SEASIDE BASIN WATERMASTER ANNUAL REPORT – 2023

January 3, 2024

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SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2023

Integral to the Superior Court Decision (Decision) rendered by Judge Roger D. Randall on March 27, 2006 is the requirement to file an Annual Report. This 2023 Annual Report is being filed on or before January 15, 2023, consistent with the provisions of the Decision, as amended by the Order Amending Judgment filed March 29, 2018.

This Annual Report addresses the specific Watermaster functions set forth in Section III. L. 3. x. of the Decision. In addition, this Annual Report includes sections pertaining to:

- Water quality monitoring and Basin management
- Information that the Watermaster would otherwise include within a Case Status Conference Statement, including:
    - A summary of basin conditions and important developments concerning the management of the Basin
    - Planned near- and long-term actions of the Watermaster
    - Information concerning the status of regional water supply issues
    - Management activities that may bear on the Basin's wellbeing.

A. Groundwater Extractions

The schedule summarizing the Water Year 2023 (WY 2023) groundwater production from all the producers allocated a Production Allocation in the Seaside Groundwater Basin is provided in Attachment 1, "Seaside Groundwater Basin Watermaster, Reported Quarterly and Annual Water Production from the Seaside Groundwater Basin for all Producers Included in the Seaside Basin Adjudication During Water Year 2023." Water Year 2023 is defined as beginning October 1, 2022 and ending on September 30, 2023.

B. Groundwater Storage

Monterey Peninsula Water Management District (MPWMD), in cooperation with California American Water (CAWC), operates the Seaside Basin Aquifer Storage and Recovery (ASR) program. Under the ASR program, CAWC diverts water from its Carmel River sources during periods of flow in excess of NOAA-Fisheries' bypass flow requirements, and transports the water through the existing CAWC distribution system for injection and storage in the Seaside Basin at the MPWMD's Santa Margarita ASR site and CAWC's Seaside Middle School ASR site. During WY 2023, 1,656 acre-feet was diverted and stored in the Seaside Basin under the ASR program. Rainfall in the area was about 166% of normal, and Carmel River flow was about 304% of normal.

Based upon production reported for WY 2023, the following Standard Producers are entitled to Carryover Credits to WY 2024 in accordance with the Decision, Section III. H. 5. *Note: "Free" and "Not-free" carryover was a function of ramp down in production; now that ramp down is complete and NSY = Operating Yield, carryover is no longer divided into "Free and Not-free" (NSY and Operating Yield) carryover.*

Producer	Carryover Credit (Acre-feet)
Granite Rock	267.49
DBO Development	479.57 (-2.31 transfer)
Calabrese (Cypress)	18.04 (-3.17 transfer)
CAWC	753.95 (+5.48 transfer)
City of Seaside Muni	31.15

C. Amount of Artificial Replenishment, If Any, Performed by Watermaster
Per the Decision, "Artificial Replenishment" means the act of the Watermaster, directly or indirectly, engaging in contracting for Non-Native Water to be added to the Groundwater supply of the Seaside Basin through Spreading or Direct Injection to offset the cumulative Over-Production from the Seaside Basin in any particular Water Year pursuant to Section III.L.3.j.iii. It also includes programs in which Producers agree to refrain, in whole or in part, from exercising their right to produce their full Production Allocation where the intent is to cause the replenishment of the Seaside Basin through forbearance in lieu of the injection or spreading of Non-Native Water (referred to herein as "In-lieu Replenishment").

During Water Year 2023 the Watermaster did not indirectly engage in In-lieu Replenishment of the Basin. No non-native water was made available to the Basin during Water Year 2022 under the April 7, 2010 Memorandum of Understanding and Agreement entered into by Watermaster with the City of Seaside for its golf course irrigation program creating in-lieu replenishment water.

As reported in the 2019 Annual Report, on September 4, 2019 the City of Seaside filed a motion with the Court seeking the Court's approval of the City's request for a Storage and Recovery Agreement for in-lieu storage and recovery of water. On October 25, 2019 the Court approved the City's request. Court documents pertaining to the City's request were contained in Attachment 15 of the 2019 Annual Report. On February 5, 2020 the Watermaster executed a Storage and Recovery Agreement with the City of Seaside, a copy of which was included in Attachment 7 of the 2020 Annual Report. 365.03 AF of non-native water was made available to the Basin during Water Year 2023 under this Storage ad Recovery Agreement. The 365.03 AF accrues as a storage credit for future City of Seaside Municipal or Golf Course use per the agreement.

D. Leases or Sales of Production Allocation and Administrative Actions
As reported in the 2019 Annual Report, in WY2019 a transfer or assignment of water allocation was activated, as provided for in the Cypress Pacific Investors (CPI), successor to Muriel L. Calabrese 1987 Trust, front-loading delivery of water agreement that was contained in Attachment 14 of the 2019 Annual Report. Per the agreement, CPI leases to California American Water Company (CAWC) 8.0 AF of water (subject to reduction per the formulas in the Decision) for the purpose of producing such water from, or moving the production of such water to, the inland wells operated by CAWC and for delivery of such water by CAWC to one or more CPI properties. In WY 2017 CPI assigned its entire Standard Production Allocation water right to CAWC effective October 1, 2016.

As discussed in Attachment 13 of the 2018 Annual Report, in 2019 Security National Guarantee (SNG) indicated it intended to convert a portion of its Alternative Production Allocation to Standard Production. However, SNG subsequently decided not to make such a conversion.

During WY 2023 the Watermaster Board made changes to sections 3.3.1 through 3.3.2 of the *Rules and Regulations* regarding Standing Committees.

During WY 2023 the Watermaster Board was comprised of the following Members and Alternates:

MEMBER	ALTERNATE	REPRESENTING
Director Paul Bruno	Director John Gaglioti	Coastal Subarea Landowner
Christopher Cook	Tim O'Halloran	California American Water
Director John Gaglioti	Director Paul Bruno	Laguna Seca Subarea Landowner
Director George Riley	Director Alvin Edwards	MPWMD
Mayor Mary Ann Carbone	City Manager Vibeke Norgaard	City of Sand City
Supervisor Wendy Askew	Supervisor Mary Adams	Monterey County (MCWRA)
Councilmember Kim Shirley	Council Member Bill Ragsdale-Cronin	City of Del Rey Oaks
Councilmember Kim Barber	Mayor Tyller Williamson	City of Monterey
Mayor Ian Oglesby	Mayor Pro Tem David R. Pacheco	City of Seaside

E. Use of Imported, Reclaimed, or Desalinated Water as a Source of Water for Storage or as a Water Supply for Lands Overlying the Seaside Basin

The CAWC/MPWMD ASR Program operated in WY 2023 and 1,656 acre-feet of water was injected into the Basin as Stored Water Credits and 806 acre-feet was extracted.

As reported in the 2019 Annual Report, the Watermaster issued a Storage and Recovery Agreement to CAWC and MPWMD governing the injection and recovery of water from the Pure Water Monterey (PWM) Project. A copy of the agreement was included in Attachment 13 of the 2019 Annual Report. The quantities of water that were stored and recovered in accordance with that Agreement during WY 2023 are reported in the lower portion of the spreadsheet in Attachment 1.

F. Violations of the Decision and Any Corrective Actions Taken

Section III. D. of the Decision enjoins all Producers from any Over-Production beyond the Operating Yield in any Water Year in which the Watermaster declares that Artificial Replenishment is not available or possible. Section III. L. 3. j. iii. requires that the Watermaster declare the unavailability of Artificial Replenishment in December of each year, so that the Producers are informed of the prohibition against pumping in excess of the Operating Yield.

In WY 2021 the Watermaster implemented a final ramp-down in production to achieve the Basin's Decision-established Natural Safe Yield of 3,000 AFY. The Watermaster made its declaration regarding the availability of Artificial Replenishment Water, and the Total Usable

Storage Space of the Basin, for WY 2023 at its Board meeting of December 7, 2022. Copies of these declarations are contained in Attachment 2.

Total pumping for WY 2023 did not exceed the Operating Yield (OY) of the Basin, and did not exceed the Natural Safe Yield (NSY) of the Basin.

G. Watermaster Administrative Costs

The total estimated Administrative costs through the end of Fiscal Year 2023 amounted to $75,000 including a $25,000 dedicated reserve. Costs include the Administrative Officer salary and legal counsel fees. The "Fiscal Year 2023 Administrative Fund Report" and "Fiscal Year 2023 Operations Fund Report" are provided in Attachment 3.

H. Replenishment Assessments

At its meeting of November 1, 2023 the Watermaster Board determined that beginning with WY 2024 the Natural Safe Yield Replenishment Assessment unit cost should be updated to $4,528.63 per acre-foot, and the Operating Yield Replenishment Assessment unit cost should be updated to $1,132.16 per acre-foot. The spreadsheet that was included with the agenda transmittal for the November 1 meeting, and which explains the basis of calculation for these new unit costs, is contained in Attachment 4.

Alternative and Standard Producers report their production amounts from the Basin to the Watermaster on a quarterly basis. Based upon the reported productions for WY 2023, no replenishment assessments were made.

A summary of the calculations for Replenishment Assessments for WY 2023 is contained in Attachment 5. Credits against Replenishment Assessments are contained in Attachment 6.

I. All Components of the Watermaster Budget

The Watermaster budget has four separate funds: Administrative Fund; Monitoring & Management–Operations; Monitoring and Management–Capital Fund and; Replenishment Fund. At its meeting of September 6, 2023 the Watermaster Board approved these budgets for Fiscal Year 2024, and copies of these budgets are contained in Attachment 6.

The Watermaster Board is provided monthly financial status reports on all financial activities for each month with year-to-date totals.

J. Water Quality Monitoring and Basin Management

Water Quality Analytical Results

Groundwater quality data continued to be collected and analyzed on a quarterly basis during WY 2023 from the enhanced network of monitoring wells. The low-flow sampling method implemented in 2009 continued to be used in 2023 and is expected to continue to be used in the future to improve the efficiency of sample collection.

Monitoring and Management Program for the Upcoming Year

The 2024 Monitoring and Management Program (M&MP) contained in Attachment 8 includes the same types of basin management activities that have been conducted in prior years.

Most of the differences between the 2023 M&MP and the 2024 M&MP are relatively minor,

but:

- Task I.2.b.5 mentions that a replacement for Monitoring Well FO-9 Shallow, which had to be destroyed because of casing leakage, is being installed in 2023. Drilling of this new well commenced on October 16, 2023 and was completed in early November 2023.
- Task I.3.a.3 provides updated information regarding replenishment water for the Basin, gained from analyses performed in 2023, and updated information about Groundwater Sustainability Plans that may affect the Laguna Seca Subarea. The proposed budget to provide funds for modeling or other work to assess Basin management issues, if so directed by the Board, has been reduced from $60,000 to $40,000 because no specific modeling or other work has been identified for 2024.

The 2024 Monitoring and Management Program (M&MP) Budgets contained in Attachment 8 cover the same types of basin management activities that have been conducted in prior years.

The following are comments and/or principal revisions from the 2023 M&MP Budget:

Technical Program Manager: Although the Groundwater Sustainability Plan for the adjacent Monterey Subbasin has been completed and was submitted in early 2022 by the Salinas Valley Basin and the Marina Coast Water District Groundwater Sustainability Agencies, there will continue to be regular meetings of their GSP-related committees that I serve on representing the Watermaster. Also, there will likely be further work related to obtaining replenishment water for the Basin. Therefore, it is anticipated that the 2024 workload will be similar to that of 2023, so the proposed line-item budget amount has been maintained at $75,000 in 2024.

