SEASIDE GROUNDWATER BASIN WATERMASTER
REGULAR MEETING OF THE BOARD OF DIRECTORS

Wednesday, February 3, 2021 – 2:00pm
Draft Agenda

IN KEEPING WITH GOVERNOR NEWSOM'S EXECUTIVE ORDERS N-29-20 AND N-35-20, THE WATERMASTER REGULAR BOARD MEETING WILL NOT BE HELD IN PERSON. YOU MAY ATTEND AND PARTICIPATE IN THE MEETING BY JOINING FROM A PC, MAC, IPAD, IPHONE OR ANDROID DEVICE (NOTE: ZOOM APP MAY NEED TO BE DOWNLOADED FOR SAFARI OR OTHER BROWSERS PRIOR TO LINKING) AT THIS WEB ADDRESS:
https://us02web.zoom.us/j/84067227501?pwd=eExCZlIwdzRLRmYvclBPOE54RHZwUT09
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If problems are encountered joining the meeting via the link above, try using the following information in your Zoom screen:
Meeting ID: 840 6722 7501 **Password:** 247782

Watermaster Board
Coastal Subarea Landowner – Director Paul Bruno
City of Seaside – Mayor Ian Oglesby
California American Water – Director Christopher Cook
City of Sand City – Mayor Mary Ann Carbone
Monterey Peninsula Water Management District – Director George Riley
Laguna Seca Subarea Landowner – Director Wesley Leith
City of Monterey – Councilmember Dan Albert
City of Del Rey Oaks – Councilmember John Gaglioti
Monterey County/Monterey County Water Resources Agency – Supervisor Mary Adams, District 5

I. CALL TO ORDER

II. ROLL CALL

III. Schedule of Watermaster Board Member Representative and Alternate appointments for 2021 (informational only – no action required) 3

IV. ELECTION AND APPOINTMENT OF OFFICERS FOR CALENDAR YEARS 2020 AND 2021
A. Chairperson - (Must be member of the Board of Directors) – Currently Director Bruno
B. Vice Chairperson - (Must be member of the Board of Directors) – Currently Council Member Albert
C. Secretary - (Need not be a member of the Board of Directors) – Currently Admin. Officer Paxton
D. Treasurer - (Need not be a member of the Board of Directors) – Currently Council Member Gaglioti

V. PUBLIC COMMUNICATIONS
Oral communications are on each meeting agenda in order to provide members of the public an opportunity to address the Watermaster on matters within its jurisdiction. Matters not appearing on the agenda will not receive action at this meeting but may be referred to the Watermaster Administrator or may be set for a future meeting. Presentations will be limited to three minutes or as otherwise established by the Watermaster. In order that the speaker may be identified in the minutes of the meeting, it is helpful if speakers state their names.

VI. REVIEW OF AGENDA
A vote may be taken to add to the agenda an item that arose after the 72-hour posting deadline pursuant to the requirements of Government Code Section 54954.2(b). (A 2/3-majority vote is required).

VII. MINUTES - Approve Minutes of Regular Board meeting held December 2, 2020 5

VIII. CONSENT CALENDAR

A. Consider Approving Summary of Payments made November 2020 through December 2020 totaling **$47,838.35** 11

IX. ORAL PRESENTATION – None

X. NEW BUSINESS – None

XI. OLD BUSINESS

A. Update on Water Quality Issues and Background Information About the Watermaster's Seawater Intrusion Response Plan (SIRP)..... 15

B. Discuss Potential Installation of a New Monitoring Well Between Monitoring Well FO-9 and the Pumping Depression in the Northern Coastal Subarea, and Other Alternatives 23

C. Direct Staff regarding obtaining additional water to recharge the Basin in order to raise groundwater levels 29

XII. INFORMATIONAL REPORTS (No Action Required)

A. Watermaster report of production of the Seaside first quarter Water Year 2021 (October 1, 2020 – December 31, 2020)..... 51

XIII. DIRECTOR'S REPORTS

XIV. STAFF COMMENTS

XV. NEXT REGULAR MEETING DATE

A. Consider canceling the Wednesday, March 3, 2021 meeting and set the next regular meeting date for **April 7, 2021- 2:00 P.M.**

XVI. ADJOURNMENT

This agenda was forwarded via e-mail to the City Clerks of Seaside, Monterey, Sand City and Del Rey Oaks; the Clerk of the Monterey Board of Supervisors, the Clerk to the Monterey Peninsula Water Management District; the Clerk at the Monterey County Water Resources Agency, Monterey One Water and the California American Water Company for posting on January 28, 2021 per the Ralph M. Brown Act, Government Code Section 54954.2(a).

SEASIDE GROUNDWATER BASIN WATERMASTER
Board Member and Alternate Appointments
Calendar Years 2021-2022

ITEM III.
February 3, 2021

MEMBER PARTY	MEMBER	ALTERNATE
California American Water	Director Christopher Cook	Tim O'Halloran
City of Del Rey Oaks	Council Member John Gaglioti	Council Member Scott Donaldson
City of Monterey	Council Member Dan Albert	Mayor Clyde Roberson
City of Sand City	Mayor Mary Ann Carbone	City Manager Aaron Blair
City of Seaside	Mayor Ian Oglesby	Council Member Jon Wizard
County of Monterey (MCWRA)	Supervisor Mary Adams	Supervisor Wendy Askew
MPWMD	Director George Riley	Director Alvin Edwards
Coastal Sub Area Landowner	Director Paul Bruno	N/A
Laguna Seca Sub Area Landowner	Director Wesley Leith	N/A

SEASIDE GROUNDWATER BASIN WATERMASTER (Watermaster)
REGULAR MEETING MINUTES

Via Zoom Teleconference
December 2, 2020

I. CALL TO ORDER – The meeting was called to order at 2:04 p.m.

II. ROLL CALL

City of Seaside – Mayor Ian Oglesby
Coastal Subarea Landowner – Director Paul Bruno – Chair
Laguna Seca Subarea Landowner – Director Wesley Leith
City of Sand City – Mayor Mary Ann Carbone
City of Del Rey Oaks – Council Member John Gaglioti
California American Water (CAW) – Director Christopher Cook
City of Monterey – Council Member Dan Albert – Vice Chair
Monterey Peninsula Water Management District (MPWMD) – Director George Riley
Monterey County/Monterey County Water Resources Agency – Supervisor Mary Adams

Absent: None

Others Present

Robert Jaques, Watermaster Technical Program Manager (TPM)
Laura Paxton, Watermaster Administrative Officer (AO)
Georgina King, Senior Hydrogeologist, Montgomery & Associates
Sarah Hardgrave, Policy Analyst, Office of Supervisor Adams
David Stoldt, General Manager, MPWMD
Alvin Edwards, MPWMD
Jonathan Lear, Water Resources Manager, MPWMD
Maureen Hamilton, Water Resources Engineer, MPWMD
Tim O'Halloran, Engineering Manager, CAW
Catherine Stedman, CAW
Aiko Yamakawa, Attorney, CAW
Ken Rutherford, Resident, Del Rey Oaks

III. PUBLIC COMMUNICATIONS: None

IV. REVIEW OF AGENDA: AO Paxton noted that the title of item VIII.A. of the posted agenda was inadvertently shortened and should include "…and Increasing the Monitoring Frequency of Monitoring Wells FO-9 and FO-10."

Vice Chair Albert presided while Chair Bruno dealt with technical difficulties.

It was moved by Director Riley and seconded by Supervisor Adams to approve the agenda with the noted change. Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Leith – Aye; Mayor Oglesby. Motion carried.

V. APPROVAL OF MINUTES

Director Riley called out the TPM report regarding the discussion of projected impacts to groundwater levels resulting from the Monterey Peninsula Water Supply Project or the Pure Water Monterey Expansion Project as reported under item D in the minutes. Director Riley noted, and TPM Jaques concurred, that pay back of 700 acre-feet (AF) over 25 years to the Basin would be in jeopardy if the CAW desalination plant *or the Pure Water Monterey Expansion Project* was not built.

It was moved by Supervisor Adams and seconded by Council Member Albert to approve the minutes of the Regular Board meeting held September 2, 2020 with the addition of "or the Pure Water Monterey Expansion Project" to the TPM report and the minutes. Director Cook – Aye; Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Bruno – Aye; Director Leith – Aye; Mayor Oglesby – Aye. Motion carried.

VI. CONSENT CALENDAR

A. Consider Approving the Board and TAC schedule of meetings for 2021
Chair Bruno stated he would be absent for the March 3, 2021 meeting if held.

B. Consider Approving Summary of Payments made August 2020 through October 2020 totaling **$33,315.50**

C. Consider Approving Fiscal Year 2020 Financial Reports through October 31, 2020

D. Receive Report on Virus Removal in Pure Water Monterey Advanced Water Treatment Plant

It was moved by Supervisor Adams and seconded by Mayor Carbone to approve the consent calendar as presented. Director Cook – Aye; Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Bruno – Aye; Director Leith – Aye; Mayor Oglesby – Aye. Motion carried.

ORAL PRESENTATION: Georgina King, Montgomery & Associates presented the 2020 Seawater Intrusion Analysis Report (SIAR). In Water Year 2020 for the first time, what may be a precursor to seawater intrusion was detected in two monitoring wells experiencing increasing chloride concentrations. One of these is north of and outside of the Seaside Basin (monitoring well FO-10 Shallow), and the other is just inside the northern boundary of the Seaside Basin in the Northern Coastal Subarea (monitoring well FO-9 Shallow). Sampling was repeated at FO-10 and again results showed an increase in chloride concentrations of 48 mg/L, to 90 mg/L. This is the largest increase in the Basin to date. Chloride concentration trends were stable for the other monitoring wells. Since the Sentinel Wells have not detected an increase in salinity, the impact to the FO-9 Shallow and FO10-Shallow monitoring wells may be coming from the north out of the Monterey Subbasin where there is already seawater intrusion, rather than directly inland from the coastline of the Seaside Basin. Groundwater levels remain below protective elevations in all deep target monitoring wells.

Supervisor Adams inquired whether seawater intrusion would jeopardize the Pure Water Monterey or Aquifer Storage and Recovery Projects. Mr. Lear responded that the increased chloride concentrations have been detected in the shallow aquifer and the projects draw from the deep aquifer so it is not likely that the projects would be impacted.

Director Riley inquired whether the rate of seawater intrusion could be calculated, and what intrusion level would trigger an alert. Ms. King stated that the alert system is now activated beginning with the data being analyzed in the SIAR. Determining the rate of seawater intrusion can be calculated by collecting further data and performing further analysis. Seawater intrusion can occur very quickly. Response would be to follow the directives of the Seawater Intrusion Response Plan (SIRP 2/2009) with reduced pumping and/or recharging with supplemental water supply, and increased sampling schedules. The SIRP established chloride threshold values of 67 mg/L for FO-9 and 94 mg/L for FO-10 as trigger points; FO-10 sampled at 90 mg/L.

Director Cook inquired of how much is known of the flow gradient of the potential intrusion precursor. Ms. King would need to analyze more data to further discern flow direction. The only known well between FO-9/10 and the production wells is the Bayonet Blackhorse Golf Course (Coe) well. Production, level and quality is reported for this well. TPM Jaques has asked Marina Coast Water District MCWD to collaborate with Watermaster during development of its GSA to install or monitor existing wells in Fort Ord to the benefit of MCWD data collection and for Watermaster to better understand the Basin. Installation of the Watermaster sentinel well 10 years ago cost approximately $250,000.

Director Cook anticipated that the ASR 3 and PWM projects and Ryan Ranch/Bishop intertie would help redistribute production from the Coastal Wells. He requested a quarterly update on well condition be provided to the board. Mr. Lear noted that when the City of Seaside golf courses ceased irrigating with MCWD water and began production from its wells, a lowering of groundwater levels and an increase in chloride were detected. City of Seaside is arranging to again use MCWD supply for irrigation and produce the stored groundwater from its municipal wells; Mayor Oglesby would provide more information on timing.

TPM Jaques responded to Council Member Albert, stating that there is no Watermaster jurisdiction over the area east of the Laguna Seca Subarea (LSSA). Any leverage is through TPM involvement with the Monterey Subbasin Coral de Tierra area under the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA). TPM Jaques and Ms. King have advised the agency of declining LSSA groundwater levels due to pumping in their area. It is hopeful that sustainable management criteria being developed for the SVBGSA Monterey Subbasin plan such as reduced pumping, use of recycled water, etc. will help to alleviate the LSSA problem, else a challenge would need to be made to the Department of Water Resources that oversees sustainability agencies. Supervisor Adams advised the board that Sarah Hardgrave on her staff is overseeing the subcommittee of the SVBGSA looking at the area east of LSSA if anyone has questions.

VII. NEW BUSINESS:

A. Consider Approving the Seawater Intrusion Analysis Report for 2020 and Increasing the Monitoring Frequency of Monitoring Wells FO-9 and FO-10. The Executive Summary is included in the Board agenda packet. The complete SIAR is posted on the Watermaster website at http://www.seasidebasinwatermaster.org. Director Cook requested the City of Seaside timeline for the MCWD irrigation water / production redirection program be included in the motion of approval of the report. Mayor Oglesby asked that it not be included in the motion to which Director Cook concurred.

It was moved by Director Cook and seconded by Mayor Carbone to approve the 2020 Seawater Intrusion Analysis Report; increasing the monitoring frequency of monitoring wells FO-9 and FO-10; approving a budget transfer from the Monitoring and Management Program contingency line item not to exceed $4,000 to cover the costs of additional monitoring; directing the TAC to give quarterly or more frequent updates to the board on increased monitoring results; and directing staff to obtain a quote for installation of a shallow monitoring well between FO-10 and the -28 groundwater depression as described in the report. Director Cook – Aye; Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Bruno – Aye; Director Leith – Aye; Mayor Oglesby – Aye. Motion carried.

B. Discussion/Consider Adopting for Water Year 2021 a Declaration regarding the Unavailability of Artificial Replenishment Water (Water Year 2021 Production Allocations and Basin Storage Allocations attached)

Moved by Director Riley and seconded by Mayor Oglesby to adopt for Water Year 2021 a Declaration of Unavailability of Artificial Replenishment Water. Director Cook – Aye; Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Bruno – Aye; Director Leith – Aye; Mayor Oglesby – Aye. Motion Carried

C. Discussion/Consider Approving the Watermaster Annual Report for Water Year 2020. The body of the Draft 2020 Annual Report is included in the Board agenda packet. The complete draft version is posted on the Watermaster website at http://www.seasidebasinwatermaster.org. The report will be filed with the court by January 15, 2021. Watermaster obligations and perpetuity were discussed. Chair Bruno and Director Riley thanked staff and TAC for the report.

Moved by Director Riley and seconded by Council Member Albert to approve the Watermaster 2020 Annual Report to the Court with minor edits as described by staff. Director Cook – Aye; Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Bruno – Aye; Director Leith – Aye; Mayor Oglesby – Aye. Motion Carried

D. Consider Approving the Professional Service Contract with Baker Manock & Jensen PC Attorneys at Law to provide legal services to Watermaster. AO Paxton gave item highlights. The term of the contract is that either party can terminate at any time.

Moved by Council Member Albert and seconded by Mayor Carbone to approve the Professional Service Contract with Request for Service 20-01 with Baker Manock & Jensen PC Attorneys at Law to provide Watermaster legal services. Director Cook – Aye; Council Member Albert – Aye; Mayor Carbone – Aye; Supervisor Adams – Aye; Director Riley – Aye; Director Bruno – Aye; Director Leith – Aye; Mayor Oglesby – Aye. Motion carried.

Director Gaglioti joined the meeting at 3:36 pm

IX. OLD BUSINESS: Direct Staff regarding obtaining additional water to recharge the Basin in order to raise groundwater levels. Mr. Jaques reviewed the item transmittal. Director Riley felt protection of the Basin against seawater intrusion by procuring water to be injected ("banked") and not transacted is an expensive process with no known financing method. Director Gaglioti felt financing was the least challenging of all Basin issues and finding water resources to support the population of the Peninsula the greatest. He stated there is a crisis in this 44,000acre-foot (AF) over-drafted Basin, with up to 1,500AF/year needed to meet adjudication requirements of protective groundwater elevations, and even more to make the Basin whole.

David Stoldt made clear the Pure Water Monterey (PWM) Expansion Project sizing, like the Monterey Peninsula Water Supply Project desalination plant, also assumed Basin recharge of 700AF/year for 25 years (in MPWMD opinion any new project brought on line would need to meet the 700AF/year/25 years set-aside). This would result in 20,000AF being recharged to the Basin by the PWM expansion after 29 years, plus 17,500AF after 25 years by CAW in-lieu recharge, totaling 37,500AF achieved by the 30th year of recharge.

