, and would not result in, any forfeiture or abandonment of the overlying groundwater rights of the land owners who were going to voluntarily buy the supplemental reclaimed wastewater from the MCWRA/MRWPCA as part of the comprehensive plan to conserve their existing, senior, potable groundwater supplies and groundwater rights in the overdrafted Salinas Valley Groundwater Basin.

With the execution of these "subscription contracts", both the California Department of Water Resources AND CALEPA (of which the SWRCB was a subsidiary agency) were fully advised of the terms of those contracts so that future challenges to the retained groundwater rights by the overlying landowners would be avoided. These express agreements make any arguments about unfounded assertions of the potential for that acquisition of "salvaged water rights" (by "third party, junior, non-overlying potential appropriators") MOOT. Moreover, it is imperative to note that the "subscription contracts" did not require ANY abandonment or cessation of the use of groundwater wells by the overlying landowners. In fact, at the beginning of the reclamation project, reclaimed water was not available during the winter months and irrigated winter vegetable crops (cauliflower, celery, and broccoli) were irrigated with groundwater from the landowners' existing wells. Ag Land Trust owns two groundwater wells on our Armstrong Ranch that may be used pursuant to these comprehensive supplemental water supply contracts and groundwater conservation programs.

Ag Land Trust used 347.203-acre feet of reclaimed wastewater for agricultural irrigation purposes in 2020, in lieu of exercising our senior overlying groundwater rights and pumping groundwater from our existing groundwater wells. This reclaimed wastewater use can be confirmed by the attached property tax bill showing our annual paid assessments for the reclaimed water project and piping AND the attached bill showing the reclaimed water purchased for the purposes of irrigating multiple crops on our prime coastal farmlands. As indicated, we have been actively pursuing this water conservation effort and strategy on our ranch annually since 1998.

Please record this Notice of our annual efforts to conserve our existing groundwater rights and resources with the SWRCB Division of Water Rights and the SWRCB Office of the Chief Counsel.

Most Respectfully,

Richard Nutter

Richard Nutter, Board Chairperson
Ag Land Trust

MARY A. ZEEB
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County of Monterey

PROPERTY INFORMATION

ASSESSMENT #	**203-011-010-000**	TAX RATE AREA	099-147
FEE NUMBER	203-011-010-000	ACRES:	17.00
LOCATION	LAPIS RD		
ASSESSED OWNER	MONTEREY COUNTY AGRICULTURAL &		

**********MIXED AADC 840 AA 76028-1/1-P282 T228

MONTEREY COUNTY AGRICULTURAL &
HISTORIC LAND CONSERVANCY INC
10855 CARA MIA PKWY STE C
CASTROVILLE CA 95012

IMPORTANT MESSAGES

Original bill date 09/18/2020
This property is part of an agricultural preserve

Armstrong

Fiscal Year beginning July 1, 2020 and ending June 30, 2021

2020-2021

Pay Taxes by Credit Card or E-Check
1-800-491-8003 or www.co.monterey.ca.us/taxcollector
DISC VISA ELECTRONIC CHECK OFFICIAL PAYMENTS

COUNTY VALUES, EXEMPTIONS AND TAXES

PHONE NUMBERS		VALUE DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	COUNTY TAXES
VALUATIONS	(831) 755-5035	LAND	147,990				
TAX RATES	(831) 755-5040						
EXEMPTIONS	(831) 755-5035						
PAYMENTS	(831) 755-5057						
PERS PROP	(831) 755-5035						
ADDR CHGS	(831) 755-5035						
GENERAL INQ	(831) 755-5057						

NET TAXABLE VALUE	**147,990**	**X**	**1.000000**	**=**	**$1,479.90**

VOTER APPROVED TAXES, TAXING AGENCY DIRECT CHARGES AND SPECIAL ASSESSMENTS

PHONE NUMBERS	TAX CODE	DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	AGENCY TAXES
(831) 755-6700	12000	Hartnell 2014 Ref AB 2015Ref AB 2016 AB	147,990		0.042886		63.46
(831) 633-3343	12200	No Mty Cty USD 2012Ref 2013 2014 A & 2016Ref	147,990		0.058950		87.24
(831) 755-4860	80600	MCWRA Zone 2Y	DIRECT CHARGE				60.34
(831) 755-4860	80700	MCWRA Zone 2Z	DIRECT CHARGE				184.10
(831) 755-4860	81800	MCWRA Zone 2B	DIRECT CHARGE				1,819.60
(831) 755-4860	81900	MCWRA Zone 2C Ops	DIRECT CHARGE				382.50
(831) 755-4860	81901	MCWRA Zone 2C Spwy	DIRECT CHARGE				48.62
(831) 755-4860	81902	MCWRA Zone 2C Dvrsn	DIRECT CHARGE				105.06
(831) 755-4860	81903	MCWRA Zone 2C Admin	DIRECT CHARGE				26.52
(831) 633-2578	82050	NorthCountyFire-EMS	DIRECT CHARGE				2.50
(800) 273-5167	83050	NoSalinasValleyMosquitoAbatementDist	DIRECT CHARGE				1.20
(831) 471-7526	88410	SVBGSA Groundwater Sustainability Fee	DIRECT CHARGE				93.88
(831) 755-4964	93500	CSA74 EMSAmbCountyWide	DIRECT CHARGE				5.00

The Treasurer-Tax Collector office will be closed to the public December 24, 2020 through January 1, 2021. We will reopen Monday, January 4, 2021 at 8:00 am. Please contact our office for available payment options during the closure.

TOTAL AGENCY TAXES AND DIRECT CHARGES **$2,881.02**

1ST INSTALLMENT	2ND INSTALLMENT	TOTAL TAXES
$2,180.46 ✓	$2,180.46 ✓	$4,360.92
DUE BY 11/01/2020	DUE BY 02/01/2021	
DELINQUENT AFTER 12/10/2020	DELINQUENT AFTER 4/10/2021	

MARY A. ZEEB
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www.co.monterey.ca.us/taxcollector

County of Monterey

PROPERTY INFORMATION

ASSESSMENT #	**203-011-011-000**	TAX RATE AREA	099-147
FEE NUMBER	203-011-011-000	ACRES:	76.00
LOCATION	FSZ 01-010		
ASSESSED OWNER	MONTEREY COUNTY AGRICULTURAL &		

**********MIXED AADC 840 AA 76029-1/1-P282 T228

MONTEREY COUNTY AGRICULTURAL &
HISTORIC LAND CONSERVANCY INC
10855 CARA MIA PKWY STE C
CASTROVILLE CA 95012

IMPORTANT MESSAGES

Original bill date 09/18/2020
This property is part of an agricultural preserve

Armstrong

Fiscal Year beginning July 1, 2020 and ending June 30, 2021

2020-2021

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COUNTY VALUES, EXEMPTIONS AND TAXES

PHONE NUMBERS		VALUE DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	COUNTY TAXES
VALUATIONS	(831) 755-5035	LAND	1,082,485				
TAX RATES	(831) 755-5040						
EXEMPTIONS	(831) 755-5035						
PAYMENTS	(831) 755-5057						
PERS PROP	(831) 755-5035						
ADDR CHGS	(831) 755-5035						
GENERAL INQ	(831) 755-5057						

NET TAXABLE VALUE	**1,082,485**	**X**	**1.000000**	**=**	**$10,824.86**

VOTER APPROVED TAXES, TAXING AGENCY DIRECT CHARGES AND SPECIAL ASSESSMENTS

PHONE NUMBERS	TAX CODE	DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	AGENCY TAXES
(831) 755-6700	12000	Hartnell 2014 Ref AB 2015Ref AB 2016 AB	1,082,485		0.042886		464.24
(831) 633-3343	12200	No Mty Cty USD 2012Ref 2013 2014 A & 2016Ref	1,082,485		0.058950		638.12
(831) 755-4860	80600	MCWRA Zone 2Y	DIRECT CHARGE				257.86
(831) 755-4860	80700	MCWRA Zone 2Z	DIRECT CHARGE				786.70
(831) 755-4860	81800	MCWRA Zone 2B	DIRECT CHARGE				11,688.72
(831) 755-4860	81900	MCWRA Zone 2C Ops	DIRECT CHARGE				1,633.86
(831) 755-4860	81901	MCWRA Zone 2C Splwy	DIRECT CHARGE				207.64
(831) 755-4860	81902	MCWRA Zone 2C Dvrsn	DIRECT CHARGE				448.76
(831) 755-4860	81903	MCWRA Zone 2C Admin	DIRECT CHARGE				113.20
(831) 633-2578	82050	NorthCountyFire-EMS	DIRECT CHARGE				2.50
(800) 273-5167	83050	NoSalinasValleyMosquitoAbatementDist	DIRECT CHARGE				5.36
(831) 471-7526	88410	SVBGSA Groundwater Sustainability Fee	DIRECT CHARGE				318.78
(831) 755-4964	93500	CSA74 EMSAmbCountyWide	DIRECT CHARGE				6.00

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TOTAL AGENCY TAXES AND DIRECT CHARGES **$16,571.74**

1ST INSTALLMENT	2ND INSTALLMENT	TOTAL TAXES
$13,698.30	$13,698.30	$27,396.60
DUE BY 11/01/2020	DUE BY 02/01/2021	
DELINQUENT AFTER 12/10/2020	DELINQUENT AFTER 4/10/2021	

MARY A. ZEEB
TREASURER-TAX COLLECTOR
PO Box 891, Salinas, CA 93902-0891 (831)755-5057 Salinas (831)647-7857 Monterey (831)385-8357 King City
www.co.monterey.ca.us/taxcollector

County of Monterey

PROPERTY INFORMATION

ASSESSMENT #	**203-011-013-000**	TAX RATE AREA	099-008
FEE NUMBER	203-011-013-000	ACRES:	16.00
LOCATION	LAPIS RD		
ASSESSED OWNER	MONTEREY COUNTY AGRICULTURAL &		

**********MIXED AADC 840 AA 76030-1/1-P282 T228

MONTEREY COUNTY AGRICULTURAL &
HISTORIC LAND CONSERVANCY INC
10855 CARA MIA PKWY STE C
CASTROVILLE CA 95012

IMPORTANT MESSAGES

Original bill date 09/18/2020
This property is part of an agricultural preserve

Armstrong

Fiscal Year beginning July 1, 2020 and ending June 30, 2021

2020-2021

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COUNTY VALUES, EXEMPTIONS AND TAXES

PHONE NUMBERS		VALUE DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	COUNTY TAXES
VALUATIONS	(831) 755-5035	LAND	232,195				
TAX RATES	(831) 755-5040						
EXEMPTIONS	(831) 755-5035						
PAYMENTS	(831) 755-5057						
PERS PROP	(831) 755-5035						
ADDR CHGS	(831) 755-5035						
GENERAL INQ	(831) 755-5057						

NET TAXABLE VALUE	**232,195**	**X**	**1.000000**	**=**	**$2,321.94**

VOTER APPROVED TAXES, TAXING AGENCY DIRECT CHARGES AND SPECIAL ASSESSMENTS

PHONE NUMBERS	TAX CODE	DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	AGENCY TAXES
(831) 755-6700	12000	Hartnell 2014 Ref AB 2015Ref AB 2016 AB	232,195		0.042886		99.58
(831) 633-3343	12200	No Mty Cty USD 2012Ref 2013 2014 A & 2016Ref	232,195		0.058950		136.88
(831) 755-4860	80600	MCWRA Zone 2Y	DIRECT CHARGE				47.96
(831) 755-4860	80700	MCWRA Zone 2Z	DIRECT CHARGE				146.38
(831) 755-4860	81800	MCWRA Zone 2B	DIRECT CHARGE				4,077.18
(831) 755-4860	81900	MCWRA Zone 2C Ops	DIRECT CHARGE				303.72
(831) 755-4860	81901	MCWRA Zone 2C Splwy	DIRECT CHARGE				38.56
(831) 755-4860	81902	MCWRA Zone 2C Dvrsn	DIRECT CHARGE				83.40
(831) 755-4860	81903	MCWRA Zone 2C Admin	DIRECT CHARGE				21.00
(831) 633-2578	82050	NorthCountyFire-EMS	DIRECT CHARGE				2.50
(800) 273-5167	83050	NoSalinasValleyMosquitoAbatementDist	DIRECT CHARGE				1.12
(831) 471-7526	88410	SVBGSA Groundwater Sustainability Fee	DIRECT CHARGE				95.82
(831) 755-4964	93500	CSA74 EMSAmbCountyWide	DIRECT CHARGE				6.00

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TOTAL AGENCY TAXES AND DIRECT CHARGES **$5,060.10**

1ST INSTALLMENT $3,691.02	2ND INSTALLMENT $3,691.02	TOTAL TAXES $7,382.04
DUE BY 11/01/2020	DUE BY 02/01/2021	
DELINQUENT AFTER 12/10/2020	DELINQUENT AFTER 4/10/2021	

MARY A. ZEEB
TREASURER-TAX COLLECTOR
PO Box 891, Salinas, CA 93902-0891 (831)755-5037 Salinas (831)647-7857 Monterey (831)385-8357 King City
www.co.monterey.ca.us/taxcollector

County of Monterey

PROPERTY INFORMATION

ASSESSMENT #	**203-011-014-000**	TAX RATE AREA	099-008
FEE NUMBER	203-011-014-000	ACRES:	83.00
LOCATION	FSZ 01-010		
ASSESSED OWNER	MONTEREY COUNTY AGRICULTURAL &		

**********MIXED AADC 840 AA 76031-1/1-P282 T228

MONTEREY COUNTY AGRICULTURAL &
HISTORIC LAND CONSERVANCY INC
10855 CARA MIA PKWY STE C
CASTROVILLE CA 95012

IMPORTANT MESSAGES

Original bill date 09/18/2020
This property is part of an agricultural preserve

Armstrong

Fiscal Year beginning July 1, 2020 and ending June 30, 2021

2020-2021

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COUNTY VALUES, EXEMPTIONS AND TAXES

PHONE NUMBERS		VALUE DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	COUNTY TAXES
VALUATIONS	(831) 755-5035	LAND	1,687,573				
TAX RATES	(831) 755-5040						
EXEMPTIONS	(831) 755-5035						
PAYMENTS	(831) 755-5057						
PERS PROP	(831) 755-5035						
ADDR CHGS	(831) 755-5035						
GENERAL INQ	(831) 755-5057						

NET TAXABLE VALUE	**1,687,573**	**X**	**1.000000**	**=**	**$16,875.72**

VOTER APPROVED TAXES, TAXING AGENCY DIRECT CHARGES AND SPECIAL ASSESSMENTS

PHONE NUMBERS	TAX CODE	DESCRIPTION	ASSESSED VALUES	X	TAX RATE/100	=	AGENCY TAXES
(831) 755-6700	12000	Hartnell 2014 Ref AB 2015Ref AB 2016 AB	1,687,573		0.042886		723.74
(831) 633-3343	12200	No Mty Cty USD 2012Ref 2013 2014 A & 2016Ref	1,687,573		0.058950		994.82
(831) 755-4860	80600	MCWRA Zone 2Y	DIRECT CHARGE				294.64
(831) 755-4860	80700	MCWRA Zone 2Z	DIRECT CHARGE				898.88
(831) 755-4860	81800	MCWRA Zone 2B	DIRECT CHARGE				22,822.34
(831) 755-4860	81900	MCWRA Zone 2C Ops	DIRECT CHARGE				1,867.50
(831) 755-4860	81901	MCWRA Zone 2C Splwy	DIRECT CHARGE				237.38
(831) 755-4860	81902	MCWRA Zone 2C Dvrsn	DIRECT CHARGE				512.94
(831) 755-4860	81903	MCWRA Zone 2C Admin	DIRECT CHARGE				129.48
(831) 633-2578	82050	NorthCountyFire-EMS	DIRECT CHARGE				2.50
(800) 273-5167	83050	NoSalinasValleyMosquitoAbatementDist	DIRECT CHARGE				5.86
(831) 471-7526	88410	SVBGSA Groundwater Sustainability Fee	DIRECT CHARGE				402.62
(831) 755-4964	93500	CSA74 EMSAmbCountyWide	DIRECT CHARGE				6.00

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TOTAL AGENCY TAXES AND DIRECT CHARGES **$28,898.70**

1ST INSTALLMENT	2ND INSTALLMENT	TOTAL TAXES
$22,887.21	$22,887.21	$45,774.42
DUE BY 11/01/2020	DUE BY 02/01/2021	
DELINQUENT AFTER 12/10/2020	DELINQUENT AFTER 4/10/2021	

Farm Bureau Monterey

1140 Abbott St., Ste. C, Salinas CA 93901
P.O. Box 1449, Salinas CA 93902-1449
831-751-3100 www.montereycfb.com

October 12, 2022

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

VIA: E-mail to tom.luster@coastal.ca.gov

RE: Comments Supporting Coastal Development Permit Issuance
Monterey Peninsula Water Supply Project, CSP Application No. 9-20-0603
California American Water, Monterey County

Monterey County Farm Bureau participated as an intervener in the California Public Utilities Commission Proceeding A.12-04-019 (Monterey Peninsula Water Supply Project) and submits these comments to the California Coastal Commission staff in support of the Coastal Development Permit for California American Water's Monterey Peninsula Water Supply Project.

Background and History

Monterey County Farm Bureau (MCFB) represents family farmers and ranchers in the interest of protecting and promoting agriculture throughout our County. MCFB strives to improve the ability of those engaged in production agriculture to provide a reliable supply of food and fiber through responsible stewardship of our local resources. Since 1917, MCFB has represented its members on issues related to water rights and supply, resources, and land use; MCFB is a non-profit agricultural trade organization supported through membership dues.

Representing 400 family farms in the Monterey County area, MCFB has constituent members that own or manage over 250,000 acres of farm and ranch lands in our County. In particular, this represents a substantial portion of the irrigated farmland of the Salinas River watershed area of the Salinas Valley, known as the *Salad Bowl of the World*. Producing over 150 different food products and crops annually, the economic value of these agricultural products exceeded $4.1 billion[1] in 2021, outdistancing all other economic sectors of Monterey County.

MCFB entered into the California Public Utilities Commission (CPUC) proceeding for the Monterey Peninsula Water Supply Project as an intervener in Spring 2012, shortly after California American Water filed their petition for a Certificate of Public Convenience and Necessity (CPCN). MCFB's main concern was the intended placement of project source water wells directly over the 180-foot aquifer of the Salinas Valley Groundwater Basin where it extends out under the Monterey Bay; the issue of water rights, exportation of fresh water from the Salinas Valley

[1] Monterey County Crop Report, produced by County of Monterey Agricultural Commissioner's Office, July 2022.

Aquifer, and seawater intrusion impacts were of paramount concern to our organization and, particularly, to our members who are overlying water rights holders and beneficial users in the coastal zone area.

To protect our interests, as part of an initial settlement agreement[2], MCFB, along with Salinas Valley Water Coalition (SVWC), supported the creation of the Hydrologic Working Group (HWG), to work independently on potential impacts the source water wells could have on the Salinas Valley aquifer. An invitation to participate was extended to all interveners of record at the time of the formation of the HWG; only SVWC along with California American Water (Cal-Am) participated materially and financially, with support from MCFB[3]. The results of the HWG review process and work were presented in a report document to the CPUC in 2017.

To address the issue of any freshwater extractions that may come from the proposed slant well source water facilities, MCFB and SVWC initiated discussions with Cal-Am and other interveners to develop a return water flow settlement that would satisfy the water rights issue and the Monterey County Water Resource Agency Act (Agency Act) provisions (i.e., no exportation of groundwater from the Salinas Valley Groundwater Basin outside of the basin boundaries). This led to a mutually beneficial settlement agreement[4] (Return Water Flow Settlement) where all parties were satisfied with the outcome, including a number of attorneys involved who crafted the language of the agreement (to ensure the legal viability).

Hydrologic Working Group Findings

At the outset of the HWG meetings, there was skepticism that the source water well array could be configured in such a way as to avoid severe impacts to the Salinas Valley Groundwater Basin. Concerns focused on exasperating seawater intrusion in the north Marina coast area by establishing a large cone of depression, triggering in-land underground water flows from further distances within the basin, thereby violating both overlying landowner water rights and the Agency Act.

The intent was to find the best science, through an independent review by experts in their field of hydrology with specific experience and knowledge of the Salinas Valley Groundwater Basin, to determine the potential impacts of the source water intakes. Collaborating with Cal-Am's experts allowed for frank and honest discussion of the issues and review of available data, and the result was a report to the CPUC that indicated that only brackish water of the Salinas Valley groundwater basin will be removed from the shallow aquifer through the source water extraction process, improving seawater intrusion in the area of the source wells. The FEIR/FEIS supports these findings of the HWG.

This, and other findings of the HWG, helped move MCFB to a conclusion that the desalination portion of the Monterey Peninsula Water Supply Project can be operated with no impact or less than significant impact to the Salinas Valley basin's groundwater[5].

[2] 'Large Settlement Agreement' submitted to the CPUC (A.12-04.019) by the majority of interveners in July 2013. Interveners participating: California-American Water Company, Citizens for Public Water, City of Pacific Grove, Coalition of Peninsula Businesses, County of Monterey, Division of Ratepayer Advocates, LandWatch Monterey County, Monterey County Farm Bureau, Monterey County Water Resources Agency, Monterey Peninsula Regional Water Authority, Monterey Peninsula Water Management District, Monterey Regional Water Pollution Control Agency (now known as Monterey One Water), Planning and Conservation League Foundation, Salinas Valley Water Coalition, Sierra Club, and Surfrider Foundation.

[3] MCFB did not claim intervener compensation during the CPUC (A.12-04-019) proceeding.

[4] 'Settlement Agreement on MPWSP Desalination Plant Return Water' submitted to the CPUC (A.12-04-019) in June 2016 by California-American Water Company and interveners Coalition of Peninsula Businesses, LandWatch Monterey County, Monterey County Farm Bureau, Monterey County Water Resources Agency, Monterey Peninsula Regional Water Authority, Planning and Conservation League Foundation, and Salinas Valley Water Coalition.

[5] "MPWSP source water would include some brackish groundwater from the SVGB." Monterey Peninsula Water Supply Project FEIR/FEIS, Chapter 2.5.1 Salinas Valley Groundwater Basin Return Water, page 2-23.

With the recent voluntary reduction of the project size by Cal Am, and a phased approach to desalination production capacity, findings of the HWG and FEIR/FEIS are not altered or changed; the presumption remains that brackish water and seawater will be the primary sources for desalination, only now less source water will be utilized as the project is reducing the initial output of produced water. This reduction does not change the overall findings of no impact or less than significant impact to the adjacent groundwater basin area.

Water Rights

As one of the major concerns during the initial stages of the CPUC proceeding, MCFB sought to protect the water rights of overlying land owners adjacent to the proposed source water intake facility. Because of the potential to create a cone of depression in that area, impacts to water rights holders of the Salinas Valley Groundwater Basin could create undesirable consequences due to the subsurface extractions.

Working with Cal-Am in the early stages of the CPUC proceeding, the proposed project was modified to include multiple monitoring wells to determine groundwater levels in the immediate area of the slant well array, with information supplied to the Monterey County Water Resources Agency for verification. In addition, mitigation measures to ensure that any impacts occurring in future years of operation of the source water intake facility are in place to protect water right holders; this applies to any overlying landowner or municipal water purveyor with water rights that shows the source water intake extractions are causing or inflicting harm.

These monitoring and mitigation measures satisfied the question surrounding groundwater impacts to water rights holders in the coastal zone area of the Salinas Valley Groundwater Basin; the Return Water Flow Settlement addresses the remaining water rights issue related to the exportation of freshwater from the basin.