Tasks Involving MPWMD and Montgomery & Associates: The scopes-of-work for both MPWMD and Montgomery & Associates are essentially unchanged from 2023. However, both will have hourly-rate increases in 2024, so the costs of the Tasks in which they are involved reflect somewhat higher dollar amounts in 2024 compared to 2023.

For several of the Tasks involving MPWMD (I.2.a.1, I.2.b.2, I.2.b.3) certain of their costs have been re-allocated to more closely match the Tasks to which they pertain. This accounts for some of the changes in costs of these Tasks in 2024 compared to their costs in 2023.

Task I.2.b.3 includes induction logging of the Sentinel Wells. Access to Sentinel Well #4 may be reduced if the access road leading to it is removed and re-vegetated in conjunction with the demolition of the Ord Village Pump Station. If that is the case, the induction logging vehicle will have to be located some distance away from this well, and the cable that connects the logging tool to the vehicle will have to be supported by a series of braces with pulleys on them. A contingency amount of $5,000 has been included in the cost estimate for this work in case this additional work is needed. This, along with increases in the charges from the induction logging subcontractor, led to the increase in the cost of this Task.

As a result of the changes described above, as indicated by the right-hand column titled "Comparative Costs from 2023 Budget" in the 2024 M&MP Operations Budget in Attachment 6, the proposed 2024 Budget is $31,149 lower ($324,930 -$293,781) than the 2023 Budget.

Basin Management Database

Pertinent groundwater resource data obtained from a number of sources has been consolidated into the Watermaster's database to allow more efficient organization and data retrieval. No modifications or enhancements to the database are planned in FY 2024.

Enhanced Monitoring Well Network

The Seaside Basin M&MP uses an Enhanced Monitoring Well Network to fill in data gaps in the previous monitoring well network used by the Monterey Peninsula Water Management District (MPWMD), and others, in order to improve the basin management capabilities of the Watermaster. The Enhanced Monitoring Well Network has been described in detail in previous Watermaster Annual Reports. It continues to be used to obtain additional data that is useful to the Watermaster in managing the Basin.

As reported in the 2021 Annual Report, monitoring well FO-9 Shallow had developed a leak in its casing and had to be destroyed to prevent cross-aquifer contamination. A Capital Project to drill a replacement for this well was included in the 2022 and 2023 M&MP Capital Budgets. Monitoring data from the replacement well will be useful to MPWMD and MCWD as well as the Watermaster. Therefore, in 2023 a three-party cost-sharing agreement (between MPWMD, the Watermaster, and MCWD) was developed and executed to share in the costs to replace the well. The replacement well was installed in late 2023 and is included in the 2024 M&MP as one of the wells in the Enhanced Monitoring Well Network.

The Security National Guaranty (SNG) well is privately owned and is located in the dunes area in the northern portion of Sand City. It is on land where a development project is being pursued by the owner. Prior to 2021this was an inactive well, and therefore water quality samples were not collected from it. In early 2021 it started to be pumped, thus making it an active well from which water quality samples are to be collected The first sample taken from this well had a very high chloride level (8,660 mg/L) which is a strong indicator that this well is sea water intruded. The well owner was contacted and he was asked to look into whether the well casing was leaking and allowing salty water from a shallow aquifer to flow downward into the Paso Robles aquifer and cause the higher chloride level. He responded that he would look into this, but that the development project on this property was in the midst of litigation and he was prevented by the Court from doing any work on the well until the litigation was concluded. The well is currently inactive and there is no active pumping.

In late fall of 2021 the owner reported that he was awaiting the Court's Decision on the development project litigation, which he expected he would get in late January 2022. He went on to say that as soon as he got the Court's Decision, and finalized the title, he would be able to repair the well. In October 2022 the well owner reported that the final Court Decision which he originally expected would come out in January of 2022 did not come out until August 2022. He said that SNG found the Decision to be unacceptable. In late 2023 the owner reported that an appeal to the Court's Decision had just been filed, and that he did not anticipate a final Court ruling until early 2025.
In the meantime , however, another lawsuit was filed against the other owner Evariste Group (conversion of property and embezzlement) and that matter is pending in Orange County. Because of this litigation and the appeal, the owner said he is not able to address fixing any of the well issues or concerns. As soon as the litigation is concluded or a settlement is achieved, the owner said he will be able to examine the well and address any concerns that need repairs.

In summary, the well problem cannot be remedied unless/until the other litigants agree to having the repair work performed prior to the litigation being resolved, or there is some other resolution.

Basin Management Action Plan (BMAP)

The BMAP constitutes the basic plan for managing the Seaside Groundwater Basin. The BMAP identifies both short-term actions and long-term strategies intended to protect the groundwater resource while maximizing the beneficial use of groundwater in the basin. It provides the Watermaster a logical set of actions that can be undertaken to manage the basin to its Safe Yield.

The Watermaster's first BMAP was completed in 2009 and the Executive Summary from that BMAP was contained in Attachment 9 of the 2009 Annual Report. The complete document is posted on the Watermaster's website at: http://www.seasidebasinwatermaster.org/Other/BMAP_FINAL_5-Feb-2009.pdf.

The BMAP was updated in 2019 and the Executive Summary from the updated BMAP was contained in Attachment 7 of the 2019 Annual Report. The complete document is posted on the Watermaster's website at: http://www.seasidebasinwatermaster.org/Other/BMAP%20Final_07192019.pdf .

One of the findings in the Updated BMAP is that the Natural Safe Yield (NSY) of the Basin is 2,370 AFY, which is lower than the Adjudication Decision's initially-established 3,000 AFY. Attachment 10 of the 2019 Annual Report contains a Memo titled "Seaside Groundwater Basin Natural Safe Yield Allocations to Producers." The Memo describes how the Adjudication Decision allocated water rights to each of the Producers (both Standard and Alternative Producers), and the water rights that each Producer would have after all of the Adjudication Decision-required ramp-downs in pumping have been completed. The Memo also briefly describes the water rights impacts that would result from lowering the NSY of the Basin from 3,000 AFY to 2,370 AFY.

At its meeting of June 5, 2019 the Watermaster Board determined to stay with the 3,000 AFY NSY for the time being, in part because ramping-down to 3,000 AFY would cause less hardship on the Alternative Producers by not requiring them to ramp-down along with the Standard Producers, and because ramping down to 2,913 AFY would provide negligible additional benefit and would require both the Standard and Alternative Producers to ramp-down.

In conjunction with updating the BMAP, the Watermaster's hydrogeologic consultants recommended that at some point in the future the Watermaster change to a different approach (Sustainable Yield) rather than continuing to use the Natural Safe Yield approach that was used in the Adjudication Decision, for basin management purposes.

Attachment 11 in the 2019 Annual Report contains a discussion of the pros and cons of using the Sustainable Yield approach vs. the Natural Safe Yield approach. The Watermaster Board considered the information contained in that attachment at its June 5, 2019 meeting and made the following determinations:

- A Sustainable Yield analysis should not be performed at this time.

- The concept of using the Sustainable Yield approach to replace the Natural Safe Yield approach should be revisited after the Groundwater Sustainability Plans (GSP) for the subbasins within the Salinas Valley Groundwater Basin (notably the Monterey and 180/400-Foot Aquifer Subbasins) have been completed, and their impacts on the Seaside Groundwater Basin have been determined. The status of those GSPs is discussed below in the section of this Annual Report titled "Sustainable Groundwater Management Act."
- If something is learned, or events occur, that would warrant performing a Sustainable Yield analysis sooner, the Board should revisit the decision at that time.

The Watermaster Board revisited this topic at its September 1, 2021 meeting, and concluded the following:

- Sustainable Yield (SY) is a technically superior Basin management approach compared to the Natural Safe Yield (NSY) approach used in the Decision, and an SY analysis should be performed at some point in time.
- Because of the historical over pumping from the Basin, regardless of the approach that is used for Basin management, be it NSY or SY, even reducing pumping levels to match either the NSY or SY pumping levels will not achieve protective groundwater elevations. This is because these approaches only seek to stabilize groundwater levels and do not take into account that the Basin would still be at risk of seawater intrusion at some time in the future. An additional source(s) of water (replenishment water) that can be injected into the Basin to raise groundwater levels, and to maintain them at protective water levels, will be necessary regardless of which approach is used for Basin management.
- In view of the expense and complexity of changing to the SY approach, the Board concluded that making this change would not be justified until a source for this replenishment water has been secured.

Seawater Intrusion Response Plan

HydroMetrics LLC (now Montgomery and Associates) was hired by the Watermaster to prepare a long-term Seawater Intrusion Response Plan (SIRP), as required in the M&MP.

The Final SIRP was approved by the Watermaster Board in 2009 and a summary of the Seawater Intrusion Contingency Actions from the SIRP were contained in Attachment 10 of the 2009 Annual Report. The complete document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

Seawater Intrusion Analysis Report

The Seawater Intrusion Analysis Report (SIAR) examines the "health" of the Basin with regard to whether or not there are any indications that seawater intrusion is either occurring or is imminent. Previous SIARs have stated that depressed groundwater levels, continued pumping in excess of recharge and freshwater inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin.

The 2022 Annual Report includes a discussion of two monitoring wells which have experienced increased chloride concentrations. One of these, monitoring well FO-10 Shallow, is north of and outside of the Seaside Basin, and the other, monitoring well FO-9 Shallow, was just inside the northern boundary of the Northern Coastal Subarea of the Seaside

Basin. As reported earlier in this 2023 Annual Report, the original monitoring well FO-9 Shallow was destroyed and was replaced with a new FO-9 Shallow monitoring well in late 2023. Further investigation of Well FO-10 Shallow led to the conclusion that it might be allowing leakage to occur from the shallower Aromas or Dunes Sands formation into the Paso Robles aquifer below. One of the actions listed in the Monterey Subbasin GSP is for MCWD to install monitoring wells near the northern boundary of the Seaside Subbasin. Although work to destroy and replace monitoring well FO-10 Shallow is not mentioned, MCWD may wish to perform such work in order to restore that well for its monitoring purposes.

The induction logging device that has been used each year needed to be repaired before this year's logging event could be performed. Although there were some minor variations in this year's results compared to prior years, the induction logs of the Sentinel Wells remained essentially stable over the historical record. The variations were potentially the result of making the repairs, and were not greater than those experienced in prior years.

The Watermaster retained Montgomery & Associates to prepare the WY 2023 SIAR required by the M&MP. The WY 2023 SIAR provided an analysis of data collected during that Water Year.

There continue to be ongoing detrimental groundwater conditions within the Basin that pose a potential threat of seawater intrusion. Groundwater levels below sea level, the cumulative effect of pumping in excess of recharge and freshwater inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion has the potential to occur in the Seaside Groundwater Basin. However, no data collected in Water Year (WY) 2023 indicate that seawater intrusion is occurring within the Seaside Groundwater Basin.

The SIAR is lengthy, but the full *Executive Summary Section* from it is provided in Attachment 7. A complete copy of the document is posted for viewing and downloading from the Watermaster's website at: https://www.seasidebasinwatermaster.org/Other/2023%20Seawater%20Intrusion%20Analysis%20Final%20Report%20Appendices%2012-23-23.pdf. All recommendations contained in the SIAR are being or will be carried out and are included in the budgeted activities contained in Attachment 6 and described in Attachment 8.