Director Riley emphasized Watermaster's responsibility for finding funds to procure alternative water supplies. He asked the board at some point to rethink the calculations in the Replenishment Assessment Fund. Supervisor Adams expressed support of a more affordable regional alternative that by all indications would be desalination. Director Bruno surmised there will be State funding to protect endangered basins in like manner as funding for protection of endangered species. Director Cook pointed out the that with inflation, the longer a supplemental supply is forestalled the more it will cost down the road. Moreover, although the requirements of the CDO would be met by an operational water supply project, protective groundwater levels and other supply challenges would still need to be addressed.

Council Member Albert stated that finding supplemental water supply is not within the authority of Watermaster but is for other jurisdictions to address. He asked for clarification on what staff is asking for direction on, whether it was for the board to make a recommendation to other jurisdictions on how to proceed. Mr. Jaques recommended the board direct him to pursue the bulleted items in his report to get a sense of what projects may have extra production capacity to generate supplemental supply, and whether the cost would be incremental or full unit.

Mr. Stoldt stated that paying incremental costs for production of desalinated water leaves the fixed financing and labor costs to the original CAW rate payers; he urged Watermaster to carefully consider paying full unit cost. Regarding Watermaster managing the Basin more forcefully – water injected and extracted – he reminded that the adjudication granted the District the authority to store water in the Basin for the benefit of the District separate from a Watermaster Storage and Recovery Agreement. The District has heretofore chosen to work with Watermaster's agreement however has the right to store and recover water without an agreement.

Supervisor Adams felt additional board discussion was needed in a broader sense of long-term water supply, one step at a time, first with consensus on what it is the board is working toward putting forth. Mayor Oglesby noted the Court gave Watermaster the authority to develop a plan of injection and extraction that would prevent seawater intrusion, and the plan is what needs to be put forth. Director Cook felt the subject boils down to two key items: the need for the board to come to agreement on what the actual Natural Safe Yield (NSY) of the Basin is, and what the actual water supply needs are forecasted into the future. Council Member Albert stated the board needs to first establish what constitutes a healthy basin – completely full, just full enough to avoid seawater intrusion, etc. Council Member Gaglioti felt there *was* consensus that the Basin is not healthy and that preventive and protective measures should be taken. He inquired whether Watermaster has the authority to institute a production curtailment to protect the basin or whether that would require further legal proceeding. Mr. Jaques responded that Watermaster could reduce the NSY of the Basin and continue to ramp down production to achieve the lower figure. He suggested directing counsel to draft a legal opinion on what Watermaster can impose to protect the Basin.

Supervisor Adams requested Mr. Jaques work collaboratively with GSAs on mutual regional solutions to address seawater intrusion in the Marina and Ord Community, the 180/400 Foot Aquifer Subbasin, as well as to prevent intrusion in the Seaside Basin.

The board directed staff to research all of the bulleted items in the transmittal provided and report back at a subsequent board meeting. Mayor Oglesby supported researching all of the items if it culminated in a plan. Chair Bruno responded that the research would provide information on what proposed supplemental water supply projects are realistic for including in the development of a plan; Mayor Oglesby was satisfied.

X. INFORMATIONAL REPORTS:

- **A.** Technical Advisory Committee (TAC) minutes from August 12, 2020 meeting and November 18, 2020 meeting (draft version)
- **B.** Budget and Finance Committee draft minutes from November 5, 2020 meeting
- **C.** Watermaster report of production of the Seaside Basin through Water Year 2020 (October 1, 2019 – September 30, 2020)
- **D.** Replenishment Fund Assessment calculations and 2020 Standard Producer Assessments

XI. DIRECTOR'S REPORTS: None

XII. STAFF COMMENTS: AO Paxton introduced new legal counsel, Christopher Campbell, Baker Manock & Jensen. Staff currently had no significant agenda items to present at the January 6, 2021 board meeting and the board concurred that the meeting be canceled.

XIII. NEXT MEETING DATE: The next meeting of the Watermaster board is scheduled for Wednesday, February 3, 2021.

XIV. There being no further business, Chair Bruno adjourned the meeting at 4:25 p.m.

TO: Board of Directors
FROM: Laura Paxton, AO
DATE: February 3, 2021
SUBJECT: Summary of Payments made from November through December 2020

RECOMMENDATIONS:

Consider approving payment of bills submitted and authorized to be paid November - December 2020

Summary of Payments Made November 2020

Paxton Associates (Administrative Officer (AO))

October 26, 2020 through November 25, 2020	58.5		**$**	**5,850.00**

Responded to telephone inquiries, e-mail, and other correspondence as needed regarding the Seaside Basin. Prepare agenda and packet for Budget/Finance Committee meeting; attend 11/5 meeting, prepare minutes. Receive instruction on WM website maintenance. Post production and finalize 2020WY production report. Prepare Replenishment Assessments & distribute. Prepare 2021 Notice of No Replenishment Water Available. Prepare new Declaration of Basin Total Useable Storage Space. Coordinate reporting data w/consultants for 2020 SIAR. Schedule & interview legal candidate. Provide information for 2020 Annual Report and arrange filing. Draft agenda and prepare reports for 12/2/20 board meeting. Prepare contracts for new legal counsel. Routinely picked up mail from PO Box; reconciled accounts to the City of Seaside Watermaster accounts; prepared financial reports; processed invoices; reviewed and posted items to web site.

Robert Jaques (Technical Program Manager)

November 1, 2020 through November 30, 2020	38		**5,700.00**

Responded to emails, telephone inquiries, and other correspondence on a variety of Watermaster issues. Prepare for/attend 11/5/20 Budget/Finance Committee meeting. Prepare for/attend SVBGSA Advisory/TAC meetings & webinar 11/6, 11/19 & 11/23. Prep/attend MCWDGSA stakeholder meeting 11/17. PWM WQ & Ops Committee meeting 11/18. Prepare TAC 11/18 meeting agenda packet; attend TAC meeting; prepare minutes. Prepare 12/2 board meeting transmitals. Research why "Total Usable Storage" is so much higher in the 2019 BMAP than in the 2009. Interview with legal counsel candidate. Telecon with G. King re: Monterey Subbasin WQ issues and MCWDGSA. Prepare summary memos re: PWM and GSA meetings. Prepare 2020 Annual Report to Court.

Montgomery & Associates (Technical Consultant)

November 1, 2020 - November 30, 2020

RFS 2020-01 General Hydrogeologic Consulting	1.0	200	**200.00**
Review well log and screen depth for SNG, PCA-W, and PCA-E wells; correspond with J. Lear on available data for SNG; and prepare email to B. Jaques on opinion that SNG well is sampled.			
RFS 2020-02 Seawater Intrustion Analysis Report	100.5	Various	**15,325.00**
			15,525.00

Compile water quality, level and production data; prepare hydrographs,
chemographs, piper and stiff diagrams, groundwater elevation contours, and maps for report; prepare chemograph and piper appendices; add water quality and level data to the database; generate water quality and level data reports from database for appendix; prepare SIAR; senior review of SIAR; email TAC draft of SIAR to B. Jaques; prepare SIAR presentation to TAC; prepare for and present at November TAC meeting; prepare Board version of SIAR taking into account TAC and B. Jaques feedback; email to B. Jacques for Board

Martin B. Feeney, PG, CHg - Consulting Hydrogeologist	7.0	175		**1,225.00**
March 15, 2020 through November 4, 2020 RFS 2020-01	Reimbursements			**8,068.35**
Hydrogeologic consulting: Semi-Annual water level collection, induction logging. Repair and surface vaults (clean vaults, insert heli-coils to repair stripped threads, paint covers, new stainless steel bolts). Data processing and reporting.				**9,293.35**
		Total for November 2020	**$**	**36,368.35**

Summary of Payments Made December 2020

Christopher Campbell, Baker Manock & Jensen PC (WM Legal Coun	0.1	200	**$**	**20.00**
December 1, 2020 through December 31, 2020	3.6	300		**1080.00**
	Telephone/postage			**16.70**
Review correspondence re: appellate rulings. Review 12/2 board meeting agenda & attend partially. Email correspondence from CAW legal counsel. Issues briefing w/WM AO (no charge). Review 2020 Annual Report. Review of adjudication (no charge). Prepare legal opinion of WM responsibilities per Jaques request.				**1,100.00**

Paxton Associates (Administrative Officer (AO))

November 26, 2020 through December 25, 2020	40.0	**4,000.00**

Responded to telephone inquiries, e-mail, and other correspondence as needed regarding the Seaside Basin. Review 2020 Annual Report and arrange filing. Continue preparing reports for 12/2/20 board meeting. Finalize contracts for new legal counsel; legal briefing with staff. Prepare & distribute Admin & Ops Funds assessment invoicing. Prep for/attend 12/2 board meeting; prepare minutes; review MPWMD Supply/Demand report to understand Stoldt comments for minutes. Provide Replenishment Assessment Fund information to Director Riley. Solicit 2021-2022 board appointments. Cancel 1/6/21 board meeting. Routinely picked up mail from PO Box; reconciled accounts to the City of Seaside Watermaster accounts; prepared financial reports; processed invoices; reviewed and posted items to web

Robert Jaques (Technical Program Manager)

December 1, 2020 through December 31, 2020	29.0	**4,350.00**

Responded to emails, telephone inquiries, and other correspondence on a variety of Watermaster issues. Prepare for/attend 12/2 board meeting; review MPWMD Supply/Demand report; follow up on board actions. Prep for/attend PWM WQ & Ops Committee meeting 12/17. Finalize 2020 Annual Report & SIAR to web. Prepare and send to MPWMD the Amendment to their RFS WQ monitoring of FO-10 well. Legal counsel briefing. Research PWM unit costs for water. Begin issues paper re: recharge water to Basin. Prepare summary memos re: PWM and GSA meetings.

Montgomery & Associates (Technical Consultant)	1.0	220	**220.00**
December 1, 2020 through December 31, 2020	7.0	200	**1,400.00**
RFS 2020-01General Hydrogeologic Consulting			
Review and share results regarding FO-10 shallow confirmation sample; email J. Lear regarding dataloggers; review potential datalogger sites; research background information regarding dedicated monitor well dataloggers for possible redeployment; calls with J. Lear and B. Jaques on history of dataloggers in Seaside Basin; prepare technical memorandum on dataloggers; and discuss datalogger technical memorandum with B. Jaques.			
RFS 2020-02 Seawater Intrustion Analysis Report	2.0	200	**400.00**
Prepare for and present results of SIAR at December Board meeting.			**2,020.00**
Total for December 2020		**$**	**11,470.00**
Grand Total November - December 2020		**$**	**47,838.35**

ITEM XI.A
2/3/21

SEASIDE GROUNDWATER BASIN
WATERMASTER

TO: Board of Directors

FROM: Robert S. Jaques, Technical Program Manager

DATE: February 3, 2021

SUBJECT: Update on Water Quality Issues and Background Information About the Watermaster's Seawater Intrusion Response Plan (SIRP)

RECOMMENDATIONS:
It is recommended that the Board have staff reevaluate monitoring well FO-09 Shallow after more data has been obtained, in order to determine if the Contingency Plan actions in the SIRP should be implemented.

BACKGROUND:
At its December 2, 2020 meeting, under the Agenda Item pertaining to approval of the 2020 Seawater Intrusion Analysis Report (SIAR), information was provided to the Board regarding the detection of what may be a precursor to seawater intrusion in two monitoring wells experiencing increasing chloride concentrations. One of these is north of and outside of the Seaside Basin (monitoring well FO-10 Shallow), and the other is just inside the northern boundary of the Seaside Basin in the Northern Coastal Subarea (monitoring well FO-9 Shallow).

DISCUSSION:
Subsequent to the December 2 Board meeting the laboratory results from the January 5, 2021 resampling of FO-9 Shallow were received. Its chloride concentration was 92.2 mg/L, which is up from 90.4 mg/L from the last sample that was collected on September 28, 2020. The January sample data is included in the plot on the attached chart. The last 4 samples have shown increased chloride levels above each of the preceding samples.

Due to these increasing chloride levels, at its December 2 meeting the Board approved increasing the monitoring frequency of these two wells and installing a sampling pump in FO-10 Shallow. Previously, monitoring well FO-9 Shallow was being monitored twice per year and monitoring well FO-10 Shallow was being monitored once per year. As a result of the Board's action, both wells will now be monitored on a quarterly basis.

In 2009 the Watermaster adopted a *Seawater Intrusion Response Plan* (SIRP), dated February 2009. This document is posted on the Watermaster's website at this link:
The SIRP is the Watermaster's contingency plan for responding to seawater intrusion in the Seaside Groundwater Basin, if and when it occurs. The SIRP was developed as part of the Watermaster's implementation of the Seaside Groundwater Basin Monitoring and Management Program in 2006. This document was produced in accordance with requirements contained in the Adjudication Decision under which the Watermaster was created.

The SIRP details the indicators of seawater intrusion, and contains a list of recommended actions to be taken if seawater intrusion is observed. “Trigger” levels were established to determine when response measures should be taken, if seawater intrusion were to be detected in the Basin.

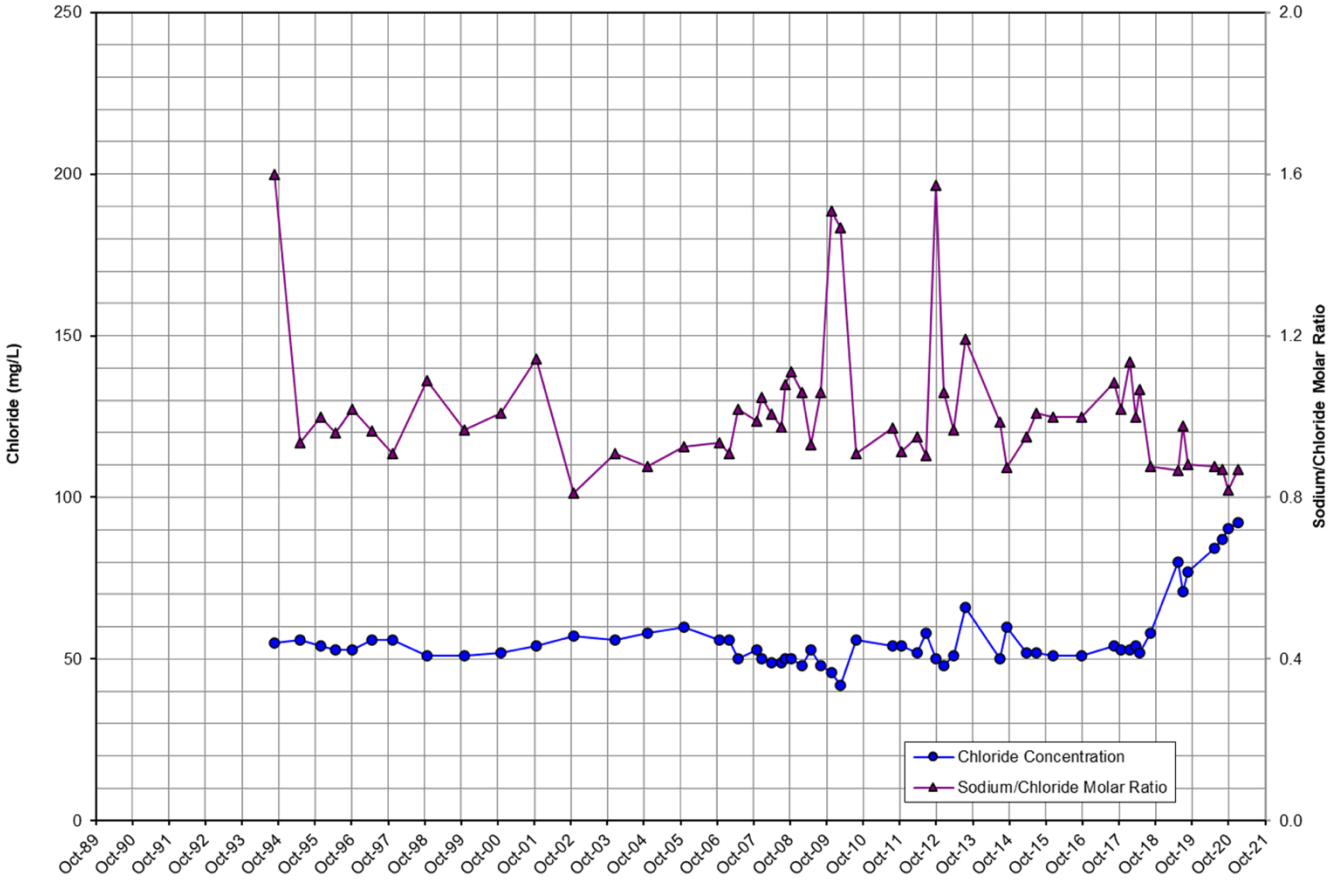
The attached excerpt from the SIRP describes the Contingency Plan Triggers. Also in that attachment is an evaluation of those triggers as currently applied to monitoring well FO-9 Shallow.

The SIRP calls for a series of actions to be taken if the Contingency Plan Triggers are met. As discussed in the second attachment, it appears that it is too early to determine if all of the triggers have been met in monitoring well FO-09 Shallow.