Return Water Flow Settlement

MCFB entered into negotiations with several interveners (and their attorneys) to create language for the return water flow of fresh-quality water extracted during the source water extraction process for desalination. Cal-Am has characterized this fresh water component of their source water supply as approximately 7% or less of the seawater extracted on any given day.[6]

MCFB's primary concern is with fresh water extraction related to the Monterey County Water Resources Agency Act which protects the groundwater basin *legislatively* from any water exports. The Agency Act's requirement that all fresh water extracted from the basin must be used in the basin dictates that extracted fresh water for desalination must be returned for use in the basin; the settlement constrains this return flow to *in-lieu* of other groundwater pumping within the basin. This indicates that the return water flow must supplement other supplies within the basin that are sourced from the groundwater itself.

MCFB asserts that the best choices for this return water flow are the Castroville Community Services District (CCSD) that is challenged with degrading groundwater quality, and the Castroville Seawater Intrusion Project (CSIP) that provides irrigation water to 12,000 acres of farmland in the coastal zone where seawater intrusion has made groundwater unsuitable for crop production. Both of these beneficial uses of return flow water would reduce reliance on marginal quality coastal groundwater and curtail these extractions for critical consumptive and irrigation uses (the *in-lieu* requirement of the settlement).

Under the Return Water Flow Settlement, water would be delivered to CCSD and CSIP prior to any desalinated water is delivered to the Monterey Peninsula. This translates into Cal-Am's source water intake extractions having a net-zero impact on Salinas Valley Basin Groundwater extractions, makes the basin whole, and the project legally feasible by avoiding any potential conflicts with the Agency Act. By delivering return water flows to these basin water users prior to the Monterey Peninsula, there is a starting point of avoiding net basin exportation.

[6] Results of the test well operations - https://www.watersupplyproject.org/test-well

The Return Water Flow Settlement contemplates a win-win-win solution for this difficult legal constraint for Cal-Am, benefiting CCSD and CSIP. The CPUC decision to award the CPCN to Cal-Am included the Return Water Flow provisions, which fully satisfies the Agency Act requirements.

Portfolio Project Approach of Monterey Peninsula Water Supply Project

When initially entering into the CPUC proceeding as an intervener, MCFB understood the project description to include a portfolio of projects, to ensure not only adequate supply but redundant operational protections for service disruptions. This portfolio includes desalination, aquifer storage and recovery (ASR), and reclaimed water from the Monterey One Water purification project (known as Pure Water Monterey). MCFB is on record as supporting this portfolio approach at a number of occasions throughout the CPUC proceeding[7].

Several interveners, who previously supported CPUC settlement agreements, and community organizations are now calling for reliance on a single water source for the majority of the Monterey Peninsula's water supply through expansion of the Pure Water Monterey (PWM) project. Regardless of claims to amounts of water this project expansion could ultimately supply, the key point for MCFB is that the Monterey Peninsula would be solely dependent on a single water project to provide potable water for the majority of its demand. This is a short-sighted approach to solving a long-term water supply for a region that has been challenged to find adequate water supplies for decades.

We also raise concerns with the reliability of source waters, long-term, for the PWM expansion project; our comment letter to CPUC in the proceeding[8] pending the issuance of an amended and restated water purchase agreement notes there are significant differences in testimonies of available water supplies for reclamation, either surface, stormwater, industrial, or effluent. Any significant interruption in any of the source water supplies could limit reclaimed water production to an insufficient level of supply for Monterey Peninsula customers.

By relying on a portfolio approach, a redundancy of water projects would ensure that any one project that fails to meet its supply demands could be supplied by another project of the portfolio; if any of these projects needs to contemplate a longer service interruption (such as planned maintenance or equipment upgrades), other projects of the portfolio could plan ahead to meet demand, or meet demand in emergency situations.

MCFB supports the portfolio approach as the best way to ensure that the Monterey Peninsula maintains an adequate and reliable water supply for decades to come; desalination is an important and necessary component of the portfolio approach.

CPCN Issuance

In their decision to approve the project and issue the CPCN, the CPUC Commissioners affirmed that the groundwater basin surrounding the source water intake wells would be adequately protected from harm; monitoring wells will ensure that early signs of any impacts will be detected. The FEIR/FEIS was exhaustive on the environmental studies, particularly on the groundwater basin influences, and represents a substantial amount of work involving historical data and modeling. The Return Water Flow Settlement ensures that any freshwater removed as a result of source water extractions will be returned to the Salinas Valley Groundwater Basin *in-lieu*.

MCFB supported the issuance of the CPCN; our concerns have been satisfied to a positive outcome. Our support for this project has not changed in the intervening years while waiting for the coastal development permit to be considered.

[7] CPUC Proceeding A.12-04-019, referencing testimony and comments enshrined in the administrative record.

[8] CPUC Proceeding A.21-11-024

Social Justice Issues

Much discussion has taken place recently in the Monterey Peninsula community over the subject of social justice interactions should this coastal development permit be approved and issued. MCFB reminds the Coastal Commission staff that many of the communities that are served by Cal Am are classified as disadvantaged (DAC), and the Castroville area, a beneficiary of the Return Water Flow Settlement, is classified as severely disadvantaged. Providing a reliable, safe drinking water resource for these DAC water users satisfies the social justice equities that are overlooked by those who oppose this project.

The State of California demands and requires the human right to drinking water, especially including areas of service that include DAC residents and businesses. Meeting this demand by providing redundant water supply projects with reliability is providing equity to all concerned; the Monterey Peninsula Water Supply Project, with desalination, provides an additional right to drinking water.

Conclusion

Salinas Valley landowners and water users have spent multiple decades and hundreds of millions of dollars developing their own water resources, building two reservoirs (Nacimiento and San Antonio), the Salinas Valley Water Project, and the Castroville Seawater Intrusion Project. These projects have been constructed and financed by bringing together the greater community to manage water resources in a sustainable manner, allowing for a robust agricultural sector to flourish and expand. The Salinas Valley community has taken charge of their water resource destiny and successfully developed a reliable water supply system that provides for groundwater recharge while supplying significant irrigation resources. The Sustainable Groundwater Management Act will continue to influence water resource development for the Salinas Valley in the coming two decades.

The Monterey Peninsula has continued to ignore potential projects as solutions to their water supply resources in these same intervening decades. Continued acrimony over various aspects of the Monterey Peninsula Water Supply Project only continue to serve as delays to finding a solution. Now is the time that the Monterey Peninsula's water supply be made reliable by meeting current and future demand, and that Monterey County has significant and stable water resources for all regions of our County.

MCFB supports the issuance of the Coastal Development Permit for the Monterey Peninsula Water Supply Project, specifically for the source water intake wells in the coastal dunes of Monterey County.

It's time to move this desalination project across the finish line and ensure that the Monterey Peninsula has a long-term, reliable and redundant water supply for decades into the future. Reliance on a single water resource should be eliminated as a choice in such an important region encompassing environmental, residential, commercial, and tourism sectors when a portfolio of projects can ensure that the community will not have to suffer through another period of water shortages and a cease-and-desist order. This will then place the Monterey Peninsula on the same level of sustainable water supply that the Salinas Valley basin has ensured for itself.

MCFB thanks the CCC staff for their thoughtful consideration of the Coastal Development Permit; issuance will secure a long-term water supply solution for the Monterey Peninsula area.

Sincerely,

Norman C. Groot
Executive Director

Farm Bureau Monterey

1140 Abbott St., Ste. C, Salinas CA 93901
P.O. Box 1449, Salinas CA 93902-1449
831-751-3100 www.montereycfb.com

October 11, 2022

Honorable Chair John Reynolds & Commissioners
California Public Utilities Commission
505 Van Ness Ave.
San Francisco, CA 94102

VIA: E-mail to alice.reynolds@cpuc.ca.gov; clifford.rechtschaffen@cpuc.ca.gov; genevieve.shiroma@cpuc.ca.gov; Darcie.houck@cpuc.ca.gov; john.reynolds@cpuc.ca.gov

RE: **California-American Water Company**
Application Proceeding 21-11-024
Amended and Restated Water Purchase Agreement

Dear Chair Reynolds & Commissioners:

Monterey County Farm Bureau represents family farmers and ranchers in the interest of protecting and promoting agriculture throughout our County. Since 1917, Farm Bureau strives to improve the ability of those engaged in production agriculture to provide a reliable supply of food and fiber through responsible stewardship of our local resources.

On behalf of the Board of Directors of Monterey County Farm Bureau, we offer these comments on the application for the amended and restated water purchase agreement between California American Water (CalAm), Monterey One Water (M1W), and Monterey Peninsula Water Management District related to the expansion of the Pure Water Monterey project (PWMx).

We express serious concern that the source waters for PWMx are heavily dependent on effluent and surface water flows that originate in the Salinas Valley basin area, and that these source waters are not fully understood or quantified in terms of availability, rights, and reliability.

Since 2015, all groundwater basins in California are now managed under the Sustainable Groundwater Management Act (SGMA), a set of complex regulations that ultimately requires all groundwater basins (and sub-basins) to be in balance by 2040 … meaning that all extractions must be counterbalanced with equal amounts of recharge. Our Salinas Valley basin is one of the critical groundwater basins that must find this balance.

Monterey County formed a new agency (as a Joint Powers Authority with seven other agencies and municipalities), the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA), to develop groundwater sustainability plans required under SGMA. These plans include a number of significantly impactful management practices for farming operations for future utilization of irrigation water towards achieving that critical balance equation, as

well as a series of projects identified that will contribute to balancing the basin for all beneficial uses in the next 20 years.

As each drop of water is now becoming more critical for the prime agricultural region that is the Salinas Valley (also known as the Salad Bowl of the World due to the predominance of healthy greens, vegetables, and berries produced nearly year-round), management practices and potential projects will require full understanding of where all sources of water may be best reclaimed after initial use.

Farming requires adequate water to produce crops to a market-level yields. Farmers and ranchers in the Salinas Valley have constructed and paid for a series of water resource projects over the past eight decades, including Nacimiento and San Antonio reservoirs, the Castroville Seawater Intrusion Project (CSIP), and the Salinas Valley Water Project (SVWP) that includes the Salinas River Diversion Facility (SRDF). Conceived in response to seawater intrusion that was detected in the groundwater of the Salinas Valley basin, these projects were designed and constructed to manage the surface and groundwater resources. Until recent droughts impacted water supplies, CSIP was showing that the project was slowing (and some areas halting) the advancement of seawater into the groundwater basin. This was due to the design of the project primarily to remove the dependence on groundwater for irrigation in the coastal zone areas and replace irrigation water with reclaimed surface water supplies. Indeed, CSIP was the first such project approved for fresh food production in California.

Production of reclaimed water for the CSIP system has been critical to making the premise of the project work, as fresh water from the Salinas River (blended with the reclaimed water) is not available during the drought years (4 of the last 9 years now). In order to maintain minimal groundwater pumping in the coastal zone and expand the CSIP project to more acreage, additional water supply resources will be needed to increase the reclaimed water supply annually.

Additionally, conservation efforts by local farming operations have reduced irrigation water extractions from the Salinas Valley groundwater basin by nearly 20% over the past 25 years, primarily due to investment in irrigation technologies such as micro irrigation. This shows that farm operations are cognitive of the value of their water supplies and continue to improve irrigation efficiency as technology evolves.

SGMA places significant challenges on Salinas Valley farm operations (and their landowners) as they will be the majority basis of funding for projects needed to help balance the basin. Whether the project is a brackish water extraction barrier, reclaimed water direct injection, expansion of CSIP, or additional reclamation of surface water flows, the Salinas Valley will be looking to keep every drop of effluent within the basin for future water project needs and supply.

Agriculture drives the Monterey County economy; farm operations employ over 50,000 each year to harvest crops and process fresh foods into value-added consumer products. Strawberries are primarily grown in the coastal zone where the climate and soils make for productive fields, but only with water that keeps the crops growing. CSIP delivers water to some of the most productive fields in California; ensuring an adequate supply of reclaimed water for current operations, as well as possible expansion, will continue food production but also assist with environmental challenges related to seawater intrusion.

PWMx intends to utilize many different source waters that are currently not fully understood or remain in contention, as evidenced by prior testimony and comment letters. Salinas Valley residents, farmers, and the Salinas Valley environment should not be expected to supply reclaimed water that is ultimately delivered to the Monterey Peninsula where there have been numerous failed attempts to find water supply solutions for the past three decades. Salinas Valley landowners and residents have developed their water resources and are challenged by SGMA to continue that process, at great cost; the Monterey Peninsula has failed to do the same and continues in their efforts to take other source waters to satisfy their shortfalls and failure to accept desalination as a resource for potable water.

For example, currently in negotiation with M1W, Monterey County Water Resources Agency, and the City of Salinas is the contractual use of agricultural wash water (industrial waste water) for reclamation as part of the PWMx project. As our comment letter for the environmental impact report for the project noted, this water should be considered an interruptible source as it is dependent solely on private business operations in the City of Salinas agricultural zone. It will be up to those private business operations to determine their business plan and if the use of water will continue in processing of value-added products. Should these facilities relocate, choose to recycle their own waste water safely, or find another method of 'washing' their product, these water supplies will not be available for reclamation, and thus, not for PWMx should those agreements be consummated between the parties.

Surface water flows collected from various ditches and canals may also be at risk, as farm operations may be ultimately required to hold their surface discharges on-site due to future iterations of water quality regulations. This would mean that there are little to no surface water flows available for reclamation.

While PWMx may be a desirable solution for the Monterey Peninsula's water needs, placing a reliance on a single source for potable water may be unwise. A more regional approach to potable water supplies is needed for multiple communities in Monterey County and the broader solution is to include desalination as one of the sources for this water supply. A portfolio of projects is a better choice for all water users in Monterey County; indeed, Monterey County Farm Bureau supported this 'three-legged stool' approach to solve the water supply issues of the Monterey Peninsula during the extended California Public Utilities Commission proceeding that approved the Monterey Peninsula Water Supply Project.[1]

Due to SGMA and continued drought, water has now become a precious and valuable resource, both from original source to reclamation post-use. The Salinas Valley basin should not be expected to commit these resources to supply potable water to a community that has failed to solve their own supply problem.

We appreciate the opportunity to provide comment and perspective on source waters for PWMx from the Salinas Valley perspective and urge resolution to all source water contentions. Monterey County Farm Bureau respectfully requests that the CPUC delay granting approval of the amended and restated water purchase agreement until such time that the amount of available source water for PWMx is fully quantified.

Sincerely,

Norman C. Groot
Executive Director

cc: CPUC Service List (e-mail only)

[1] Monterey County Farm Bureau served as an intervener in California Public Utility Commission proceeding 12-04-019 (filed April 23, 2012).

LANDWATCH
MONTEREY COUNTY

October 18, 2022

John Ainsworth
California Coastal Commission
455 Market Street
San Francisco, CA 94105
John.ainsworth@coastal.ca.gov

Re: Public hearing on the California American Water Company's ("CalAm") CDP Application #9-20-0603

Dear Mr. Ainsworth:

I write on behalf of LandWatch Monterey County, a regional group working to combat climate change through sensible land use, transportation and water policy. The Coastal Commission should delay any action on a Coastal Development Permit (CDP) for the CalAm desalination facility because it lacks critical information about the project and its alternative, the Pure Water Monterey Expansion. If the Commission decides it cannot delay action, it must deny the CDP because it does not have the information the Coastal Act requires to make findings related to Section 30260 and 30013 of the Act.

The missing information includes the results of

(1) The California Public Utilities Commission's (CPUC's) pending adjudication of the water supply and demand assumptions; and

(2) The pending adjudication of water rights before the Monterey Superior Court and the State Water Resources Control Board (SWRCB).

Both of these adjudications have a strong potential to alter the project the CPUC previously authorized. A week ago, a CPUC Administrative Law Judge issued a Proposed Decision that would direct CalAm to purchase 2,250 AFY from the Pure Water Monterey Expansion. Under the CPUC's 2018 decision, this increase in water supply requires the CPUC to reassess operating restrictions for any desalination facility to protect ratepayers. Changes in supply and demand should also require the CPUC to reassess the need, timing, and size of a desalination facility. CalAm admits that the project must be changed by

proposing a new "phased" approach, which the CPUC specifically rejected in 2018 as more costly and more environmentally damaging.

The Coastal Commission does not have a procedure to adjudicate the competing claims about supply and demand, which are now being litigated before the CPUC with a decision not expected before March 2023. Nor does the Commission have a procedure to determine how changes in supply and demand affect the need, timing, size, or operating restrictions for a desalination facility or how changes in these assumptions, and changes in the desalination facility costs since 2017, will affect water rates. Yet the Coastal Commission must draw conclusions about all of these matters in order to make *required* Section 30260 findings about the availability of a feasible alternative and the relative effects of the desalination project and its alternative on public welfare and environmental justice.

To move forward now, without information about potential water charges and environmental impacts, would mean giving CalAm a blank check for an undefined future desalination project that could harm the public welfare, impede environmental justice, and thwart the intent of the Coastal Act.

And there is no reason to proceed without the CPUC's adjudication of supply and demand and its likely reassessment of the desalination facility. The approval of the Pure Water Monterey Expansion will result in new water availability well before a desalination facility could provide new water, and it will allow the SWRCB to lift its Cease and Desist Order (CDO).

Even though the CPUC has authorized and directed CalAm to proceed with a specific project, that project is now likely to be substantially changed given new circumstances. As the agency with authority to direct CalAm to implement a project, the CPUC, not the Coastal Commission, must determine the need, timing, and rate consequences of a potential desalination project in light of changed circumstances.

The Coastal Commission has not assumed the obligation under CEQA to examine a revised desalination project, yet the change CalAm now proposes in the project approved by the CPUC will require a supplemental environmental impact report (EIR).

Accordingly, the Coastal Commission should defer action on a CDP until the CPUC, the Monterey County Superior Court, and the SWRCB resolve these outstanding issues.

A. To issue a CDP, the Coastal Commission must have an adequately analyzed project and alternative before it.

1. Because the Coastal Commission must make findings regarding alternatives and public welfare, it cannot reasonably act until presented with a stable and adequately analyzed project and alternative.

Coastal Act Section 30260 requires specific findings in order to issue a CDP for a coastal-dependent industrial facility that is inconsistent with Coastal Act Chapter 3 policies.

It is undisputed that the project is inconsistent with policies for protection of biological resources, for example, because it will destroy over 7 acres of an Environmentally Sensitive Habitat Area (ESHA), i.e., the rare coastal dune habitat.

Thus, the Coastal Commission must make Section 30260 findings that (1) there is no feasible alternative with lesser environmental impacts; (2) denial of the permit would adversely affect public welfare; and (3) environmental impacts are mitigated to the maximum extent feasible.

To find there is no feasible alternative, the Coastal Commission must have accurate information about supply and demand to assess the actual need for the project and the feasibility of the alternative.

To assess public welfare effects of the project, the Coastal Commission must have accurate and stable information about the desalination project size, its timing in relation to water supply and demand, its utilization and costs, and the resulting water rates for the project and its alternative.

2. The Coastal Commission policy to consider environmental justice also requires a stable and adequately analyzed project.

The Coastal Act requires the Commission to take environmental justice impacts into account. Coastal Act Section 30013 requires the Coastal Commission to "advance the principles of environmental justice and equality." Applicable environmental justice considerations include ensuring "availability of a healthy environment for all people" and ensuring that "the effects of the pollution are not disproportionately borne" by communities already experiencing such impacts.[1] The Coastal Commission's stated policy

[1] Coastal Act, § 30107.3(b)(1), (2); see also Coastal Act, § 30604(h).

is "to integrate the principles of environmental justice, equality, and social equity into all aspects of the Commission's program and operations."[2]

There are substantial environmental justice and public welfare issues with the project.

For example, the desalination facility would site another industrial facility in the already overburdened and disadvantaged City of Marina with no benefits to that city.

Or, for example, the desalination facility would result in higher water rates for disadvantaged and low income populations in the Peninsula and Seaside. Although the desalination project would provide subsidized water to the Castroville community, there are seven times more disadvantaged and lower income ratepayers in the Peninsula and Seaside than there are in Castroville, and they would pay higher rates to subsidize Castroville.[3]

To assess environmental justice effects of the project and its alternative, the Coastal Commission must have the same information it needs to assess the public welfare effects: accurate and stable information about the project size, its timing in relation to demand, its capacity utilization, its costs, and the resulting water rates for the project and its alternative.

B. The Coastal Commission should delay any action on a CDP for CalAm because it lacks necessary information to make required findings or a decision in the best interest of the public. The Commission should not act until the CPUC completes its current adjudications.

1. The CPUC is poised to approve the Pure Water Monterey Expansion, which four local public agencies identify as a feasible alternative to desalination.

The CPUC's Administrative Law Judge (ALJ) has issued a Proposed Decision in Phase One of Proceeding A-21-11-024, which would direct CalAm to enter a Water Purchase Agreement (WPA) for 2,250 AFY from the Pure Water Monterey (PWM) Expansion.[4] The CPUC may act to approve this decision as early as November 3, 2022. Based on the consensus recommendation of all parties to the CPUC proceeding, including CalAm, and based on the ALJ's Proposed Decision, it is very likely that the CPUC will approve the WPA.

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[2] Coastal Commission Environmental Justice Policy, March 8, 2019, available at https://documents.coastal.ca.gov/assets/env-justice/CCC_EJ_Policy_FINAL.pdf.

[3] Coastal Commission Staff Report, August 25, 2020.

[4] CPUC Proposed Decision, 9/30/22, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M497/K343/497343610.PDF.

According to public agencies, including the City of Marina, Marina Coast Water District (MCWD), the Monterey Peninsula Water Management District (MPWMD), and Monterey One Water (M1W), and according to other parties to the CPUC proceedings, the PWM Expansion is a feasible alternative, which has lesser environmental impacts and substantially reduces environmental justice impacts. These parties have argued and presented substantial evidence that:

- the PWM Expansion is a feasible alternative because it meets foreseeable demand for 30 years and provides a drought-proof supply by banking water in the Seaside aquifer;

- the PWM Expansion would substantially avoid environmental justice impacts because it would not site another industrial facility in Marina, which is already overburdened with such facilities, and because it would provide substantially lower water rates for the vast majority of affected disadvantaged communities; and

- the PWM Expansion would avoid impacts to ESHA biological resources and have lesser environmental impacts.

CalAm, acting as it must to maximize profits on behalf of its shareholders, has disputed the evidence offered by the public agencies, their experts, and other participants in the proceedings. However, facing penalties for non-compliance with the SWRCB's CDO, CalAm has agreed that the CPUC should authorize and direct CalAm to enter into a WPA for 2,250 AFY from the PWM Expansion.

2. **The Coastal Commission cannot anticipate the results of the CPUC's current reassessment of supply and demand.**

In the ongoing Phase 2 of Proceeding A-21-11-024, the CPUC is reassessing the supply and demand assumptions on which it relied when it approved the 6.4 million gallons per day (mgd) desalination facility in 2018. These CPUC proceedings must be concluded to enable the CPUC and the Coastal Commission determine (1) whether the PWM Expansion is a feasible alternative that meets foreseeable demand and (2) whether the desalination facility previously approved by the CPUC is still needed. If the desalination facility is still needed, the CPUC will need to reconsider how large it should be, when it should be constructed, and what operating restrictions are needed to protect ratepayers from an oversupply of water.

The public agency parties and their experts have submitted testimony that the Pure Water Monterey Expansion and existing supplies provide a drought-proof supply sufficient to meet foreseeable demand for decades. CalAm disputes this testimony. Because the CPUC

must still hold evidentiary hearings and accept briefing, it will not be able to resolve these issues until March 2023.

The Coastal Commission cannot authoritatively resolve, and should not attempt to resolve, these complex supply and demand issues. The Commission will not review the extensive testimony submitted by the parties to the CPUC proceeding. The Commission does not have the benefit of the CPUC's evidentiary hearings, including cross examination of witnesses, because those hearings have not yet been held. The Commission does not have the benefit of the parties' briefing to the CPUC on supply and demand, because that briefing will not be submitted until after the evidentiary hearings. The CPUC, not the Coastal Commission, is charged to resolve these matters. The Commission should defer action on the CDP until the CPUC does so.