Geochemical Impact Assessments

When new sources of water are introduced into an aquifer, with each source having its own unique water quality, there can be chemical reactions that may have the potential to release minerals into solution which have previously been attached to soil particles, such as arsenic or mercury, and thus into the water itself. This has been experienced in some other locations where changes in water quality occurred as a result of water being injected into an aquifer.

The 2022 Annual Report includes a discussion of geochemical impact assessments pertaining to the introduction of desalinated water, additional ASR water, and advanced wastewater treatment (AWT) water under the Pure Water Monterey Project (PWM).

In 2023 no additional geochemical impact assessments needed to be performed, since the desalination plant component of the Monterey Peninsula Water Supply Project was still in the process of obtaining the permits necessary to move forward.

Sustainable Groundwater Management Act (SGMA)

As reported in the 2015 Annual Report the Watermaster Board determined that the Watermaster should monitor the development of the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) and the State Department of Water Resources' (DWR) development of SGMA regulations with the intent to collaborate with these entities as appropriate.

At the State Level:

During 2023 DWR did not issue any new regulations, or revisions to prior regulations, that impacted the Seaside Groundwater Basin or the Watermaster. In March of 2023 the Watermaster submitted to DWR the reporting information required of it, as an adjudicated basin, under SGMA.

At the Monterey County level:

The 2022 Annual Report includes a discussion of the formation of the Groundwater Sustainability Agencies (GSAs) involved in the development and implementation of the GSP for the Monterey Subbasin. The Watermaster participated in the development of the Monterey Subbasin GSP and continued monitoring the implementation of that GSP in 2023. The Watermaster also continued monitoring the implementation of the GSP for the 180/400-Foot Aquifer Subbasin GSP, since that subbasin has a direct impact on groundwater conditions in the Monterey Subbasin. Its participation as a member of the SVBGSA's Advisory Committee, and the MCWDGSA's Stakeholder Group, helps to ensure that there is close coordination between the SVBGSA, MCWDGSA, and the Watermaster on matters of mutual interest. Monthly summary reports of meetings of those groups are provided to the Watermaster Board by the Watermaster's Technical Program Manager.

K. Information that the Watermaster Would Otherwise Include within a Case Status Conference Statement

This Section was added to the Annual Report beginning in 2018 year as directed by the Court in its Order Amending Judgment filed March 29, 2018. It is formatted to contain the topic headings below, which were requested by the Court in its March 29, 2018 Order.

Summary of Basin Conditions and Important Developments Concerning the Management of the Basin

The condition of the Basin is discussed in the *Water Quality*, *Seawater Intrusion Analysis Report*, and *Basin Management Action Plan* subheadings in Section J of this Annual Report.

In summary, the *2023 Seawater Intrusion Analysis Report*, which analyzes the water quality data collected under the Watermaster's sampling program, reported that while conditions exist within the Basin that pose a risk of seawater intrusion, none of the data collected in WY 2023 indicate that seawater intrusion has actually occurred.

The 2019 updated *Basin Management Action Plan* found that in spite of recent pumping at levels less than the Decision-established Natural Safe Yield of 3,000 AFY, water levels in some portions of the Basin are continuing to drop. It is expected that once the desalination plant component of the MPWSP becomes operational, or if that plant is not constructed but an expansion of the PWM project is constructed, and CAWC is able to further reduce its pumping from the Basin by 700 AFY through its 25-year overpumping repayment program, the rate of drop in groundwater levels will be at least partially mitigated. However, unless the Basin is

replenished to raise groundwater levels to protective elevations, the Basin will remain vulnerable to seawater intrusion.

As the Groundwater Sustainability Plans (GSPs) were developed under the State's Sustainable Groundwater Management Act (SGMA), the Watermaster became more aware of the impact of adjacent groundwater basins on the Seaside Groundwater Basin. In the context of the Salinas Valley Groundwater Basin, as recognized and defined by the DWR, each basin within that larger Basin is referred to as a "subbasin". Therefore, in this section of this Annual Report the Seaside Basin is referred to as the "Seaside Subbasin." The GSP for the Monterey Subbasin (which abuts the Seaside Subbasin to the north and east) made it clear that:

- The portion of the Monterey Subbasin to the east of the Seaside Subbasin (referred to as the Corral de Tierra/Toro Subarea) will not be able to achieve sustainability as defined under the SGMA without the importation of additional sources of water supply.
- The portion of the Monterey Subbasin to the north of the Seaside Subbasin (referred to as the Marina-Ord Subarea) will not be able to achieve sustainability unless the subarea immediately to the north (the 180/400-foo Aquifer Subbasin) raises its groundwater levels high enough to stop seawater from intruding that subbasin.
- There is significant loss of groundwater from the Seaside Subbasin to the Monterey Subbasin because the groundwater levels in the Monterey Subbasin are lower than those in the Seaside Subbasin.

Planned Near and Long-term Actions of the Watermaster

Near-term actions are described in the 2023 Monitoring and Management Program discussed in Section J and Attachment 8 of this Annual Report.

Long-term actions will include:

- Continuing to carry out the duties and responsibilities assigned to the Watermaster by the Decision
- Continuing to coordinate with the Monterey County Water Resources Agency, the SVBGSA, and the MCWDGSA:
  - In their development of updated hydrogeologic models to ensure that there is hydrogeologic agreement between those models and the Watermaster' Seaside Basin model, and
  - Continuing to coordinate with the SVBGSA to develop measures to aid in groundwater management of the Laguna Seca Subarea.
- Continuing meetings of the ad hoc "Public Awareness Committee" of the Watermaster Board to:
  - Develop information about potential funding mechanism options for the purchase of replenishment water
  - Developing materials to educate decision makers and the public in general about:
    - The risk of seawater intrusion that the Seaside Basin faces
    - The need to replenish the Basin to raise groundwater levels high enough to keep that from occurring
    - Ensuring the Basin has sufficient groundwater resources to supply customer demands.

Information Concerning the Status of Regional Water Supply Issues

MPWSP

Implementation of the Monterey Peninsula Water Supply Project (MPWSP) continues to be actively pursued by CAWC. CAWC received approval of the project from the Coastal Commission in November 2022. The MPWSP 4.8 MGD desalination plant is currently anticipated to be operational in 2027 to 2028.

During WY 2023 CAWC continued to work on getting well ASR-4 permitted for use so it could be used in place of ASR-1 as a supply well. Because ASR-4 had been found to have a mercury concentration level above the drinking water standard, CAWC installed a mercury removal treatment unit so it could be permitted for use as a supply well. The mercury treatment system has been approved by DDW, and CAWC is currently working on startup and commissioning of the well and treatment system.

PWM

Construction work on the Monterey One Water (M1W) and Marina Coast Water District (MCWD) Pure Water Monterey (PWM) recycled water project in Marina was completed in late 2019, and the Advanced Water Treatment (AWT) plant began producing water in early 2020. Water began being injected into the Seaside Groundwater Basin in February 2020. In WY 2023 a total of 4,516 acre-feet of water was injected. Of this amount, 3,493 acre-feet was available to CAWC for extraction and 663 acre-feet was added to the operating reserve.

The Title 22 Indirect Potable Reuse (IPR) Groundwater Replenishment regulations require that the water from the PWM project be retained underground no less than two months before it reaches the closest downgradient drinking water well. This is referred to as the Response Retention Time, and is intended to provide sufficient response time to identify a treatment failure and a quick response.

Extrinsic tracer studies conducted during WY 2023 indicated that the minimum retention time was consistently being met, and no violations of the AWT plant's permit had occurred.

On September 14, 2021 the State Division of Drinking Water (DDW) issued a letter to CAWC stating that "the drinking water source designation of ASR Well 01 (ASR-1) has been changed from active to inactive." DDW issued this letter because tracer studies indicated that the minimum retention time requirement for water injected by the PWM project was likely not being met for this well. That inactive status remains in effect today since no changes were made in the operation of the PWM project that would enable the status to revert to "active."

During WY 2023 CAWC continued to work on getting well ASR-4 permitted for use so it could be used in place of ASR-1 as a supply well. Because ASR-4 had been found to have a mercury concentration level above the drinking water standard, CAWC installed a mercury removal treatment unit so it could be permitted for use as a supply well. The Mercury Treatment system has been approved by DDW, California American Water is currently working on startup and commissioning of the well and treatment system.

In 2022, M1W received Division of Drinking Water approval for additional virus log reduction credits for chloramine disinfection based on chlorine residual in the pipeline and the contact time during conveyance. M1W also received approval for 4-logs of virus reduction credit for an underground retention time of 4 months modeled with additional injection volumes and all extraction well operational scenarios. In 2023 M1W optimized the monitoring and reporting of

virus reduction credits through the reverse osmosis system and through conveyance. Since start-up of the PWM Project, M1W has always exceeded the regulatory requirement of 12-logs of virus reduction using a combination of reverse osmosis, ultraviolet advanced oxidation, conveyance system disinfection, and underground retention time.

Public Buyout of CAWC's Water System

As discussed in the 2022 Annual Report, the Local Agency Formation Commission (LAFCO) passed a resolution denying MPWMD's application to activate its latent powers in order to acquire CAWC's Monterey Water System. MPWMD filed an Application for Reconsideration of LAFCO's disapproval, and LAFCO denied MPWMD's Application.

MPWMD initiated litigation against LAFCO on April 1, 2022 as set forth in Monterey County Superior Court Case No. 22CV000925. Numerous filings were made by the parties involved in the litigation, and the case was heard in late September 2023. At that hearing the Court asked for additional citations from the administrative record to be provided, and a "Statement of Intended Decision" was issued by the Court on October 25, 2023. The Conclusion at the end of that Intended Decision reads as follows:

> *Conclusion:*
> *In summary, the Court orders that writ of mandate shall issue on the grounds that (1.) Respondent LAFCO failed properly to consider whether Petitioner will have sufficient revenue to carry out the proposed new or different services following the proposed change, pursuant to Government Code section 56668 (k); (2.) LAFCO improperly applied the 'Environmental Justice" factor of Government Code section 56668(p), since there is no evidence in the record of any pollution; (3.) there is no substantial evidence to support its finding that the proposed action would pose an undue economic hardship on other County residents in satellite water systems; and (4.) LAFCO's findings regarding the sufficiency of water supply for the proposed action here are inconsistent and irreconcilable with its findings the same day in its adoption of the 2021 Municipal Service Review and Sphere of Influence for the District, which concluded that 'completion of either Cal-Am's MPWSP desalination plant or MlW/MPWMD'S Pure Water Monterey Expansion Project will be more than sufficient to meet anticipated water demand for at least the next 20 years." Petitioner is to prepare and submit proposed Writ of Mandate consistent with this ruling. This Statement of Intended Decision shall serve as the Statement of Decision, subject to any objections of the parties.*

At its meeting on October 10, 2023 the MPWMD Board voted to approve a "resolution of necessity" authorizing MPWMD to move ahead with the forced acquisition of the CAWC system and convert it to government ownership. MPWMD has six months from that date to commence an eminent domain proceeding in court to determine the value of CAWC and acquire it.