ATTACHMENTS:

1. Plot showing chloride levels in monitoring well FO-9 Shallow
2. Contingency Plan Trigger excerpt from the SIRP and evaluation of monitoring well FO-9 Shallow
3. Figure C-9 of Appendix C from the 2020 Seawater Intrusion Analysis Report (SIAR)

Chloride Levels and Na^+:Cl^- Ratios in Monitoring Well FO-9 Shallow



Contingency Plan Triggers from the SIRP

and an

Evaluation of Monitoring Well FO-9 Shallow Against Those Triggers

The four seawater intrusion indicators listed in the SIRP are combined to form the triggers that prompt the contingency actions described in the SIRP. These four indicators are:

1. Increasing chloride concentrations
2. Decreasing sodium/chloride molar ratios
3. Visual inspection of cation/anion ratios
4. Chloride concentration maps

Because no one indicator definitively identifies seawater intrusion, a combination of indicators is necessary to identify intrusion. In order to clearly define seawater intrusion, the following combination of indicators should be used to trigger the implementation of the contingency response actions described in Section 4 of the SIRP:

1. Chloride concentrations must be higher than the chloride threshold value shown on Table 1 of the SIRP (titled *"Chloride Threshold Values and Trend Analysis"*).
2. Sodium/chloride molar ratios must show a rapid drop, and be below the 0.86 molar ratio.
3. At least one of the following four trends or qualitative indicators must be apparent:
   a. The Mann-Kendall statistical trend for chloride concentrations is increasing.
   b. Evolution of seawater mixing is observed in Piper diagram(s).
   c. Change of Stiff diagram(s) shape from baseline conditions featuring prominent high chloride spike.
   d. Concentration maps indicate increasing chloride concentrations near the coast.

When these triggers are applied to monitoring well FO-9 Shallow, the following conclusions can be drawn:

Regarding the 1st Trigger: The Chloride Threshold value in Table 1 for monitoring well FO-9 Shallow is 67 mg/L. Currently, chloride levels in this well have risen to around 90 mg/L. Thus, the first trigger has been met.

Regarding the 2nd Trigger: In Figure C-9 in Appendix C of the 2020 SIAR there does not appear to be an appreciable change in any of the plots in the Piper Diagram for this well, but the most recent data is slightly more toward the Seawater (typical) red box in the middle and right-hand plots in that figure. The left-hand plot does not show this, and the recent data point there falls in the midst of the grouping of prior data points in that plot.

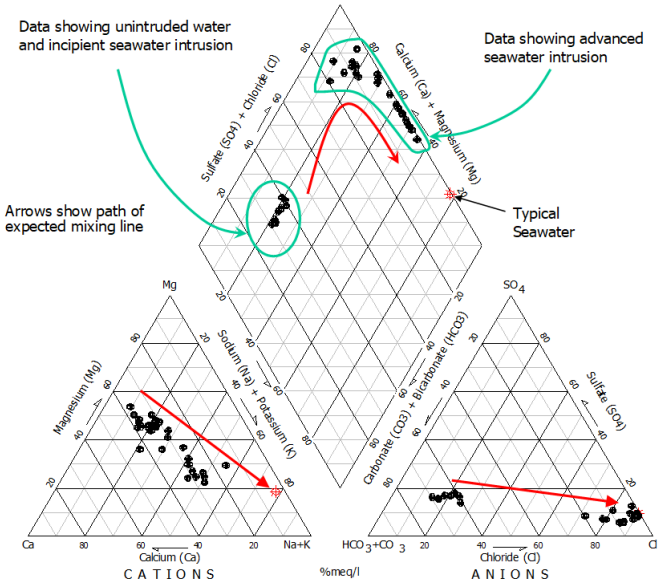
In the figure above titled *Chloride Levels and Na^+:Cl^- Ratios in Monitoring Well FO-9 Shallow*, the Na^+:Cl^- molar ratio is clearly below 0.86, and there is a decrease in the Na^+:Cl^- molar ratio in 2020, along with the increase in Cl^- concentration. However, the Na^+:Cl^- molar ratio was pretty stable through WY 2019 and the first half of WY 2020, even though the Cl^- concentration was going up

during that same time period. The decrease in Na^+:Cl^- molar ratio is only about 0.08 from the 2019 data. This is somewhat of a rapid drop compared to its historical fluctuations, but we can't determine for sure whether this is an ongoing trend or just part of a fluctuation, until we get more sampling data from this well. Thus, it is not clear whether this trigger has been met.

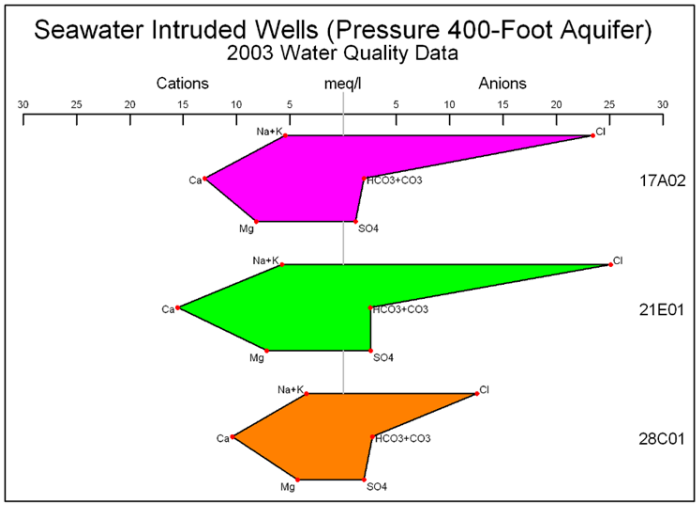
Regarding the 3rd Trigger:

Condition a: Applying the Mann-Kendall statistical test to the data from this well indicates that the chloride values are definitely increasing. Thus, this trigger has been met.

Condition b: Seawater mixing with native water would show a path looking like the one shown in the sample Piper diagram shown below. The Piper diagram for monitoring well FO-9 Shallow has not started to show this type of path. Thus, it does not appear that this trigger has been met.



Condition c: Figure 12 in the 2020 SIAR (see below) clearly does not show a Stiff diagram shape change with a high chloride spike, like this example of a seawater intruded well from another groundwater basin. Thus, this trigger has not been met.



Stiff Diagrams from Salinas Valley Wells with Seawater Intrusion

Condition d: The discussion in the 2020 SIAR about mapping of chloride concentrations indicates that there is too much variation in chloride levels in wells that are near to each other to be able to plot chloride concentration contours. We do not have chloride data from coastal wells north of monitoring well PCA-West, because we have been relying on induction logging from the Sentinel Wells as the means of detecting seawater intrusion in that area. The near-coast wells from which there is chloride data do not show increasing levels. Thus, it does not appear that this trigger has been met, but we would not know for sure unless we had a shallow monitoring well at the coast in the vicinity of the Sentinel Wells, from which samples could be collected and analyzed for chloride.

Figure C-9 of Appendix C from the 2020 Seawater Intrusion Analysis Report

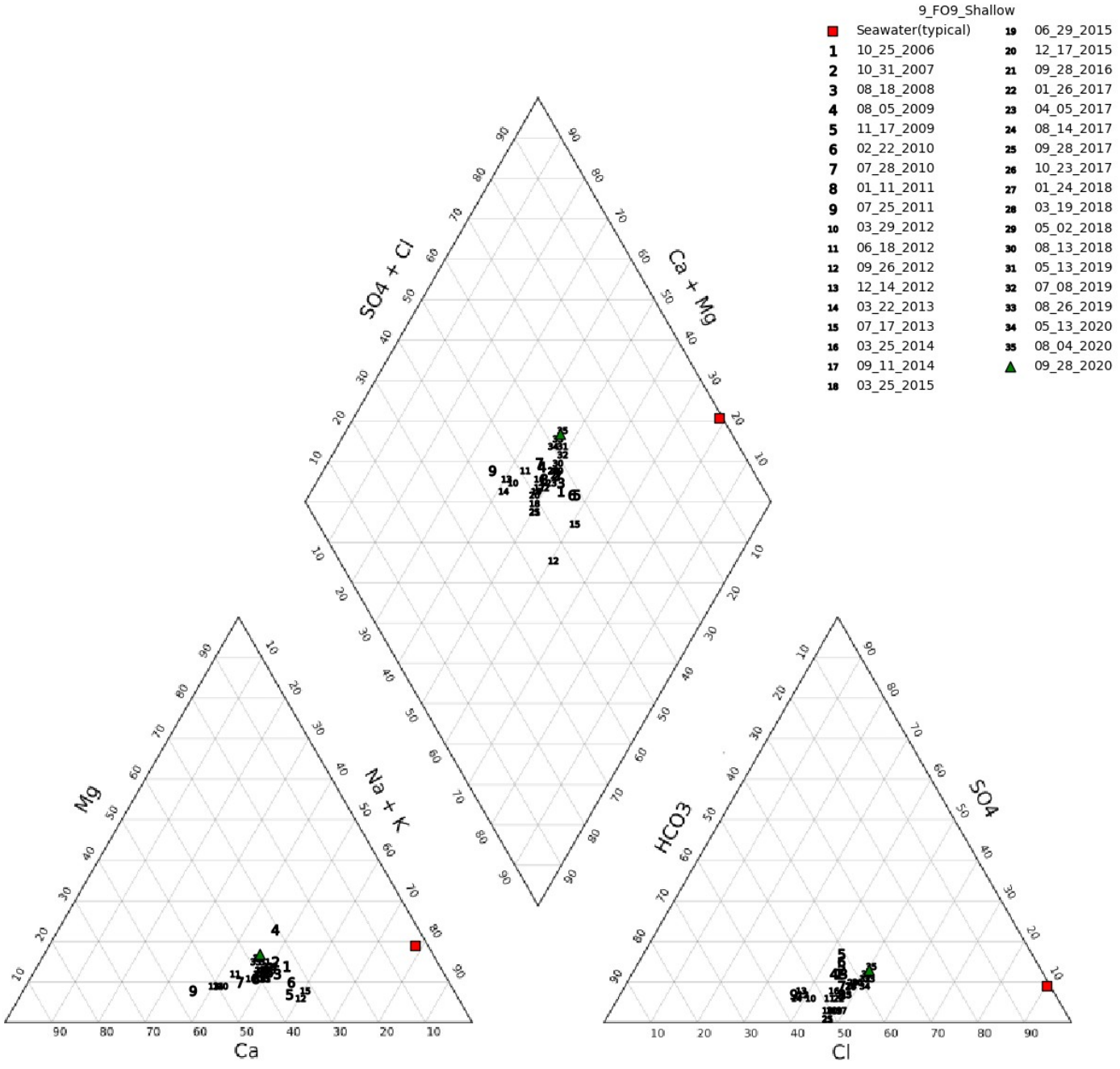
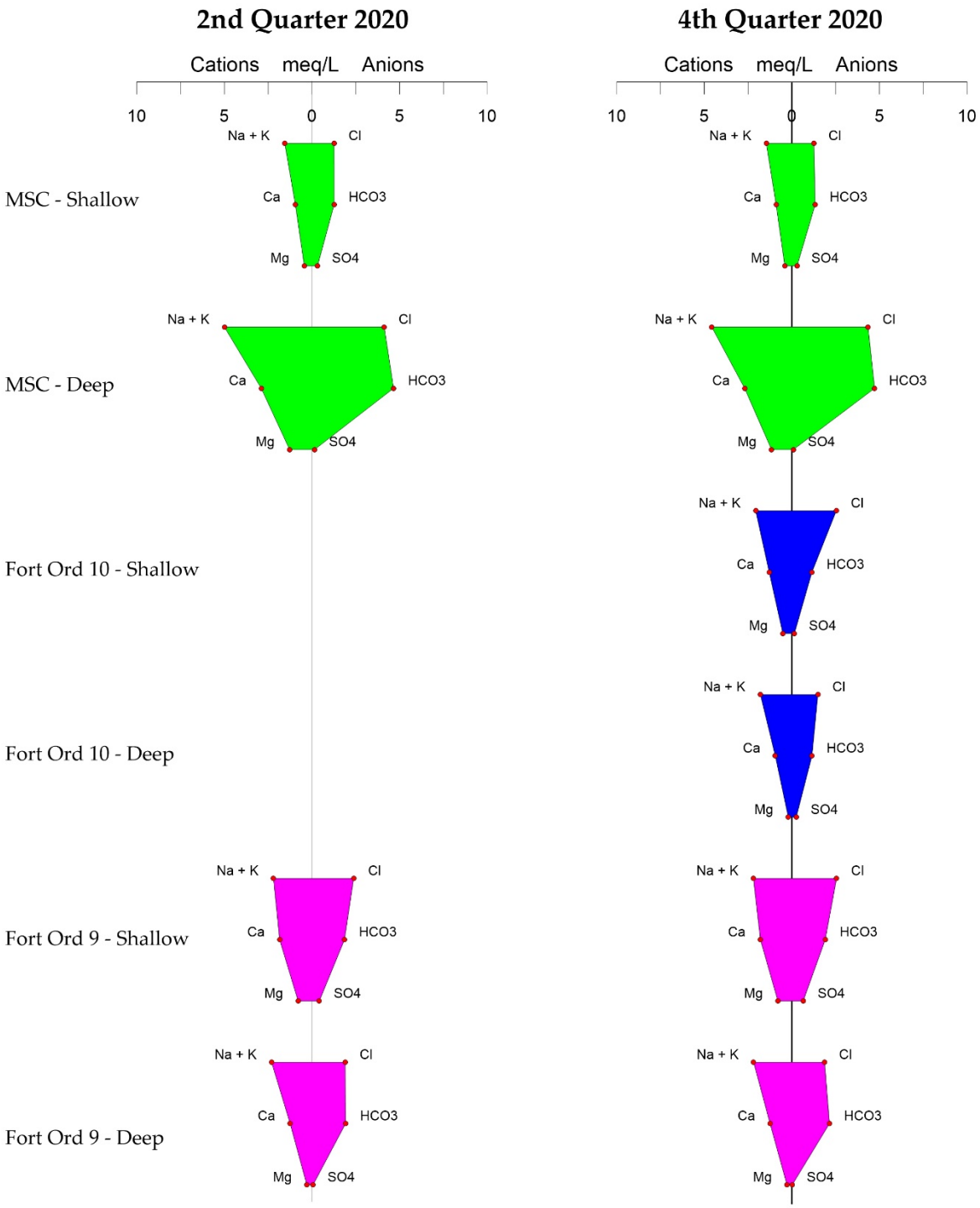


Figure C-9. Piper Diagram of Fort Ord 9 Shallow

Figure 12 in the 2020 Seawater Intrusion Analysis Report



ITEM XI.B
2/3/21

SEASIDE GROUNDWATER BASIN
WATERMASTER

TO: Board of Directors

FROM: Robert S. Jaques, Technical Program Manager

DATE: February 3, 2021

SUBJECT: Discuss Potential Installation of a New Monitoring Well Between Monitoring Well FO-9 and the Pumping Depression in the Northern Coastal Subarea, and Other Alternatives

- -

RECOMMENDATIONS:
It is recommended that the Board provide direction to staff on:
(1) Whether to solicit a scope of work and cost proposal to design and install a new monitoring well in the northern part of the Northern Coastal Subarea of the Seaside Basin.
(2) Whether to solicit a scope of work and cost proposal from Montgomery & Associates to evaluate the movement of groundwater flowing southerly from the Monterey Subbasin toward the Seaside Basin.

BACKGROUND:
At its December 2, 2020 meeting, under the Agenda Item pertaining to approval of the 2020 Seawater Intrusion Analysis Report (SIAR), the Board directed staff to obtain a quote for installation of a shallow monitoring well in the area between the groundwater depression that exists to the southwest of the Bayonet/Blackhorse golf courses, and existing monitoring well FO-9, which is located to the north in the Northern Coastal Subarea of the Seaside Basin. The purpose of the new monitoring well would be to be able to obtain water quality data from this part of the Basin where there currently are no monitoring or production wells, and thus no ability to obtain water quality data. The additional data from a new monitoring well in this location might provide useful information about the potential movement of seawater intruded water which may be coming toward the Basin from the north.

DISCUSSION:
I contacted Martin Feeney, the Watermaster's hydrogeologic consultant who has managed the installation of all of the Watermaster's Sentinel Wells, and requested a cost estimate to install a new monitoring well into the shallow (Paso Robles) aquifer. He spoke with colleagues who had recently finished installing a similar monitoring well in Santa Cruz. Based on cost information from that project, he estimates the drilling contractor's cost to install a monitoring well would be approximately $280/ ft. It is estimated that a well into the shallow (Paso Robles) aquifer would need to be between 650 and 900 feet deep, meaning the drilling contractor's cost would be between $180,000 and $250,000. It is estimated that the cost to design, provide geologic support, and manage the well installation work would be about $35,000. So the estimated total installed cost would likely be in the range of $200,000 to $300,000.