3. **In order to protect ratepayers, the CPUC's 2018 decision provides for reexamination of the desalination project if CalAm is directed to purchase water from the PWM Expansion. The Coastal Commission should not act on a CDP until the CPUC makes revisions to the size, timing, or operations of the desalination facility in light of new supply and demand information.**

The CPUC's 2018 decision provides that the CPUC would act to protect ratepayers from "excessive costs" if CalAm buys water from the Pure Water Monterey Expansion:

> If . . . Cal-Am seeks approval of a WPA for water from an expanded PWM project to serve customers in Cal-Am's Monterey service territory, *the Commission will consider, and would likely, impose as enforceable conditions additional operational restrictions on the desalination project approved by this decision*. These restrictions, if adopted, *would avoid excessive costs being charged to Cal-Am ratepayers* by ensuring that the total water supply available to Cal-Am customers from the desalination plant plus the PWM expansion WPA would not exceed the water that would be available by virtue of operating the desalination project alone, absent further Commission discretionary action. In any application for a PWM expansion WPA, Cal-Am shall include information concerning such water amounts and potential operational restrictions to meet this operational parameter.[5]

Since the PWM Expansion supply was not assumed in the 2018 CPUC approval of the 6.4 mgd desalination facility, even if CalAm's original demand estimates remained accurate, there would be a substantial oversupply of water if CalAm were to the 6.4 mgd project, *which is the only project CalAm is currently authorized by the CPUC to implement*.

[5] CPUC Decision 18-09-017, p. 44, emphasis added.

The supply and demand assumptions will also change unless the CPUC disagrees with every argument made by the public agencies and their experts that projected supply will meet projected demand for decades.

In light of the change in supply assumptions with the very probable approval of the PWM Expansion WPA, and the probable change in demand assumptions if the CPUC agrees with any of the local public agency intervenors in the current proceeding, the CPUC must address critical ratepayer impact issues. The CPUC must either assure that no desalination facility is constructed before there is demand for its water supply, or must clarify that shareholders, not ratepayers, would be responsible for the costs of over-capacity, including the enormous fixed costs that will be incurred regardless how much water is produced by the facility.

The CPUC's 2018 decision does not clarify at what operating capacity level the CPUC would allow CalAm to recover these costs from ratepayers.[6] For example, would CalAm be permitted to recover all of its costs if the desalination facility operated at only 60% or 40% of capacity? If so, what would be the impact on rates? If not, would the desalination project be viable for CalAm?

Furthermore, as noted above, the 2018 Decision provides that CalAm was supposed to provide information on operating restrictions for the desalination facility in any application to contract for PWM Expansion supply in order to "*avoid excessive costs being charged to Cal-Am ratepayers* by ensuring that the total water supply available to Cal-Am customers from the desalination plant plus the PWM expansion WPA would not exceed the water that would be available by virtue of operating the desalination project alone, absent further Commission discretionary action."[7] CalAm's application for the WPA did not propose such operating restrictions, and the CPUC has neither scoped nor considered the issue.

Participants in the current proceedings asked that the Commission include consideration of the need, size, timing, and operating restrictions for the desalination facility as part of the second phase of the current proceedings.[8] The CPUC limited Phase 2 to reassessment

[6] Order Paragraph 36 provides: "Three cost factors will be considered by the Commission when reviewing the advice letters submitted pursuant to this decision. These cost factors are: 1) costs are for facilities that are used and useful; 2) costs must be reasonable; and 3) costs are for facilities that operate at an appropriate capacity to minimize costs for ratepayers." (CPUC Decision 18-09-017, p. 214.) The Decision does not clarify how these factors, which may pull in different directions, would be balanced or how the Commission would determine what operating capacity would "minimize costs for ratepayers." (CPUC Decision 18-09-017.)

[7] CPUC Decision 18-09-017, p. 44, emphasis added.

[8] See, e.g., CPUC, Prehearing Conference Reporter's Transcript, Vol. 1, January 25, 2022, pp. 27-40, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M444/K124/444124005.PDF.; Motion Of The Monterey Peninsula Water Management District For Party Status, Jan. 3, 2022, p. 4 [proceeding should consider

of supply and demand. However, at the conclusion of the Phase 2, depending on its results, the CPUC may decide on additional proceedings, or a Phase 3 to the current proceedings, to consider these issues.

In sum, neither the CPUC nor the Coastal Commission has assessed the issues related to the need to protect ratepayers by altering the size, timing, or operations of the desalination facility in light of the new supply from the PWM Expansion and revised demand estimates.

The Coastal Commission is neither competent nor authorized to change the size, timing, or operations of a desalination facility, or to assess the rate impacts from such changes, which will affect the public welfare and environmental justice findings the Commission must make. The Coastal Commission should defer consideration of a CDP until the CPUC addresses these issues.

4. Desalination project costs and water rates have not been updated since 2017.

Although the CPUC's 2018 Decision establishes certain cost caps for the desalination facilities, it provides a mechanism for CalAm to seek recovery of additional costs beyond those caps. The cost caps were based on cost estimates provided in 2015 and 2017.

Construction costs have substantially increased in the past five years and are likely to continue to increase further before any construction actually commences.

Neither the CPUC nor the Coastal Commission has assessed the likely changes in project costs and how those changes would affect water rates and thus affect the public welfare and environmental justice findings the Commission must make. Again, the Coastal Commission should not act on the CDP until the CPUC has addressed this issue.

C. The Coastal Commission should defer action on a CDP until the water rights litigation between MCWD, City of Marina, and CalAm is resolved.

"whether Cal-Am's MPWSP is needed, when it is needed, at what size, and at what cost"]; Response Of The City Of Marina To Application 21-11-024, Jan. 3, 2022, pp. 14-16 [proceedings should include, inter alia, rate impacts, operating restrictions, updated costs, construction timeline, and whether desalination facility is still needed and consistent with community values and environmental justice]; Response Of Marina Coast Water District In Support Of Approval Of Amended And Restated Water Purchase Agreement For The Pure Water Monterey Groundwater Replenishment Project, Jan. 3, 2022, pp. 8-9 [proceedings should consider modifications to desalination facility to ensure ratepayers are not overburdened by oversized or unnecessary facilities]; LandWatch Monterey County's Motion For Party Status, Jan. 14, 2022, p. 2, [proceedings should include assessment of continuing need for and appropriate sizing of desalination facility].

Litigation over water rights issues between Marina and CalAm, which MCWD has joined, will not be resolved until late 2023.[9] The Superior Court has sought an opinion from State Water Resources Control Board as to whether CalAm may take groundwater from the critically overdrafted Salinas Valley Groundwater Basin.

The litigation should be completed in 2023. The Coastal Commission should not issue a CDP until the litigation is resolved because it cannot make authoritative findings on groundwater impacts on the exiting record.

D. If the CPUC approves the Pure Water Expansion Water Purchase Agreement, there will be no reason to act immediately on a CDP for CalAm.

The approval of the PWM Expansion will result in new water availability well before a desalination facility could provide new water. Regardless of the conclusion regarding long term demand, the PWM Expansion water supply will certainly be sufficient for near term demand.

Water from the PWM expansion facility will be available within about two years, well before any desalination facility could begin supplying water. Indeed, CalAm admitted as much by seeking authorization to enter into the WPA in order to get out from under the SWRCB's CDO. Accordingly, the Coastal Commission need not act now on a CDP for a desalination facility

E. The Coastal Commission should not consider CalAm's newly proposed 4.8 mgd desalination project or its "phased" approach to a 6.4 mgd facility because (1) the CPUC rejected this approach as more costly and environmentally damaging and (2) the Coastal Commission has not assumed the legal obligation to environmentally review this changed project.

News reports state that CalAm is now proposing a "phased" implementation beginning with a 4.8 mgd facility and following this with an expansion to 6.4 mgd.[10] The news report says that CalAm would use only 4 slant wells instead of the seven that the CPUC approved and directed CalAm to implement.

[9] City of Marina v. RMC Lonestar, et al., Monterey Superior Court Case No. 20CV001387.

[10] Businesswire, California American Water Announces Phasing for Monterey Peninsula Water Supply Project. Oct. 5, 2022; Monterey Herald, Monterey Peninsula: Cal Am announces it will pursue Marina desal plant in phases, Oct. 11, 2022.

1. **The CPUC rejected a phased project because it would be more costly, would not reduce or avoid any environmental impacts, and would in fact cause more environmental impacts.**

The CPUC's 2018 approval of the desalination project was for a 6.4 mgd facility, i.e., Alternative 5a.[11] The Decision *directs CalAm to implement the 6.4 mgd facility*.[12] The CPUC specifically found that the 6.4 mgd facility is the "environmentally superior alternative" and that "no other alternatives are feasible, are capable of meeting project objectives, or would reduce significant impacts of the project."

This decision came after six years of proceedings with 21 intervenors.[13]

The CPUC specifically rejected a 4.8 mgd facility based on its findings that there would be "little or no cost differential."[14]

The Decision found that "a 4.8 mgd desalination plant would not avoid or substantially lessen any significant impacts of the project: the significant impacts that would result from construction would be the same as the plant would have the same footprint, and require the same pipelines, and while one fewer well would be drilled, it would still require five well pads at the CEMEX site."[15] Indeed, *the CPUC found that a phased implementation of a 4.8 mgd facility followed by a 6.4 mgd facility would "increase environmental impacts,* face additional scrutiny in the permitting review process, *and increase costs to ratepayers*."[16]

Environmental impacts would be increased by the phased approach because construction impacts would occur twice; for example, "[d]rilling all wells at once will likely result in fewer environmental effects than drilling six wells now and returning in the future to disturb the area to drill the seventh well."[17] These findings were based on argument and data submitted by CalAm.

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[11] CPUC Decision 18-09-017, pp. 72, 79, 206, 207.

[12] *Id*., p. 207.

[13] *Id*., Appendix A, Procedural History.

[14] *Id*., p. 69.

[15] *Id*., pp. 69-70.

[16] *Id*.

[17] *Id*., pp. 129-130.

The CPUC found that the "reduction in the size of the desalination plant from 6.4 mgd to 4.8 mgd would increase the annual Operations and Maintenance (O&M) costs by $340,000" and that these increased O&M costs would "would offset the increased one-time capital costs for the larger 6.4 mgd plant within only a few years." The Commission found "we cannot identify significant, if any, cost savings to ratepayers associated with construction of a 4.8 mgd size plant compared with the construction of a 6.4 mgd size plant." Again, these findings were based on argument and data submitted by CalAm.

Also based on CalAm's arguments and data, the CPUC found that the smaller plant would still require six slant wells, four for source water and two "for back-up and peaking capacity," so only one well could be deferred.[18] The CPUC found that "the cost savings for deferring one slant well to initially operate the facility at 4.8 mgd is small in comparison to the risks associated with eliminating the well. [footnote omitted] For example, drilling all seven wells at once reduces overall costs spent on each well (due to economies of scale) while the cost to drill only one well in the future is significantly higher. Drilling all wells at once will likely result in fewer environmental effects than drilling six wells now and returning in the future to disturb the area to drill the seventh well. Also, delay in drilling just one well increases overall project risks."[19] Thus, the CPUC concluded "[w]e therefore do not find a benefit to ratepayers in deffering [sic] the drilling of one well."[20] Again, these findings were based on argument and data submitted by CalAm.

Despite CalAm's 2018 position that the 4.8 mgd plant would require six slant wells to ensure back-up and peaking capacity, news reports indicate that CalAm is now proposing only four slant wells. This proposal is flatly inconsistent with the CPUC's 2018 findings.

The CPUC's CEQA findings that there would be overriding considerations that justify approving a project with unmitigated impacts were based on its finding that the 6.4 mgd facility is the environmentally superior project and that its benefits "outweigh the benefits of any of the other alternatives examined, including the alternatives deemed infeasible. . .."[21]

In sum, based on cost and CEQA considerations, the CPUC's 2018 decision rejected both the 4.8 mgd alternative and the alternative that would commence with a 4.8 mgd facility and subsequently phase in the 6.4 mgd facility.

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[18] *Id*., quoting CalAm.

[19] *Id*., p. 130.

[20] *Id*.

[21] *Id*., p. 207.

2. **As a responsible agency under CEQA, the Coastal Commission cannot approve the changed project CalAm now proposes without a subsequent environmental review of the effects of the changed project.**

CalAm's proposed 4.8 mgd phased project is a change to the project that the CPUC approved, and the CPUC found that it would have more severe significant impacts. If there are changes in the project or changes in circumstances, or if significant new information becomes available after the lead agency certified the EIR for the project, *the responsible agency* must prepare a subsequent or supplemental EIR before making a new discretionary approval like issuing a CDP.[22]

Furthermore, the Coastal Commission may not rely on the CPUC's administrative record because the CPUC's EIR did not formally assess a 4.8 mgd facility or the phased project approach, and the CPUC findings specifically rejected the phased project approach, finding that it was not the environmentally superior project.

Where a project has significant unmitigated impacts, CEQA requires that the approving agency adopt a feasible alternative that reduces that impact.[23] Here, the record does not support adoption of a phased project as a reduced impact alternative. To the contrary, the CPUC found that it would increase significant construction-related environmental impacts and that it was not feasible.

Conclusion

We urge the Commission to fulfill its obligation to protect California's coast, resources, and communities by deferring any action on the CDP permit until pending adjudications of supply and demand and water rights are completed and the Commission can consider a stable, well defined desalination project and its alternative in meaningful detail.

Regards,

Michael DeLapa
Executive Director

Cc: Tom Luster
Wade Crowfoot

[22] CEQA, § 21166; 14 Cal Code Regs §§ 15052(a)(2), 15096(e)(3), 15162.

[23] CEQA, § 21002.

An Analysis of Weaknesses in the MPWMD Supply and Demand Report

In order to determine future water needs for the Monterey Peninsula we must look at what water is reliably available to the Peninsula, against the current and future water needs. The best (and probably most accurate) calculation of the Monterey Peninsula water supply available usually comes from the Monterey Peninsula Water Management District. A chart of the water claimed to be available (by source) is shown below – as are notes on potential weaknesses in the analysis.

The Monterey Peninsula Water Management District (MPWMD) was formed on June 6, 1978 under the enabling legislation found in West's California Water Code, Appendix Chapters 118-1 to 118-901, and in response to the drought of 1976-77.

It currently serves approximately 112,000 people within the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Seaside, Sand City, Monterey Peninsula Airport District and portions of unincorporated Monterey County including Pebble Beach, Carmel Highlands and Carmel Valley. Sources of revenue for the agency includes but are not limited to; property tax, user fees, water connection charges, investments, grants, permit fees and project reimbursements.

The Agency's original goals were to:

- Augment the water supply through integrated management of ground and surface water.
- Promote water conservation.
- Promote water reuse and reclamation of storm and wastewater.
- Foster the scenic values, environmental qualities, native vegetation, fish and wildlife, and recreation on the Monterey Peninsula and in the Carmel River Basin.

Because of the agency's continuing failure to augment the water supply with the sufficient and reliable sources of water needed to solve the Peninsula's chronic water shortage, the California State Water Resources Control Board (SWRCB) properly imposed a Cease-and-Desist Order (CDO) on Cal Am and the District in 1995.

Yet after 44 years of water poverty – and 27 years after the CDO was imposed - the Peninsula is still short of both water and housing because not enough has been done to develop the sufficient and reliable, water the Monterey Peninsula needs. As a result, as recently as March of this year, the California State Water Resources Control Board denied their request to have the CDO lifted or receive a special allocation – even if only for special projects such as much needed affordable housing. <u>But that just proves that the Monterey Peninsula is still woefully short of water!</u>

And the agency is still playing games. They have developed a report entitled "Supply and Demand for Water on the Monterey Peninsula". This 159 page report is an expansion of their 30 page 2020 report. The weakness of this report is that it was developed internally and without input from Monterey Peninsula property owners, residents, cities, the business or hospitality communities, property developers, or owner of lots of record who cannot build because of the water shortage and the resulting CDO. Now, as Cal Am is proposing a scaled down desal plant,

it is important to look at potential weaknesses and errors in that report. Only that way can we make the best decision on the Monterey Peninsula's water future.

Below are the water projection numbers from the MPWMD Supply Demand Report. Based on data and inquiries of the various communities in Monterey County who suffer from a water insufficiency, I have added a column which I believe has more accurate data – with explanations for the differences included.

WATER SUPPLY NUMBERS

AGREED ON SUPPLY SOURCES	**MPWMD PROJECTIONS ON ACRE FEET (AFY) AVAILABLE**	**MORE LIKELY AFY WATER AVAILABILITY (And explanatory notes)**
Carmel River water	3,376	3,376
Pure Water Monterey recycled water plant (PWM)	3,500	3,500
Pure Water Monterey (PWM) expansion	2,250	1,650-2,250 **note 1**
Seaside basin	774	400 **note 2**
Aquifer Storage and Recovery (ASR)	1,300	836 **note 3**
Sand City desalination plants	210	94 **note 4**
Malpaso Water Rights	58	0 **note 5**
TOTAL AVAILABLE SUPPLY	**11,468**	**9,856-10,456**

NOTE 1: This is NOT water which is actually available now. It is water which will be available once the Pure Water Monterey expansion is completed in 2025 – and even then only if all water sources continue to provide past amounts. The source water for the expansion is treated, but unused, agricultural quality water.

TWO OTHER COMPLICATING FACTORS: (1) The Monterey County Water Resources Agency (MCWRA) may have a right to some of the source water slated for the expansion and, (2) The agricultural interests in the Castroville area – who get recycled water from M1W for irrigation - have indicated they may need more water for the Castroville Seawater Intrusion Project (CSIP) because they are running into seawater-tainted groundwater

Another wild card is that, because they own 17% of the pipeline bringing water from the Pure Water Monterey Plant to the Seaside injection sites, the Marina Coast Water District has a right to up to 600 acre feet of PWM water (but for non-potable uses only). They recently asked for 132 million gallons of water for the Bayonet and Blackhorse golf course. That is 405 AFY and corresponds pretty closely with the agreement we had to make with them when I was on the board at M1W. Needless to say; this may reduce what can be provided by PWM

If I remember correctly, we were trying to make sure we could build the project with the money we were able to get from the state, and using a section of a pipeline Marina Coast already had in place would save us a lot of money in building the pipeline on a project where financing was tight. SOURCE: Pure Water Monterey Planning Documents – and, though not happy with the agreement even at the time - I helped negotiate it.

NOTE 2: At one time Cal Am was withdrawing more than 2,600 acre-feet per year from the basin, though it has now reduced that down to an assumed "natural safe yield" of 1,474 acre-feet. It is unlikely, however, that the basin actually recharges at that rate, and a recent report sent to the Seaside Watermaster indicated that the sub basin may need much more recharge that originally thought. Unless we are willing to write that sub basin off, every year that injection is delayed likely increases the injection need at some point in the future. SOURCE: Montgomery & Associates report presented to MPWMD at their June 20, 2022 meeting – and turned down.

NOTE 3: The 1,300 AF is a projection of future potential. MPWMD's 2021 Annual Report stated that Aquifer Storage and Recovery (ASR) has diverted 10,873 AF of water since 1998; an average of 836 AF per year for past 13 years. It is important to note that 20% of that was in one particularly wet year (2,300 AF in 2017).

While diversions have increased since the project was started, even in the last seven years it has been as low as 215 AFY. But, since ASR amounts are dependent on taking excess water from the Carmel River, amounts could be lower in exactly the years they are needed most - in a drought. SOURCE: MPWMD Annual Water Reports.

NOTE 4: According to testimony by Cal Am's Ian Crooks, because of the city's vested rights to water from the Sand City desal plant, even if it operated at its full potential of 300 AFY, only 94 AFY can be guaranteed for customers outside of Seaside. While there MAY be more available, that can only be speculation at this point.

NOTE 5: Though for book-keeping purposes there are 80 AF of water available to Clint Eastwood's Malpaso Water Company – granted under SWRCB License 13868A – which is treated and delivered by Cal Am. I do not believe that water is available to the general public through MPWMD, however. It is restricted to customers within the Carmel River Watershed and the City of Carmel-by-the-Sea ONLY. Also, all of that water has been purchased and the amount which can be counted even just on paper will decline over the next several years. That is because developers have only received "Water Permits" through the MPWMD for 22 AF - leaving 58 AF – but other Malpaso water purchasers are in line to get Water Permits for already existing – not future - projects.
SOURCE: Michael Waxer of the Malpaso Water Company - 10/8/2022 – and SWRCB Conditions of Approval for Malpaso. DISCLOSURE: I was a Board Member of a Carmel Valley project which purchased just about the last 6 AF available.

WATER DEMAND

The Monterey area is currently in a several year drought (though some contend that we have been in a continuous drought for the last 22 years). During the last recognized drought period however - from 2012 to 2016 - the Peninsula cut its water use from its average use of 14,000 to 15,000 AFY (from 2000 to 2009) to a range of 10,863 to 9,725 acre feet per year. ***The difference in these numbers is whether we use Cal Am's 10 year average figure or the MPWMD's shorter five year average.***

But the fact is, we cut our water use substantially during that drought. Conservation worked - and the MPWMD's rebates and assistance helped make that happen; so they should be given the credit due them. But at this point further conservation would likely not be very productive, and we still need more water than we currently have in order to even meet current water needs.

Based on their best guess of what will happen with economic development, new building activities, and other water needs, the most recent MPWMD Supply and Demand Forecast lists the demand and projected future demand as follows:

YEAR	**2022**	**2025**	**2030**
WATER DEMAND IN AFY	9,725	9,882	10,039

This would indicate that there are 1,743 acre feet of excess water available this year and 1,429 in even 2030. While some of this excess water can be "banked" for use in future years, it is still preferable to have adequate and reliable sources of water to meet future needs.

But the MPWMD projections – which minimize needs - may not be totally accurate, and we need to hone in on the real numbers so we can guide the process and avoid future problems.

Against the projected near term water supply, we have to measure the water demand we can realistically expect. Several cities have loudly publicized their desire to build workforce and low income housing; an effort which has been stymied by the lack of water. It is fairly certain that these communities would immediately turn to building these projects – and more – to meet the pent up demand which has arisen because of a the long-term moratorium on new construction.

In fact, the city of Seaside allowed part of their city to be annexed into the service territory of the Marina Coast Water District (MCWD). That agency is not affected by the Cease and Desist Order and has water available; allowing Seaside to build homes in that area of their city.

Monterey and the other cities of the Peninsula, on the other hand – by being in the Cal Am service territory – are running into opposition to their building plans from the State Water Resources Control Agency (SWRCA). That agency has ruled that :

(1) the Peninsula has not developed the secure and sufficient water that would be needed to lift the CDO imposed 27 years ago.
AND
(2) that the new buildings would use more water than those now at the selected locations; and thus be affected by their Condition 2, which does not allow "intensification of use".

The Peninsula must therefore develop an adequate and reliable source of water so that the CDO can be lifted. **Planning for what constitutes an adequate and reliable water supply in future years depends on several factors:**

What will be needed for planned and/or required building?
What will be needed to satisfy 27 years of pent up building demand once the CDO is lifted?
For new building on vacant lots.
For adding bathrooms or water fixtures for growing families.
For new renovations.
What will be needed to take care of different business practices such as restaurant outdoor seating and changes in the category of business in specific locations (e.g. store to restaurant)?
What will be needed to take care of:
Business recovery.
New or renovated business locations.
New or expanded hotels, motels, and B&B's.
Local military facility expansion.
How much will be needed to correct past overdrafting of resources (such as the Seaside basin)?
And where will that water come from?
And who will pay for the water and restoration infrastructure?
We also must plan for extra water to take care of unexpected local contingencies.