Management Activities that May Bear on the Basin's Wellbeing

1. *Water Conservation***.** From a water conservation standpoint, customers of CAWC are doing an exceptional job. CAWC's Monterey system has one of the highest levels of voluntary conservation in the state. There has essentially been no back-off in conservation following the end of mandatory conservation that occurred after the wet winter of 2016-2017.

2. *Storm Water and Recycled Water*. Storm water and recycled water are both components of the Pure Water Monterey (PWM) project that has been implemented by M1W and MCWD. CAWC has already contracted to receive 3,500 AFY of PWM recycled water for injection into, and recovery from, the Seaside Basin. M1W, in coordination with others, is pursuing the PWMX project to expand the delivery capacity of the PWM project by using additional sources of recycled water and storm water.

Construction contracts for the initial components of the PWMX project were issued in late 2023 by M1W. The current schedule for that project indicates the project is expected to become operational in early 2026, and would deliver an additional 2,250 AFY of recycled water.

3. *Sustainable Groundwater Management Act*. Coordination between the Watermaster and the SVBGSA and the MCWDGSA is ongoing and is discussed in more detail above under Section J of this Annual Report. That coordination will aid in groundwater management of the Seaside Basin.

4. Climate Change. Higher seawater levels could exacerbate seawater intrusion concerns, which punctuates the importance of monitoring and long-term management to avoid seawater intrusion. From a water supply perspective, reliance on groundwater with sustainable management is ideal because the resource is a reservoir and therefore not subject to sharp fluctuations in availability resulting from year-to-year precipitation amounts as is the case with surface water supplies. Updating of the Watermaster's *Groundwater Model* in 2018 (discussed in Section J of the 2018 Annual Report) and *Basin Management Action Plan* in 2019 (discussed in Section J of the 2019 Annual Report) incorporated projected impacts from climate change and sea level rise.

5. *New Technical Issues or Activities.*

- Stormwater Projects Being Evaluated in the Monterey Peninsula Stormwater Resource Plan (SWRP).

As reported in the 2018 Annual Report, Monterey One Water as the lead entity coordinated the development of a Stormwater Resource Plan (SWRP) for the Monterey Peninsula, Carmel Bay, and South Monterey Bay (Monterey Peninsula) Integrated Regional Water Management Plan (IRWMP) area.

The purpose of the SWRP is to identify opportunities to capture stormwater that could be utilized as new water supply sources for the Monterey Peninsula and provide additional water quality and environmental benefits. Some of those projects have the potential to minimally benefit the Seaside Basin, and are discussed in the 2019 Updated Basin Management Action Plan.

Of the seven priority projects that were identified in the SWRP, several projects have been able to receive funding and are proceeding as described below.

City of Seaside: The Del Monte Manor project in the City of Seaside received a grant in the amount of approximately $560,000 to complete the project, and the project was completed in 2023. This will divert stormwater that is captured in this area into an infiltration structure and the storm drain.

City of Sand City: The City of Sand City has two green street retrofit projects. They are the West End Stormwater Improvement Projects on Contra Costa Street and Catalina Street. The Contra Costa Street project is funded by an SWRCB Proposition 1 Stormwater Grant (technical assistance and implementation) and the Catalina Street project is funded by a DWR Proposition 1 IRWMP Grant. At the time of preparation of this 2023 Annual Report, both of these projects are in the approximately 70% design phase with construction anticipated to begin at the end of the 1st quarter or in the 2nd quarter of 2024. They are described in more detail below:

West End Stormwater Improvement Project – Contra Costa Street

Project Description

The West End Stormwater Improvement Project is a retrofit of an existing major collector street, Contra Costa Street between Olympia Avenue and Redwood Avenue. The Project will integrate Low Impact Development (LID) strategies to address flood control, water quality, and meet several community objectives. The Project proposes to install bioretention facilities (i.e., urban rain gardens), trash capture, permeable pavement, landscaping, and subsurface infiltration chambers and will improve pedestrian and Americans with Disability Act (ADA) access throughout the corridor. The Project will improve urban storm water runoff quality, augment groundwater quantity, provide climate change adaptation, reduce flooding, and create urban green space. The City developed the conceptual phase of the Project with a grant from the State Water Resources Control Board Proposition 1 Technical Assistance Funding Program for disadvantaged communities. Final design and construction of the Project will be funded through a Proposition 1 Stormwater Implementation Grant.

West End Stormwater Improvement Project – Catalina Street

Project Description

The West End Stormwater Improvement Project is a retrofit of an existing minor collector street, Catalina Street, between Olympia Ave. and Ortiz Avenue. The Project will integrate Low Impact Development (LID) strategies to address flood control, water quality, and meet several community objectives. The Project proposes to install bioretention facilities (i.e. urban rain gardens), trash capture, permeable pavement, landscaping, and subsurface infiltration chambers and will improve pedestrian and Americans with Disability Act (ADA) access throughout the corridor. The Project will improve urban storm water runoff quality, augment groundwater quantity, provide climate change adaptation, reduce flooding, and create urban green space. The City developed the conceptual phase of the Project with a grant from the State Water Resources Control Board Proposition 1 Technical Assistance Funding Program for disadvantaged communities. Final design and construction of the Project will be funded through a Proposition 1 Round 1 Integrated Regional Water Management (IRWM) Grant.

Note: Both Projects are designed to capture, treat, and infiltrate urban storm water runoff to reduce the amount of pollutants such as metals, bacteria, nutrients, and trash that are currently being discharged into the Monterey Bay. Both Projects will increase the reliability of the Seaside Groundwater Basin through infiltration of treated storm water and will incorporate City and regional objectives for economic vitality, community livability, and environmental equity. In addition, the Project will improve regional water self-reliance and strengthen collaborative efforts between local agencies to provide sustainable water resources. The City obtained community input regarding storm water management priorities which influenced the design of the Projects.

City of Monterey:

Oliver Street Stormwater Diversion Project

In October 2022, the City of Monterey received a $25,000 Local Agency MPWMD grant to help with the costs of survey work for the Olivier Street Stormwater Diversion Project (previously known as the Tunnel Diversion Project). The Project will divert urban stormwater drainage from an existing storm drain, currently discharging untreated into the Harbor/Monterey Bay, to an existing City sanitary sewer utility for treatment at M1W's Regional Wastewater Treatment Plant. This diversion is estimated to provide 10-12 acre-feet of dry-weather source water for water recycling at the time of year when source water is not abundant, and reduce the discharge into the Bay. The City is now coordinating with MPWMD on a State funding award to assist with the design and construction of the project.

Lake El Estero Urban Diversion Project

The City of Monterey has received State funding for this project and is beginning to work on the design and permitting for it. Currently, storm water that flows into Lake El Estero is periodically pumped into Monterey Bay to avoid flooding. This project will divert a portion of that pumped flow into the sanitary sewer for treatment at M1W's Regional Wastewater Treatment Plant.

These diversion projects will increase the amount of water that can be recycled for beneficial reuse.

6. Reduction in Pumping in the Laguna Seca Subarea

As mentioned in the 2022 Annual Report, in 2020 CAWC completed construction of an intertie pipeline that enabled it to serve the customers in its Bishop and Ryan Ranch Units in the Laguna Seca Subarea with water from its Main System. With the completion of this pipeline, CAWC has been able to discontinue pumping from the Laguna Seca Subarea to serve those customers. This is expected to reduce total pumping from the Laguna Seca Subarea by about 28%.

7. Obtaining Replenishment Water.

As described in Section J under the subheading "Basin Management Action Plan," and above in the subsection of this Section titled "Summary of Basin Conditions and Important Developments Concerning the Management of the Basin," portions of the Seaside Basin have groundwater levels below sea level. Therefore, even with the pumping reductions achieved to date the Basin will remain vulnerable to seawater intrusion. Replenishing the Basin by injecting water and leaving it in the Basin, rather than withdrawing it as is done in the ASR and PWM projects, could help to raise groundwater levels high enough to protect the Basin against seawater intrusion.

Potential sources of replenishment water include the MPWSP's desalination plant and the PWMX project during their initial years of operation when projected water demands will be less than the production capacities of either of these projects. The replenishment water would be obtained by operating either of these projects at their full capacities and injecting the excess water into the Basin. Doing this would increase the operational costs of those projects, and funds to cover those costs would be needed. Other potential sources being evaluated by MCWD include a Phase II PWM project to deliver recycled water to areas in the former Fort Ord, and MCWD's Reservation Road desalination project.

As reported in the 2022 Annual Report, it was found that there are no State or Federal funding programs that could provide money to purchase replenishment water. All of those programs only provide funding for planning, design, and construction of projects, but not for operational costs once the projects are constructed. Discussions involving the Watermaster, MPWMD, M1W, and CAWC led to the conclusion that MPWMD had the legal authority to levy fees to help pay for replenishment of the Basin. In 2023 the Watermaster formed an ad hoc committee to develop concepts and/or funding mechanisms for replenishing the Seaside Basin, once replenishment water becomes available. Meetings of that ad hoc committee were ongoing as of the date of preparation of this 2023 Annual Report.

Studies performed for the Watermaster in 2022 pertaining to the need for replenishment water to raise ground water levels in the Seaside Subbasin to protect it against seawater intrusion concluded:

- Under a "best case" scenario based on future water demand projections, Aquifer Storage and Recovery (ASR) injection rates, and Pure Water Monterey Expansion (PWMX) injection rates prepared by MPWMD, 1,000 acre-feet-per-year (AFY) of water would need to be injected into the Seaside Basin every year to replenish it and raise groundwater levels high enough to prevent seawater intrusion from occurring.
- Under a more "conservative" scenario based on future water demand projections and the timing of start-up of CAWC's desalination plant contained in CAWC's 2020 Urban Water Management Plan, ASR and PWMX injection rates with a built-in margin of safety, and revised water demands for the City of Seaside's golf courses proposed by Cal Am and the City of Seaside, the amount needed would be 3,600 AFY every year.
- Unless replenishment water in these quantities is added annually, the Seaside Basin will be at risk of seawater intrusion, and that risk will increase each year that groundwater levels continue to fall and remain below sea level.
- Implementation of the PWMX project does not accomplish this, and an additional source of replenishment water will be needed. Of the projects currently being pursued, the only other potential source of replenishment water will be from desalination.

The entire Technical Memorandum describing the work that led to these conclusions is posted on the Watermaster's website at this link: http://www.seasidebasinwatermaster.org/Other/ExcecSummary_and%20TMs_Replenishment_Modeling_WaterBudget_and_AlternateScenario_Analysis%20_BOARD_DRAFT_20220901pdf.pdf. A summary of this Technical Memo was contained in Attachment 9 of the 2022 Annual Report.

As reported in the 2022 Annual Report, studies performed for the Watermaster pertaining to the directions and inland velocities that seawater intrusion into the Seaside Subbasin would move, if intrusion should occur, concluded:

- Under current conditions inland seawater intrusion encroachment of 250 ft/yr could occur.
- Periods of prolonged drought with no ASR injection increases inland travel rates and the risk of seawater intrusion.
- The number of critically dry rainfall years has greatly increased in the last 50 years compared to the prior 50 years of data. Critically dry years now exceed the number of "normal rainfall" years thus becoming the "new norm".

These studies highlight the vulnerability of the Seaside Subbasin to seawater intrusion, and the need for replenishment water to raise groundwater levels within the Seaside Subbasin to prevent that from occurring.