As an alternative means of estimating the movement of groundwater coming toward the Basin from the north, I asked Montgomery & Associates (Georgina King) if the Watermaster's groundwater model could be used for that purpose. Her response notes are attached.

Installing a new monitoring well will be quite costly and will only provide data from the location where the well is installed. However, a new well would be useful in seeing how water quality in its location is changing over time. Using the groundwater model, or manually estimating groundwater flow patterns using available groundwater level data, would provide information on how groundwater is moving in a larger area, but would only be as accurate as the Model or the manual plotting can predict. The model is currently not capable of predicting changes in water quality, only the movement of groundwater. A supplemental software would need to be added to the model to predict water quality changes.

I will be meeting (via Zoom) with our hydrogeologic consultants before the February 3rd Board meeting to discuss the topics covered in this Agenda transmittal. At the February 3rd meeting I will provide an oral update on the outcome of that meeting.

ATTACHMENTS:
Information from Montgomery & Associates about using the Groundwater Model to estimate groundwater movement

Response from Montgomery & Associates Regarding Use of the Seaside Basin Groundwater Model to Estimate Velocities and Directions of Flow in the Aquifers

These notes are in response to these two topics:

1) Could the Seaside Basin Groundwater Model be used to show velocities and directions of flow in the aquifers? If so, would that be helpful in predicting where the chloride plume that we are seeing in FO-9 and FO-10 is going and how fast it is moving?

2) Draft Chapter 5 of the Monterey Subbasin GSP shows a localized groundwater level depression in the 400-Foot Aquifer around monitoring wells FO-10 and FO-11 (outside of the Seaside Basin to the north). What pertinent information does this provide?

Response:

The model is only as good as its calibration and input of measured stresses such as pumping and rainfall etc. In the next month or so, we will be improving model calibration in the Santa Margarita aquifer based on the travel times of water injected in the Santa Margarita aquifer at the PWM deep injection wells. This is being done [for M1W] because more accurate data from the model is needed to understand potential travel times to meet permit requirements. Unfortunately, as this effort focuses on the Santa Margarita aquifer, there will be no calibration of the Paso Robles model layer in the model where the increase in chloride has been observed within the Seaside basin.

The model could still be used to evaluate the movement of groundwater in the Paso Robles aquifer even at its current calibration, but the stress that is causing the decline in groundwater levels around FO-10 and FO-11 (outside of the basin) is not simulated in the model so we can't simulate flow very well outside of the basin. The Marina Coast Water District is also developing a groundwater model, and since Draft Chapter 5 of the Monterey Subbasin GSP says there is no known pumping in this area, what is causing the declines may not be simulated in their model either. Matters are complicated even more so because of the groundwater flow divide that runs between FO-9 (inside the basin) and FO-10 (outside the basin).

It may be better to manually calculate groundwater flow directions and velocities between wells using measured groundwater levels and a range of effective porosities. It is almost certain, though, that because of the significant pumping depression in the Paso Robles aquifer in the Northern Coastal subarea, groundwater in the vicinity of FO-9 is flowing towards the subarea's lowest groundwater elevations which are being caused by the pumping depression.

Flow from FO-10 outside of the basin is likely towards FO-11[which is located to the east of FO-10] and not towards the Seaside Basin, since FO-11 is where the lowest measured groundwater elevations are [in that part of the Monterey Subbasin]. Figure 5-3 of the Draft Chapter 5 of the Monterey Subbasin GSP has a contour map of the 400-Foot aquifer which is equivalent to the Paso Robles aquifer that shows the groundwater low around FO-11.

Figure 1 includes hydrographs of wells in the vicinity of FO-9 and FO-10 (see Figure 2 for well location map). The hydrographs show that the greatest decline in groundwater levels in the shallow aquifer (Paso Robles) has occurred around FO-11 Shallow (about 25 feet). As you move away from FO-11 the decline seems to decrease with distance from FO-11. Groundwater level declines observed in FO-10 Shallow and FO-11 Shallow start before the City of Seaside was supplied water by Marina Coast Water District for their golf courses in-lieu of pumping their Reservoir and Coe Ave wells in the Seaside basin. Declines in FO-10 Shallow and FO-11 Shallow continued through the period the City was not pumping indicating some other source outside of the Seaside basin that is causing groundwater declines in FO-10 Shallow and FO-11 Shallow. Camp Huffman Shallow [the Watermaster's Sentinel Well No. 5] located 2 miles southeast of FO-11 also has a declining groundwater level similar to the wells plotted on the hydrograph.

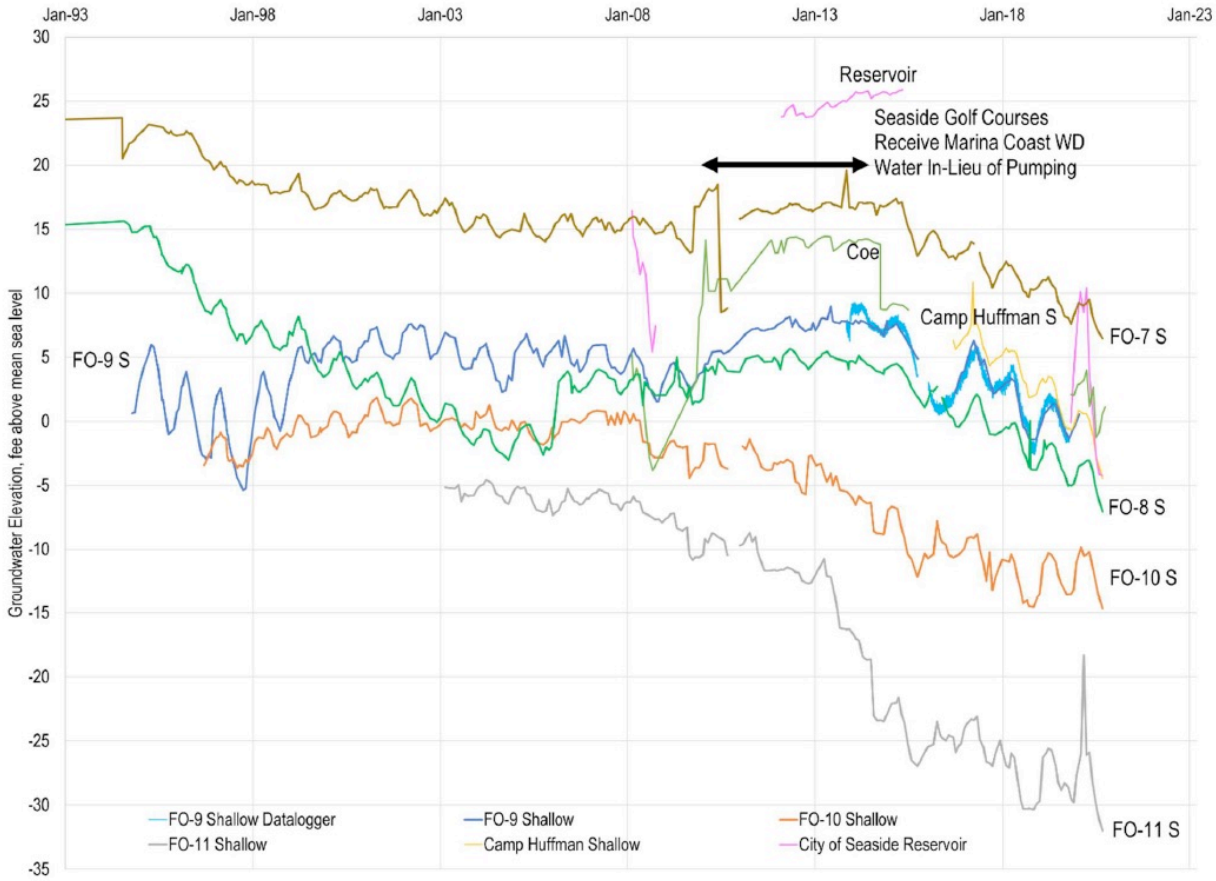


Figure 1. Comparison of Shallow Aquifer Well Groundwater Elevations

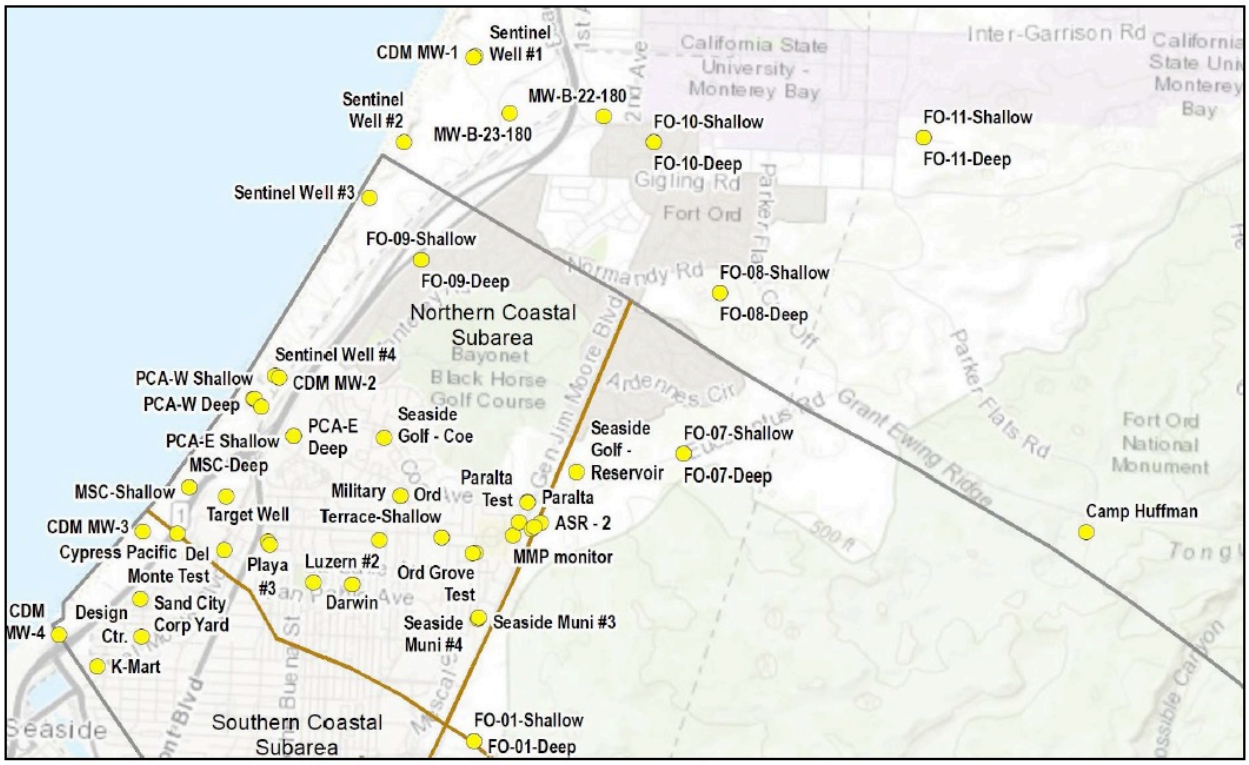


Figure 2. Well Locations

In the SIAR we associate the decline in FO-9 Shallow groundwater levels with the City of Seaside golf course pumping that started back up once their contract with Marina Coast Water District ended. This association is made because FO-9 Shallow recovered when golf course well pumping stopped and declined when pumping started back up (Figure 1). The monitoring wells that show the same groundwater level trends when the City of Seaside golf course pumping stops and starts are: FO-7 Shallow, FO-8 Shallow, and FO-9 Shallow (Figure 1).

FO-10 Shallow and FO-11 Shallow are on the north side of a groundwater divide between the Seaside basin and Monterey Subbasin, and so it makes sense that they do not respond to golf course pumping in the Seaside basin. Their declines are most likely due to pumping in the Monterey Subbasin and not Seaside basin. Based on measured groundwater levels, FO-10 Shallow and Deep appear to be screened in the same aquifer since their groundwater levels are very similar (Figure 3) while FO-11 Shallow and Deep appear to be screened in different aquifers that are connected since their groundwater level trends are similar but not at the same elevation (Figure 4). Figure 5 has FO-9 Shallow and Deep groundwater elevations that are very different to FO-10 and FO-11 that reflects that FO-9 is separated from FO-10 and FO-11 by the groundwater divide.

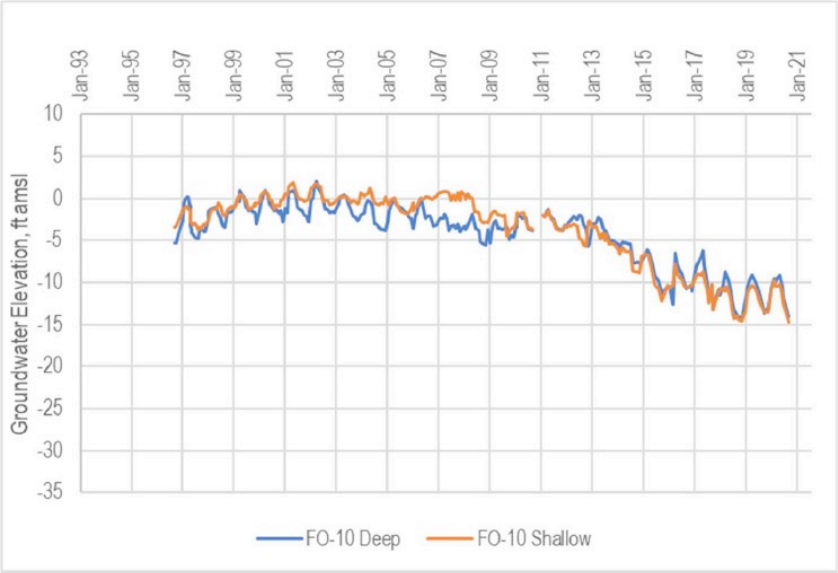


Figure 3. FO-10 Deep and Shallow Hydrographs

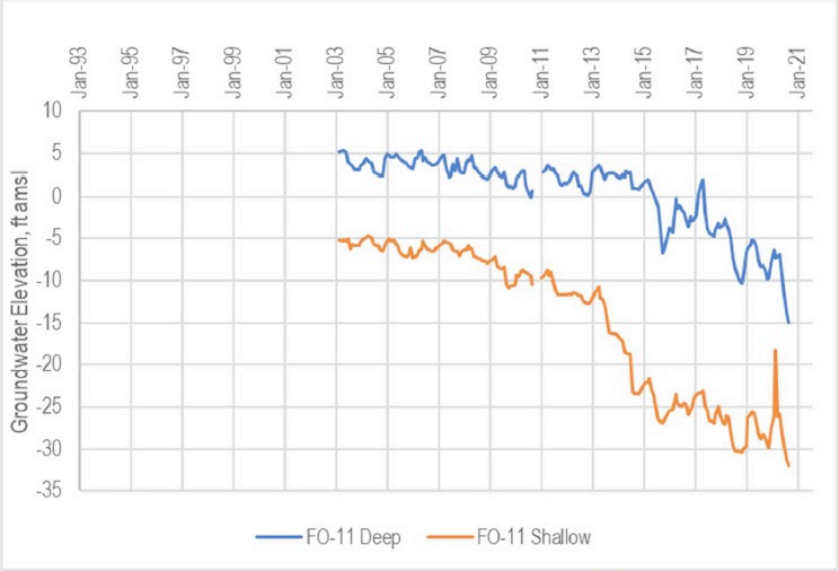


Figure 4. FO-11 Deep and Shallow Hydrographs

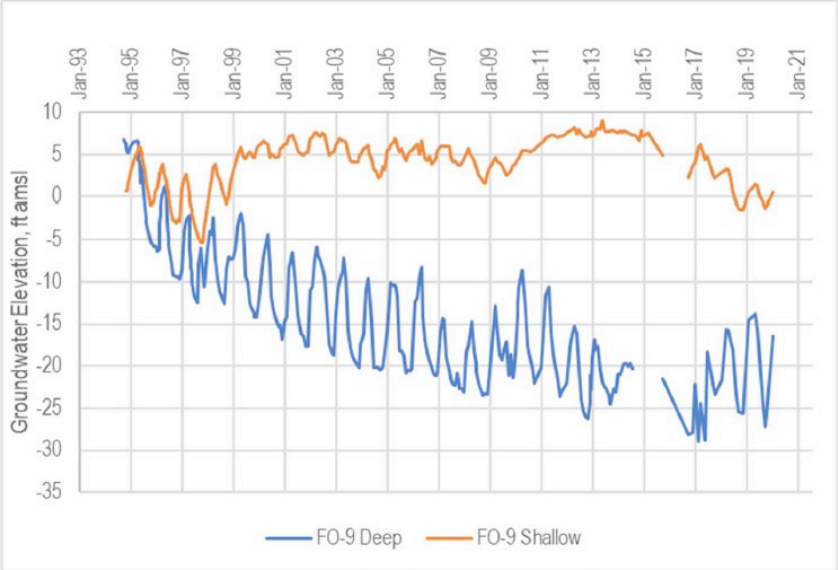


Figure 5. FO-9 Deep and Shallow Hydrographs

SEASIDE GROUNDWATER BASIN
WATERMASTER

TO: Board of Directors

FROM: Robert S. Jaques, Technical Program Manager

DATE: February 3, 2021

SUBJECT: Direct Staff Regarding Obtaining Additional Water to Recharge the Basin to Raise Groundwater Levels

- -

RECOMMENDATIONS:
It is recommended that the Board direct staff on what additional information it would like staff to prepare, and any actions it would like staff to take, to assist the Board in developing a plan to obtain recharge water for the Basin.