Below is a breakdown and discussion of additional water is needed for:

REGIONAL HOUSING NEEDS ASSESSEMENT (RHNA) - Starting in 1969, the State of California has required all local governments to plan for the adequate housing needs for everyone in the community. As a result, the Association of Monterey Bay Area Governments (AMBAG) was formed as a public organization to analyze regional issues, issue reports

containing data and recommendations, and to plan and implement regional policies for the benefit of the Counties and Cities of Monterey, San Benito and Santa Cruz (though San Benito developed its own report this cycle). It is governed by a twenty-four member Board of Directors comprised of elected officials from each City and County within the region.

AMBAG recently completed a report entitled REGIONAL HOUSING NEEDS ALLOCATION (RHNA) OVERVIEW - AMBAG 2022 Regional Growth Forecast. Such reports are issued every eight years, and for this cycle the Bay Area is planning for the period from June 30, 2023 to December 15, 2031.

The process for developing RHNA numbers is for the State of California, through the Housing and Community Development Department (HCD), to issue a Regional Housing Needs Determination. Using information from the state Department of Finance and the latest US Census Bureau data, it develops a regional determination of an overall housing need number, as well as a breakdown of the percentage of units required in four income distribution categories:

- Very Low Income: 0-50% of Area Median Income
- Low Income: 50-80% of Area Median Income
- Moderate Income: 80-120% of Area Median Income
- Above Moderate Income: 120% or more of Area Median Income

To meet these requirements, each city is to then develop a Housing Element as part of its General Plan which demonstrates how it will meet that community's housing needs. by December 2030.

For the Monterey Peninsula these numbers increased dramatically in this go-around, and there was some consternation and grumbling among elected officials about how it would be possible to meet such aggressive goals. A statewide push by the Governor and Legislature for more housing to solve California's housing shortage crisis, however, caused this cycle to be a major review of needs. But the Monterey Peninsula's housing crisis is decades in the making. I believe the MPWMD dramatically underestimates the need for affordable housing by only allocating 190 AFY by not counting all needs, which – based on city announced goals - are more likely:

RHNA housing needs for the Peninsula alone between now and 2030 is as follows:

Community	**RHNA Numbers**	**Acre Feet Needed ***
City of Monterey	3,654 units	438
City of Pacific Grove	1,125 units	135
City of Seaside	616 units	74
City of Del Rey Oaks	184 Units	22
Unincorporated Monterey County (About half of the total whole unincorporated area need of 3,326 units)	1,663 units	200
Total Homes	**7,242 units**	**869**

NOTE: Calculation based on using 52 gallons per person per day with two people per housing unit, or .12 AFY/home.

WATER NEEDS FOR CAL STATE UNIVERSITY MONTEREY BAY (CSUMB) – The CSUMB campus partially located in both Marina and Seaside has grown rapidly in recent years. In May of 2022 MPWMD received a letter from the university detailing their final EIR for expansion between 2022 and 2035. Much of this expansion will occur before 2030.

Because the campus is partly in Seaside and partly in Marina, the impact will not exclusively impact the MPWMD's demand numbers. This university, which supports 12,700 students, 1,176 faculty. and 2.6 million more NEW square feet of building by 2035 will affect the whole area however – including the Cal Am/MPWMD service area. The new plans call for student housing to accommodate 3,820 student beds (and associated bathrooms, sports, and dining facilities), as well as 757 converted units for faculty and staff. Source: ***CSUMB's May 2022 notice letter to MPWMD.***

BUSINESS– The Monterey Peninsula business community has struggled for years due to shortage of available water for additional building and change in use of businesses by adding water fixtures. While the MPWMD report minimizes their needs, the Co-Chairs of one of the business groups recently wrote the Coastal Commission that "members have struggled for years – some for as many as 40 years" waiting for a reliable supply of water for the Peninsula.
Source: October 13, 2022 letter from the Co-Chairs of the Coalition of Peninsula Businesses to the California Coastal Commission.

TOURISM "BOUNCE BACK" – The MPWMD Supply and Demand report minimizes this, but Rob O'Keefe, of the Monterey County Convention and Visitors Bureau recently said ""business meeting, group, and convention visitors are at about 60% of what they were in 2019". In addition; businesses and hotels have consistently indicated a desire to expand, renovate and update properties to meet current customer desires, bring laundry services back in-house, increase their water fixtures, and/or build new offices and hotels. There are two hotel projects in Pacific Grove which may need additional water. There are others Sand City and Seaside – and Marina has its own projects also. Over the years properties have been stymied from adding new rooms on their site, and are likely to want to move forward as soon as water is available.
Source: September 14, 2022 Monterey County Hospitality Letter to the CPUC.

VACANT LOTS OF RECORD – According to the Monterey County Association of Realtors, there are about **6,000** vacant lots where owners have paid their property taxes for years and want to build new homes. This may be an undercount, however, as these are lots which have been on the books for years. However, there are also property owners who have or wish to split lots, or moved garages to clear part of their land so they can sell that excess property for more homes.

For instance, in just one small area of Monterey off of Del Monte Avenue and Foam Street are at least 4 lots with beach views and access. But every city has multiple lots spread throughout their city boundaries. Whether owned by individuals, investors, or builders; many of these people are ready to start immediately upon receiving notice of the availability of water hook ups and meters. On Green Street in Pacific Grove alone (and on Crocker I believe) is a large lot on which the owners have cleared half and wish to do a lot-split in order to sell the unused portion.

For a recent inquiry by the real estate community, the Monterey County Assessors office stated that there are approximately 6,000 vacant lots in the county. Your agency could quickly obtain

more detailed data for specific geographic areas by submitting an Information Request by zip codes for any area you would like information on.
Source: October 17, 2022 response from the Monterey County Association of Realtors.

RENOVATIONS - Many existing homes which are purchased are then renovated. To date; those people were limited in how much they could do, and certainly could not add water fixtures for new guest rooms, laundry rooms, larger kitchens, or other things for their growing families.

For instance, a 2019 analysis In Pacific Grove (looking at approved building permits from 2016 to 2019) found that approximately 85% of the houses bought with small lots were converted from one story to two and went from an average of 1,662 square feet to 2,678 square feet.

There are constant demands for more housing on the Monterey Peninsula because of a shortage of houses; but people can't build more because of a lack of water. The land is there. The will is there. The developers want to build houses, condos, and apartments. But the water is not there to do that.

ACCESSORY DWELLING UNITS (ADU's) – In order to meet the need for affordable housing, may cities have embrace allowing homeowners of existing homes to add Accessory Dwelling Units to their properties. But since these units have kitchens, bathrooms, and sometimes even laundry facilities, this is an intensification of water use on these properties. These require the use of additional water, but I am not aware of clear state, regional, or city regulations accounting for this water - **but it is used and should be counted.**

NAVAL POSTGRADUATE SCHOOL (NPS) AND DEFENSE LANGUAGE SCHOOL (DLI) – Both the Naval Postgraduate School in Monterey and the DLI on the Presidio of Monterey (between Monterey and Pacific Grove) have indicated a desire to build additional housing and barracks. Because both of the institutions train service members of all branches of the military, their ability to do this has national security implications.

SEASIDE AQUIFER - In a January 2013 CPUC filing, Cal-Am listed the average demand for their service territory as 13,290 AFA, but they wanted to increase the desal plant output by approximately 700 acre-feet per year for an in-lieu recharge of the Seaside Basin. This was built into the pricing for the water that would have been sold from the desal plant and would have allowed for some recharge of that aquifer. Primarily because there is no source of funding this without the desal plant, the MPWMD plan makes no realistic allowance for recharge of the aquifer – deferring such action until someone else comes up with a way to fund this.

At the September 22, 2022 Regional Water Forum held by the Monterey County Board of Supervisors, the Seaside Watermaster reported that "the Seaside subbasin has areas where groundwater levels are below sea level." And "This means that the basin is at risk of experiencing seawater intrusion, similar to that experienced in the Salinas Valley."

But the lines between aquifers are artificial constructs. We put then on paper to delineate areas, but the water below our feet actually moves – slowly, but inexorably. Indeed, this is the concept by which PWM injects water in the soil and Cal Am later withdraws it after it has traveled a distance over time. But some of the aquifers in Monterey County are seawater intruded up to

several miles inland, including the adjacent overdrafted Monterey Subbasin. The gradient differential between the aquifers causes those which are higher to eventually flow into those which are higher, threatening even those aquifers which are not yet intruded.

For that reason alone I believe we must keep the Seaside Aquifer in a healthy state. I would note that though the original Cal Am proposed desalination plant was sized to accommodate in-lieu recharge of the Seaside Basin at 700 AFA for 25 years, even it was not sized to recharge the aquifer to protective water levels. **Although it is great the PWM plant now injects water into the Seaside Aquifer, because that water is then also removed some time later, that does not improve the overall health of that aquifer. If, at some point the aquifer does become intruded with sea water because of the overdrafting, then it will no longer be viable for the storage of that water, however.**

OTHER REGIONAL PROJECTS - In 1994 the former Fort Ord military base located on the coast of the Monterey Peninsula was closed. This location consisting of 28,000 acres (44 square miles) of land near the cities of Seaside, Sand City, Monterey, Del Rey Oaks, and Marina. An area of land the size of San Francisco was made available to the local communities. After a lot of political and legal wrangling, much of the land has become park and open space, though some has been absorbed by local cities looking to develop that land – which will require water.

The nearby city of Marina wants to develop large parcels of land within its city limits, building thousands of new homes. A large commercial strip mall along Highway 1 at the former 12th. Street Gate entrance to Fort Ord opened in late 2007, and houses and popular retail stores followed. Marina is also planning a 13-mile recreation trail to run through Fort Ord to the Fort Ord National Monument, the Salinas River, and through Fort Ord Dunes State Park.

Then there is the 244 acre East Garrison Development Project; a partnership between the county government and the private sector, which will result in construction of a new community at the former Fort Ord. This project includes 1,400 new homes, as well as a Town Center with over 30,000 square feet of commercial stores, shops, restaurants, and a Historic District and artist's community.

Other projects contemplated or under way on former Fort Ord land include:

City of Marina

University Villages/Dunes on Monterey Bay
Sea Haven
Imjin Office Park
Cypress Knolls (senior-oriented residential community)

NOTE: Considering all economic development options for 1,400 acres, the long-term forecast includes: 7,000 housing units, 4 million sq ft. of commercial/industrial, 500 hotel rooms, for an anticipated population growth of 11,000 and the creation of 13,000 jobs.

City of Seaside

Seaside Resort
Main Gate Retail Center
Central Coast Veterans Cemetery
Seaside Highlands

The Ascent project, a mixed-use development

City of Del Rey Oaks

Del Rey Oaks Resort (currently on hold)

Monument RV Park – a 210 pad recreational vehicle resort on 53 of the approximately 310 acres received by the city after Fort Ord closed.

EXTRA CONTINGENCY WATER – to ensure the long term viability of the water system, it would be good to have some contingency water available in case of emergency or long term drought.

LIKELY ACTUAL NEW REQUIREMENTS

WATER NEEDED FOR:	**AFY WATER NEEDED**
RHNA Required Housing	869
Water Needs for CSUMB	100
Business and Tourism "Bounce Back"	500
New Hotels	108
New Restaurant need for outdoor seating	50
Water for the development of 3,000-6000 Vacant Lots of Record *	360-720
Water Needs for renovations and remodels	120
Water for Accessory Dwelling Units (ADU's)	50
Naval Postgraduate School and DLI	120
PWM water sent to Marina Coast Water District	600
Water to Return Overdrafted Seaside Aquifer to health	700 +
Approved but unbuilt housing	100
Other Regional Projects	100
Contingencies for System Safety	250
TOTAL LIKELY <u>ADDITIONAL</u> WATER DEMAND BETWEEN 2022 AND 2030.	4,107 **An average of the 3,927-4,287 AFY range.**
WATER DEMAND IN 2022	9,725
LIKELY TOTAL WATER NEEDS BY 2025	13,832
MPWMD TOTAL AVAILABLE TODAY	11,468
WATER SURPLUS OR DEFICIT	**2,364**

**** There is a difference in the number of lots of record depending on source and locations.***

NOTE: I am sure the MPWMD will dispute my numbers, AND I don't pretend to be able to predict all water use. Some of this is probably an overestimation – but is an underestimation really better? So feel free to check with the communities which will be affected about their objections to more new water – the real estate, business, hospitality, and home building industries. Also check with owners of the 6,000 Lots Of Record in Monterey County who have paid their property taxes but cannot build a home on their lots because of our water poverty. Check, also, with the people who own homes but cannot add bathrooms or water fixtures for their growing families. In addition; hotels and businesses are not able to expand, and shopping areas and medical centers cannot be built. <u>MPWMD recently made an exception by "wheeling" water 7 miles between the Community Hospital and Montage in Ryan Ranch to be able to build a needed medical facility.</u>

We can argue about the actual numbers but, as we can see, whether they turn out to be slightly lower or higher, we have a substantial gap in water needed versus what is and will be available. Additional new water will be needed to address that gap, and wishful thinking and creative numbers on paper will not close it.

SUMMARY

Since 1970, California's population has nearly doubled, while the Monterey Peninsula's population has stayed almost the same as it was 52 years ago. And while California needs between 1.8 million and 3.5 million new homes, the Monterey Peninsula only needs a few thousand. But in order to be able to build those homes, we need more water.

But if we continue our lack of sufficient and reliable water now – and in the future – the Cease and Desist Order placed on the Monterey Peninsula should remain in place. That is why new water projects should be developed for the Peninsula - and for the region as a whole. The Monterey Peninsula still needs more water – and probably lots of it.

Due to climate change our area is facing an unpredictable future; potentially going into more of a high-heat and lower-precipitation era. In addition to this declining precipitation, here in Monterey County we have to deal with declining groundwater levels. Because of the gradient differential between aquifers, this may lead to an increase in seawater intrusion, threatening other aquifers.

Add to this the probability that any desal plant receiving approval now probably won't be completed and operational until close to 2030 - and even the PWM expansion which is underway will not be completed and actually delivering water until 2025.

In many cases in this report I have used the MPWMD supply and demand numbers. In other areas, however, I have adjusted the numbers to what the business, hospitality, real estate, or other communities have indicated is the real need. **I find the MPWMD's overestimation of water available and underestimation of what the need will be extremely troubling.** But I believe that a considerable amount of it was prepared without consultation (or agreement with) those most affected by the document – the real estate, business, hospitality, owners of Lots of Record, and home building industries. It also did not involve the owners of a significant number of lots of record which are unbuildable without sufficient and reliable amounts of water.

That almost seems like a deliberate attempt to minimize water in order to stifle growth, and that greatly detracts from its utility in being used as a decision making document. But, first and foremost, it is a sales document. It was prepared by the General Manager of the MPWMD, representing his anti-Cal Am, anti-desal board of directors (the majority of whom are also members of the Public Water Now (PWN) political action committee). But because PWN's goal is to keep the cost of the company low so they can acquire most of the assets of Cal Am on the Monterey Peninsula, it is now opposing just about everything that company proposes.

In addition, MPWMD also deliberately undercuts the water needs and legal entitlements of communities such as Pebble Beach. In fact, on September 19, 2022, the Pebble Beach Company filed a notice with the CPUC complaining about the MPWMD's "misleading testimony" that its "demand projections should be lowered" and reiterating their belief in their right to all 325 acre feet they have a legal right to. The agency similarly and arbitrarily lowered the numbers it uses for Lots of Record by 27% and Business Bounce back by 80%.

And now, because Cal Am operates within their service territory, this agency has tried to take a lead role in the planned Monterey Peninsula Water Supply Project. But I believe there is much more need than the MPWMD acknowledges and recognizes.

This was demonstrated quite starkly at a September 20, 2022 Monterey County Board of Supervisors Meeting on water, where several of the presenters made important points.

Eric Tynan the General Manager of the Castroville Community Services District reported that his community needs 700 AFY of more water. His District just lost its best drinking water well to sea water intrusion and the area is "water mining the non-renewable Deep Aquifer as never before". Their Well 4 static water level in June 2022 was 115 feet below sea level. In addition, he told me earlier this year that because "any spare drop of recycle (water) is going to Pure Water and not to CSIP, the farmers are pumping their wells harder to make up the difference."

The Marina Coast Water District (MCWD) stated that they may reactivate their 300 AFY desal plant; put in operation in 1997 and shut down in 2003. Because of growth in the Marina area, their water needs may now be outstripping their ability to easily meet the demand. But even if they are able to spend the considerable sums to bring this plant back to operation, it was only designed to provide 300 AFY – hardly enough to make a big difference to anyone.

But please note that several years ago the city of Seaside allowed the Marina Coast Water District (MCWD) to incorporate some of their city's territory into its service area. This was done to get around the MPWMD's inability to provide water to Seaside and other communities for needed building. This shows the desperation of Peninsula cities for water to build housing, hotel, and retail facilities. That increased the requirement to further tap their resources, and may be why the MCWD is also asking for water they have a right to from the PWM plant.

I find that the MPWMD projections for water available are more hope than reality. We cannot simply plan for the lowest possible demand for water. In order to plan appropriately we must plan for **sufficient and reliable** water for all potential uses several years out. It cannot be based on speculation alone and a minimization of what might be needed. That is simply control of current supplies, and not planning for a future of sufficient and reliable water. The MPWMD report, by itself, does not produce any water. Action is needed to do that.

Monterey One Water on its own - or with Cal Am or another partner – could develop the sources of the sufficient, reliable, and uninterruptible water the Peninsula needs in order to meet the requirements to get off of the CDO.

RECOMMENDATION:

Although the Monterey Peninsula's current water supply is insufficient, the Pure Water Monterey expansion **may** meet water needs short-term – as the MPWMD has claimed. But that is not certain – and then what? It would then probably take another 15 to 20 years to design, complete the EIR, permit, and actually build any new water project. Monterey needs more certainty in its water supply, and a more-long term project is in front of you in the form of a regional desal plant. But a 4.8 million gallon a day desal plant produces over 5,000 acre feet of water per year which may still be more than is needed in the foreseeable future.

For that reason I recommend that the California Coastal Commission approve a small (but expandable, as needed) desal plant to provide **additional** needed water (not to replace water that is already being sourced). That means the company could not leave available water in the river

or refuse to take water from PWM or another source in order to use its more expensive desalinated water instead. It should be built by Cal Am but overseen by a public agency.

A one train, 1.6 million gallon per day plant, operating at 80% efficiency would net the Peninsula about 1,433 acre feet a year, which would add about 15% to the area's water supply. That would fulfill Monterey County's immediate and short term (5-15 year) water needs. A 3.2 MGD plant would provide even more, and probably meet the area's needs for even longer. And a plant built with infrastructure for expansion in place - similar to the way in which the Pure Water Monterey plant was built – could then be quickly expanded to provide additional water if needed later.

The question has to be asked whether we want one straw in the ocean or multiple straws. I believe there is substantial safety in having only one. Under the concept of "One throat to choke", it is easier to monitor and regulate one slightly larger plant than several smaller ones. In many ways this has also become a regional project – not just one that involves the Monterey Peninsula. After all, the source waters for the PWM plant come from both the Peninsula and the overall county. In addition, this project should now provide water to Castroville and (potentially) other customers in Monterey County – and even Marina, Pajaro-Sunny Mesa, etc.

That brings up the question of who the lead public agency should be. Some in the business community (such as the Coalition of Peninsula Businesses - which has a mission to "Resolve the Peninsula water challenge to comply with the CDO at a reasonable cost") – out of some desperation - have weighed in that they would be OK with a public/private project or one with some sort of public ownership. That brings up the question of who that public agency should be.

The MPWMD, which would normally be the logical agency, is in an antagonistic and litigious relationship with Cal Am and is actively involved in a hostile acquisition attempt. Trying to have two bitter adversaries developing a critical project together would at least be problematic – and would probably mean it will never be completed.

Reporting directly to the Board of Supervisors, the Monterey County Water Resources Agency could be a better lead agency. It has jurisdiction over matters regarding water within the entire area of the County of Monterey (incorporated and unincorporated). In addition, the Agency is authorized to conserve water in any manner; as well as to buy and sell water. It is also governed by a board made up of representatives of all of Monterey County – not just the Peninsula.

But there is another agency which is much better for this monumental task – Monterey One Water (M1W). This agency has a good working relationship with both Cal Am and the MPWMD, has board members who represent all of the communities where parts of the plant would be built AND which could benefit from a desal plant. This includes all of the Monterey Peninsula cities; as well as Salinas, Castroville, Baronda and the agricultural interests, and the Marina Coast Water District. In addition, M1W has experience developing, designing, and building water projects; having just completed the Pure Water Monterey plant several years ago. They are now expanding that plant, and also have experience in obtaining grants - which helps to lower the cost of water for the consumers.

Monterey Peninsula Taxpayers Association
PO Box 15 – Monterey – CA – 93942
Established 1965

October 18, 2022

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market St, Ste 300
San Francisco, CA 94101

Subject: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603

Dear Mr. Luster:

The Monterey Peninsula Taxpayers Association was formed in 1965 to advocate for the interests of taxpayers on the Monterey Peninsula.

The Cal Am Desal project is the only project which will meet the long-term water needs of the Monterey Peninsula with a drought proof water supply satisfying the CDO. It is also the environmentally superior option.

The alternative to the Desal project being pushed by others is the Pure Water Monterey Phase 2 project. Despite assurances from the Monterey Peninsula Water Management District there is no source water guaranteed for the project and there are competing demands for many of the proposed sources. In addition, all sources indicated would be impacted during a drought.

The biggest issue with Pure Water Monterey is that both it and ASR rely on the Seaside Aquifer, in effect putting all water eggs in one basket. The Seaside Aquifer is at risk of seawater intrusion. should that occur, the Peninsula would lose its entire water supply except for the Carmel River. This would put tremendous pressure on the Carmel River and would be an economic and environmental disaster for the Monterey Peninsula.

Water from this Desal project is drought resistant and is the ONLY solution to the water problems on the Monterey Peninsula

On behalf of Monterey Peninsula Taxpayers, the Monterey Peninsula Taxpayers Association urges you to **APPROVE** this project.

Sincerely,

Rick Heuer
President

CASTROVILLE COMMUNITY SERVICES DISTRICT

P.O. BOX 1065
OFFICE: 11499 GEIL STREET
CASTROVILLE, CA 95012
FAX (831) 633-3103

24-HOUR TELEPHONE: (831) 633-2560

October 21, 2022

California Coastal Commission Members
455 Market Street, Suite 300
San Francisco, CA 94105

RE: Support for the Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603

Members of the Coastal Commission:

I am writing in strong support of the Monterey Peninsula Water Supply Project (MPWSP).
The MPWSP will provide a critically-needed, reliable water source for our region. I urge the California Coastal Commission to approve this project to help bring water access to disenfranchised communities, support local conservation efforts, and protect the economic vitality of the Monterey Peninsula.

Source Water for PWMx
When considering future long-term water demand virtually every potential source had conflicting quantity issues except Desal. Wastewater flow is the basis for the Castroville Seawater Intrusion Project, the Pure Water Monterey and PWMx. Wastewater inflow that "Experts" projected to be at 29 MGD currently treats closer to 18 MGD.

In addition, the drought has resulted in empty reservoirs. The Reclamation and Tembladera are dry ditches. The river is not providing a source for the SRDF. There has been no storm water and ground water pumping is depleting the 400' aquifer leading to sea water intrusion and unsustainable water mining of the deep aquifer which are all exacerbated by lack of a new water supply.

North County Water
The attached graph show Castroville's well levels and the dramatic decline due to extractions from CSIP supplemental wells as seen in the MCWRA report. Well #3 (the green trend) in spite of being shut off due to sea water intrusion in May 2021 has a static water level of -90 ' below sea level. Finally, the tan trend line is our deep well # 5 and shows it is in a steadily decline. The drastic decline of the 400' aquifer in North Monterey County is due to over-pumping caused in part by a lack of recycle water for CSIP that instead went to PWM for the Peninsula.