The Watermaster considered performing additional analyses to reflect the impacts from more severe climatic conditions of reduced rainfall and longer periods of drought. However, it was concluded that such additional analyses would be unlikely to provide any further information that would be useful in Basin management. A Memorandum summarizing this work and the basis for not conducting additional analyses is contained in Attachment 10.

L. Conclusions and Recommendations

The Seaside Basin Watermaster Board has worked diligently to meet all of the Court's established deadline dates. All of the Phase 1 Scope of Work activities, which are described in the "Implementation Plan for the Seaside Basin Monitoring and Management Program" dated March 7, 2007, have been completed. The FY 2024 budgets contained in Attachment 6 support carrying out all elements of the 2024 Seaside Groundwater Basin Monitoring and Management Program (M&MP). The M&MP is contained in Attachment 8 and describes the activities that the Watermaster plans to conduct during Fiscal Year 2024.

As described in Section J above, information from the Enhanced Monitoring Well Network is being utilized to detect seawater intrusion. The response actions described in the Watermaster's Seawater Intrusion Response Plan, which was contained in the 2009 Annual Report, will be implemented if seawater intrusion is detected within the Basin.

As of the date of preparation of this 2023 Annual Report, no future status conferences with the Court have been scheduled.

LISTING OF ACRONYMS USED IN THIS ANNUAL REPORT

AF - acre-feet
ASR - Seaside Basin Aquifer Storage and Recovery program
Basin - The adjudicated Seaside Groundwater Basin
BLM - Bureau of Land Management
BMAP - Basin Management Action Plan
CASGEM - California Statewide Groundwater Elevation Monitoring
CAWC - California American Water Company
DDW – State Water Resources Control Board Division of Drinking Water
Decision - Decision filed February 9, 2007 by the Superior Court in Monterey County under Case No. M66343 - California American Water v. City of Seaside et al.
DWR - California State Department of Water Resources
GSA - Groundwater Sustainability Agency
GSP - Groundwater Sustainability Plan
LSSA - Laguna Seca Subarea
M1W - Monterey One Water (formerly Monterey Regional Water Pollution Control Agency)
MCWD - Marina Coast Water District
MCWDGSA - Marina Coast Water District Groundwater Sustainability Agency
MPWMD - Monterey Peninsula Water Management District
MPWSP - Monterey Peninsula Water Supply Project
M&MP - Monitoring and Management Program
NSY - Natural Safe Yield
PWM - Pure Water Monterey Project
PWMX – Pure Water Monterey Expansion Project
SGMA - Sustainable Groundwater Management Act
SIAR - Seawater Intrusion Analysis Report
SIRP - Seawater Intrusion Response Plan
SVBGSA - Salinas Valley Basin Groundwater Sustainability Agency
SWRCB - State Water Resources Control Board
TAC - Technical Advisory Committee
USGS - United States Geological Survey
WY - Water Year

ATTACHMENT 1

GROUNDWATER EXTRACTIONS

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 2023

(All Values in Acre-Feet [AF])

	Type	Oct	Nov	Dec	Oct-Dec	Jan	Feb	Mar	Jan-Mar	Apr	May	Jun	Apr-Jun	Jul	Aug	Sep	Jul-Sep	Reported Total	Yield Allocation	from WY 2022	for WY 2023
Coastal Subareas																					
CAW - Coastal Subareas	SPA	497.16	410.19	389.22	**1,296.57**	370.86	475.09	659.11	**1,505.05**	585.36	606.31	99.22	**1,290.89**	328.60	328.42	247.05	**904.07**	**1,538.81**	1,466.03	110.45	1,576.48
Luzern		49.71	0.00	0.00	**49.71**	0.08	21.35	52.18	**73.61**	49.92	52.09	8.35	**110.36**	0.47	53.61	29.76	**83.84**	**317.51**			
Ord Grove		107.26	101.65	107.01	**315.92**	107.13	103.08	125.80	**336.00**	123.14	125.76	25.68	**274.58**	112.53	133.33	129.04	**374.90**	**1,301.40**			
Paralta		128.77	119.63	95.62	**344.02**	93.48	130.05	183.04	**406.57**	168.46	186.59	106.98	**462.03**	164.02	182.61	172.94	**519.57**	**1,732.19**			
Playa		32.86	32.92	33.50	**99.28**	33.69	30.01	31.91	**95.60**	31.54	32.73	1.04	**65.31**	1.07	30.85	32.92	**64.85**	**325.04**			
Plumas		27.64	26.92	27.46	**82.03**	27.60	24.67	26.76	**79.04**	23.50	26.82	0.85	**51.17**	1.06	26.76	25.15	**52.97**	**265.20**			
Santa Margarita		150.92	129.07	125.62	**405.62**	108.88	165.93	239.42	**514.23**	188.79	182.32	162.21	**533.32**	128.52	125.35	153.81	**407.68**	**1,860.85**			
ASR Recovery		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	(205.88)	**(205.88)**	(79.08)	(224.09)	(296.56)	**(599.73)**	**(805.62)**			
PWM Recovery		(404.79)	(333.96)	(359.30)	**(1098.05)**	(339.81)	(436.43)	(498.90)	**(1,275.15)**	(301.76)	0.00	0.00	**(301.76)**	(237.24)	(327.02)	(218.55)	**(782.81)**	**(3,457.77)**			
Seaside Municipal		15.26	11.75	10.85	**37.86**	11.05	13.22	10.07	**34.34**	12.54	14.66	14.00	**41.20**	16.25	15.92	12.90	**45.06**	**158.46**	120.28		120.28
In-lieu Extraction					**0.00**				**0.00**				**0.00**	0.00	0.00	0.00	**0.00**	**0.00**			
Granite Rock Company	SPA	--	--	--	**0.00**	--	--	--	**0.00**	--	--	--	**0.00**	--	--	--	**0.00**	**0.00**	11.35	249.6	260.95
DBO Development No. 30	SPA	--	--	--	**0.00**	--	--	--	**0.00**	--	--	--	**0.00**	--	--	--	**0.00**	**0.00**	20.59	447.12	467.71
Calabrese (Cypress Pacific Inv.)	SPA	--	--	--	**0.00**	--	--	--	**0.00**	--	--	--	**0.00**	--	--	--	**0.00**	**0.00**	2.76	13.69	16.45
City of Seaside (Golf Courses)	APA	41.260	0.00	0.00	**41.26**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	**41.26**	540.00		540.00
Sand City	APA	0.16	0.14	0.06	**0.36**	0.07	0.18	0.00	**0.25**	0.06	0.14	0.08	**0.28**	0.10	0.16	0.05	**0.31**	**1.20**	9.00		9.00
SNG (Security National Guaranty) / MLDC (Mountain Lake Dev. Corp.)	APA	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**	90.00		90.00
	APA	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**	59.00		59.00
Calabrese (Cypress Pacific Inv.)	APA	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**	6.00		6.00
Mission Memorial (Alderwoods)	APA	3.72	1.21	0.45	**5.38**	0.78	0.36	0.25	**1.40**	0.82	1.71	1.85	**4.39**	3.04	4.83	3.28	**11.16**	**22.32**	31.00		31.00
Coastal Subareas Totals					**283.38**				**265.89**				**1,035.00**				**177.78**	**1,762.05**	**2,356.01**	**820.86**	**3,176.87**
Laguna Seca Subarea																					
CAW - Laguna Seca Subarea	SPA	12.42	10.03	8.35	**30.79**				**0.00**				**0.00**				**0.00**	**30.79**	0.00		0.00
Ryan Ranch Unit	05/27/21: Ryan Ranch Wells #7, #8, and #11 physically disconnected from the distribution system.								0.00	0.00	0.00	0.00	**0.00**				0.00	0.00			
Hidden Hills Unit		12.42	10.03	8.35	30.79	7.82	6.93	7.47	22.22	8.66	11.26	13.96	**33.88**	14.65	13.83	13.29	41.77	128.67			
Bishop Unit 3	05/27/21: Bishop Wells #1 and #3 physically disconnected from the distribution system.								0.00	0.00	0.00	0.00	**0.00**				0.00	0.00			
Bishop Unit 1	The Monterey Main to Ryan Ranch & Bishop Intertie was opened on 12/08/20								0.00	0.00	0.00	0.00	**0.00**				0.00	0.00			
The Club at Pasadera	APA	19.00	0.00	0.00	**19.00**	0.00	0.00	0.00	**0.00**	0.00	31.00	20.00	**51.00**	20.00	39.00	41.00	**100.00**	**170.00**	251.00		251.00
Laguna Seca Golf Resort (Bishop)	APA	20.00	5.17	0.00	**25.17**	0.00	0.00	0.00	**0.00**	6.12	15.96	29.18	**51.26**	36.19	39.65	20.78	**96.63**	**173.06**	320.00		320.00
York School	APA	1.40	0.12	0.02	**1.54**	0.01	0.00	0.00	**0.01**	1.25	1.33	2.48	**5.07**	2.12	1.64	2.10	**5.87**	**12.49**	32.00		32.00
Laguna Seca County Park	APA	1.17	1.14	0.15	**2.46**	0.47	0.25	0.84	**1.56**	2.85	3.63	1.98	**8.46**	5.16	4.72	1.94	**11.82**	**24.30**	41.00		41.00
Laguna Seca Subarea Totals					**78.96**				**1.58**				**115.79**				**214.31**	**410.64**	**644.00**	**0.00**	**644.00**
Total Production by WM Producers					**362.34**				**267.46**				**1,150.79**				**392.10**	**2,172.69**	**3,000.01**	**820.86**	**3,820.87**
									Annual Production from APA Producers									444.62			1,379.00
									Annual Production from SPA Producers									1,728.07			2,441.87

																			Previous Balance	*Total*
CAW / MPWMD ASR (Carmel River Basin source water)																				
Injection		0.00	0.00	37.49	**37.49**	244.16	323.50	299.63	**867.29**	344.76	406.89	0.00	**751.64**	0.00	0.00	0.00	0.00	**1,656.42**		
(Recovery)		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	(205.88)	**(205.88)**	(79.08)	(224.09)	(296.56)	**(599.73)**	**(805.61)**		
Net ASR		0.00	0.00	37.49	**37.49**	244.16	323.50	299.63	**867.29**	344.76	406.89	(205.88)	**545.76**	0.00	0.00	0.00	**0.00**	**850.80**	**872.10**	**1,722.90**
Pure Water Monterey (PWM) Injection and Cal-Am Recovery																				
	Balance Forward																		*Previous Balance*	*Total*
Injection Operating Reserve	1,164.52	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	705.60	**705.60**	**1,870.12**		
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**		
Delivery to Basin		349.81	333.96	397.41	**1081.18**	423.25	379.74	434.04	**1237.03**	311.01	303.12	350.42	**964.54**	237.24	327.02	218.55	**782.81**	**4,065.57**		
CAW Extraction		(404.79)	(333.96)	(359.30)	**(1,098.05)**	(339.81)	(436.43)	(498.90)	**(1,275.14)**	(301.76)	0.00	0.00	**(301.76)**	(237.24)	(327.02)	(218.55)	**(782.81)**	**(3,457.76)**		
																		607.81	**228.64**	**836.45**
	Balance Forward																			
City of Seaside Golf Course Recycled Water Use/Municipal Potable Water Recovery *2,361AF Max*																			*Previous Balance*	*Total*
In-lieu Storage/Recycled Water Use	0.00	0.00	0.00	0.00	**0.00**	0.00	10.54	0.66	**11.20**	34.22	83.29	66.54	**184.05**	68.47	64.02	37.28	**169.77**	**365.03**	**0.0**	**365.03**
City of Seaside Municipal Extraction		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**
Net In-lieu					**0.00**				**11.20**	34.22	83.29	66.54	**184.05**	68.47	64.02	37.28	**169.77**	**365.03**	**0.0**	**365.03**

Notes:

1. The Water Year (WY) begins October 1 and ends September 30 of the following calendar year. For example, WY 2023 begins on October 1, 2022, and ends on September 30, 2023.
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 October 15, 2023.
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 2023* (see Item IX.B. in 12/7/2022 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.
9. Cal-Am Toro Well #3 Destroyed 09/30/21

ATTACHMENT 2

WATERMASTER DECLARATION
OF
NON-AVAILABILITY
OF
ARTIFICIAL REPLENISHMENT WATER

NOTICE TO ALL SEASIDE GROUNDWATER PRODUCERS:

Case No. M66343 Amended Decision Section III.B.2.