BACKGROUND:
At its December 2, 2020 meeting the Board discussed the topic of replenishment water for the Basin. Following considerable discussion of this topic the Board directed staff to research the items that were discussed in the agenda transmittal for this item, and to report back at a subsequent board meeting.

Several specific suggestions were made by Board members, including:

- Developing a plan for injection and extraction of water that would recharge the Basin to prevent seawater intrusion
- Providing information on what proposed supplemental water supply projects are realistic for including in the development of such a plan
- Working collaboratively with Groundwater Sustainability Agencies on mutual regional solutions to address seawater intrusion in the Marina and Ord Community, the 180/400 Foot Aquifer Subbasin, as well as to prevent intrusion in the Seaside Basin
- Having further Board discussion on the broader issue of long-term water supply, one step at a time, first with consensus on what it is the Board is working toward
- Establishing what constitutes a healthy Basin in terms of groundwater levels (fullness of the Basin)

DISCUSSION:
On January 15, 2021 I met (via Zoom) with representatives of the Monterey Peninsula Water Management District (Dave Stoldt), M1W (Mike McCullough), Cal Am (Chris Cook, Ian Crooks, Tim O'Halloran) to discuss the topic of recharging the Basin to achieve groundwater levels that would be protective against seawater intrusion. We discussed several topics, including:

- Recharge water would not be sold to users, it would be left in the Basin to benefit all users of the Basin and to help ensure the long-term beneficial use of the Basin. Similar to other water management and water resource protection activities that are already being performed and paid for by users, does Cal Am, MPWMD, or M1W have any way of recouping such costs from their rate payers?

  M1W and Cal Am felt they did not have that ability, but MPWMD felt doing so would be within their mission. Mr. Stoldt felt it would be a complicated matter to determine who should pay for the recharge water. He cautioned that his Board would first need to be in agreement that purchasing water to

recharge the Basin would be an appropriate cost for which landowners within its jurisdictional area should pay.

- The Watermaster has already explored with the State their various grant and loan programs to see if there is any funding available through them to purchase water to recharge the Basin. The State responded that they do not have any funding programs to pay for the purchase of recharge water. Did the representatives have any suggestions on sources of money to pay the cost of producing the recharge water?

  No one was aware of any State or Federal funding programs that could help with the cost to purchase recharge water.

Following considerable discussion, there was consensus that the Watermaster Board should initially discuss and come to agreement on the broader issues pertaining to obtaining water to recharge the Basin, before getting into details about costs, which projects would be best to provide the water, etc. The broader issues would include what the Watermaster's authorities and obligations are under the Adjudication Decision, how much water is coming into the Basin, how much is going out, how much would be needed to protect the Basin against seawater intrusion, and potential sources of recharge water.

Following the collective input from these representatives, and from the Watermaster Board's discussion at its December 2 meeting, I prepared the attached issue paper titled *"Information on Issues Associated with Obtaining Additional Water to Recharge the Basin in Order to Raise Groundwater Levels."* This issue paper is intended to provide information for the Board's use in its ongoing discussion of the topic of recharging the Basin to protect it against seawater intrusion.

ATTACHMENTS:
Information on Issues Associated with Obtaining Additional Water to Recharge the Basin in Order to Raise Groundwater Levels

Information on Issues Associated with Obtaining Additional Water to Recharge the Basin in Order to Raise Groundwater Levels

How Much Water Flows Into and Out of the Seaside Basin Annually

The 2018 updated Basin Management Action Plan (BMAP), used the updated Seaside Basin groundwater model to analyze groundwater conditions in the Seaside Basin over the time period of Water Years 1988 through 2017. Information in this section was taken from that BMAP.

A groundwater budget is an accounting of all the inflows and outflows to a groundwater basin. The components of the long-term water budget, which is representative of long-term average hydrologic conditions, are shown in Table 1.

Table 1. Modeled Water Budget, Average over Water Years 1988 - 2017

Recharge Source	Northern Coastal Subarea	Northern Inland Subarea	Southern Coastal Subarea	Laguna Seca Subarea	Total
	Acre-feet per Year				
Basin Inflows					
Percolation from streams	0	0	0	0	0
Deep Percolation					
Rainfall	510	1,670	130	900	3,210
Irrigation & System Losses	150	20	100	10	280
Injection wells	260	0	0	0	260
Groundwater inflow					
From adjacent subareas	2,900	1,520	520	360	5,300
From adjacent basins	130	400	50	770	1,350
From offshore area	490	0	10	0	500
Total inflows	**4,440**	**3,610**	**810**	**2,040**	**10,900**
Basin Outflows					
Wells	3,660	70	170	680	4,580
Groundwater outflow					
To adjacent subareas of the Basin	290	2,710	550	1,750	5,300
To adjacent basins	280	1,310	70	490	2,150
To offshore area	260	0	60	0	320
Total outflows	**4,490**	**4,090**	**850**	**2,920**	**12,350**
Storage Change					
Based on Inflows-Outflows	-50	-480	-40	-880	-1,450

Table 1 shows that for the Basin as a whole there is a net outflow (loss of water) of 1,450 Acre-Feet-Per-Year (AFY).

Figure 1 shows the subareas of the Basin. There are substantial groundwater flows between subareas as shown in Table 2. The largest net inflows between Basin subareas are from the Northern Inland Subarea to the

Northern Coastal Subarea (2,130 acre-feet per year) and from the Laguna Seca Subarea into the Northern Inland Subarea (940 acre-feet per year). Net Basin inflows from neighboring groundwater basins only occur at the eastern boundary of the Laguna Seca Subarea where it is adjacent to the Corral de Tierra Subarea of the Monterey Basin. At this location flows are both into and out of the Laguna Seca Subarea, however, net inflows across the Basin's eastern boundary are 280 acre-feet per year. However, as noted later in this report, in the future if pumping in the Corral de Tierra subarea of the Monterey subbasin is not reduced, this will shift from a net inflow to a net outflow.

There is an average inflow of 500 acre-feet per year and an average outflow of 320 acre-feet per year from the ocean. Net flow is the difference between the average inflow and the average outflow. The net flow from or to the ocean depends on hydrologic conditions. However, over the 30 years of the water budget, there was an average net flow from the ocean into the Basin of 180 acre-feet per year. Onshore flow within the deep aquifer does not necessarily represent seawater intrusion. This is because fresh water may be stored offshore in the deep aquifer, and onshore flow is pulling this stored fresh water into the Basin. If the deep aquifer is truly not connected to the ocean, this fresh water will not be replaced by saline water, although unsustainably extracting this groundwater may induce vertical leakage from overlying sediments that are in contact with the ocean. If there is some connection to the ocean, the fresh water stored offshore will be replaced offshore by saline water, and continued onshore flows will eventually lead to saltwater intrusion. Table 2 shows that the Northern Coastal Subarea has net onshore flow and the Southern Coastal Subarea has net offshore flow. This is a result of groundwater elevations which are well below sea level in the Northern Coastal Subarea and above sea level in the Southern Coastal Subarea.

Table 2. Modeled Net Flows between Subareas, Adjacent Basins and the Ocean, Average over Water Years 1988 - 2017

Net Flows From	Net Flows To					
	Northern Coastal Subarea	Northern Inland Subarea	Southern Coastal Subarea	Laguna Seca Subarea	Adjacent Basins	Ocean
	acre-feet per year					
Northern Coastal Subarea		-2,130	-480	0	150	-230
Northern Inland Subarea	2,130		0	-940	910	0
Southern Coastal Subarea	480	0		-450	20	50
Laguna Seca Subarea	0	940	450		-280	0
Adjacent Basins	-150	-910	-20	280		0
Ocean	230	0	-50	0	0	

Although there are some subsurface inflows into the Basin from adjacent basins, overall there is more subsurface flow out of the Basin than into the Basin. The largest subsurface outflow from the Basin to an adjacent basin is from the Northern Inland Subarea to the Ord subarea of the Monterey subbasin of the Salinas Valley Basin. This outflow averages 910 acre-feet per year. On average, 150 acre-feet per year flows from the Northern Coastal Subarea to the Ord Subarea of the Monterey Subbasin of the Salinas Valley Basin. Examination of modeled groundwater flow directions reveals that in months when ASR recharge occurs, there are more outflows to the Ord subarea from the Coastal and Northern Inland Subareas.

Groundwater pumping constitutes the largest outflow of groundwater from the Basin. As shown in Table 1, on average 4,580 acre-feet per year were pumped from the Basin between Water Year 1988 and Water Year 2017.

Because of Adjudication Decision-mandated reductions in pumping, in the 5-year period from 2012 to 2017 pumping outflows averaged only 3,840 acre-feet per year.

The Adjudication Decision-established Operating Yield started at 5,600 acre-feet per year. The Adjudication Decision required that the Operating Yield be reduced in increments until the Operating Yield reached the Adjudication Decision-established Natural Safe Yield (NSY) of 3,000 acre-feet per year.

As shown in Table 3, the estimated NSY using data from Water Year 1988 through 2017 is 2,570 acre-feet per year for the Coastal and Northern Inland Subareas, and -200 acre-feet for the Laguna Seca Subarea, with an estimated 2,370 acre-feet per year for the entire Basin. The negative Natural Safe Yield for the Laguna Seca Subarea in Table 3 indicates that reducing pumping from existing wells in the Laguna Seca Subarea will not stabilize all groundwater elevations in that subarea. Predictive modeling done in 2013 indicates that continued pumping at current rates from the neighboring Corral de Tierra subarea of the Monterey subbasin will eventually induce outflow from the Laguna Seca Subarea to the Corral de Tierra subarea.

The NSY estimate reflects the theoretical maximum amount of groundwater production that, for the Basin as a whole, would have resulted in no decrease in groundwater in storage. However, pumping is unevenly distributed across the Basin. This results in areas of significant drawdown and other areas with limited or no drawdown. Therefore, the amount of pumping that can be sustained without ongoing localized groundwater level declines is likely lower than the NSY estimated here.

Climate change is expected to further impact groundwater recharge and thus the Natural Safe Yield in the future as there will be more extremes in rainfall, a shift in when the majority of rainfall occurs, longer drought periods, and hotter temperatures that increase evapotranspiration. The result of these changes is that there may be less water available for natural groundwater recharge than has been historically available and estimates used in the updated BMAP based on historical rainfall may not be correct in the upcoming decades.

Table 3. Estimated Water Year 1988-2017 Natural Safe Yield of the Seaside Groundwater Basin

Yield Components and Adjustments[1]	Coastal & Inland Subareas	Laguna Seca Subarea	Total
	acre-feet per year		
Pumping (prescribed pumping plus recovery of injected water)	3,900	680	4,580
Storage change[2]	-570	-880	-1,450
Ocean boundary inflow	500	0	320
Injected water	-260	0	-260
Yield (assuming no outflow to the ocean)	3,570	-200	3,370
Ocean boundary outflow needed to prevent seawater intrusion[3]	1,000	0	1,000
Natural Safe Yield	**2,570**	**-200**	**2,370**

Table Notes: values are rounded to nearest 10.
[1] The values for pumping, storage change and ocean boundary flows are from the subarea groundwater budgets in **Error! Reference source not found.**.
[2] The estimate of storage change equals the difference between inflows and outflows.
[3] Yates et al. (2005).

The updated BMAP explained that the simplified method used to estimate NSY does not take into account the complexities of inflows and outflows that are occurring in the Basin, and which ultimately affect the amount of groundwater that can be sustainably pumped from the Basin without causing negative effects. A more complete approach to managing the Basin would be to estimate the Basin's Natural Sustainable Yield, which would take those complexities into account. The Natural Sustainable Yield is nearly always lower than the NSY.

Because of the high cost of estimating the Natural Sustainable Yield, the impacts on groundwater flows that may result from the Groundwater Sustainability Plan currently under development for the Corral de Tierra subarea of the Monterey Subbasin of the Salinas Valley Basin, and proposed water supply projects (Desalination Plant Project and PWM Expansion Project) that could considerably alter Basin groundwater dynamics, at its June 5, 2019 meeting the Board elected to defer performing this work. Specifically, the Board voted:

- *To not perform a sustainable yield analysis at this time;*
- *To revisit the concept of using the Sustainable Yield Approach to replace the Natural Safe Yield approach after the Groundwater Sustainability Plan for the Monterey Subbasin of the Salinas Valley Groundwater Basin has been completed in 2022, and its impacts on the Seaside Groundwater Basin have been determined; and*
- *To revisit this decision if something is learned, or events occur, that would warrant performing a Sustainable Yield analysis sooner.*

At its June 5, 2019 meeting the Board also voted to continue using the Adjudication Decision-established NSY of 3,000 AF for the time being.

What is Meant by the Term "Protective Groundwater Elevations" and Why Do Protective Groundwater Elevations Need to be Achieved

Protective groundwater elevations means groundwater elevations that are sufficiently above sea level such that seawater cannot flow into the aquifer. If groundwater levels are below protective levels, and if there are porous formations between the aquifer and the ocean, seawater will intrude the aquifer.

To put the need to achieve protective elevations in perspective, Derrik Williams of HydroMetrics WRI (now Montgomery & Associates) provided this information regarding the potential for seawater intrusion into the Seaside Basin if protective groundwater elevations are not achieved:

> ***Does the Santa Margarita Formation in the Seaside Basin daylight somewhere on the ocean floor?*** *I have seen no geological evidence that the Santa Margarita Formation daylights on the ocean floor. Lack of evidence, of course, does not mean it is not true. But without any data, the supposition that it does* ***not*** *daylight is just as good as the supposition that it does daylight. Furthermore, the rapid drawdown in response to pumping that we observe in the Santa Margarita Formation suggests that the formation does not have a nearby boundary (such as an ocean boundary) that is able to feed substantial amounts of water into the Santa Margarita Formation. To visualize what we would expect to see if the Santa Margarita Formation was closely connected to the Ocean, imagine that we had a monitoring well located next to Roberts Lake in Seaside. Roberts Lake is in very sandy soils, and water can flow in and out of the lake easily. If we started pumping a well near the Home Depot, we might expect to see some drawdown in our Roberts Lake monitoring well. But what really happen is that the Home Depot pumping simply pulls water out of Roberts Lake – keeping the water level in the nearby monitoring well at relatively high levels. The short story is that if a geologic formation is closely connected to a large source of water, you will only see muted drawdown in response to pumping. However, in the Santa Margarita*

Formation we see significant drawdown in response to pumping. We conclude that there is no nearby source of surface water, and that the Santa Margarita Formation is not closely connected to the ocean.

Is the Santa Margarita Formation at risk of Seawater Intrusion? *This does not mean the Santa Margarita Formation is not susceptible to seawater intrusion. It is most definitely susceptible to seawater intrusion. It's just that the intrusion may take longer to appear because the pathway for seawater to get to our wells in the Santa Margarita Formation is long. The Santa Margarita Formation may be surrounded by low-conductivity clay-rich deposits. But seawater will eventually percolate through those clay rich deposits and get to our Santa Margarita wells. It's not if, but when we will see Seawater Intrusion. And my fear is that "when" is coming closer and closer.*

Martin Feeney, the hydrogeologist who has constructed and monitors the Watermaster's Sentinel Wells, provided this additional information:

Following up on Derrik's response, the Santa Margarita has not been mapped in the offshore by any of the investigations I am aware of. Why it doesn't outcrop is not clear. It may be that structurally it just doesn't daylight. Or as we see in other places it is overlain by the Purisma (which is absent in Seaside). The Purisma is mapped as outcropping on the seafloor in a few places.

I would echo Derrik's comment as to the hydraulic evidence. If water levels can be 20-30 feet below sea level at the coast, then the degree of hydraulic connection to an outcrop, should it exist, has to be limited. That doesn't mean the Santa Margarita is not at risk, it only means that it may be protected from lateral movement of seawater. This doesn't mean that seawater cannot move vertically from intruded overlying materials.

How Much Water Would be Required to Achieve Protective Groundwater Elevations in the Basin

In 2013 the Watermaster had HydroMetrics WRI prepare a document titled *Technical Memorandum Groundwater Modeling Results of Replenishment Repayment in the Seaside Basin*. That report evaluated groundwater level impacts that would result from implementation of Cal Am's 700 acre-feet per year for 25-years overpumping repayment plan.