Long-term water restrictions and the latest drought have continued a building moratorium on the Peninsula resulting in a shortage of affordable housing. Castroville has taken on a large number of affected families who could not find affordable housing on the Peninsula. In Castroville you can often find 2-3 families sharing a 2-bedroom home. In spite of this, Castroville reduced its pumping from 1,010 acft in 2000 to 760 acft in 2021.

If Castroville is being starved so PWM can meet its quota, it is a poor example of the Coastal Commissions dedication to Social Justice.

The Solution:

The three-legged Monterey Peninsula Water Supply Project was/is a WIN-WIN-WIN answer.

- Reduces by 700 AF of pumping directly in front of the 400' Sea Water Intrusion
- Gets the Peninsula off the CDO
- Provides Castroville, a severely disadvantaged community, a long-term, reliable water supply
- Reduces traffic in and out of the Peninsula by allowing people to live in the community they serve
- Provides for critically needed and state mandated affordable housing
- Protection from current and future droughts
- Social justice for both basins

Now, we are left with a lose-lose-lose:

- Unfairly benefits the Peninsula by taking water from a basin that has a greater need and has worked harder to solve its own water issues without taking it from the Carmel River basin.
- Instills animosity and the appearance of entitlement between entities
- Guarantees even more litigation, delay and expense
- No protection from prolonged droughts or effects of global warming
- Does not create a new water source just redirects an existing one

This drought is showing the folly of depending on a 1-legged stool. Both of our water basins are in trouble. It is unfair to take the water from our basin to solve the Peninsula's problem, particularly when it has had decades to resolve this problem and finds every excuse to control growth by limiting the water supply, denying every solution, each one more expensive than the last, and then complaining about the cost.

If the Carmel Valley was being starved of water by North County taking sources to solve its water problem, would the Coastal Commissions consider that social justice?

Castroville receiving Subsidized Water

Finally, Castroville has never asked for or received subsidized water. In fact, CCSD twice turned down any water deal with the MPWSP because we anticipated getting dragged into the never-ending Peninsula Water Politics Insanity (PWPI). Castroville was approached by MPWMD, MCWRA, Mayors Select Water Committee, Landwatch, Surfrider, MCFB, SVWC, and others to please help by taking the in-basin water (fresh water that could not leave the basin) allowing our friends on the Peninsula to stop illegally pumping the Carmel river and get off the CDO.-WIN+WIN.

It was actually cheaper to sell the <5% component of fresh water to Castroville than to pump back in the ground. Castroville still had to come up with millions for a pipeline and risked the source water going 100% salty. With a Median Household Income of $35K (as confirmed by the 2017 California Rural Water Assoc. MHI survey) Castroville is a confirmed Severely Disadvantaged Community, but we agreed to pay the same cost for pumping from our wells and in return shut off our wells which would reduce the

overdraft in the 400' aquifer by 680 acft thus helping our overdrafted basin some measure of recovery-WIN.

WIN-WIN-WIN

A win for the peninsula, a win for Castroville and a win for our basin. Then, a return to the insanity.... Measure J, PWMx and Coastal Commission denial. After measure J, which no one in the Salinas Valley voted for, everyone bailed on us confirming my worst premonition. Instead, CCSD wasted valuable time, money and resources by trying to help our neighbors only to get thrown under the bus. Time in which Seawater intrusion ruined our best well and is now within 1800' or less from our remaining wells. Well, I guess they are correct, no-good deed goes unpunished. Castroville is the "canary in the coal mine" and should be a warning to Coastal staff and others that delaying further a new regional solution in the face of droughts and global warming is reckless.

In the big picture, If we have a water system that impacts the number one industry in your county and we are going through these types of issues, to consider that an adequate resilient water supply, and so we need other sources. Trying to do this with just pure water expansion is a mistake we must look to other sources beyond just Pure One Water, we must have another water system and that is desalination

I urge you to support the MPWSP, create a long-term solution for the Peninsula's CDO, water shortages, affordable housing, help Castroville and stop the endless excuses denying a Desal project.

Respectfully submitted,

J Eric Tynan
General Manager
Castroville CSD
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October 14, 2022

Mr. Tom Luster, Senior Environmental Scientist
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

Via Email: tom.luster@coastal.ca.gov

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603

The California Chamber of Commerce (CalChamber) urges that the Commission grant a Coastal Development Permit for California American Water Company's (CalAm) Monterey Peninsula Water Supply Project (Project). The current extended drought period and the increasing impacts of climate change have highlighted how critical it is for California to be proactive and creative in order to secure more reliable water supplies.

Desalination is a viable option to increase the state's water supply. Every effort should be made to pursue desalination where appropriate and feasible. These projects provide an invaluable addition to a well-balanced local or regional water portfolio. Indeed, Governor Newsom's recent Water Supply Strategy expressly identifies desalination as an important tool in building a more resilient water supply system in California. The Monterey Peninsula business community has a significant stake in the future of the region's water supply, the health of the Carmel River, and the protection of the Monterey Bay National Marine Sanctuary. The Project will meet the community's need for water, satisfy the State Water Resources Control Board's 2009 Cease & Desist Order and end the moratorium on new water hook ups.

When it comes to the environment, California has never been satisfied with business as usual. We lead the world in technology, adapting to climate change, protecting the environment, and providing safe, clean drinking water. Desalination should be no exception. However, in this respect, California is falling behind many other parts of the world. In order to rise to the challenges presented by climate change and prevent water shortages, California must embrace desalination. The Project in particular would employ slant wells, which are more environmentally friendly than other types of ocean water intakes because they only minimally disturb habitat and ocean life. Furthermore, CalAm has committed to expanding its current water affordability programs to ensure that all consumers can afford water service. In short, the Project is the right design in the right place at the right time.

CalChamber believes that the Coastal Commission should approve the Coastal Development Permit required for this Project.

Sincerely,

Brenda C Bass

Brenda Bass
Policy Advocate

cc:
Donne Brownsey, Chair
Dr. Caryl Hart, Commissioner
Sara Aminzadeh, Commissioner
Mike Wilson, Commissioner
Carole Groom, Commissioner
Roberto Uranga, Commissioner
Dayna Bochco, Commissioner
Effie Turnbull-Sanders, Commissioner
Linda Escalante, Commissioner
Catherine Rice, Commissioner
Meagan Harmon, Commissioner
Steve Padilla, Commissioner

1215 K Street, Suite 1400
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CHAMBER OF COMMERCE
& TOURIST CENTERS

14 October 2022

California Coastal Commission Members
455 Market Street, Suite 300
San Francisco, CA 94105

RE: Support for the Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603

Members of the Coastal Commission,

On behalf of the Pacific Grove Chamber of Commerce Board of Directors, representing over 350 local businesses and organizations, I am writing in in strong support of the Monterey Peninsula Water Supply Project (MPWSP). The MPWSP will provide a critically needed, reliable water source for our region. I urge the California Coastal Commission to approve this project to help protect the economic vitality of the Monterey Peninsula.

Water shortages hurt our workforce. A lack of reliable water has resulted in a decades-long building moratorium, exacerbating our ability to provide affordable workforce housing in the region, increasing costs and forcing workers to drive long distances between their jobs and where they can afford to live. The uncertainty of a reliable water source directly threatens jobs and our local economy. Local businesses from agriculture to hospitality to the construction industry all need water to remain viable.

The MPWSP is part of a comprehensive, responsible approach to create a long-term, reliable water source through desalination, stormwater capture and water recycling. It will protect the Carmel River ecosystem and supply new water for housing and jobs.

The Monterey Peninsula has been in dire need of drought-proof, reliable water supplies for decades. There's no time left to wait. Without new water supplies, our region is already facing water rationing, continued building moratoriums and a strained economy. We desperately need the California Coastal Commission to approve the Monterey Peninsula Water Supply Project.

Stay well and thank you,

Jenny MacMurdo

Jenny MacMurdo
President & CEO
Pacific Grove Chamber of Commerce

Seaside Groundwater Basin Watermaster
P.O. Box 51502, Pacific Grove, CA 93950
watermasterseaside@sbcglobal.net
(831) 595-0996

October 14, 2022

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603

Dear Mr. Luster,

The Seaside Groundwater Basin Watermaster is tasked by the Court to administer the Seaside Basin. Our board is comprised of elected officials and others who each have a role in the protection and management of the basin.

Today we once again write regarding the Coastal Development Permit (CDP) for California American Water Company's (CAW) Monterey Peninsula Water Supply Project (MPWSP). The Watermaster also wrote the Commission on October 4, 2019 and August 12, 2020. Please incorporate those prior letters by reference.

The Commission and other stakeholders must understand what is at stake for the Seaside Basin and the water supplies that are dependent on the health and security of the Basin. The long-term health of this basin is of the utmost importance. It has become the most critical water supply resource for the Monterey Peninsula. The Basin provides native groundwater for municipal uses in CAW's Monterey and Laguna Seca service areas and the City of Seaside. The Seaside Basin also provides critical groundwater storage for CAW's Aquifer Storage and Recovery (ASR) diversions from the Carmel River, and provides storage and treatment of recycled water for Monterey One Water's original Pure Water Monterey (PWM) Project as well as its expansion.

The loss of Seaside Basin storage as a result of overdraft and seawater intrusion would have a catastrophic impact on these crucial existing water supplies, not only for CAW's customers on the Monterey Peninsula, but for the other municipal and irrigation users in Monterey County.

We ask that the Commission take notice of the recent updates to our groundwater modeling and water budget analysis. Attached, please find the Summary of Updated Replenishment Water Analyses prepared by our Technical Program Manager. As noted, the original basin studies were performed in 2013. That work, as well as additional modeling, was referenced in prior correspondence. The two 2022 updates simulated groundwater conditions from 2018 through 2050. The most recent used a "hybrid water budget" that contained additional assumptions. In short, our technical team and the consulting hydrologists looked at both a "best case scenario" and a more "conservative" one. Montgomery & Associates presented these studies to our Board at its September 7, 2022 meeting where they were unanimously accepted.

As noted in the attached Executive Summary, our basin is in need of replenishment water. Specifically, it states –

> *"Under the "best case" scenario 1,000 acre-feet-per-year (AFY) of water would need to be injected into the Seaside Basin every year to replenish it and raise groundwater levels high enough to prevent seawater intrusion from occurring. Under the "conservative" scenario the amount needed would be 3,600 AFY every year.*
>
> *Unless replenishment water in these quantities is added annually, the Seaside Basin will be at risk of seawater intrusion, and that risk will increase each year that groundwater levels continue to fall and remain below sea level. Implementation of the PWMX project does not accomplish this, and an additional source of replenishment water will be needed. The only other potential source of replenishment water will be from desalination."*

While the Seaside Basin's need for additional replenishment water is universally recognized, there remains some disagreement as to how much is actually necessary. For instance, the Monterey Peninsula Water Management District's General Manager has argued that the actual amount may be less than what the studies show. Conversely, a presentation by Montgomery & Associates to our Board at its last meeting suggested that the basin needs may actually be greater. Specifically, they questioned "What is the new normal?" for rainfall. They noted that the percentage of critically dry years over the last 25 years was higher than over the last 50 years. This suggests that the negative impacts of climate change might not be fully accounted for in our current modeling.

We cannot stress enough the Seaside Basin's need for water so that it can build protective water levels and stave off seawater intrusion. While some projects appear to address this need, they really just treat the basin like a bank account…depositing, storing, and then removing water. The studies and modeling show what we really need is water that remains in the basin.

Please take our basin needs into account when making your water supply decision.

Sincerely,

Paul B. Bruno
Chairman

Attachment: Summary of Updated Replenishment Water Analyses, Seaside Basin Watermaster, October 10, 2022

SUMMARY OF UPDATED REPLENISHMENT WATER ANALYSES

Prepared by Robert Jaques, P.E., Technical Program Manager, Seaside Basin Watermaster
October 10, 2022

Executive Summary

Two sets of assumptions were used in these analyses. One was a "best case" scenario based on future water demand projections, Aquifer Storage and Recovery (ASR) injection rates, and Pure Water Monterey Expansion (PWMX) injection rates prepared by the Monterey Peninsula Water Management District (MPWMD). The other was a more "conservative" scenario based on future water demand projections and the timing of start-up of Cal Am's desalination plant contained in Cal Am's 2020 Urban Water Management Plan, ASR and PWMX injection rates with a built-in margin of safety, and revised water demands for the City of Seaside's golf courses proposed by Cal Am and the City of Seaside.

Under the "best case" scenario 1,000 acre-feet-per-year (AFY) of water would need to be injected into the Seaside Basin every year to replenish it and raise groundwater levels high enough to prevent seawater intrusion from occurring. Under the "conservative" scenario the amount needed would be 3,600 AFY every year.

Unless replenishment water in these quantities is added annually, the Seaside Basin will be at risk of seawater intrusion, and that risk will increase each year that groundwater levels continue to fall and remain below sea level. Implementation of the PWMX project does not accomplish this, and an additional source of replenishment water will be needed. The only other potential source of replenishment water will be from desalination.

Background

In April 2013, HydroMetrics Water Resources Inc. (now acquired by Montgomery & Associates) performed groundwater modeling to estimate the amount of replenishment water that would be needed to achieve protective groundwater levels in the Basin. In 2022 the 2013 work was updated to account for new assumptions and information gained since the 2013 work was performed, and to incorporate the impacts of projects that have been implemented since the 2013 work was performed, or are expected to be implemented in the next few years. This Summary provides a condensed version of this updated analysis.

In 2009 HydroMetrics Water Resources Inc. performed groundwater modeling to establish "protective elevations" at six wells located along the coastline. The term "protective elevation" refers to an elevation that is sufficiently above sea level such that seawater cannot move inland into the well.

Updated Analysis

The updated analysis simulated groundwater conditions in the Seaside Basin from 2018 through 2050. It focused on the groundwater conditions in the Northern Coastal Subarea of the Basin, within which are located all of the ASR and PWM injection and extraction wells, and the majority of the water supply production wells. This subarea is the one in which all but one (CDM-MW4) of the six protective elevation monitoring wells are located, is the only subarea that sees notable response to the simulated replenishment operations, and is the subarea at greatest risk from seawater intrusion.

In this Summary the term "*Baseline Scenario*" refers to the simulation of future conditions assuming only operation of currently planned projects with no additional replenishment added. The *Baseline Scenario* represents recent conditions from Water Year (WY) 2018 through 2021 based on actual measured pumping, injection, and hydrology. The projected potential future conditions from WY 2022 through WY 2050 are based on pumping to meet the water demands projected by MPWMD, currently operational or planned projects (but not including a desalination plant), and repeating the historical hydrology cycle into the future. That assumes that the same rainfall and drought pattern that has been experienced in recent years (the period 1988 through 2016) will repeat itself beginning in 2022 and up to the end of the analysis period in 2050.

The term "*Baseline Scenario with Replenishment Water Added*" refers to the simulations in which replenishment water in varying amounts was added to the *Baseline Scenario* in order to see how much replenishment water would be needed to achieve protective groundwater elevations in the Basin.

The term "*Alternate Scenario*" refers to the simulation of future conditions with the following different assumptions than those used in the *Baseline Scenario*, as requested by the City of Seaside and Cal Am:

- Revised City of Seaside Golf Course water demand
- Applying a factor of safety on the amount of water that will be supplied by ASR by using a lower daily ASR injection rate of 15 Acre-feet-per-day (AFD) compared to the 20 AFD used in the *Baseline Scenario*
- Use of the water demand figures and the start-up date for the desalination plant in Cal Am's 2020 Urban Water Management Plan
- Starting Cal Am's over-pumping repayment program of 700 Acre-feet-per-year (AFY) coinciding with the start-up of the desalination plant
- Applying a factor of safety on the amount of water that will be supplied by the PWM Expansion project by reducing its projected supply from the 5,750 AFY used in the *Baseline Scenario* to 4,600 AFY

The term "Shallow Aquifers" refers collectively to the Aromas Sands & Older Dune Deposits and the Paso Robles Aquifer. The term "Deep Aquifer" refers to the Santa Margarita Aquifer.

All of the Scenarios take into account:

- The City of Seaside's replacement of groundwater with recycled water for golf course irrigation and the construction of the Security National Guaranty (SNG) and Campus Town developments in the City of Seaside
- The assumption that no proposed Groundwater Sustainability Plan (GSP) projects are implemented in the neighboring Monterey and 180/400 Foot Subbasins, and that groundwater levels along the northern boundary of the Model (located close to the boundary between those two subbasins) remain unchanged as currently represented in the Model boundary conditions
- A projected mean sea level rise of up to 1.3 feet by 2050
- Cal Am's overpumping repayment program assumed at 700 AFY for a period of 25 years

Comparisons of the events and assumptions under the *Baseline Scenario* and the *Alternate Scenario* are shown in Tables 1 and 2. The hydrologic cycle used in each Scenario is shown in Figure 1.

Figure 2 shows the annual net flows going into and out of the Basin's shallow and deep aquifers in the Northern Coastal Subarea under the *Baseline Scenario*. There are a number of flow components that are accounted for in determining the net flows each year, including:

- Inflows consisting of percolation from rainfall and PWM and ASR injected water.
- Outflows consisting of pumping from extraction wells (production wells, ASR wells, and PWM wells).
- Flows into and out of the adjacent subareas and the offshore area, and between the Shallow and Deep aquifers. These can be either flows into or out of the aquifers, depending on the hydraulic gradients between the aquifers and the adjacent subareas or aquifers. Changes in those gradients can change the flow directions as groundwater levels change.

In Figure 2 positive values of net flow mean that inflows were greater than outflows in that Water Year. Negative values mean that outflows were greater than inflows in that Water Year. Figure 3 shows the cumulative change in storage in the aquifers over the simulation period. In years when there is a positive net flow, storage increases and groundwater levels rise. In years when there is a negative net flow, storage decreases and groundwater levels fall.

Figure 4 shows the locations of the six protective elevation wells. Figures 5 through 10 compare the groundwater elevations achieved at each of the protective elevation wells under the *Baseline* and *Baseline with Replenishment Water Added Scenarios*. Those Figures show that without replenishment water being added, protective groundwater elevations cannot be achieved and the Seaside Subbasin will be at risk of seawater intrusion.

Figure 11 shows the magnitude of groundwater loss from the Seaside Subbasin to the adjacent Monterey Subbasin under the *Baseline Scenario*. The losses under all of the scenarios in which replenishment water is added to the Subbasin will be greater than the amounts shown in Figure 11.

Figure 12 shows the amount of additional replenishment needed each year under the *Alternate Scenario* to achieve the same water level increases as in the *Baseline Scenario* (green bars), and to achieve the same level of protective elevations as in the *Baseline Scenario with Replenishment Water Added* (blue line with circle markers). Since the *Baseline Scenario* did not achieve protective elevations, only the amount of water needed under the *Baseline Scenario with Replenishment Water Added* is of significance.

Table 1. Timeline Comparison of the Baseline and Alternate Scenarios

Sim Year	Water Year	Hydrology Source WY	Pumping & Injection	Major Projects Timeline (Does not show the Campus Town and SNG development projects, but the water demands of those projects are accounted for in the analyses)	
				Baseline Scenario	*Alternate Scenario*
1	2018	Actual	Actual		
2	2019	Actual	Actual		
3	2020	Actual	Actual	PWM Base Project Begins (3,500 AFY)	PWM Base Project Begins (3,500 AFY)
4	2021	Actual	Actual	Cal-Am ceases pumping in Laguna Seca	Cal-Am ceases pumping in Laguna Seca
5	2022	1988	Projected	PWM ramps up to 4,100 AFY	PWM ramps up to 4,100 AFY
6	2023	1989	Projected	Seaside Golf Courses shift to PWM water	Seaside Golf Courses shift to PWM water
7	2024	1990	Projected	PWM Expansion Begins (5,750 AFY) & Cal Am Overpumping Repayment of 700 AFY Begins	PWM Expansion Begins (4,600 AFY)
8	2025	1991	Projected		
9	2026	1992	Projected		
10	2027	1993	Projected		
11	2028	1994	Projected		
12	2029	1995	Projected		
13	2030	1996	Projected		Cal Am Desalination Plant Goes On-line & Overpumping Repayment of 700 AFY Begins
14	2031	1997	Projected		
15	2032	1998	Projected		
16	2033	1999	Projected		
17	2034	2000	Projected		
18	2035	2001	Projected		
19	2036	2002	Projected		
20	2037	2003	Projected		
21	2038	2004	Projected		
22	2039	2005	Projected		
23	2040	2006	Projected		
24	2041	2007	Projected		
25	2042	2008	Projected		
26	2043	2009	Projected		
27	2044	2010	Projected		
28	2045	2011	Projected		
29	2046	2012	Projected		
30	2047	2013	Projected		
31	2048	2014	Projected	Potential Final Year of Cal-Am Repayment Period	
32	2049	2015	Projected		
33	2050	2016	Projected		Cal-Am Repayment Period Does Not End Before the End of the Simulation Period

Table 2. Differences in Golf Course Demand and ASR Injection Rates Between the Baseline and Alternate Scenarios

Supply or Demand Source	*Baseline Scenario*	*Alternate Scenario*
City of Seaside Golf Course Water Demand, AFY	301	514
ASR Daily Injection Rate, AFD	20	15