Commencing with the fourth Water Year, and triennially thereafter, the Operating Yield for both Subareas will be decreased by ten percent (10%) until Operating Yield is the equivalent of the Natural Safe Yield unless:

a. *The Watermaster has secured and is adding an equivalent amount of Non-Native water to the Basin on an annual basis; or*
b. *The Watermaster has secured reclaimed water in an equivalent amount and has contracted with one or more of the Producers to utilize said water in lieu of their Production Allocation, with the Producer agreeing to forego their right to claim a Stored Water Credit for such forbearance; or*
c. *Any combination of a and b above which results in the decrease in Production of Native Water required by this Decision; or*
d. *The Watermaster has determined that Groundwater levels within the Santa Margarita and Paso Robles aquifers are at sufficient levels to ensure a positive offshore gradient to prevent seawater intrusion.*

The Watermaster has determined that the conditions necessary to avoid the ten percent Operating Yield reduction have not been met as follows:

1. Watermaster has not secured water for adding an equivalent amount of Non-Native water to the Basin on an annual basis.
2. The Watermaster has not secured reclaimed water in an equivalent amount.
3. The Watermaster has not secured Non-Native water or reclaimed water that results in the decrease in Production of Native Water required by the Decision.
4. The firm contracted by Watermaster for technical analyses continued to report in 2019 that Groundwater levels within the Santa Margarita and Paso Robles aquifers are not at sufficient levels to ensure a positive offshore gradient to prevent seawater intrusion, so the requirement for this item continues to not be met.

Section III.L.3.j.iii: Watermaster declares that for Water Year 2023 Artificial Replenishment Water is not available to offset Operating Yield Over-Production and producers are limited in production to the following quantities of water:

Coastal Subarea Alternative Producers:

Seaside (Golf)	540.00 acre-feet
SNG	149.00 acre-feet
Cypress (Calabrese)	6.00 acre-feet
Mission Memorial (Alderwood)	31.00 acre-feet
Sand City	9.00 acre-feet

Laguna Seca Subarea Alternative Producers:

The Club at Pasadera	251.00 acre-feet
Bishop	320.00 acre-feet
York School	32.00 acre-feet
Laguna Seca County Park	41.00 acre-feet

Coastal Subarea Standard Producers:

California American Water.....	1,576.48 acre-feet*
Seaside (Municipal)	120.28 acre-feet**
Granite Rock	260.96 acre-feet***
D.B.O. Development 30	467.70 acre-feet****
Cypress (Calabrese)	16.45 acre-feet*****

Laguna Seca Subarea Standard Producers:

California American Water.....	0.0 acre-feet

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* Total is the 2023 base allocation of 1,466.03 acre-feet, plus transferred credits of 3.17 & 2.31 acre-feet plus 104.97 of "not free" carryover. California American Water has a positive balance of 2072.58 acre-feet of stored water credit at WY-end 2022 from Basin injections exceeding extractions since WY 2010 under the CAW/MPWMD ASR Program, formalized through a Storage Agreement in 2012; and under the CAW/M1W Pure Water Monterey Program formalized through a storage agreement in 2019.

** Total is the 2023 base allocation of 120.28 acre-feet.

*** Total includes 222.49 acre-feet of "free" carryover and 27.12 acre-feet of "not-free" carryover credit from previous water years, plus the 2023 base allocation of 11.35 acre-feet.

**** Total includes 410.44 acre-feet of "free" carryover plus 38.98 acre-feet of "not-free" carryover credit from previous water years, minus 2.31 in transferred water rights, plus the 2023 base allocation of 20.59 acre-feet.

***** Total includes 15.28 acre-feet of "free" carryover and 1.58 acre-feet of "not-free" carryover credit from previous water years, minus 3.17 acre-feet in transferred water rights, plus the 2023 base allocation of 2.76 acre-feet.

NOTICE TO ALL SEASIDE GROUNDWATER PRODUCERS

Pursuant to Section III.3.L.3.j.xix of the Amended Decision Filed February 2, 2007 in the Superior Court of the State of California, in and for the County of Monterey, Case No. M66343 (the "Decision"), the Seaside Basin Watermaster hereby Declares that the Total Usable Storage Space in the Seaside Groundwater Basin ("Basin") is as follows:

Total Usable Storage Space in the Coastal and Northern Inland Subareas is 75,610 acre-feet.
Total Usable Storage Space in the Laguna Seca Subarea is 28,560 acre-feet.
Total Usable Storage Space in the entire Seaside Groundwater Basin is 104,170 acre-feet.

Pursuant to Section III.B.3.b of the Decision, Alternative Producers do not receive a storage allocation, only Standard Producers receive such an allocation. Pursuant to Section III.H.2 of the Decision, the Seaside Basin Watermaster further Declares that the Total Usable Storage Space in the Basin shall be allocated to the Standard Producers, who are identified in the Decision, as follows:

	Current Allocation (Using Table 1 of the Decision)		
Producer	**Operating Yield Allocation Percentage (1)**	**Usable Storage Allocation Percentage (2)**	**Useable Storage Allocation Acre-Feet**
Coastal and Northern Inland Subareas			
California American Water (3)	77.55%	90.44%	68,382
City of Seaside (Municipal)	6.36%	7.42%	5,610
Granite Rock Company	0.60%	0.70%	529
DBO Development No. 27	1.09%	1.27%	960
Calabrese (Cypress Pacific Investors LLC)	0.15%	0.17%	129
SUBAREAS TOTAL	**85.75%**	**100.00%**	**75,610**
Laguna Seca Subarea			
California American Water (3)	45.13%	100.00%	28,560
SUBAREA TOTAL	**45.13%**	**100%**	**28,560**
BASIN TOTAL		**100%**	**104,170**

Footnotes:
(1) From Table 1 on page 19 of the Decision.
(2) Calculated as each Standard Producer's percentage of the total Standard Producers' operating yield allocation percentages within each subarea.
(3) CAW's Usable Storage Allocation is subject to the provisions and requirements of Section III.H.3 of the Decision.

Pursuant to Section III.H.6 of the Decision, no Producer may store water in the Basin without first executing with the Watermaster a Storage and Recovery Agreement.

Nov 2, 2019

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ATTACHMENT 3

WATERMASTER ADMINISTRATIVE AND OPERATIONS COSTS FOR WY 2023

Seaside Groundwater Basin Watermaster

Budget vs. Actual Administrative Fund

Fiscal Year (January 1 - December 31, 2023)
Balance through September 30, 2023

	2023 Adopted Budget October 5, 2022	Contract Amount		Year to Date Revenue / Expenses
Available Balances & Assessments				
Other Assessments	-			
FY (Rollover)	39,500.00			55,111.67
Admin Assessments	60,500.00			60,500.00
Available	**100,000.00**			**115,611.67**
Expenses				
Contract Staff	60,000.00	60,000.00		40,815.00
PAC / 3D Basin Modeling	3,000.00	3,000.00		2,610.00
Legal Counsel	12,000.00	20,000.00	*	1,312.50
Filing fees and postage				-
Total Expenses	**75,000.00**	**83,000.00**		**44,737.50**
Total Available	25,000.00			
Dedicated Reserve	25,000.00			-
Net Available	-			**70,874.17**

** $8,000 of the contracted amount is an approximation of expenditures related to the Replenishment Fund*

ATTACHMENT 4

UPDATED REPLENISHMENT ASSESSMENT UNIT COSTS

WATER YEAR 2024 (October 1, 2023-September 30, 2024)

ANTICIPATED UNIT COSTS OF WATER COULD POTENTIALLY BE USED FOR REPLENISHMENT OF THE SEASIDE BASIN

POTENTIAL SOURCE OF REPLENISHMENT WATER	POTENTIAL DATE REPLENISHMENT WATER COULD BECOME AVAILABLE	POTENTIAL VOLUME OF WATER THAT COULD BE SUPPLIED BY THE PROJECT (AFY) [1]	BASE UNIT COST ($/AF)
Regional Desalination[2]	2025	6,250	$6,147
Pure Water Monterey and PWMX	2024	5,750	$3,486
Seaside Basin ASR Expansion[3]	2021	1,000	$2,025
Regional Urban Water Augmentation Project (RUWAP)[4]	2021	1,400-1,700 (use an average of 1,550)	$3,486
	TOTAL=	14,550	
(6,250 x $6,147 + 5,750 x $3,486 + 1,000 x $2,025 + 1,550 x $3,486)/14,550 =		**$4,528.63 2024 Natural Safe Yield Overproduction Unit Cost/AF**	
	$4,528.63/4 =	**$1,132.16 2024 Operating Yield Overproduction Unit Cost/AF**	

FOOTNOTES:

(1) For the Regional Desalination Project this is the total amount of water from this source which could potentially come to the CAW distribution system, based on the desalination plant having a 6.4 MGD capacity which is equivalent to 7,169 AFY. Only a portion of this amount might be available as initially unused capacity that could be used to help replenish the Seaside Basin. For the RUWAP this is the total amount of non-potable water from this source. Only a portion of this amount might be used for in-lieu replenishment of the Seaside Basin. For the ASR Expansion Project this is the additional amount of water that could potentially be provided by this project (see footnote 4).

(2) Base unit cost data based on PUC filing documents and provided by Dave Stoldt of MPWMD . This unit cost was confirmed in August 2020 by Tim O'Halloran of Cal Am as being the latest unit cost available for this project.

(3) Base unit cost data provided by MPWMD in 2016. No updated unit cost was provided for this project. The 1,000 AFY of potential water that this project could supply would be in addition to the 1,300 AFY included as part of the Monterey Peninsula Water Supply Project, and would be an annual average taking into account river flow and hydrologic conditions that change from year to year.

(4) Project data updated in 2022. Patrick Breen of MCWD noted that to determine total cost per acre-foot, use the $3,486/acre-foot cost from Pure Water Monterey (which would be the cost for RUWAP as well) and add MCWD O&M and Financing costs which are yet to be determined.