The 2013 Technical Memorandum concluded that, when combined with Cal-Am's 25-year overpumping repayment schedule, protective elevations in the Seaside Basin could be achieved by injecting an additional 1,000 acre-feet of water per year for a 25-year period into the basin at the location of the existing ASR wells. This recharged water would be left in the basin, and not pumped by Standard or Alternative producers. This would require a total of approximately 25,000 AF of recharge water over that 25-year period.

More hydrogeologic information about the Seaside Basin is now known than was known when the 2013 Technical Memorandum was prepared, and the impacts of the PWM Project on groundwater levels and groundwater flow patterns can now be more accurately assessed. Therefore, additional modeling would need to be done to update and refine the work performed in 2013.

Adjudication Decision (Judgement) Authorities and Obligations of the Watermaster Pertaining to Replenishment of the Seaside Basin

The Board expressed interest in knowing if the Adjudication Decision has any specific requirements directing the Watermaster to obtain additional recharge water to protect the Basin, or if the Watermaster is only required to see that pumping is reduced to the NSY, even if that does not protect the Basin against the threat of seawater intrusion.

The Legal Opinion on this question prepared by Chris Campbell, the Watermaster's recently hired legal counsel, is attached and concludes in part that:

- The Watermaster has the authority and the obligation to prevent seawater intrusion into the Basin, and to manage the water supply of the Basin for the beneficial use of the public.

- The Watermaster must ensure that the Basin's ongoing viability [as a potable water supply source] is maintained.
- The Watermaster is to work collaboratively with other entities to complete the work required to achieve groundwater levels that protect the Basin against seawater intrusion.
- If the Court determines that the Watermaster is not carrying out its duties, the Court, may impose sanctions. Those could include fines, pumping moratoriums, or even the creation of a Special Master to take over management of the Basin.

Note that "Exhibit A" to the Judgement titled *"Principles and Procedures for the Seaside Basin Monitoring and Management Plan,"* which is referred to in the Legal Opinion, includes this specific wording in the section titled "Plan Criteria":

> *"Within one year after entry of the Judgment by the Court, the Watermaster will:…(d) develop a plan of action to be implemented to avoid various adverse effects in the Basin, including seawater intrusion; and (e) develop a plan of action to contain seawater intrusion should it occur. The plan of action to avoid adverse effects in the Basin shall include a timeline for the importation of Non-Native water for spreading or injection into the Basin, and for acquisition of recycled water in lieu of Native Water production, and shall outline concrete steps to be taken to secure both Non-Native water and recycled water."*

Is There Water Available Now or in the Projected Future to Replenish the Basin

There currently is no water available to replenish the Basin. However, there are two projects that are being pursued that would have the potential to produce replenishment water. These are the Monterey Peninsula Water Supply Project's Desalination Project, and the Pure Water Monterey Expansion Project.

Desalination Project. The March 2018 Final EIR/EIS for the MPWSP states that the desalination plant is sized to produce 6.4 MGD (7,167 AFY)[(1)] of potable water when operating at its full (100%) capacity. However, desalination plants do not typically operate year-around at their full capacity due to down-time for scheduled and unscheduled maintenance. To account for those down-times Cal Am reportedly proposed that the actual annual production of the desalination plant be based on an assumed 86% operational capacity.[(2)] This results in a projected supply of 6,252 AFY from the desalination plant[(2)].

In addition to the supply from the desalination plant there are several other available water supply sources available to Cal Am:

- PWM project (3,500 AFY)
- Carmel River (3,376 AFY)
- Seaside Basin (774 AFY available during Cal Am's 25-year-at-700 AFY replenishment repayment plan)
- ASR (1,300 AFY)
- Sand City Desalination Plant (94 AFY)

The Final EIR/EIS for the MPWSP also states that the sizing of the desalination plant was based on a long-term demand projection of 14,275 AFY[(1)]. No breakdown of the timing over which that demand would be reached is provided in that document. This demand would be met by the desalination plant and the other sources listed above. If the desalination plant is constructed, there will initially be surplus production capacity that won't be needed until sometime in the future as demand increases to reach the plant's full capacity.

Pure Water Monterey Expansion Project. The Pure Water Expansion project would expand the capacity of the existing Pure Water Monterey AWT by 2,250 AFY. With that expansion the PWM AWT plant would be able to produce 5,750 AFY of reclaimed water for injection into the Seaside Basin. This amount of reclaimed water, together with the other water supply sources available to Cal Am that are listed above, would result in a total water supply capability of 11,294 AFY.

Supply vs. Demand. In MPWMD General Manager David Stoldt's final *Supply and Demand for Water on the Monterey Peninsula* report dated May 18, 2020, he reported that the combined total supply available to Cal Am from the desalination plant (operating at 86% of capacity) and these other sources would be 15,296 AFY[(2)]. If the plant were operated at 100% of its capacity the total supply would be 16,211 AFY[(1)].

Figure 2 shows the water supplies available under current conditions. This figure was prepared using the data in Mr. Stoldt's 2020 report. As Figure 1 shows, the currently available water supply of 9,044 AFY, which reflects (a) the reduced pumping from the Carmel River Basin as required by the SWRCB, (b) the reduced pumping from the Seaside Basin as required by the Adjudication Decision, and includes (c) the 3,500 AFY of water being provided by the Pure Water Monterey Expansion Project, is not adequate to meet the current demand of approximately 9,825AFY.

Figure 2 also shows three of the hypothetical future demand scenarios Mr. Stoldt's report assessed. These are based on water demands under three housing market absorption rates:

(1)16.4 AFY (the annual water demand during the decade that preceded the SWRCB's Cease and Desist Order [CDO] on pumping from the Carmel River Basin),
(2) Three times the pre-CDO rate, and
(3) 250 AFY over the first five years on top of the pre-CDO rate.

Figure 3 shows the other two hypothetical future demand scenarios Mr. Stoldt's report assessed. These are based on water demands under market absorption rates tied to AMBAG's 2018 Regional Growth Forecast:

(1) One using the subregional population forecast as a proxy for residential water demand, and the subregional employment forecast, using job growth as a proxy for commercial water demand, and
(2) One using "Pent-Up Demand" plus AMBAG's 2018 Regional Growth Forecast absorption rate. The Regional Growth Forecast is intended to include new housing starts for increasing population, and new commercial businesses for job formation. However, several cities have approved but unbuilt projects that might happen more quickly once a permanent water supply becomes available and new meters can be set. This scenario addresses this "pent-up" demand.

Figure 4 shows the amount of excess supply that could be available annually if the desalination plant is built and operated at 86% of its capacity, based on a hypothetical start-of-operation-date of 2020 and under the future demand scenarios that were analyzed in Mr. Stoldt's May 18, 2020 report. Figure 4 shows that the Desalination Project could provide the 1,000 AFY of recharge water that will be needed annually for each year of the 25-year recharge period.

Figure 5 shows the amount of excess supply that could be available annually if the PWM Expansion Project is built, based on a hypothetical start-of-operation-date of 2020 and under the future demand scenarios that were analyzed in Mr. Stoldt's May 18, 2020 report. Figure 5 shows that the PWM Expansion Project could only provide the 1,000 AFY of recharge water that will be needed annually for 25 years under one of the future demand scenarios. Under the other four future demand scenarios, 1,000 AFY of recharge water could only be provided for between 4 and 15 years of the 25-year recharge period.

Figure 6 compares the cumulative amounts of excess water that could be available through 2050 from the Desalination Plant Project and the PWM Expansion Project. Figure 6 shows how much more excess water would be available from the Desalination Plant Project compared to the PWM Expansion Project. The desalination plant could provide 25,000 AF of water for recharge in approximately 5 years. It would take the PWM Expansion Project between 18 and 23 years to provide this much water for recharge under the two scenarios which would be able to produce 25,000 AF. The other three scenarios would not be able to produce 25,000 AF.

Acquiring Water to Replenish the Basin

The 2019 update of the Watermaster's Basin Management Plan includes a recommendation to develop a long-term financing plan for replenishment water, which reads as follows:

The Adjudication Decision identifies three separate budgets that the Watermaster oversees: (1) the Monitoring and Management Plan budget, (2) an annual Administrative budget, and (3) a Replenishment budget. These budgets are set every year by the Watermaster.

The replenishment assessments are only intended to offset overproduction that has occurred after the Decision was issued. The current replenishment assessments are not sufficient to buy water that offsets over-pumping that occurred prior to the Adjudication Decision. The over-pumping prior to the Adjudication Decision added to the Basin's deficit. Offsetting only the over-production that occurred after the Adjudication Decision may not be sufficient to raise groundwater levels in the Basin sufficiently to prevent seawater intrusion.

The Watermaster should develop a plan to address this issue.

Based on cost information provided by Cal Am, the currently projected cost of water from the Desalination Plant Project is on the order of $5,500/AF, and for the PWM Expansion Project is on the order of $2,500/AF.

Regardless of which project moves forward, acquiring 1,000 AFY of replenishment water will cost several million dollars per year.

Footnotes:

(1) Source: Final EIR/EIS for Cal Am's Monterey Peninsula Water Supply Project, dated March 2018.

(2) Source: Supply and Demand for Water on the Monterey Peninsula, a report prepared by David Stoldt, MPWMD General Manager, dated May 18, 2020.

Figure 1. Seaside Groundwater Basin Subareas

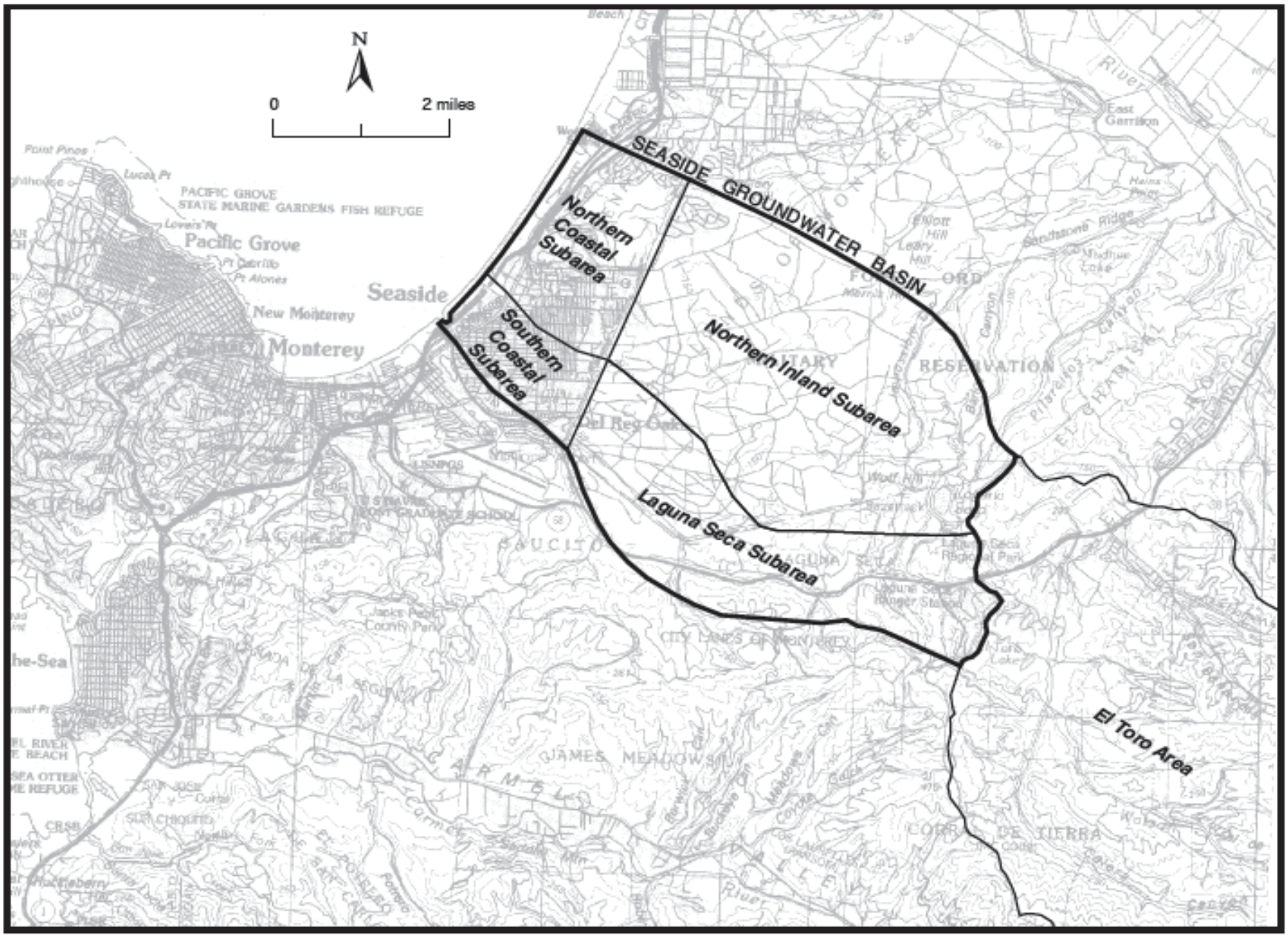


Figure 2. Market Absorption of Water Demand Compared to Water Supply
Current Demand at 5-Year Average
Pre-CDO Growth Rate Alternatives (Acre-Feet)

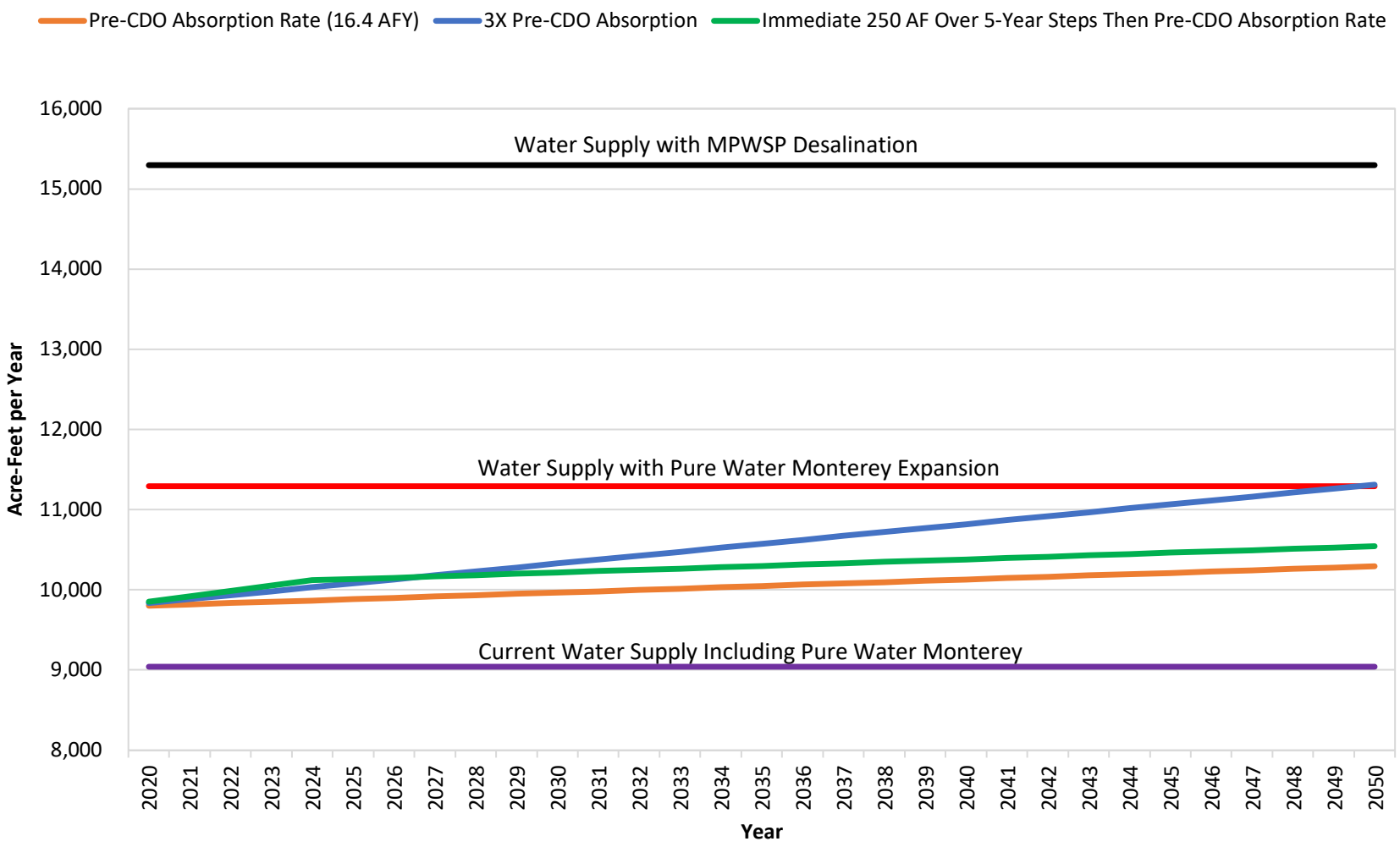


Figure 3. Market Absorption of Water Demand Compared to Water Supply
Current Demand at 5-Year Average
AMBAG 2018 Regional Growth Forecast Alternatives (Acre-Feet)