Figure 1. Hydrologic Cycle Used in all of the Scenarios

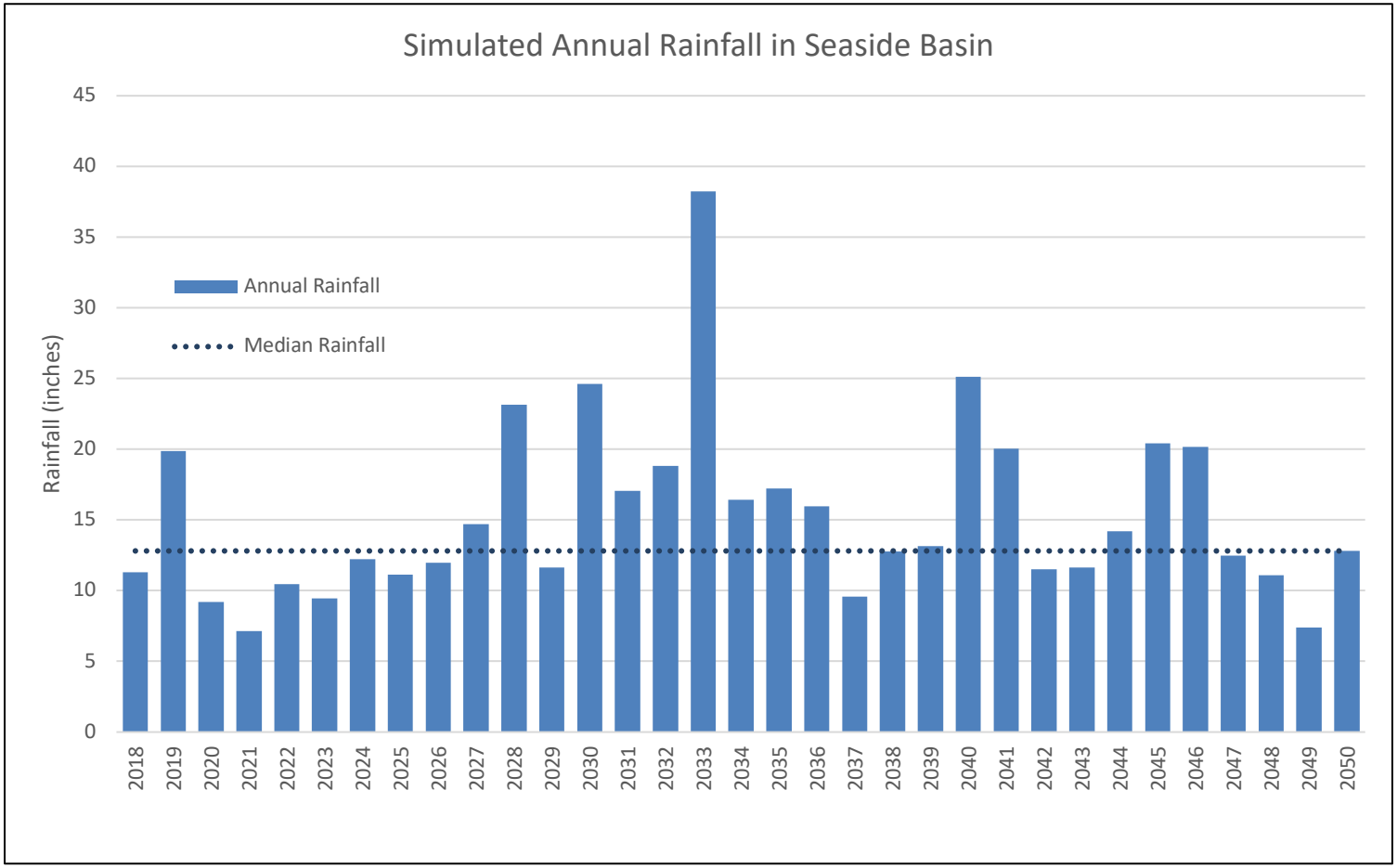


Figure 2. Yearly Flows Into and Out of the Aquifers in the *Baseline Scenario*

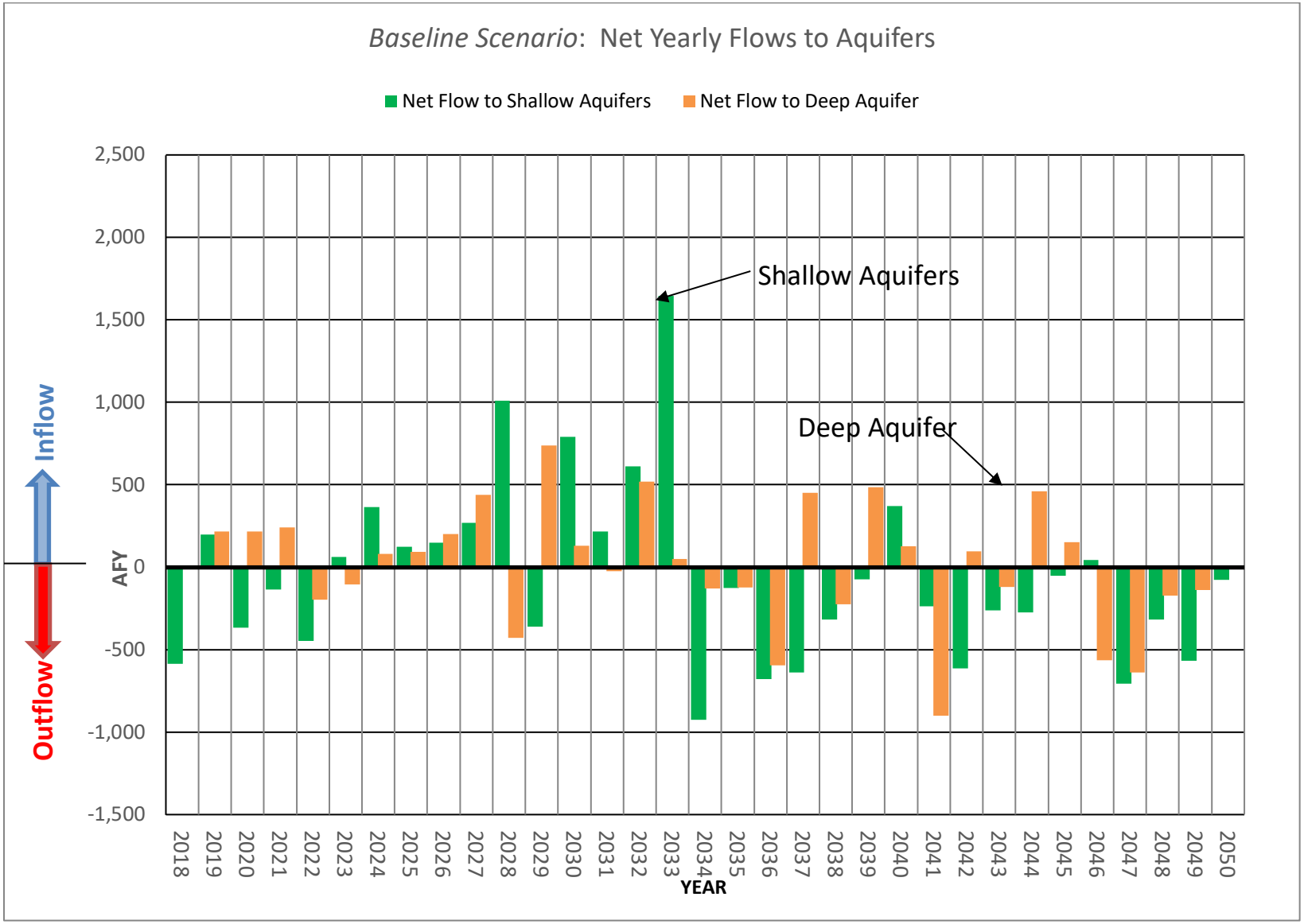


Figure 3. Cumulative Change in Storage in the *Baseline Scenario*

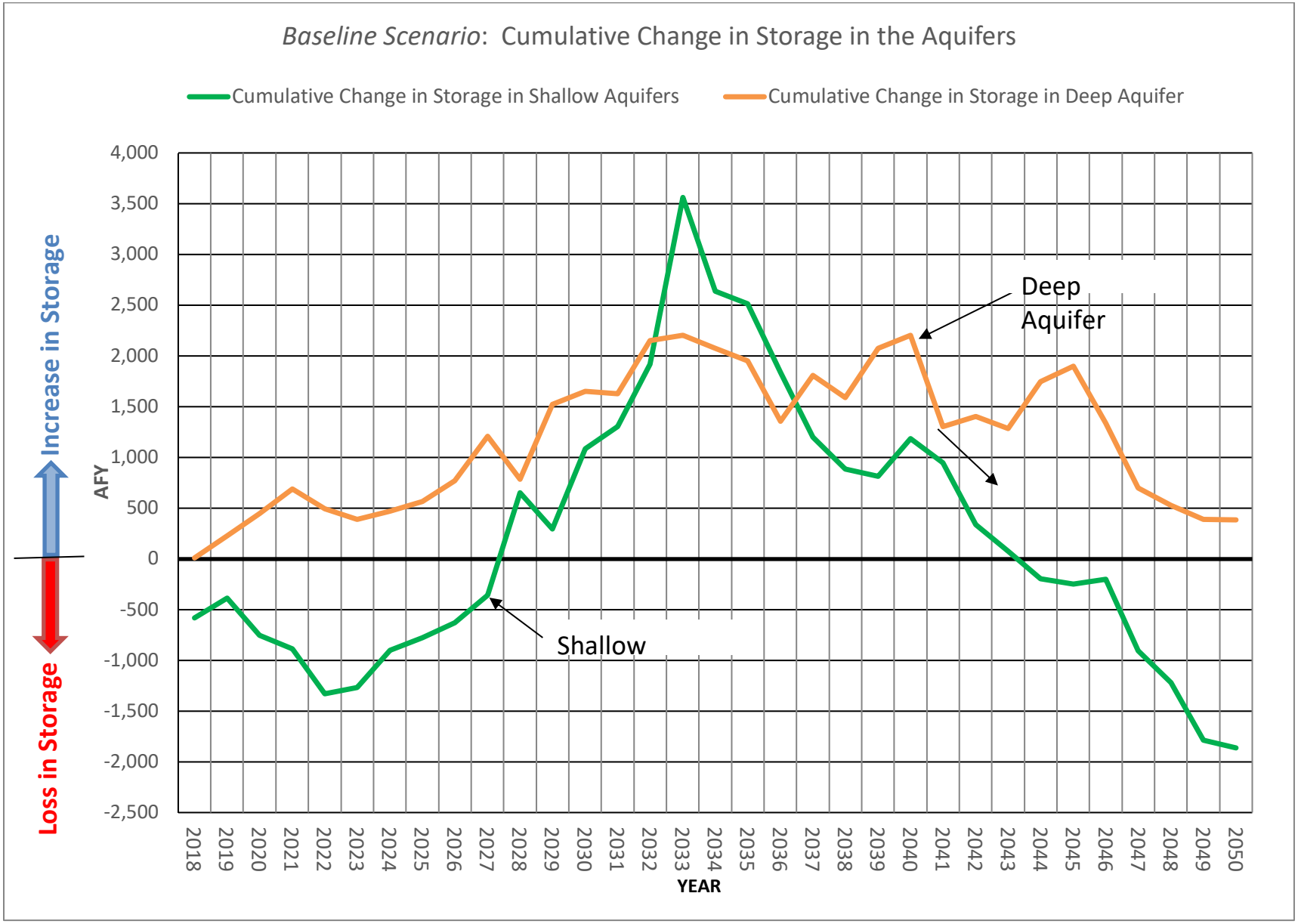


Figure 4. Locations of Protective Elevation Wells

Figure 5. Groundwater Elevations Compared to the Protective Elevation at Sentinel Well #3 Under the *Baseline and Replenishment Water Added Scenarios*

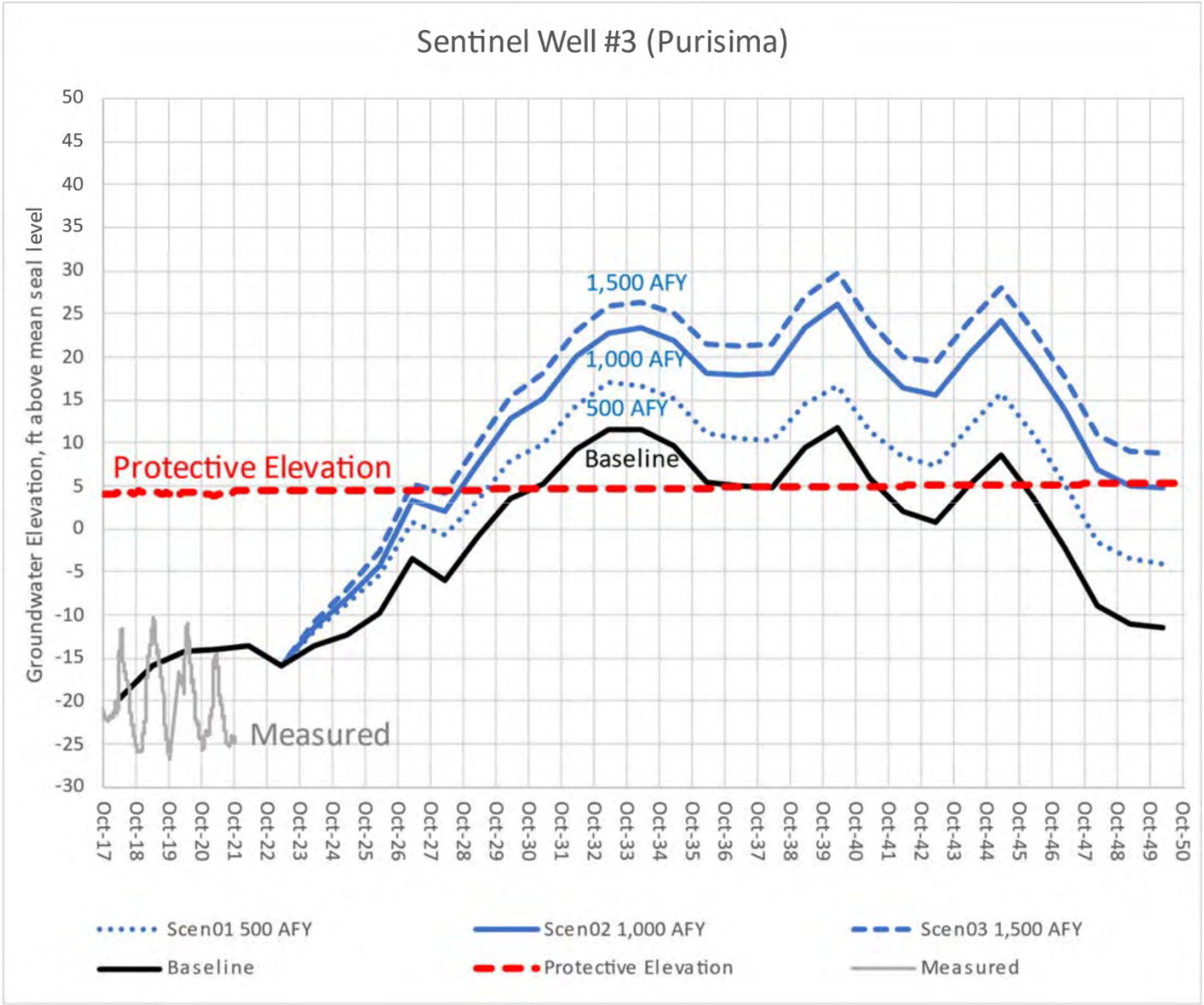


Figure 6. Groundwater Elevations Compared to the Protective Elevation at Well PCA-A West Deep Under the *Baseline and Replenishment Water Added Scenarios*

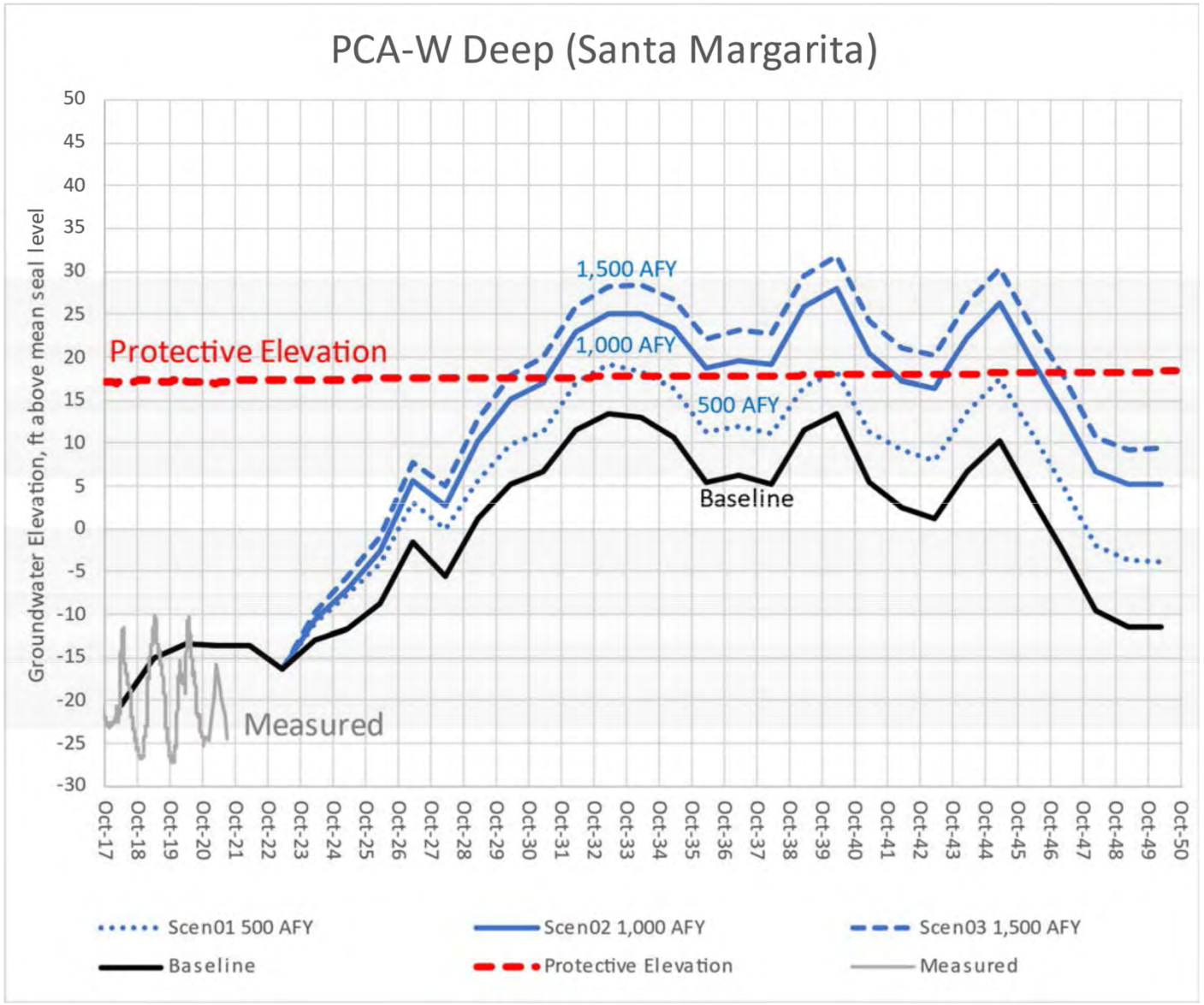


Figure 7. Groundwater Elevations Compared to the Protective Elevation at Well PCA-A West Shallow Under the *Baseline and Replenishment Water Added Scenarios*

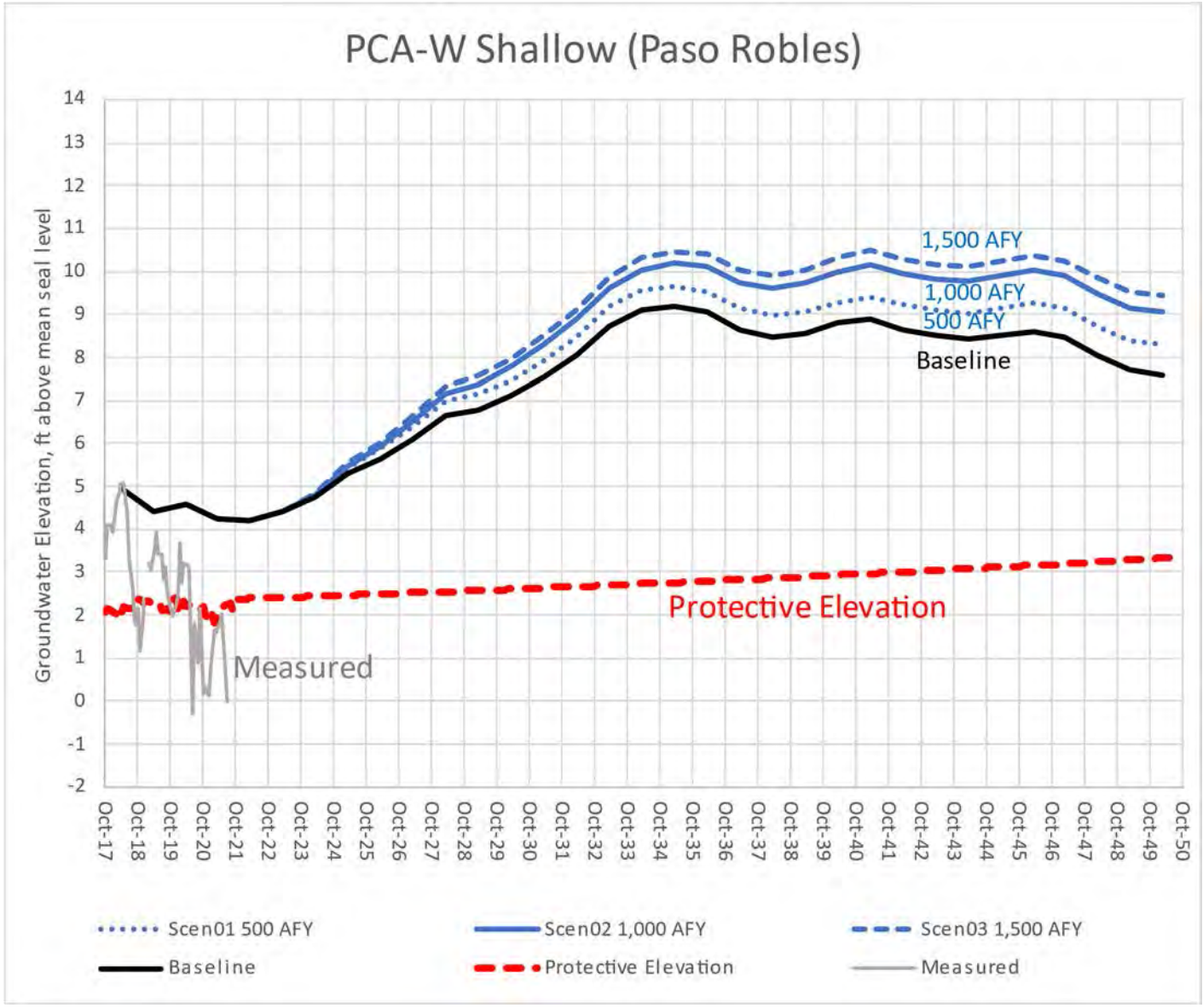


Figure 8. Groundwater Elevations Compared to the Protective Elevation at Well MSC Shallow Under the *Baseline and Replenishment Water Added Scenarios*

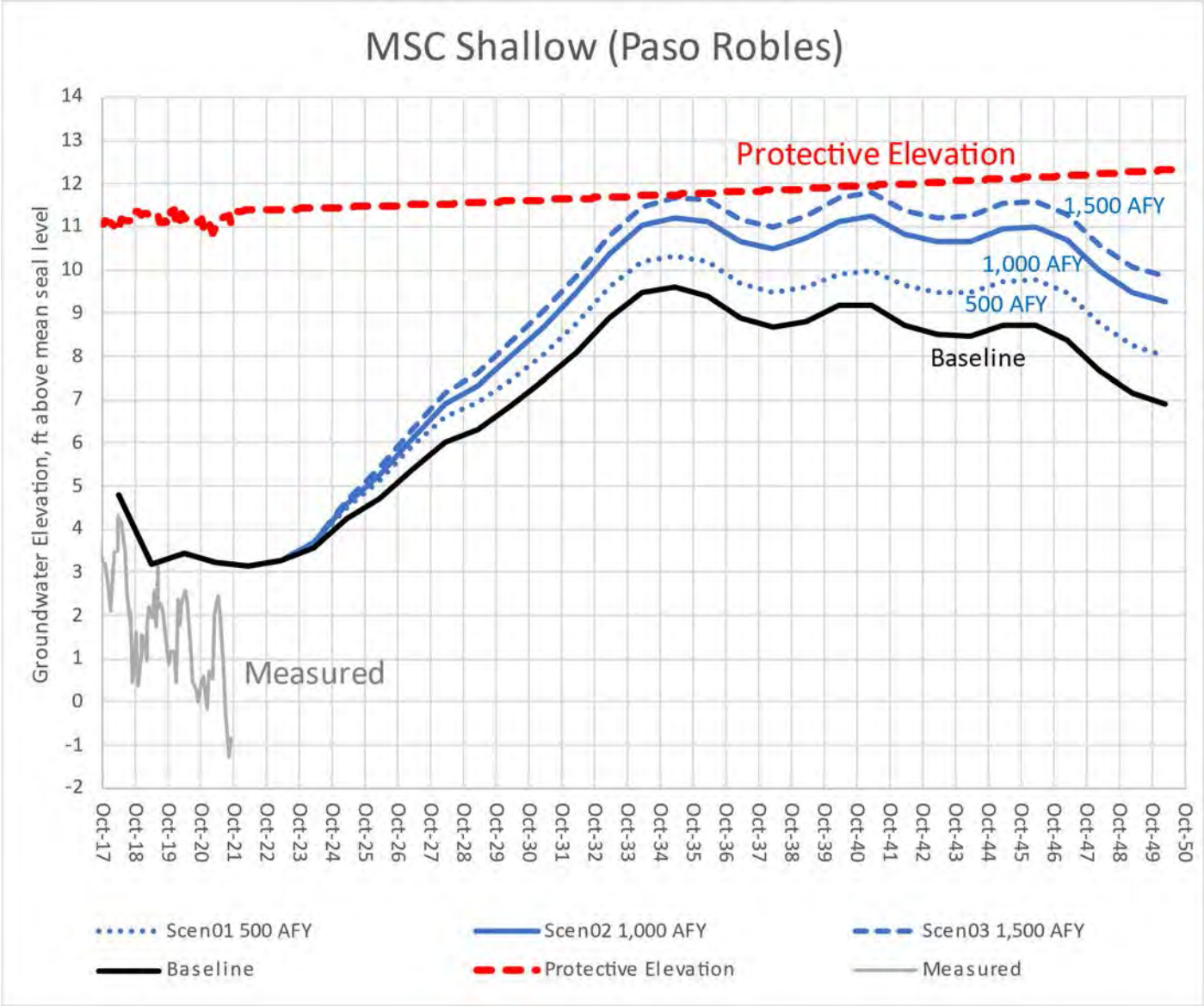


Figure 9. Groundwater Elevations Compared to the Protective Elevation at Well MSC Deep Under the *Baseline and Replenishment Water Added Scenarios*