ATTACHMENT 5

REPLENISHMENT ASSESSMENT CALCULATIONS FOR WY 2023

WATERMASTER PRODUCER ALLOCATIONS WATER YEAR 2023 IN ACRE-FEET (AF)

TRIENNIEL REDUCTION FINAL END OF WATER YEAR 2021 TO 3,000 AFY

Initial Basin-Wide Operating Yield[2]	3000.00	Coastal Operating Yield. [1]	2356.00
Natural Safe Yield (NSY)[3]	3000.00	Laguna Seca Operating Yield. [1]	644.00

ALTERNATIVE PRODUCER ALLOCATIONS

Coastal Subarea [3]	AF	Laguna Seca Subarea [1]	AF
Seaside (Golf)	540.00	Nicklaus Club Monterey	251.00
SNG	149.00	Bishop	320.00
Calabrese	6.00	York School	32.00
Mission Memorial (Alderwood)	31.00	Laguna Seca County Park	41.00
Sand City	9.00		
Total[1]	735.00	Total[1]	644.00

ALTERNATIVE PRODUCER AMOUNT PUMPED WY 2023

Coastal Subarea [3]	AF	Laguna Seca Subarea [1]	AF	Total Alternative Producer WY 2023 Production
Seaside (Golf)	41.26	The Club at Pasadera	170.00	
SNG	0.00	Bishop	173.06	
Calabrese	0.00	York School	12.49	
Mission Memorial (Alderwood)	22.32	Laguna Seca County Park	24.30	
Sand City	1.20			
Total[1]	64.78	Total[1]	379.85	444.62

STANDARD PRODUCER ALLOCATIONS

Coastal Operating Yield Available to Standard Producers (AF)			1621.00	Laguna Seca Operating Yield Available to Standard Produce (AF)			0.00
Coastal Subarea	Standard Producer Allocations		AF Available to This Producer	Laguna Seca Subarea	Standard Producer Allocations		AF Available to This Producer
	Base Water Right %[4]	Weighted %. [5]			Base Water Right % [4]	Weighted %. [5]	
California American Water (CAW)	77.55%	90.44%	1,466.03	CAW	45.13%	100.00%	0.00
Seaside (Municipal)	6.36%	7.42%	120.28				
Granite Rock	0.60%	0.70%	11.35				
D.B.O. Development No. 30	1.09%	1.27%	20.59				
Calabrese (Cypress Pacific Investors LLC)	0.15%	0.17%	2.76				
Total	85.75%	100.0%	1,621.00	Total	45.13%	100.0%	0.00

Allocation of Available Operating Yield Among Standard Producers	Base Water Right Available to this Producer (AF)	% NSY to SPA (Base Water Right ./. Total Water Right)	NSY Available to Producers (AF) Current Water Year	Carryover Credits from Prior Water Year	Water Rights Transferred / Sold DBO to CAW 710 Amador (0.16) DBO to CAW 2 Upper Ragsdale (2.15)	Water Rights Transferred / Sold Calabrese to CAW Ryan Ranch CHOME	Total Authorized Production Current WY (Base Water Right + APA non-production[7] + Carryover[6])	Actual AF Pumped by Producer in WY 2023	Carryover[8] Credits to WY 2024	Stored Water Credits to WY 2024
		NSY 3000 - 444.62 AF = 2,555.38	WY 2023 APA Pumped 444.62 AF							
California American Water	1,466.03	90.44%	2,311.07	7.00	2.31	3.17	2,323.55	1,569.61	753.95	2,559.35
Seaside (Municipal)	120.28	7.42%	189.61	0.00	0.00	0.00	189.61	158.46	31.15	365.03
Granite Rock	11.35	0.70%	17.89	249.61	0.00	0.00	267.49	0.00	267.49	0.00
D.B.O. Development No. 30	20.59	1.27%	32.46	449.42	(2.31)	0.00	479.57	0.00	479.57	0.00
Calabrese (Cypress Pacific Investors LLC)	2.76	0.17%	4.35	16.86	0.00	(3.17)	18.04	0.00	18.04	0.00
Total	1,621.01	100.00%	2,555.38	722.89	0.00	0.00	3,278.27	1,728.07	1,550.20	2,924.38

Footnotes:

(1) From page 17 of Exhibit A (Amended Decision)of Court Order filed February 9, 2007.

(2) From page 14 of Exhibit A (Amended Decision)of Court Order filed February 9, 2007.

(3) From page 21 of Exhibit A (Amended Decision)of Court Order filed February 9, 2007.

(4) From Table 1 on page 19 of Exhibit A (Amended Decision) of Court Order filed February 9, 2007.

(5) Calculated from the Base Water Right percentages in the adjacent column. Any discrepancy in totals is due to rounding.

(6) Base Water Right plus Free and Not Free Carryover Credit = 2019 Production Allocation no longer capped due to increase in storage allocation (see 2020 Declaration of Usable Storage Space)

(7) Commencing Water Year 2021 Natural Safe Yield = Operating Yield of 3,000AF. Therefore, the remainder of 3,000AF - APA production is applied to both NSY & OY Standard Producer allocations

Note: Calabrese (Cypress Pacific Investors LLC) opted to convert 8AF of its 14AF Alternative Production Allocation to Standard Production Allocation on January 22, 2015 (notice filed by Cypress with Superior Court).

Producers carryover is capped at their storage capacity.

(8) "Free" and "Not-free" carryover was a function of ramp down in production; now that rampdown is complete and NSY = Operating Yield, carryover is no longer divided into "Free and Not-free" (NSY and Operating Yield) carryover.

CALCULATION OF REPLENISHMENT ASSESSMENTS WATER YEAR 2023

Using the Basin-wide methodology approved by the Court on January 12, 2007, and as shown in detail on the spreadsheet contained in this attachement, Watermaster calculated the Water Year (WY) (October 1st through September 30th) 2023 Replenisment Assessments as follows:

	2023 Replenishment Assessment NSYO Unit Charge =					$3,461.00			
	2023 Replenishment Assessment OSYO Unit Charge =					$865.00			
2023 Natural Safe Yield (NSY) Available to Standard Producers =						2,555.38	AF (3,000 AF NSY - 444.62 Alternative Producers 2023 Production)		
Standard Producers	**WY 2023 Production (AF)**	**% of NSY Available**	**Volume of NSY Available (AF)**	**NSY Overproduction (AF)**	**NSY Overproduction Assessment**	**Operating Yield Available (AF)**	**Operating Yield Overproduction (AF)**	**Operating Yield Overproduction Assessment**	**Total Assessment**
California American Water	1,569.61	90.44%	2,311.07	-	$ -	1,753.68	-	$ -	$ -
Seaside (Municipal)	158.46	7.42%	189.61	-	-	189.61	-	-	-
Granite Rock	-	0.70%	17.89	-	-	249.60	-	-	-
D.B.O. Development No. 30	-	1.27%	32.46	-	-	449.43	-	-	-
Calabrese (Cypress Pacific Inv.)	-	0.17%	4.35	-	-	16.86	-	-	-
Total Production	**1,728.07**	**100.00%**	2,555.38	**-**	**$ -**	**2,659.18**	**-**	**$ -**	**$ -**
Alternative Producers	**WY 2021 Production (AF)**	**% of NSY Available**	**Volume of NSY Available (AF)**	**NSY Overproduction (AF)**	**NSY Overproduction Assessment**	**Operating Yield Available (AF)**	**Operating Yield Overproduction (AF)**	**Operating Yield Overproduction Assessment**	**Total Assessment**
City of Seaside (Golf Courses)	41.26	N/A	540.00	0.00	$ -	540.00	0.00	$ -	$0
Security National Guaranty		N/A	90.00	0.00	-	90.00	0.00	-	-
Mountainlake Development LLC	-	N/A	59.00	0.00	-	59.00	0.00	-	-
Calabrese (Cypress Pacific Inv.)	-	N/A	6.00	0.00	-	6.00	0.00	-	-
Mission Memorial (Alderwoods)	22.32	N/A	31.00	0.00	-	31.00	0.00	-	-
City of Sand City	1.20	N/A	9.00	0.00	-	9.00	0.00	-	-
Nicklaus Club Monterey	170.00	N/A	251.00	0.00	-	251.00	0.00	-	-
Laguna Seca Golf Resort (Bisho	173.06	N/A	320.00	0.00	-	320.00	0.00	-	-
York School	12.49	N/A	32.00	0.00	-	32.00	0.00	-	-
Laguna Seca County Park	24.30	N/A	41.00	0.00	-	41.00	0.00	-	-
Total Production	**444.62**	**N/A**	**1,379.00**	**0.00**	**$ -**	**1,379.00**	**0.00**	**$ -**	**$0**

ATTACHMENT 6

WATERMASTER BUDGETS FOR 2024

Seaside Groundwater Basin Watermaster
Administrative Fund Budget
Proposed Budget September 6, 2023
Administrative Year 2024

	2023 Adopted Budget	2023 Estimated Total	2024 Proposed Budget
Assessment Income			
Reserve/Rollover*	$ 39,500	$ 43,000	$ 23,500
Administrative Assessment	60,500	60,500	70,000
Replenishment Related Legal Costs**		8,500	20,000
Totals	100,000	112,000	113,500
Expenditures			
Contractual Services - Administrative	60,000	60,000	63,500
Legal Services	12,000	3,500	22,000
Public Awareness Committee	3,000	2,610	3,000
Total Expenses	75,000	63,500	88,500
Total Available	25,000	48,500	25,000
Less Reserve	25,000	25,000	25,000
Net Available	$ -	$ 23,500	$ -

** Note: The reserve/rollover balance of $23,500 was determined upon completion by Watermaster staff of a detailed reconciliation from 2006 through July 2023 of the Administrative Fund financial records held at the Watermaster office.*

*** Replenishment related legal costs will be covered by funds transferred into the Administrative Fund from the Replenishment Assessment Fund*