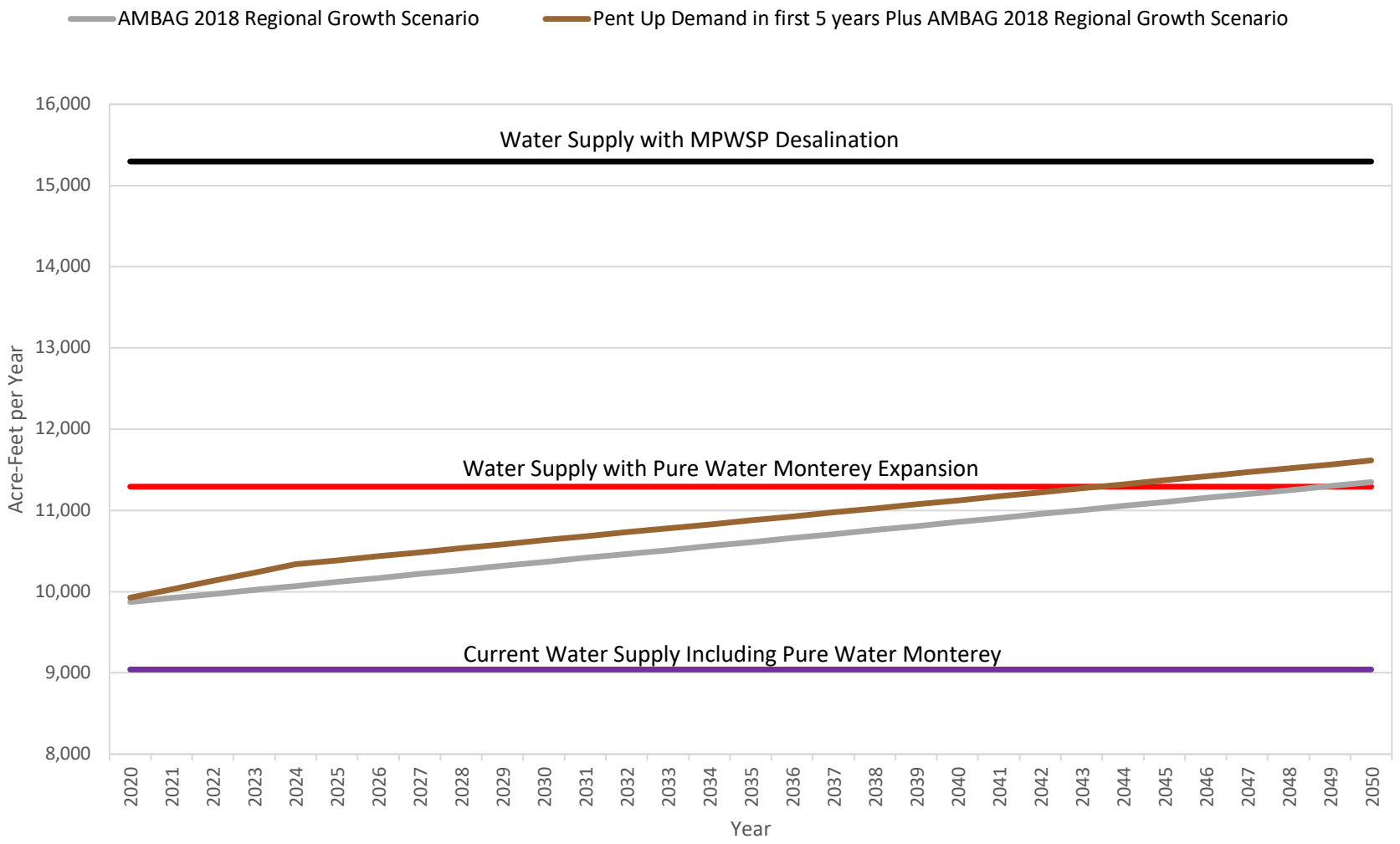


Figure 4. Excess Capacity Available Annually with Desalination Under Various Growth Rate Alternatives

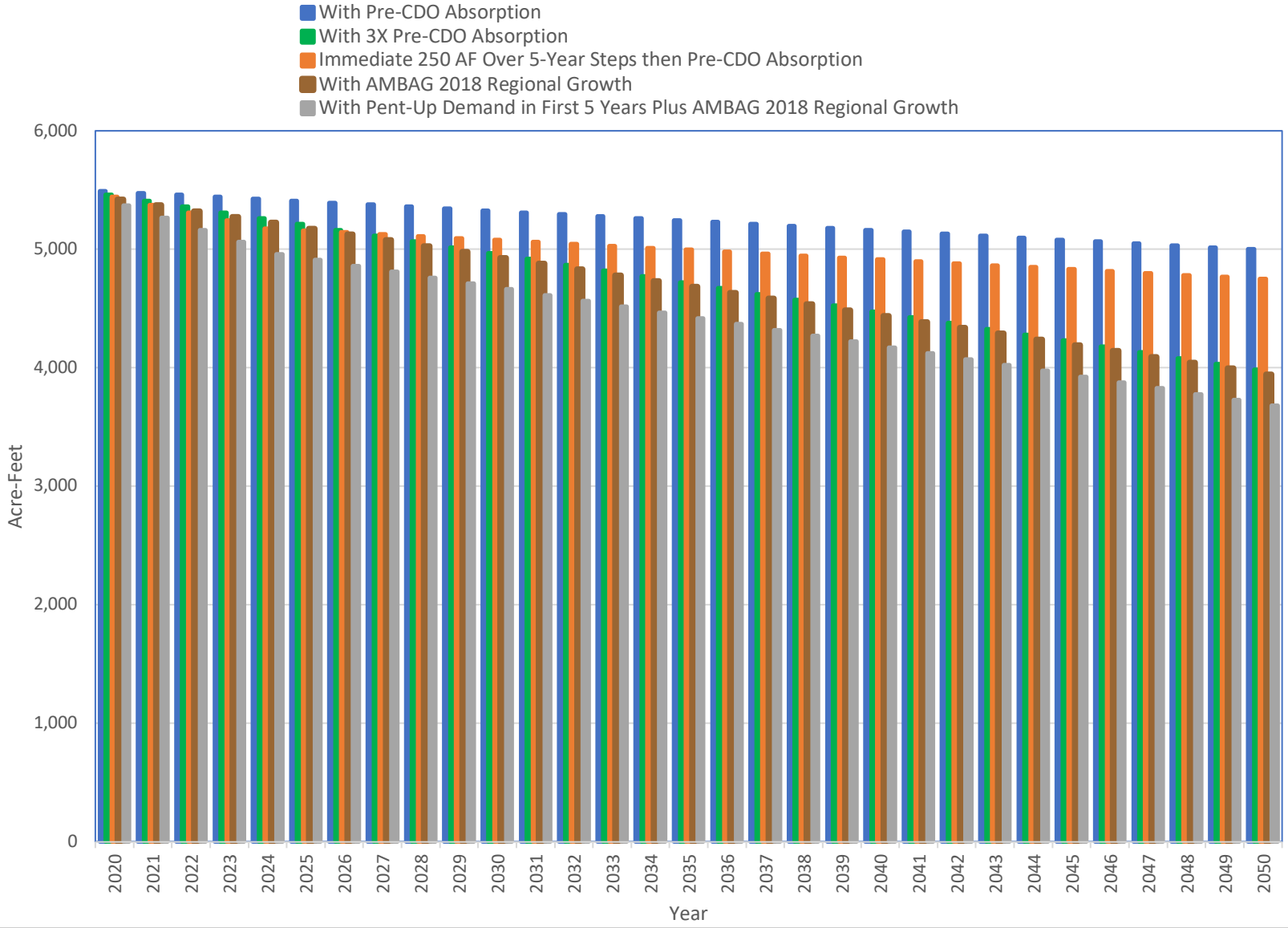


Figure 5. Excess Capacity Available Annually with Pure Water Monterey Expansion Under Various Growth Rate Alternatives

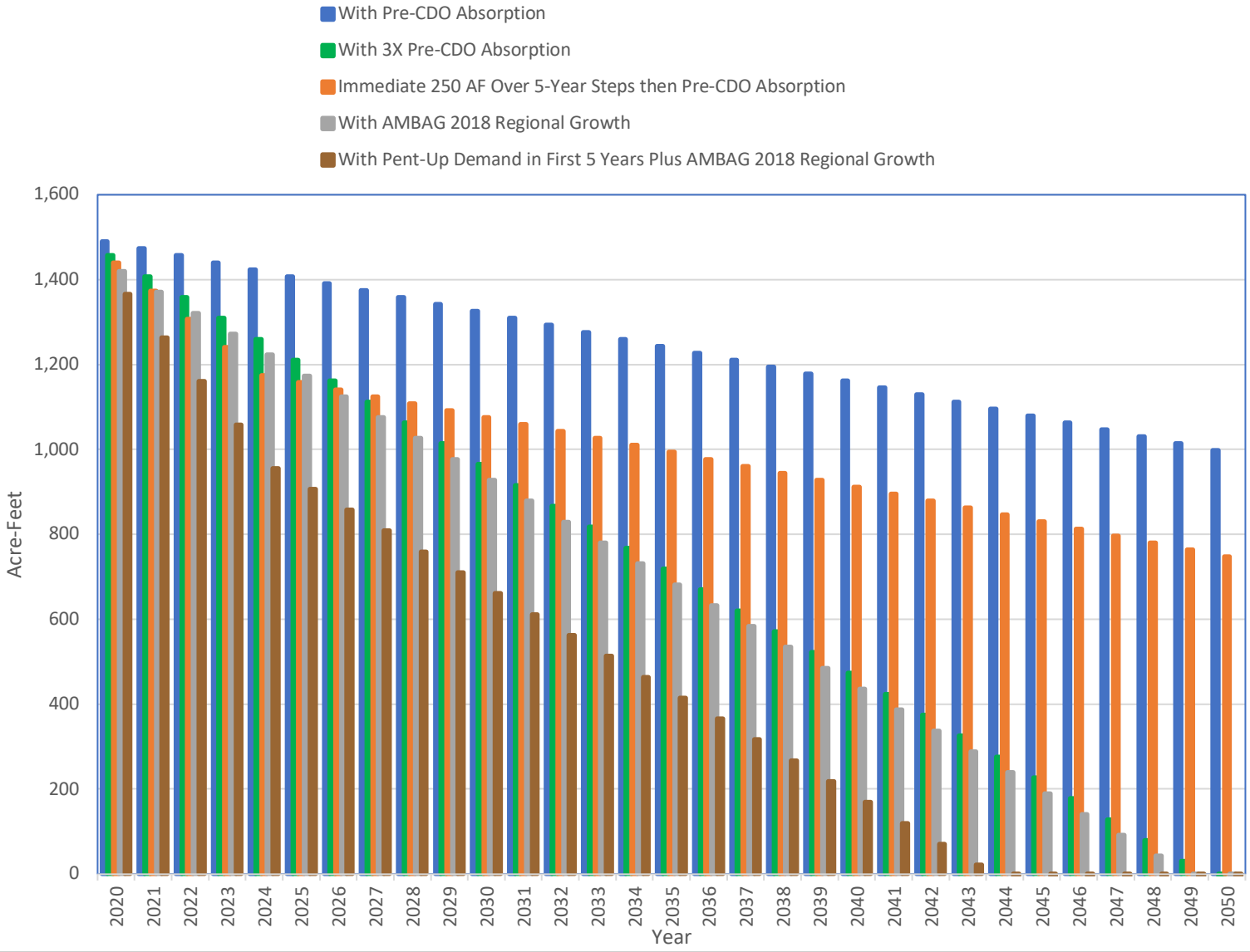
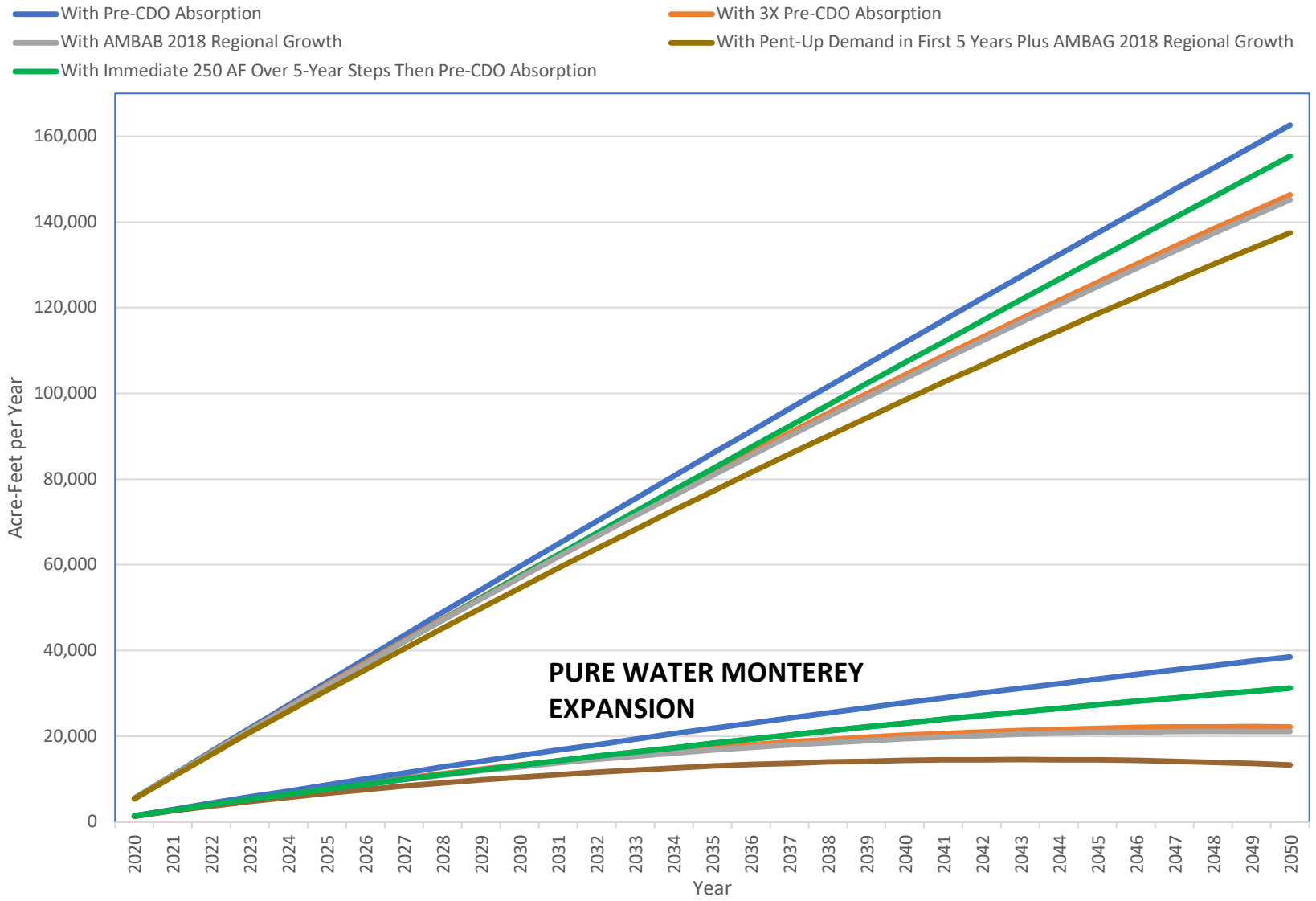


Figure 6. Comparison of Cumulative Excess Capacity Available with PWM Expansion and Desalination Under Various Growth Rate Alternatives



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MEMORANDUM

ATTORNEY-CLIENT INFORMATION
PRIVILEGED & CONFIDENTIAL

TO: Seaside Groundwater Basin Watermaster
PO Box 51502
Pacific Grove, CA 93650

FROM: Christopher L. Campbell
BAKER MANOCK & JENSEN, PC

DATE: January 18, 2021

RE: Legal Opinion: Duties of the Seaside Watermaster

The Watermaster has requested that I clarify the legal authority and the required duties of the Seaside Watermaster, focusing on the Watermaster's authority and duty to procure sufficient reliable water supply to maintain the fresh and/or reclaimed water in Seaside Basin at a level that will protect the Basin from seawater intrusion.

The Amended Judgment makes clear that the Watermaster has the authority and the obligation to (1) monitor the groundwater supply in the Seaside Basin, (2) maintain an offshore flow to prevent seawater intrusion, and (3) manage the water supply for the beneficial use of the public.

The Watermaster is subject to the Judgment, the Amended Judgement, and the post-Judgment clarification stated by Judge Randall on February 9, 2007, collectively, the "Judgment."

The Judgment states, "The Physical Solution set forth by this Decision is intended to ultimately reduce the drawdown of the aquifer to the level of the Natural Safe Yield to maximize the beneficial use of the basin and to provide a means to augment the water supply for the Monterey Peninsula."