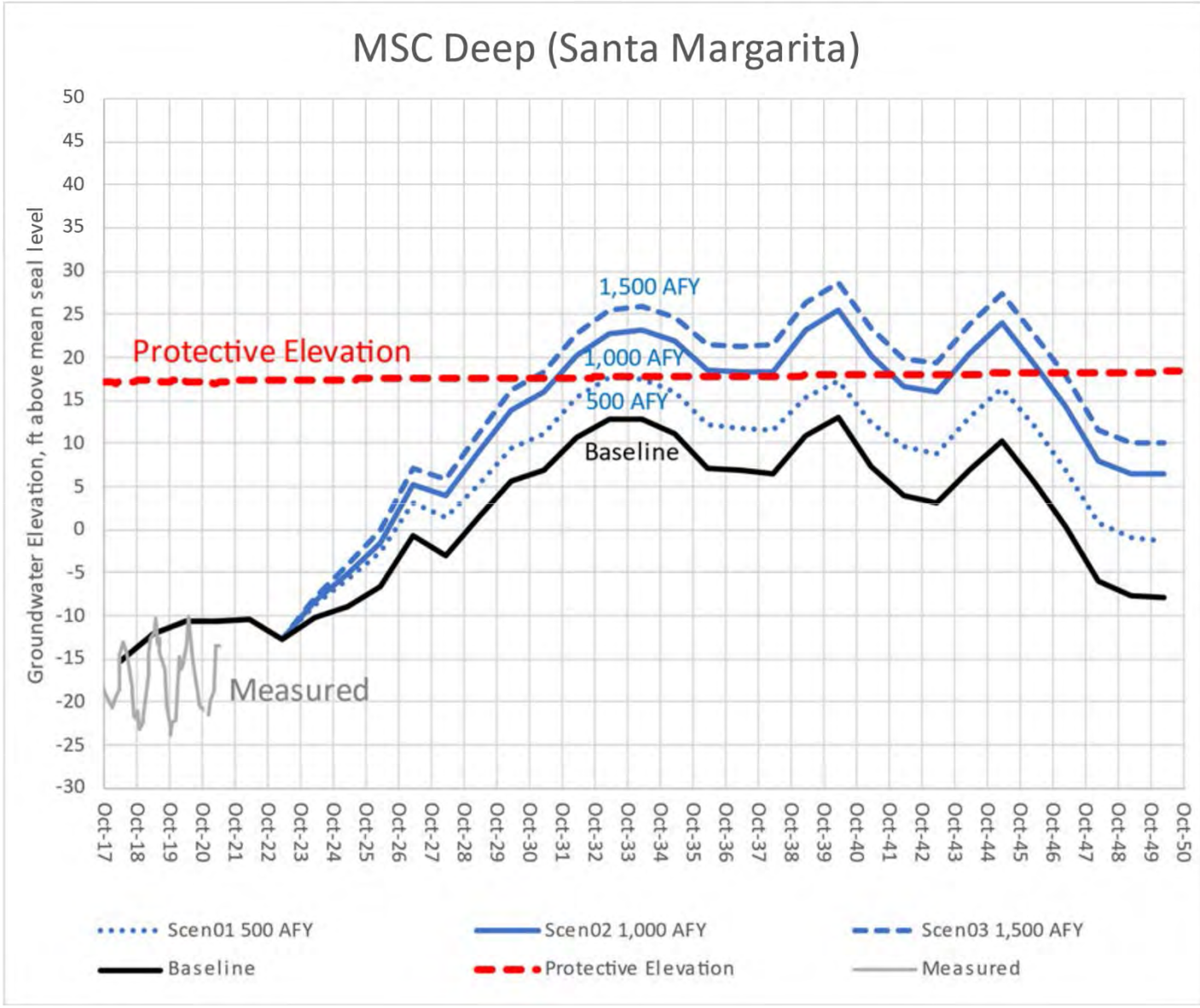


Figure 10. Groundwater Elevations Compared to the Protective Elevation at Well CDM MW-4 Under the *Baseline and Replenishment Water Added Scenarios*

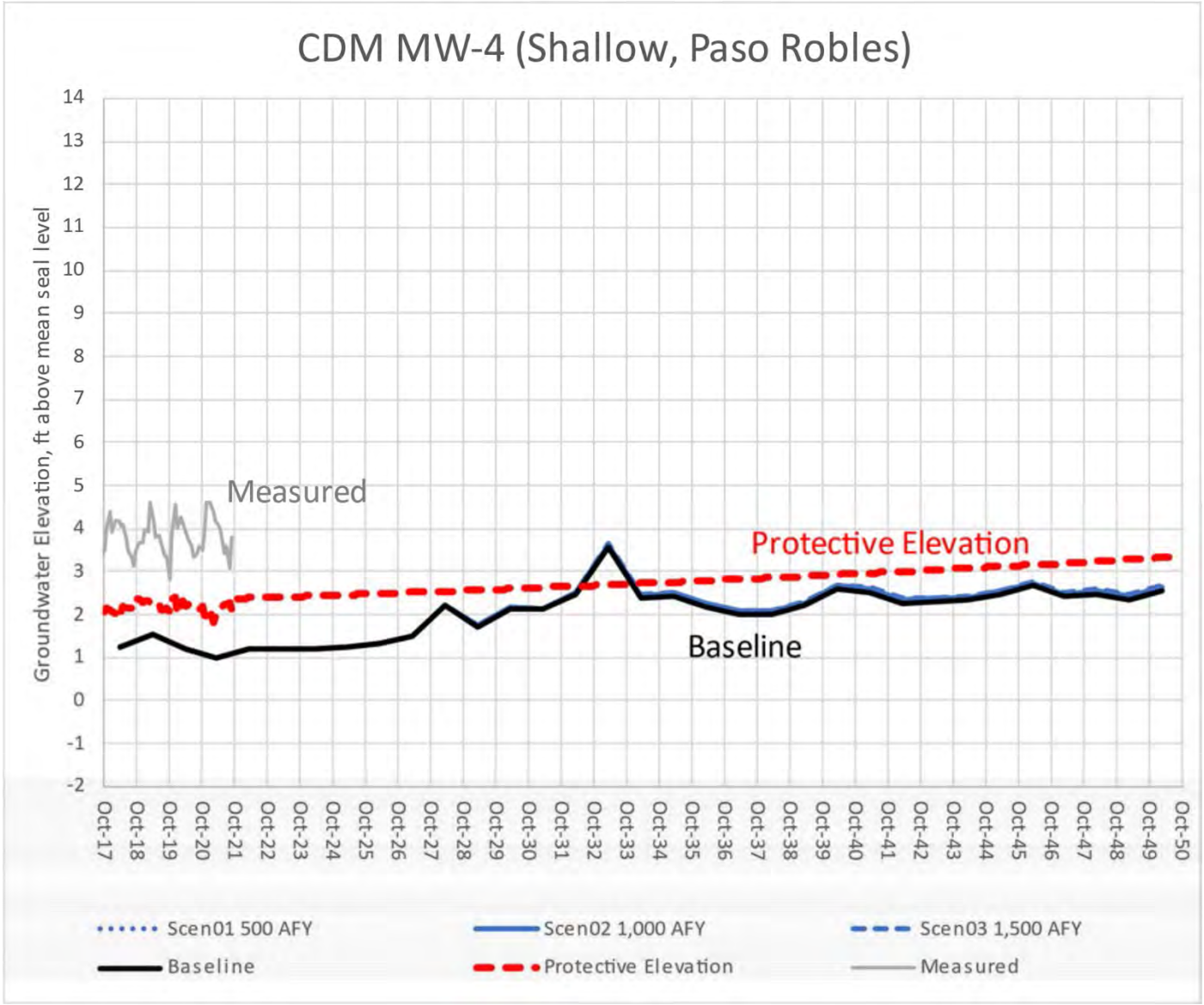


Figure 11 Annual Groundwater Losses from the Seaside Subbasin to the Monterey Subbasin under the *Baseline Scenario*

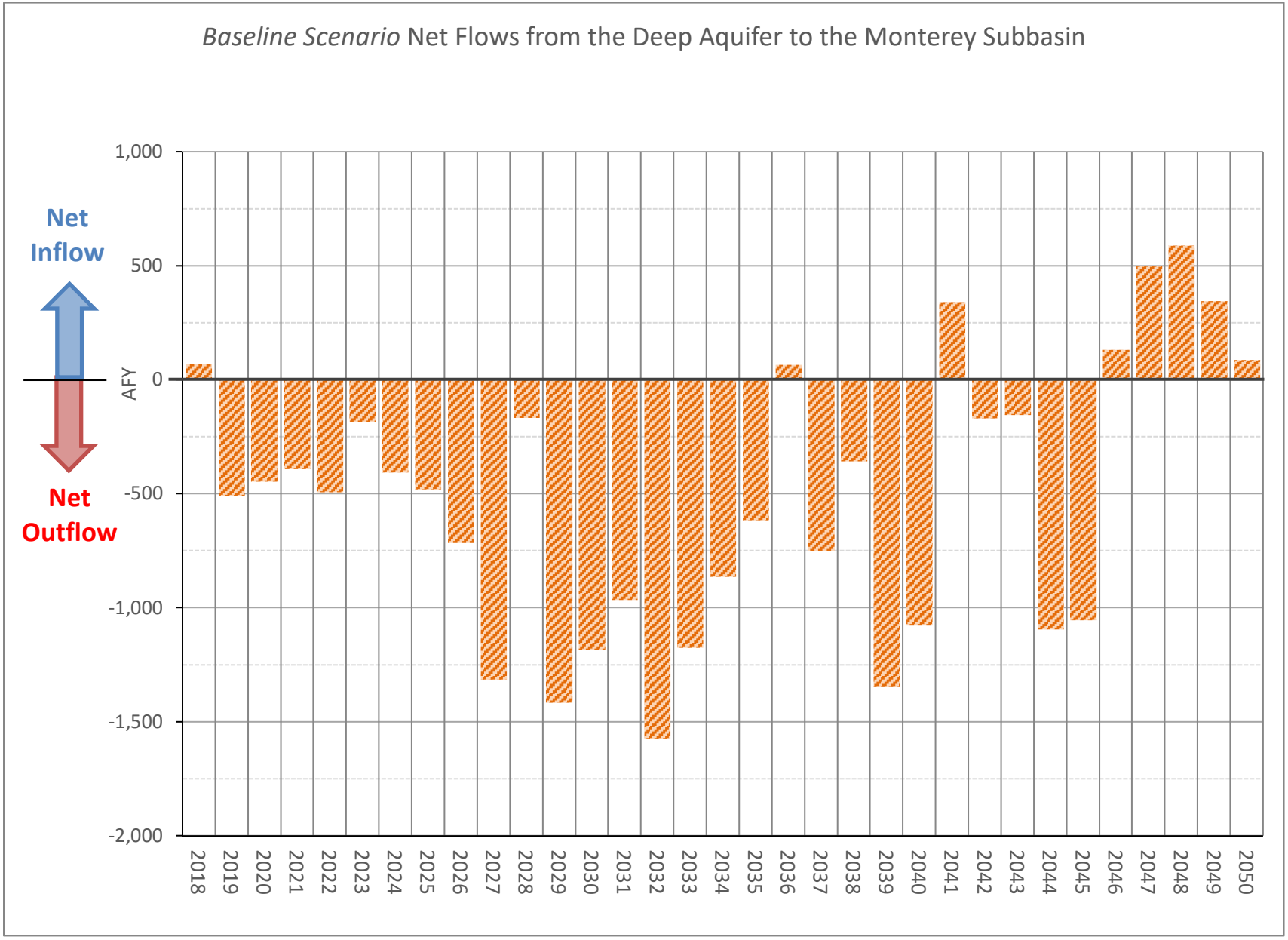
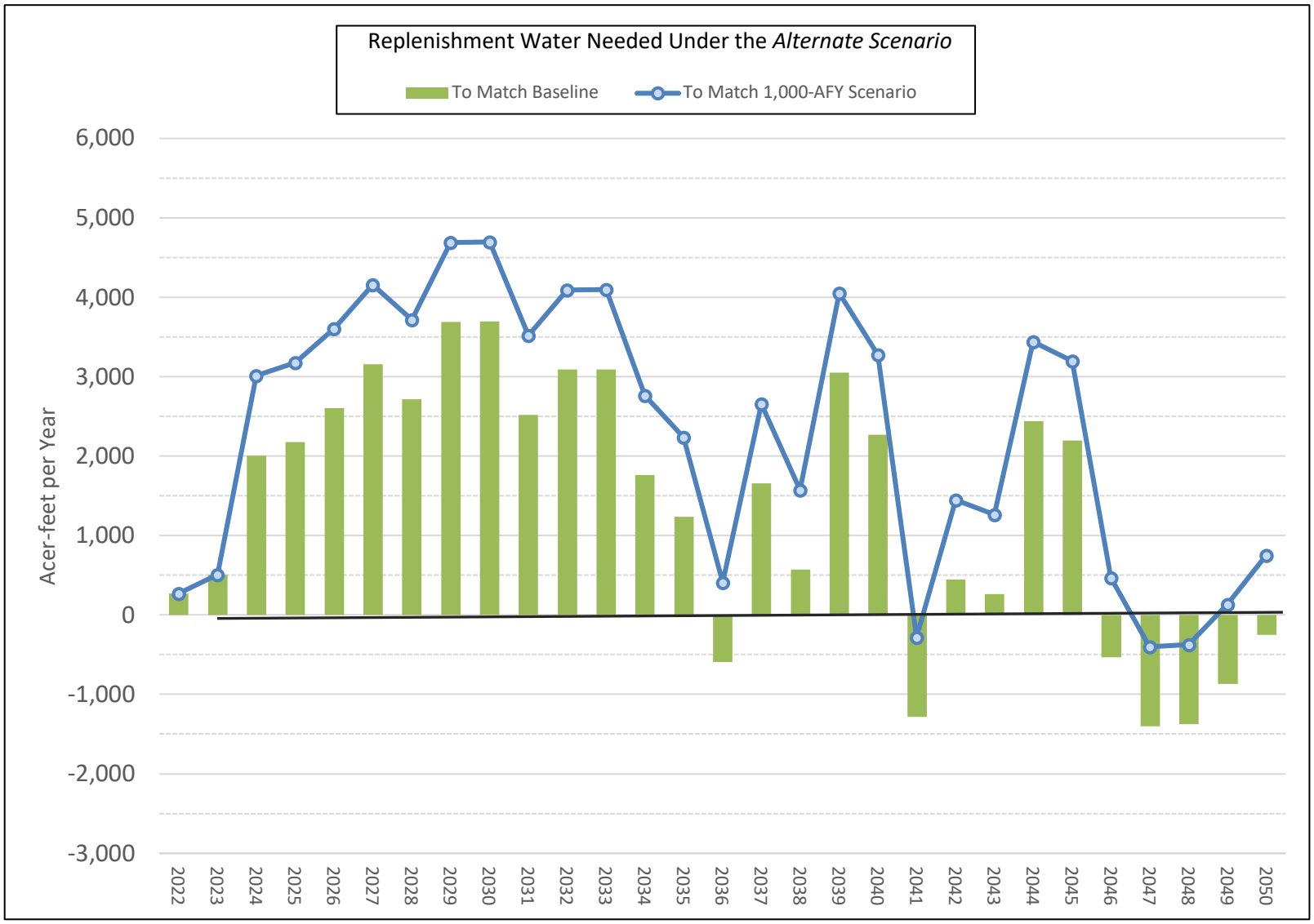


Figure 12. Replenishment Water Needed Annually to Achieve Protective Elevations Under the *Alternate Scenario*



CONCLUSIONS

General:

1. The updated analyses tie ASR and PWM injection and extraction volumes to the hydrologic cycle and illustrate the significant impact that multi-year droughts, and even just below normal rainfall periods, can have on the availability of water for ASR and PWM recharge and on the timing of reaching and maintaining protective elevations.
2. The protective elevations developed in 2009 assumed steady-state conditions that had no time component to them. That modeling work assumed that sufficient time would have passed such that conditions would have equilibrated to a fixed state. That modeling did not consider and did not suggest for how long a period groundwater levels could stay below protective elevations without greatly increasing the risk of sea water intrusion. This is something that would require additional modeling to evaluate, and would also require making an assumption about how far offshore the seawater-fresh water interface is located.
3. Groundwater levels rise quickly in response to replenishment during periods of normal and above-normal water years following the prolonged drought occurring at the start of the simulation period. This suggests that levels would rebound again after the drought that occurs at the end of the simulation period. However, the rapid rebound is also a function of the assumption that Cal-Am will extract ASR water as its last source of supply, after exhausting available water from its native groundwater rights and PWM water. This assumption has the consequence that a very large portion of the injected ASR water is left in storage in the Basin.
4. If groundwater levels in the Monterey Subbasin do not rise, outflows to the Monterey Subbasin will increase in all aquifers as groundwater levels in the Seaside Subbasin rise. An initial net inflow of water from the offshore region into the Seaside Subbasin reverses to a net outflow in all aquifers as groundwater levels increase.
5. Projected sea level rise is not a significant driver of inland flows compared to the changes in water levels associated with changes in injection and extraction in the subbasin.
6. Groundwater conditions in the adjacent Monterey Subbasin have a big effect on the amount of replenishment water needed. For all of the Scenarios in most years outflow from the Seaside Subbasin to the Monterey Subbasin is the single largest net outflow.
7. All of the Scenarios assume that water levels along the boundary between the Monterey Subbasin and the 180-400 Foot Aquifer subbasin stay fixed at recent levels and that no management actions or projects are implemented to increase groundwater levels in these neighboring subbasins during the simulation period.
8. As groundwater levels in the Seaside subbasin begin to rise in response to increased recharge, steeper gradients develop towards the Monterey Subbasin, producing increased outflows to the Monterey Subbasin. This reduces the effectiveness of replenishment activities and necessitates greater volumes of replenishment water to reach protective elevations than would be needed if water levels in the Monterey Subbasin were also increasing over time.
9. Increasing the amount of replenishment water while keeping the injection of this water focused in a narrow strip of the Basin results in localized mounding of groundwater that causes water to be lost to the Monterey Subbasin. It may be that spreading the area of injection of the replenishment water out over a broader area further from the subbasin boundary could reduce the amount of this loss.

Baseline Scenario:

1. Under the *Baseline Scenario*, with no replenishment water added it is not possible for the Basin to achieve protective groundwater elevations. This means the Basin would continue to be vulnerable to seawater intrusion.

Baseline With Replenishment Water Added Scenario:

1. Three amounts of added annual replenishment water were evaluated: 500 AFY, 1,000 AFY, and 1,500 AFY.
2. If only 500 AFY of replenishment water is added protective groundwater elevations are only achieved in some parts of the Basin.
3. If 1,000 AFY of replenishment water is added:
    - Protective groundwater elevations are reached throughout the Basin within 11 years. Average annual groundwater levels remain above protective elevations for over 50% of the water years during Cal Am's 25-year overpumping repayment period, except at one of the protective elevation monitoring wells, at which the protective elevation is reached only once, in WY 2035. After this year, groundwater levels stop increasing and slowly decline due to the impact of drought years in the projected hydrologic cycles. In addition to the constant 1,000 AFY of replenishment water, additional "booster" injections might be necessary following protracted drought periods to make up the lost water.
    - There is a reversal from a net inflow of water from offshore to a net outflow of water to offshore, even when protective elevations are not being met at all protective elevation wells. The additional replenishment water adds an additional buffer to maintain strong net offshore outflows even in drought years.
    - A net annual volume of between 200 to 500 AFY flows out from the Shallow Aquifers to the Monterey Subbasin once water levels in the Shallow Aquifers begin to rise, driven by the increasing relative gradients between the groundwater levels in the Northern Coastal Subarea and the lower groundwater levels in the Monterey Subbasin. A similar magnitude of net outflow occurs to the offshore portions of the Shallow Aquifers.
    - A net annual volume of between 600 to 1,700 AFY flows out from the Deep Aquifer to the Monterey Subbasin as groundwater levels rise. In addition, a small amount flows from the Deep Aquifer to the overlying Shallow Aquifer during peak periods when Deep Aquifer groundwater levels rise above the levels in the Shallow Aquifer.
4. Increasing the addition of replenishment water to 1,500 AFY results in only marginal increases in protective elevations. This is particularly true for the Shallow Aquifers. This suggests that there is limited benefit in trying to raise Shallow Aquifer groundwater levels by increasing the amount of replenishment water injected into the Deep Aquifer. Rather, other alternatives could be considered and evaluated such as redistributing pumping from wells screened completely or partially in the Paso Robles aquifer, increased use of recycled water for irrigation purposes such as at Mission Memorial Park, and additional recharge directly to the Paso Robles aquifer.
5. The simulation period ends just as Cal Am's 700 AFY for 25-years overpumping repayment program comes to an end. Once Cal Am resumes pumping at its full groundwater allocation of 1,474 AFY it is likely that additional replenishment water would be needed to offset this increased level of extraction.

Alternate Scenario

1. The increases in Deep Aquifer groundwater levels under the *Baseline Scenario* and the *Baseline with Replenishment Water Added Scenario* would not occur under the supply and demand

assumptions of the *Alternate Scenario* without very large quantities of replenishment water being added.

2. The amounts of replenishment water needed to achieve protective elevations under the *Alternate Scenario* is significantly greater than under the *Baseline Scenario.* As Figure 12 shows, under the *Alternate Scenario* in some years the amount of replenishment water needed to achieve protective elevations would be more than 4,500 AFY, and an average of 3,600 AFY of replenishment water would be needed annually during the time period of 2024-2035. This compares to the 1,000 AFY of replenishment needed under the *Baseline Scenario*. This highlights the sensitivity of predicted groundwater conditions in the Basin to the assumptions that are made about future water demands, future rainfall patterns, and the availability of water supplied from outside the subbasin, including Carmel River ASR diversion, the expanded Pure Water Monterey Project, and the MPWSP Desalination Plant.

MONTEREY COMMERCIAL PROPERTY OWNERS ASSOCIATION

October 13, 2022

Mr. Tom Luster
California Coastal Commission, Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, California 94101

Re: **Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603**

Dear Mr. Luster,

Monterey Commercial Property Owners Association urges you to recommend and pursue approval of the subject application.

MCPOA has existed since 1976 with 60 current members as a gathering of people united to promote sensible use of the land for the benefit of the community including an array of property types and interests. Always with the goal of public discourse to share points of view and foster consensus, MCPOA lives by the slogan "All Boats Rise Together".

The importance of a sufficient, sustainable and current water supply is vital to the community. Our members have considered this topic intently for decades leading us to the distinct conclusion this approval is necessary to provide the basic resource of water for our community on the Monterey Peninsula.