The Watermaster is required to carry out the specific duties listed in the Judgment to maximize the potential beneficial use of the Basin for the water users who are the ultimate beneficiaries of the Watermaster's work. In particular, the Court found that the public interest is served by augmenting the total yield of the Seaside Basin through (1) artificial groundwater recharge, (2) storage, and (3) water recovery.

The Judgment also finds that transferability of water and water rights is essential to the health of the Basin.

The Physical Solution is further explained in the Judgment as "the efficient and equitable management of groundwater resources within the Seaside Basin to maximize the beneficial use of water resources in a manner that is consistent with Article X Sections 2 and 5 of the California Constitution[1][2] while working to bring the production of native water to the Natural Safe Yield."

Perhaps the most crucial duty of the Watermaster is to manage the monitoring and reporting on the use of the water supply and the freshwater against seawater levels. The Watermaster must use that information to ensure that the Basin is protected from seawater intrusion at all times and protect all portions of the Basin from Material Injury (see definition P.12 of Judgment.) If the Watermaster fails to prevent Material Injury, the Watermaster shall remedy the injury promptly.

The Judgment gives the Watermaster reasonable authority to determine how the various mandates in the Judgment and Physical Solution are carried out, but the Watermaster is constrained by the general mandate to maintain and improve the health of the Basin. The Watermaster must (1) halt seawater intrusion, and (2) return the Basin to equilibrium through (a) implementation of conservation methods; (b) replacement of water drawdown by substitution of reclaimed water (where appropriate;) (c) infusion of imported water into the aquifer; and (d) utilization of controlled pumping schedules through analyses of real-time monitoring (to coordinate pumping times among users to prevent over-pumping at any specific time.)

The Judgment also requires the Watermaster to ensure that the Seaside Basin reaches a sustainable, protective freshwater level in a reasonable time. At the minimum, the Watermaster must ensure that parties reduce the Operating Yield for each area by ten percent every third year until the Operating Yield is equivalent or below the Natural Safe Yield. That schedule may require acceleration if the Watermaster determines, based on the monitoring of the Basin, that the Basin is not making progress to reach a protective water level (or onshore gradient), or the Watermaster determines that a Material Injury is, or, in the Watermaster's judgment, is likely to occur.

The Watermaster shall continue the reductions in the Operating Yield until the Watermaster initiates addition of non-native water (equivalent to the difference between the Natural Safe Yield and the Operating Yield) to the Basin on an annual basis; or until the Watermaster has secured reclaimed water in an equivalent amount and contracted with one or more of the Producers to utilize said water in lieu of their Production Allocations. The Producer(s) must agree to forgo their right(s) to claim a Stored Water Credit for such forbearance. Any of these approaches will satisfy the Judgment. The Watermaster shall continue to monitor and maintain water levels protective of the Basin in perpetuity.

[1] CA Constitution art X § 2
[2] CA Constitution art X § 5

Exhibit A to the Judgment (attached) provides the initial baseline required by the Judgment for the management and protection of the Basin. Exhibit A shows the urgency felt by the court and the comprehensive scope of the initial requirements to move toward a sustainable water balance in the Basin. Exhibit A emphasizes that the Watermaster must continue the comprehensive monitoring of the Basin and the Watermaster must utilize all the scientific data to ensure that the Watermaster is maintaining the Basin to achieve its ongoing viability.

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Finally, the Judgment requires the Watermaster to "act jointly or cooperate with any public entity to the end that the purposes of the Physical Solution may be fully carried out." The Watermaster must work collaboratively with the entities relying on the Seaside Basin to promptly complete the work required to bring the Seaside Basin to a level that protects the Basin from Seawater intrusion.

If any party to the Judgment, or the Court, on its own motion, believes that the Watermaster is not carrying out its duties, that party can ask the Court to sanction the Watermaster for the failure. If the Court finds that the Watermaster is not fulfilling its duties the Court may order appropriate sanctions. Fines and moratoriums on pumping have been used to protect basins. In extreme cases courts have appointed a Special Master to take over the management of the basin.

I look forward to any questions or discussion concerning the Opinion.

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CLC:tlw

EXHIBIT "A" OF THE JUDGEMENT

Principles and Procedures of the Seaside Basin Monitoring and Management Plan

Introduction

This document sets forth the criteria that will guide the Watermaster in creating the Seaside Basin Monitoring and Management Plan. It also establishes a procedure for dealing with seawater intrusion, should the same occur, during the time the Watermaster is developing its plan of action to deal with such an eventuality.

Plan Criteria

Within sixty days of entry of the Judgment by the Court, the Watermaster will submit for the Court's approval a Monitoring and Management Plan containing details for implementation of the following actions:

a. *Exploratory borehole drilling program.* About four exploratory boreholes shall be drilled along the shoreline and the northern boundary of the Basin to depths ranging from 500 to 1500 feet, the depth being controlled by the depth of the Monterey formations. Lithologic samples shall be collected and classified for every one foot of drilling. A full suite of geophysical logs shall be collected. The data collected as part of this program shall be compared to other well data in the Seaside Basin to further refine the hydrogeologic conceptual model in the areas between the production wells and saline groundwater.
b. *Geophysical surveys.* Geophysical surveys shall be performed along the shoreline and the northern boundary of the Basin, intersecting the test borehole locations. The results of the geophysical surveys shall be calibrated against the test borehole data. The borehole data and the surveys shall be analyzed to characterize the near shore hydrology and to locate and design new monitoring wells.
c. *New monitoring wells.* About four to six monitoring well clusters shall be drilled and installed along the shoreline and the northern boundary of the Basin. Each cluster shall consist of at least four to five wells to provide a detailed vertical characterization of head and water quality through the aquifer system. The Watermaster shall coordinate the placement of the wells with MPWMD, which already has some monitoring wells in place with plans to drill more, to avoid duplication of effort and cost inefficiencies.

EXHIBIT A

d. *Design and implementation of a piezometric and water quality monitoring program.* Pressure transducers and ionic probes (EC and Cl) shall be installed in each well at each cluster. These probes will record water levels and water quality on a frequent interval (every 15 minutes for water levels, and every day for water quality). Where possible, similar probes will be installed in the pumping wells to record water levels and on/off cycles. Grab samples will be obtained periodically to true up the ionic probes. These data will be analyzed to assess the state of seawater intrusion, reveal groundwater barriers within the aquifer system, and more accurately estimate aquifer system parameters.
e. *Development and implementation of a management program.* The objectives of the management program will be to optimize pumping , halt seawater intrusion, and return the Basin to equilibrium through implementation of conservation methods; replacement of water drawdown by substitution of reclaimed water, where appropriate; infusion of imported water into the aquifer; and utilization of controlled pumping schedules through analysis of real-time monitoring.

The management program will include periodic review of monitoring information and the use of this review to guide near-term and long-term groundwater pumping. If seawater is detected by the MPWMD monitoring wells currently in place, or by pumping wells, or by the monitoring well system contemplated by this document, the Watermaster shall follow the procedures developed pursuant to the mandate of the following paragraph. If it is detected before such procedures are in place, the Watermaster shall follow the procedure set forth in the *Interim Contingency Procedure to Contain Seawater Intrusion*, infra.

Within one year after entry of the Judgment by the Court, the Watermaster will: (a) develop improved estimates of the natural and secondary recharge within the Seaside Basin; (b) develop and implement a program for collecting groundwater production, water use, and land use data for the Seaside Basin and appropriate adjacent areas; (c) develop a suitable groundwater model of the Seaside Basin and appropriate adjacent areas; (d) develop a plan of action to be implemented to avoid various adverse effects in the Basin, including seawater intrusion; and (e) develop a plan of action to contain seawater intrusion, should it occur. The plan of action to avoid adverse effects in the Basin shall include a timeline for the importation of Non-Native water for spreading or injection into the Basin, and for acquisition of recycled water in lieu of Native Water production, and shall outline concrete steps to be taken to secure both Non-Native Water and recycled water.

Interim Contingency Procedure to Contain Seawater Intrusion

If Seawater intrusion is detected in the Basin during the development of the Watermaster's Management Plan, the following contingency plan will be set in motion to prevent seawater from contaminating larger portions of the Basin:

a. *Detection in a coastal monitoring well.* If seawater intrusion is detected in a coastal monitoring well, it is imperative that pumping stresses be reduced so that seawater is not pulled inland to producing wells. To accomplish this, all wells that produce from the intruded aquifer that are within one-half mile of the affected monitoring well will reduce their production to the equivalent of one-half their previous five-year pumping average. Monitoring of groundwater levels within the one-half mile radius of the affected well will be increased to determine if groundwater gradients following reductions in pumping have been modified sufficiently to prevent further seawater intrusion. This increase in monitoring effort will include installing at least one new monitoring well as a sentinel between the affected monitoring well and the nearest down-gradient active production well. After six months of reduced pumping, the threat of further seawater intrusion will be re-evaluated. If there continues to be a groundwater gradient that would pull the detected seawater toward producing wells, the pumping wells within one-half mile of the affected monitoring well will further reduce pumping to one-third of their previous five-year pumping average. After another six months of monitoring, the direction of groundwater gradients will again be evaluated. If there continues to be a groundwater gradient that would pull the detected seawater towards producing wells, then the wells with reduced pumping will discontinue pumping. If, after the initial discovery of intrusion, seawater is encountered in an additional monitoring well, pumping reductions will be required for nearby producing wells in the same manner as for the first intruded monitoring well.

b. *Detection in a production well.* If seawater intrusion is encountered in a production well, that well will discontinue pumping. In addition, all wells that produce from the intruded aquifer that are within one-half mile of the affected well will reduce their production to the equivalent of one-half of their previous five-year pumping average. The sequence of threat evaluation, subsequent pumping reductions, and installation of new monitoring wells will be the same as for that in subparagraph a.

If the implementation of the procedures set forth above causes a production well to reduce its pumping or to cease pumping altogether, all reasonable efforts must be undertaken by the Watermaster to insure that lost production will be replaced by redistributing pumping, further conservation efforts on the part of all parties, or provision of replacement water from other sources.

SEASIDE GROUNDWATER BASIN WATERMASTER

Reported Quarterly and Annual Water Production From the Seaside Groundwater Basin
For All Producers Included in the Seaside Basin Adjudication -- Water Year 2021

(All Values in Acre-Feet [AF])

	Type	Oct	Nov	Dec	Oct-Dec 20	Jan	Feb	Mar	Jan-Mar 21	Apr	May	Jun	Apr-Jun 21	Jul	Aug	Sep	Jul-Sep 21	Reported Total	Yield Allocation	from WY 2020	for WY 2021
Coastal Subareas																					
CAW - Coastal Subareas	SPA	533.22	494.47	358.49	**1,386.18**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**1,386.18**	1,466.02	5.48	1,471.50
Luzern		62.71	59.24	23.86	**145.81**				**0.00**				**0.00**				**0.00**	**145.81**			
Ord Grove		122.95	117.17	121.44	**361.56**				**0.00**				**0.00**				**0.00**	**361.56**			
Paralta		108.31	101.89	64.52	**274.73**				**0.00**				**0.00**				**0.00**	**274.73**			
Playa		32.31	27.38	8.13	**67.83**				**0.00**				**0.00**				**0.00**	**67.83**			
Plumas		18.83	23.76	7.88	**50.47**				**0.00**				**0.00**				**0.00**	**50.47**			
Santa Margarita		188.11	165.03	132.65	**485.79**				**0.00**				**0.00**				**0.00**	**485.79**			
ASR Recovery		0.00																			
City of Seaside (Municipal)	SPA	13.48	13.93	13.37	**40.79**				**0.00**				**0.00**				**0.00**	**40.79**	120.28	0.00	120.28
Granite Rock Company	SPA	--	--	--	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**	11.35	235.87	247.21
DBO Development No. 30	SPA	--	--	--	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**	20.59	426.81	447.40
Calabrese (Cypress Pacific Inv.)	SPA	--	--	--	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**	2.76	13.32	16.08
City of Seaside (Golf Courses)	APA	46.99	14.60	14.94	**76.54**				**0.00**				**0.00**				**0.00**	**76.54**	540.00		540.00
Sand City	APA	0.15	0.14	0.06	**0.35**				**0.00**				**0.00**				**0.00**	**0.35**	9.00		9.00
SNG (Security National Guaranty)	APA	NOT REPORTED			**0.00**				**0.00**				**0.00**				**0.00**	**0.00**	149.00		149.00
Calabrese (Cypress Pacific Inv.)	APA	0.00	0.00	0.00	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**	6.00		6.00
Mission Memorial (Alderwoods)	APA	3.17	3.07	3.91	**10.15**				**0.00**				**0.00**				**0.00**	**10.15**	31.00		31.00
Coastal Subareas Totals					**1,514.01**				**0.00**				**0.00**				**0.00**	**1,514.01**	**2,356.00**	**681.48**	**3,037.47**
Laguna Seca Subarea																					
CAW - Laguna Seca Subarea	SPA	34.97	25.48	13.11	**73.56**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**73.56**	0.00		0.00
Ryan Ranch Unit		5.02	3.56	0.99	9.57				0.00				**0.00**				0.00	9.57			
Hidden Hills Unit		13.86	10.44	9.10	33.39				0.00				**0.00**				0.00	33.39			
Bishop Unit 3		8.20	5.84	1.51	15.55				0.00				**0.00**				0.00	15.55			
Bishop Unit 1		7.89	5.64	1.52	15.05				0.00				**0.00**				0.00	15.05			
The Club at Pasadera	APA	15.90	6.30	2.00	**24.20**				**0.00**				**0.00**				**0.00**	**24.20**	251.00		251.00
Laguna Seca Golf Resort (Bishop)	APA	18.28	1.54	0.00	**19.82**				**0.00**				**0.00**				**0.00**	**19.82**	320.00		320.00
York School	APA	1.07	1.63	0.93	**3.63**				**0.00**				**0.00**				**0.00**	**3.63**	32.00		32.00
Laguna Seca County Park	APA	1.70	0.24	0.10	**2.05**				**0.00**				**0.00**				**0.00**	**2.05**	41.00		41.00
Laguna Seca Subarea Totals					**123.26**				**0.00**				**0.00**				**0.00**	**123.26**	**644.00**	**0.00**	**644.00**
Total Production by WM Producers					**1,637.27**				**0.00**				**0.00**				**0.00**	**1,637.27**	**3,000.00**	**681.48**	**3,681.47**
									Annual Production from APA Producers									136.74	1,379.00		
									Annual Production from SPA Producers									1,500.53	2,302.47		

																			Previous Balance	*Total*
CAW / MPWMD ASR (Carmel River Basin source water)																				
Injection		0.00	0.00	0.00	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**		
(Recovery)		0.00	0.00	0.00	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**		
Net ASR		0.00	0.00	0.00	**0.00**				**0.00**				**0.00**				**0.00**	**0.00**	**735.49**	**735.49**
Pure Water Monterey (PWM) Injection and Cal-Am Recovery																				
Injection Operating Reserve	1053.27	(109.88)	(77.01)	73.77	**940.15**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**940.15**	**0.0**	**940.15**
Injection Drought Reserve		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**0.00**	**0.0**	**0.00**
Ops Reserve to/(from) Storage		109.88	77.01	(73.77)	**113.12**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**113.12**	**0.0**	**113.12**
Storage		190.12	222.99	173.77	**586.88**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**586.88**	**0.0**	**586.88**
Storage + to/(from) Ops Reserve		300.00	300.00	100.00	**700.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**700.00**	**0.0**	**700.00**
(Recovery)		(300.00)	(300.00)	(100.00)	**(700.00)**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**(700.00)**	**0.0**	**(700.00)**

Notes:

1. The Water Year (WY) begins October 1 and ends September 30 of the following calendar year. For example, WY 2021 begins on October 1, 2020, and ends on September 30, 2021.
2. "Type" refers to water right as described in Seaside Basin Adjudication decision as amended, signed February 9, 2007 (Monterey County Superior Court Case No. M66343).
3. Values shown in the table are based on reports to the Watermaster received by January 15, 2021.
4. All values are rounded to the nearest hundredth of an acre-foot. Where required, reported data were converted to acre-feet utilizing the relationships: 325,851 gallons = 43,560 cubic feet = 1 acre-foot.
5. "Base Operating Yield Allocation" values are based on Seaside Basin Adjudication decision. These values are consistent with the *Watermaster Producer Allocations Water Year 2021* (see Item VIII.B. in 12/2/2020 Board packet).
6. Any minor discrepancies in totals are attributable to rounding.
7. APA = Alternative Producer Allocation; SPA = Standard Producer Allocation; CAW = California American Water.
8. It should be noted that CAW/MPWMD ASR "Injection" and "Recovery" amounts are not expected to "balance" within each Water Year. This is due to the injection recovery "rules" that are part of SWRCB water rights permits and/or separate agreements with state and federal resources agencies that are associated with the water rights permits.