Sincerely,

John Tilley
President, Monterey Commercial Property Owners Association

Kathy Anderson
Secretary, Monterey Commercial Property Owners Association

COALITION OF PENINSULA BUSINESSES

A coalition to resolve the Peninsula water challenge to
comply with the CDO at a reasonable cost

Members Include: Monterey County Hospitality Association, Monterey Commercial Property Owners' Association, Monterey Peninsula Chamber of Commerce, Carmel Chamber of Commerce, Pacific Grove Chamber of Commerce, Monterey County Association of Realtors, Associated General Contractors-Monterey Division, Community Hospital of the Monterey Peninsula

October 13, 2022

Mr. Tom Luster
California Coastal Commission, Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, California 94101

Transmitted by email to: Tom.Luster@coastal.ca.gov

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603

Dear Mr. Luster

As you and your staff prepare your report for the above referenced project, we sincerely hope you will recommend approval of the project.

The Coalition of Peninsula Businesses and its constituent members have struggled for years – some for as many as 40 years - to achieve a sufficient and sustainable water supply for the Monterey Peninsula.

The project has been the subject of thorough and exhaustive state and federal environmental review. The environmental benefits to the Carmel River are dramatic. As part of review process, hydrogeologic experts found that the project will do **no harm to other water users, no harm to other water basins, and no harm to potable water supplies.**

This project is the only chance we on the Monterey Peninsula have in this decade to secure a drought-proof, sufficient and sustainable water supply and provide the redundancy of water supply sources we need to assure water supplies for now and into the future.

The Peninsula needs water to protect our jobs, sustain our local economy and improve our social welfare. The Peninsula needs water to provide opportunities for development of much-needed (and now state-mandated) workforce housing. The Peninsula needs water to return to a normal way of life.

The Peninsula needs real water – not vague promises of reused water from other basins or legal "guarantees" of delivery of water from phantom sources (see Monterey County Water Resources Agency letter to the PUC and Monterey County Farm Bureau letters to the CCC on this point).

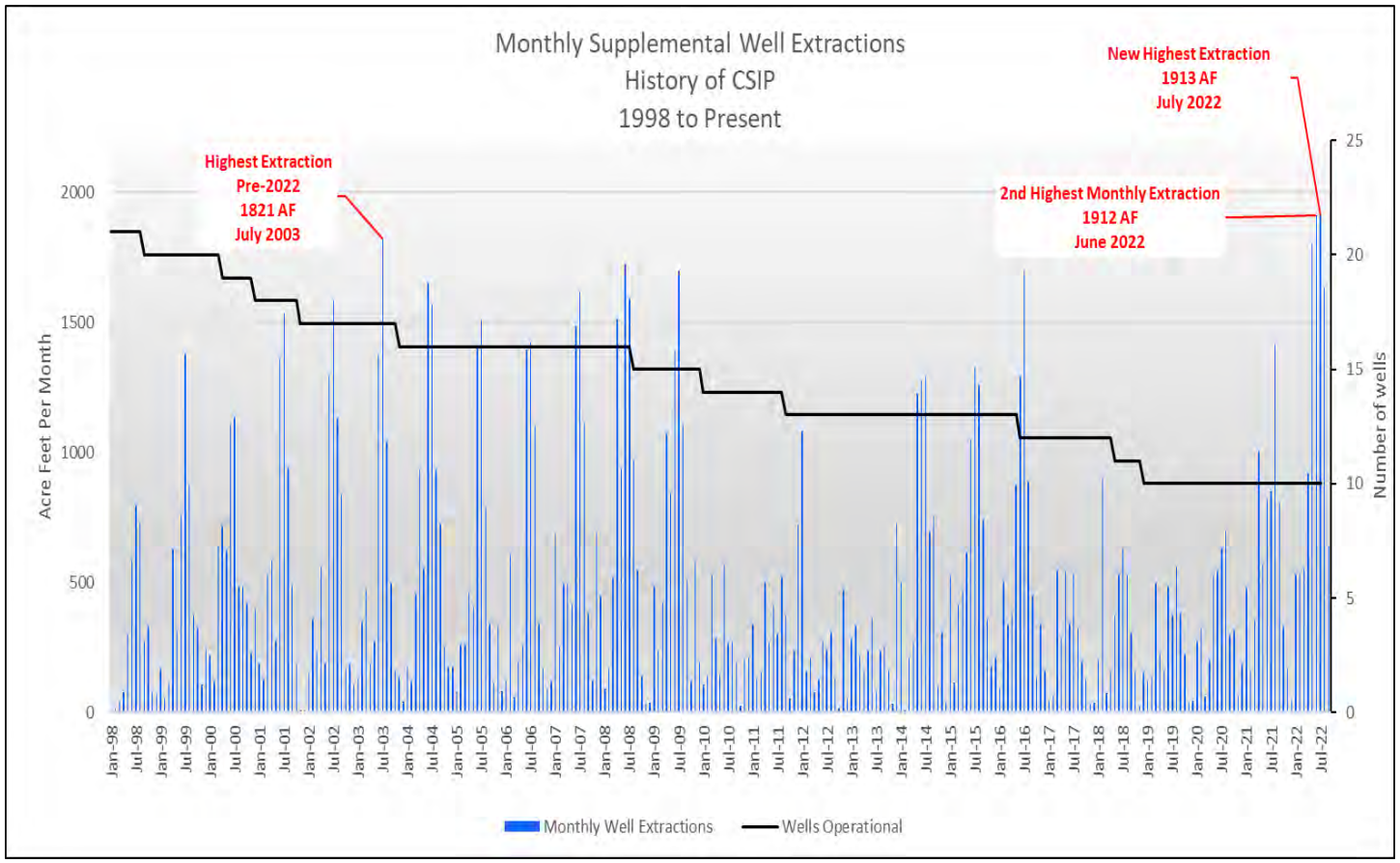
Please recommend approval of our water supply project!

Sincerely,

Jeff Davi, Co-chair

John Tilley, Co-chair

Attachment 1



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FOR: CITY OF MARINA

12 October 2022

California Coastal Commission
Members of the Commission
455 Market Street, Suite 300
San Francisco, CA 94105

RE: Support for the Monterey Peninsula Water Supply Project

Members of the Coastal Commission:

I am the Chairman of the Monterey Bay Defense Alliance (MBDA). Our organization works to ensure that the national security activities in the Monterey Region have access to adequate and reliable critical infrastructure such as water, power, and workforce housing sufficient to support current and future missions. Our mission is to protect and further the interests of Monterey County's military missions that generate $2.6B per year in economic activity and are responsible for 18,300 jobs in Monterey.

We are writing in support of the Monterey Peninsula Water Supply Project (MPWSP). The MPWSP will provide a critically needed, reliable, and resilient water source for our region. Our Alliance urges the California Coastal Commission to approve this project to better protect the economic vitality of the Monterey Peninsula and its military installations.

The MPWSP is designed to provide a reliable drought-proof water supply to the Monterey Peninsula. Decades of drought have created an unprecedented water crisis that threatens jobs and our local economy, including the continued presence of local national security assets and military missions in our region. The Monterey Peninsula Water Management District (MPWMD) Supply-Demand analysis that purports to show that the desalination plant is unnecessary is based on assumptions that are demonstrably false. Currently, critical supply assumptions are not being met because of the drought conditions. The Monterey County Water Resources Agency and the Pebble Beach Company have sent official letters to the California Public Utilities Commission questioning and objecting to the assumptions contained in the MPWMD supply-demand analysis. Additionally, a responsible critical infrastructure decision

maker will not size their project based on "averages" as envisioned by the MPWMD supply-demand document. Critical infrastructure should be sized based on worst-case assumptions about feedwater availability at maximum demand.

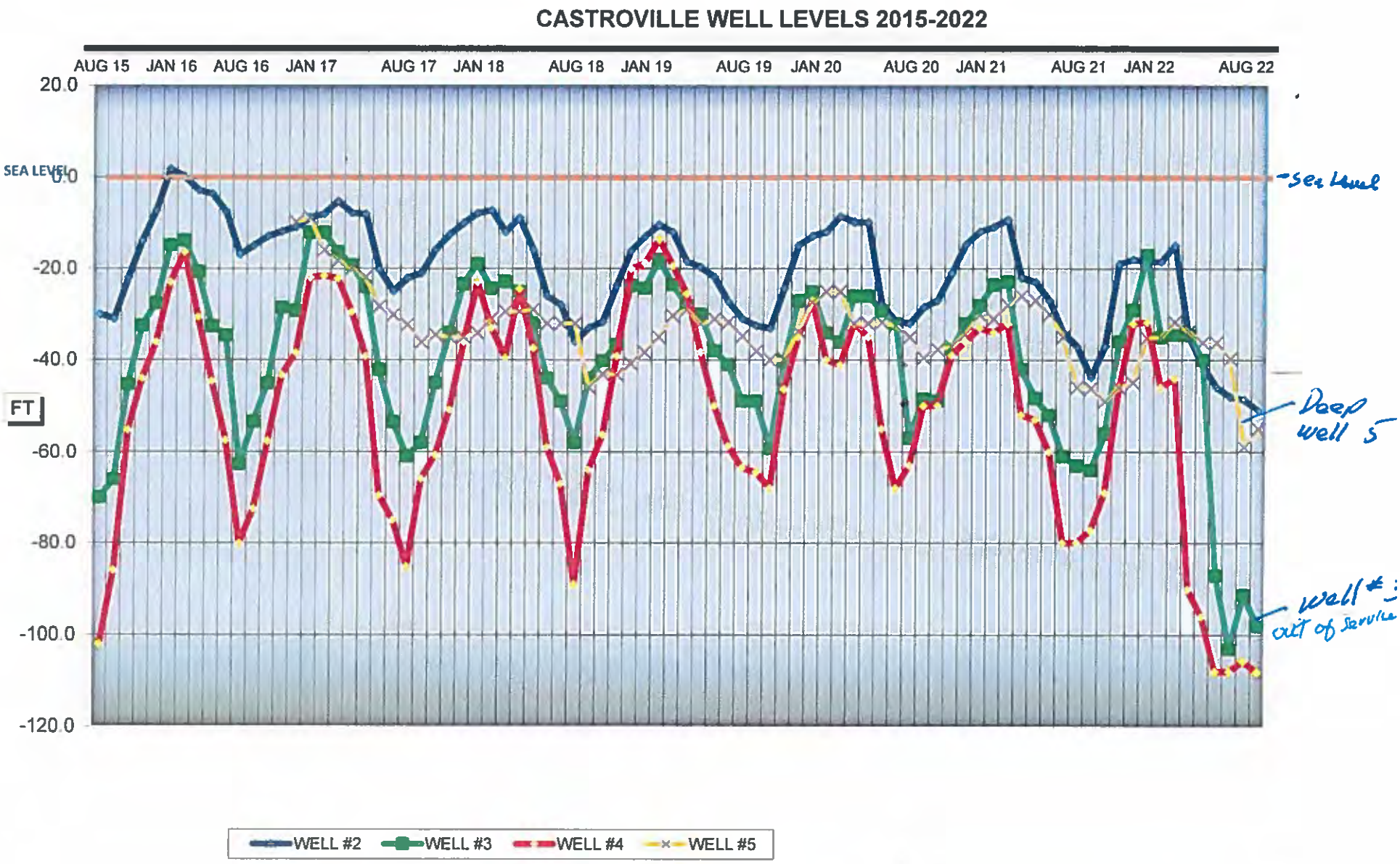
The MBDA views the region's water troubles as a major threat to a vital industry. Lack of water has resulted in a building moratorium, exacerbating the housing crisis in the region, increasing housing costs, and forcing workers to drive long distances between their jobs and affordable housing. One of our organization's major priorities is working to address the lack of workforce housing, which has harmed the ability for military installations to recruit and retain vital civilian staff. The Commander of one operational unit recently stated that they were being forced to consider moving their mission elsewhere because of the lack of workforce housing.

The MPWSP is a comprehensive approach to creating a long-term, reliable water source through a portfolio of desalination, stormwater capture, and water recycling. It will protect the Carmel River ecosystem, supply new water for housing and jobs, and improve coastal access for local communities. The Monterey Peninsula has been in dire need of additional drought-proof, reliable water supplies for the 44 years since the MPWMD was formed in 1978 to solve the Peninsula water supply problem. There's no time left to wait. Without new water supplies, our peninsula could face water rationing and further pressure on a strained economy.

Our region needs the California Coastal Commission to approve the Monterey Peninsula Water Supply Project.

Thank you,

Fred Meurer, Chairman
Monterey Bay Defense Alliance


CASTROVILLE WELL LEVELS 2015-2022
AUG 15
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JAN 22
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-80.0
-100.0
-120.0
-Sea Level
Deep well 5
well #: out of service
WELL #2
WELL #3
WELL #4
WELL #5

CSMC

To help our communities equitably implement sustainable and regenerative practices to slow and adapt to climate change.

October 24, 2022

Dear California Coastal Commissioners,

Communities for Sustainable Monterey County (CSMC) is an alliance of concerned citizens working through eight local chapters throughout the county to equitably implement sustainable and regenerative practices to slow and adapt to climate change. We have submitted two previous letters (9-5-2019 and 9-10-2020) to you in opposition to the application by Cal Am for a Development Permit and in favor of the Pure Water Monterey Expansion Project.

On the issues related to the environment we find:

- Pure Water Monterey's water treatment process helps the environment by eliminating pollutants that might otherwise contaminate the Monterey Bay Marine Sanctuary.
- Pure Water Monterey is an innovative and sustainable model of water re-use and conservation in a time when water supplies are becoming scarce.
- The process of desalinization requires substantially more energy than other forms of water purification like water re-use.
- Cal Am's desal energy consumption will be 52,000 megawatt hours per year. It will produce 8,000 metric tons of CO_2 per year.
- Cal Am's desal plant will draw 17,300 AFY of groundwater from the over drafted Salinas River Groundwater Basin.
- The desal plant will produce 8 million gallons of brine discharge per day to the Monterey Bay Marine Sanctuary with unknown effects on the marine ecosystem.
- The desal process designed by Cal-Am would contributes to seawater intrusion, threatening the city of Marina's groundwater supply and the habitat of endangered species like the Snowy Plover.

In addition, we find that the cost of water produced by the Cal-Am facility and the siting of the facility place unfair burdens on disadvantaged communities in Marina and throughout the Cal-Am service area on the Peninsula. The Pure Water Monterey Expansion Project answers the needs of the community with much greater equity. We remain opposed to this Cal-Am desalinization project.

Sincerely,

Cathy Rivera

President

CSMC
Communities for Sustainable Monterey County
http://www.sustainablemontereycounty.org/

283 Grove Acre Ave.
Pacific Grove, CA 93950

A non-Profit 501(c)3
E: info@csmc.eco
W: sustainablemontereycounty.org/

From:	Eric Tynan
To:	"Ron Weitzman"; Luster, Tom@Coastal; "Ian Crooks of Cal Am"; "Josh Stratton - Cal Am"; "Norm Groot"; "Paul Bruno"; "John Tilley"; "Rick Heuer"; "Scott Dick - MCAR"; "Kevin Stone - Realtor MCAR"; "Kevin Dayton - Monterey Peninsula Chamber of Commerce"; "Ian Crooks of Cal Am"; "Bill Kampe"
Cc:	rudyfischer@earthlink.net; "Alvin Edwards"; "Amy Anderson"; "Clyde Roberson"; "David Stoldt"; "George Riley"; "Karen Paull"; "Mary Adams"; "Safwat Malek"; KIMBERLEYCRAIG@GMAIL.COM; Ron Stefani; gefontes@fontesfarms.com; John Tilley
Subject:	RE: Response to rudy Fisxher"s "Correction" of MPWMD Supply and Dedand Projections-If CSIP is being starved so PWM can meet its quota it"s a poor example of the Coastal Commissions dedication to Social Justice.
Date:	Thursday, October 20, 2022 4:28:03 PM
Attachments:	image001.png WELL Level AUG 2015-SEP 2022.xlsx

Tom,

I also recall they thought wastewater flows would be double of what they are now and wastewater is the basis for CSIP and Pure Water Monterey & PWMx.

I'm sure some number "experts" facilitated the estimate when sizing a 29MGD plant the currently treats closer to 18MGD

If CSIP is being starved so PWM can meet its quota it's a poor example of the Coastal Commissions dedication to Social Justice.

The attached file of Castroville's well levels mirror the dramatic extractions in the MCWRA report. Well #3(the green trend) was shut off due to sea water intrusion and has not been pumped since May 2021 and currently @ -90 ' below sea level shows the drastic decline of the 400' aquifer in North Monterey County due to over pumping so recycle can go to PWM

In spite of Castroville taking on a large number of folks, who could not find affordable housing on the peninsula, with 2-3 families living in a 2 bedroom house, Castroville reduced its pumping from 1,010 Acft in 2000 to 760 acft in 2021

Finally, the tan trend line is our Deep well #b 5 and as you can see it is in a steadily declining profile . Solving the wealthy, non-diverse, Peninsula's water issues at the expense of the critically over-drafted, disadvantaged and diverse Salinas Valley will only make the lawyers happy.

If Castroville is being starved so PWM can meet its quota it's a poor example of the Coastal Commissions dedication to Social Justice.

The three legged Monterey Peninsula Water Supply Project was/is a WIN-WIN-WIN answer.

- Reduced by 700 acft of pumping directly in front of the 400' Sea Water Intrusion
- Gets the Peninsula off the CDO
- Provides Castroville, a severely Disadvantaged Community, a long term water supply
- Reduces traffic in and out of the Peninsula by allowing people the live in the community they serve
- Provides for critically needed and State mandated Affordable housing.
- Protection from the current and future droughts
- Social Justice for both basins

Now we are left with a lose-lose-lose

- Unfairly benefits the Peninsula by taking water from a basin that has a greater need and has worked harder to solve its own water issues without taking it from the Carmel river basin.

Sews animosity and the appearance of entitlement between entities
- Guarantees even more litigation
- No protection from prolonged droughts or effects of global warming
- Does not create a new water source just redirects one

This drought is showing the folly of depending on a 1 legged stool.
Finally, both of our water houses are on fire and its unfair to take the hose from our house to put out the Peninsula's, particularly when it has had decades to solve this problem and finds every excuse to control growth by limiting the water supply, denying every solution ,each one more expensive than the rest, and then complaining about the cost.

If the Carmel Valley was being starved of water so North County could solve its water problem would the Coastal Commissions consider that Social Justice?

Best O' Luck

Eric

J Eric Tynan
General Manager
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11499 Geil Street
Castroville, CA. 95012
Off. 831.633.2560
Cell 831.235.0155
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Eric@castrovillecsd.org

From: Ron Weitzman <ronweitzman@redshift.com>
Sent: Thursday, October 20, 2022 2:03 PM
To: tluster@coastal.ca.gov; 'Ian Crooks of Cal Am' <ian.crooks@amwater.com>; 'Josh Stratton - Cal Am' <Josh.Stratton@amwater.com>; 'Norm Groot' <norm@montereycfb.com>; 'Eric Tynan - Castroville Comm. Svcs. Dist.' <eric@castrovillecsd.org>; 'Paul Bruno' <paul@mpe2000.com>; 'John Tilley' <john.tilley@pinnacle.bank>; 'Rick Heuer' <rick@wearehma.com>; 'Scott Dick - MCAR' <scott@mcar.com>; 'Kevin Stone - Realtor MCAR' <kevin@mcar.com>; 'Kevin Dayton - Monterey Peninsula Chamber of Commerce' <kdayton@daytonpublicpolicy.com>; 'Ian Crooks of Cal Am' <ian.crooks@amwater.com>; 'Bill Kampe' <bkampe@mindspring.com>
Cc: rudyfischer@earthlink.net; Alvin Edwards <alvinedwards420@gmail.com>; Amy Anderson <carmelcellogal@comcast.net>; Clyde Roberson <roberson@monterey.org>; David Stoldt <dstoldt@mpwmd.net>; George Riley <georgetriley@gmail.com>; Karen Paull <karenppaull@gmail.com>; 'Mary Adams' <district5@co.monterey.ca.us>; Safwat Malek <safwat@enviro-international.com>
Subject: Response to rudy Fisxher's "Correction" of MPWMD Supply and Dedand Projections

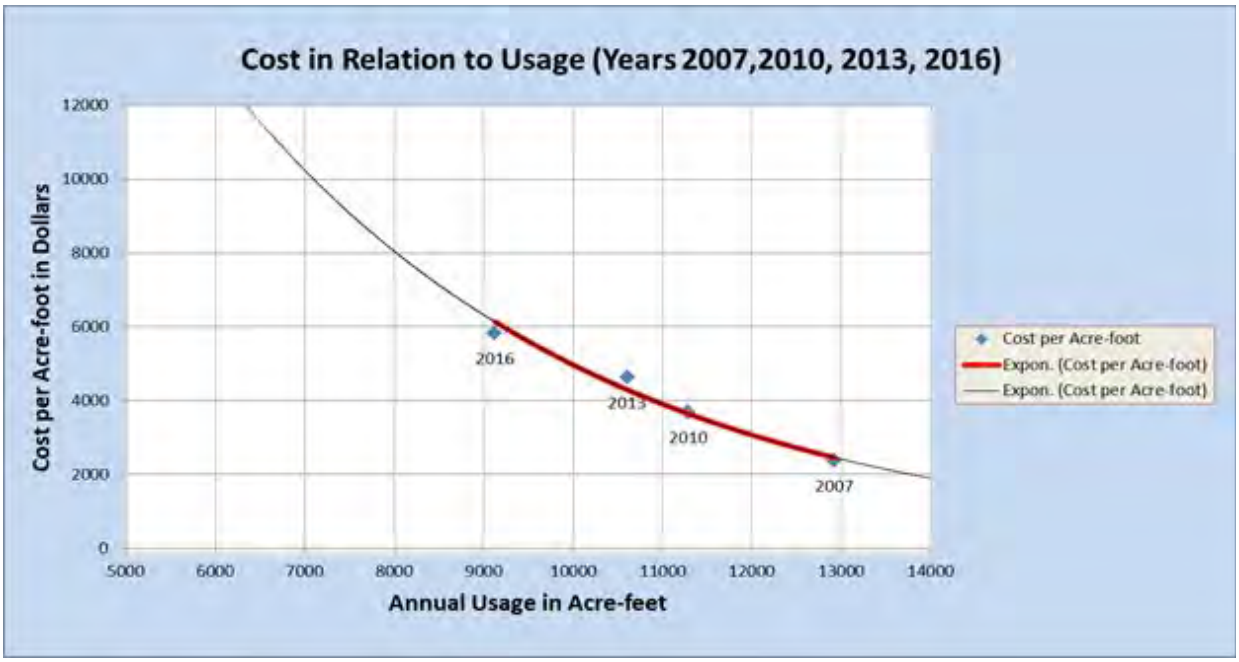
WATER PLUS

Dear Mr. Luster:

The appropriate experts to estimate future supply and demand needs are economists or econometricians. Rudy Fischer is neither. The MPWMD has hired the appropriate expertise to make those estimates for the Monterey Peninsula. That said, as a retired professor who has taught econometrics in a graduate school of business, I have a few comments to make on Mr. Fischer's estimates.

Re supply: Years ago, when I was involved in trying to return the local Golden State Theatre to its original state, partly to enhance tourism with nighttime attractions to complement the considerable daytime attractions of the Monterey Peninsula, I was told by the Monterey official in charge of the local convention center that its potential for conventions was about 120 per year. In subsequent years, however, the actual number turned out to be less than a dozen, sometimes far less. Mr. Fischer's differences from the MPWMD in supply estimates are based solely on unreliable wishful thinking like that.

Re demand: All the demand estimates, by Mr. Fischer or Cal Am, fail to take the rising unit cost of water into account. The more costly the water, the lower the demand. The MCWD has estimated the cost of Water from Cal Am's proposed desal plant to be almost $8,000 per acre-foot. As the graph made by me below shows, the usage for that unit cost of water would be only about 8,000 acre-feet per year, far less than Mr. Fischer's corrected demand for water—water that is far too costly for the low-income people for which most new housing is needed.



Ron Weitzman
President, Water Ratepayers Association of the Monterey Peninsula