Monitoring and Management Program Operations Budget For Tasks to be Undertaken in 2024								Comparative Costs from 2023 Budget
Task	Subtask	Sub-Subtask	Cost Description	CONSULTANTS & CONTRACTORS[3] MPWMD	Private Consultants	Contractors	Total	
			Labor					
			Technical Project Manager	$0	$75,000	$0	$75,000	$75,000
M.1 Program Administration								
	M.1.a		Project Budget and Controls	$0	$0	$0	$0	$0
	M.1.b		Assist with Board and TAC Agendas	$0	$0	$0	$0	$0
	M.1.c, M.1.d, & M.1.e		Preparation for and Attendance at Meetings and Peer Review of Documents and Reports[8]	$0	$19,530	$0	$19,530	$28,280
	M.1.f		QA/QC	$0	$0	$0	$0	$0
	M.1.g		SGMA Documentation Preparation	$0	$2,540	$0	$2,540	$2,464
I.1 Initial Phase 1 Monitoring Well Construction (Task Completed in Phase 1)								
I.2 Production, Water Level and Quality Monitoring								
	I. 2. a.		Database Management					
		I. 2. a. 1.	Conduct Ongoing Data Entry/ Database Maintenance[15]	$19,100	$3,600	$0	$22,700	$32,238
		I. 2. a. 2.	Verify Accuracy of Production Well Meters	$0	$0	$0	$0	$0
	I. 2. b.		Data Collection Program					
		I. 2. b. 1.	Site Representation and Selection[7]	$0	$0	$0	$0	$0
		I. 2. b. 2.	Collect Water Levels[5][6]	$21,128	$0	$0	$21,128	$20,042
		I. 2. b. 3.	Collect Water Quality Samples and Perform Sentinel Well Induction Logging[1][5]	$20,694	$0	$17,752	$38,446	$28,210
		I. 2. b. 4.	Update Program Schedule and Standard Operating Procedures.	$0	$0	$0	$0	$0
		I. 2. b. 5.	Monitor Well Construction	$0	$0	$0	$0	$0
		I. 2. b. 6.	Reports	$3,680	$0	$0	$3,680	$3,568
		I. 2. b. 7.	CASGEM Data Submittal for Watermaster's Voluntary Wells	$4,200	$0	$0	$4,200	$5,352
I.3 Basin Management								
	I. 3. a.		Enhanced Seaside Basin Groundwater Model	(Costs Shown in Subtasks Below)				
		I. 3. a. 1	Update the Existing Model[11]	$0	$0	$0	$0	$0
		I. 3. a. 2	Develop Protective Water Levels[12]	$0	$0	$0	$0	$0
		I. 3. a. 3	Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions[10]	$0	$40,000	$0	$40,000	$60,000
	I. 3. b.		Complete Preparation of Basin Management Action Plan	$0	$0	$0	$0	$0
	I. 3. c.		Refine and/or Update the Basin Management Action Plan[7]	$0	$0	$0	$0	$0
	I. 3. d		Evaluate Coastal Wells for Cross-Aquifer Contamination Potential	$0	$0	$0	$0	$0
	I. 3. e		Seaside Basin Geochemical Model[13]	$0	$10,000	$0	$10,000	$10,000
I.4 Seawater Intrusion Contingency Plan								
	I. 4. a.		Oversight of Seawater Intrusion Detection and Tracking[17]	$0	$0	$0	$0	$0
	I. 4. b.		Analyze and Map Water Quality from Coastal Monitoring Wells	(Costs Included Under I.4.a)				
	I. 4. c.		Annual Report- Seawater Intrusion Analysis[16]	$0	$28,020	$0	$28,020	$27,176
	I. 4. e.		Refine and/or Update the Seawater Intrusion Response Plan[2] [9]	$0	$0	$0	$0	$0
	I. 4. f.		If Seawater Intrusion is Determined to be Occurring, Implement Contingency Response Plan[2]	(No Costs are Included for This Task, as This Task Will Likely Not be Necessary During 2021. If it Does Become Necessary, Use of Contingency Funds or a Budget Modification Will Likely be Necessary)				
		TOTALS CONSULTANTS & CONTRACTORS		**$68,802**	**$178,690**	**$17,752**		
			SUBTOTAL not including Technical Program Manager =				$190,244	$217,330
			Contingency (not including Technical Program Manager) @ 15%[4] =				$28,537	$32,600
			Technical Program Manager =				$75,000	$75,000
			TOTAL=				**$293,781**	**$324,930**

Footnotes:

(1) Under this Subtask the Watermaster will directly contract with an outside contractor to perform the Sentinel Well induction logging work, and to also collect water level data in conjunction with doing the induction logging. MPWMD will perform the other portions of the work of this Subtask. The Sentinel Wells will be induction logged once per year (in September).

(2) The response plan would only be implemented in the event sea water intrusion is determined to be occurring.

(3) Within the context of this document the term "Consultant" refers either to a Private Consultant providing professional engineering or other types of technical services, or to the Monterey Peninsula Water Management District (MPWMD). The term "Contractor" refers to a firm providing construction or field services such as well drilling, induction logging, or meter calibration.

(4) Due to the uncertainties of the exact scopes of some of the larger Tasks listed above at the time of preparation of this Budget it is recommended that a Contingency of 15% be included in the Budget.

(5) The MPWMD portion of these Tasks includes:

For Task I.2.b.2: (1) $527 for vehicle mileage costs for both this Task and Task I.2.b.3 and (2) $893 to purchase a replacement datalogger (if

For Task I.2.b.3: (1) $5,670 for laboratory analytical costs, (2) $158 for air compressor rental to sample the Camp Huffman well, (3) $263 for CO2 bottles to run the sample pumps, (4) $945 to purchase a replacement low flow sampling pump (if necessary) and (5) $736 of administrative support costs for preparing billings and processing invoices from the water quality laboratory.

(6) Does not include costs for MPWMD to collect water level data or water quality samples from wells other than those that are part of the basic monitoring well network, i.e. for private well owners who have requested that the Watermaster obtain this data for them. Costs to obtain that data are to be reimbursed to the Watermaster by those well owners, so there should be no net cost to the Watermaster for that portion of the work under these Tasks.

(7) The BMAP was updated in 2018, and no further work on this Task is anticiapted in 2024.

(8) This cost is for Montgomery and Associates, Todd Groundwater, and Martin Feeney to provide hydrogeologic consulting assistance to the Watermaster, beyond that associated with performing other specified Tasks, when requested to do so by the Technical Program Manager. This work may include, but not be limited to, participation in conference calls and reviewing documents prepared by others.

(9) If work under this Task is found to be necessary, it will be funded through the Contingency line item in this Budget.

(10) This Task is included to provide funds for the Watermaster to perform modeling and other investigative work to aid in making Basin management decisions that the Board may wish to perform in 2024.

(11) The Model was updated and recalibrated in 2018, so no costs for this Task are anticipated in 2024.

(12) The protective water levels developed in 2009 were examined in 2013 to see if they needed to be updated. It was concluded that the 2009 protective levels were still satisfactory for Basin management purposes, and that no revisions were needed. No work under this Task is anticipated in 2024.

(13) This was a new Task that was started in 2018, and was completed for the PWM AWT water in 2019. Funds allocated for this Task in 2024 would only be used if geochemical modeling is performed in 2024 for the MPWSP desalination plant water, and if that modeling indicates the need to have Montgomery and Associates use the Seaside Basin groundwater model to provide additional information needed by the geochemical model to develop miitgation measures for any adverse water quality impacts the geochemical model predicts could occur from introducing desalinated water into the Basin.

(14) Not used.

(15) Includes $300/month for an outside consultant to maintain the Watermaster's website and post documents on it and $2,300 for MPWMD to respond to requests from consultants and others for data from the database.

(16) MPWMD's costs to assist in this Task are included in its costs under Task I.2.b.6.

(17) MPWMD's and Montgomery & Associates' costs to provide oversight in this Task are included under their other Tasks.

Monitoring and Management Program Capital Budget For Tasks to be Undertaken in 2024
No Capital projects are anticipated to be undertaken in 2024, so this budget is $0.

Seaside Groundwater Basin Watermaster
Replenishment Fund
Water Year 2024 (October 1 - September 30) / Fiscal Year (January 1 - December 31, 2023)
Proposed 2024 Budget

Replenishment Fund		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Assessment Water Year		WY 05/06	WY 06/07	WY 07/08	WY 08/09	WY 09/10	WY 10/11	WY 11/12	WY 12/13	WY 13/14	WY 14/15	WY 15/16
Unit Cost:	a	$1,132 / $283	$1,132 / $283	$2,485 / 621.25	$3,040 / $760	$2,780 / $695	$2,780 / $695	$2,780 / $695	$2,780 / $695	$2,702/$675.50	$2,702/$675.50	$2,702/$675.50
Cal-Am Water Balance Forward	b	$ -	$ 1,641,004	$ 4,226,710	$ (2,871,690)	$ (2,839,939)	$ (3,822,219)	$ (6,060,164)	$ (8,735,671)	$ (6,173,771)	$ (3,102,221)	$ (676,704)
Cal-Am Water Production (AF)	c	*3,710.00*	*4,059.90*	*3,862.90*	*2,966.02*	*3,713.52*	*3,416.04*	*3,070.90*	*3,076.61*	*3,232.10*	*2,764.73*	*1,879.21*
Cal-Am Water NSY Over-Production (AF)	d	*1,862.69*	*2,266.32*	*2,092.16*	*1,241.27*	*1,479.47*	*1,146.71*	*820.48*	*856.42*	*1,032.77*	*782.17*	-
Exceeding Natural Safe Yield Considering Alternative Producers	e	$ 2,106,652	$ 2,565,471	$ 5,199,014	$ 3,773,464	$ 4,112,933	$ 3,187,854	$ 2,280,943	$ 2,380,842	$ 2,790,539	$ 2,113,414	$ -
Operating Yield Overproduction Replenishment	f	$ -	$ 20,235	$ 8,511	$ -	$ -	$ -	$ 154,963	$ 181,057	$ 281,012	$ 312,103	$ -
Total California American	g	$ 2,106,652	$ 2,585,706	$ 5,207,525	$ 3,773,464	$ 4,112,933	$ 3,187,854	$ 2,435,907	$ 2,561,899	$ 3,071,550	$ 2,425,516	
CAW Credit Against Assessment	h	$ (465,648)		$ (12,305,924)	$ (3,741,714)	$ (5,095,213)	$ (5,425,799)	$ (5,111,413)				
CAW Unpaid Balance	i	***$ 1,641,004***	***$ 4,226,710***	***(2,871,690)***	***$ (2,839,939)***	***$ (3,822,219)***	***$ (6,060,164)***	***$ (8,735,671)***	***$ (6,173,771)***	***$ (3,102,221)***	***$ (676,704)***	***$ (676,704)***
City of Seaside Balance Forward	j	$ -	$ 243,294	$ 426,165	$ 1,024,272	$ 1,619,973	$ 891,509	$ (110,014)	$ (773,813)	$ (1,575,876)	$ (2,889,325)	$ (3,346,548)
City of Seaside Municipal Production (AF)	k	*332.00*	*287.70*	*294.20*	*293.44*	*282.87*	*240.68*	*233.72*	*257.73*	*223.64*	*185.01*	*195.16*
City of Seaside NSY Over-Production (AF)	l	*194.07*	*153.78*	*161.99*	*153.06*	*113.21*	*50.84*	*58.82*	*85.17*	*52.71*	*25.77*	*37.87*
Exceeding Natural Safe Yield Considering Alternative Producers	m	$ 219,689	$ 174,082	$ 402,540	$ 465,300	$ 314,721	$ 141,335	$ 163,509	$ 236,782	$ 142,410	$ 69,630	$ 102,330
Operating Yield Overproduction Replenishment	n	$ 12,622	$ 85	$ 4,225	$ 16,522	$ 20,690	$ -	$ 1,689	$ 27,007	$ 3,222	$ 38	$ 11,959
Total Municipal	o	$ 232,310	$ 174,167	$ 406,764	$ 481,823	$ 335,412	$ 141,335	$ 165,198	$ 263,788	$ 145,631	$ 69,667	$ 114,290
City of Seaside - Golf Courses (APA - 540 AFY)												
Exceeding Natural Safe Yield - Alternative Producer	p	$ -	$ -	$ 131,705	$ 69,701	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Yield Overproduction Replenishment	q	$ -	$ -	$ 32,926	$ 17,427	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Golf Courses	r	$ -	$ -	$ 164,631	$ 87,128	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total City of Seaside*	s	$ 232,310	$ 174,167	$ 571,395	$ 568,951	$ 335,412	$ 141,335	$ 165,198	$ 263,788	$ 145,631	$ 69,667	$ 114,290
City of Seaside Late Payment 5%	t	$ 10,984	$ 8,704	$ 26,712	$ 26,750	$ 15,737						
In-lieu Credit Against Assessment	u					$ (1,079,613)	$ (1,142,858)	$ (828,996)	$ (1,065,852)	$ (1,459,080)	$ (526,890)	$ (162)
City of Seaside Unpaid Balance	v	***$ 243,294***	***$ 426,165***	***$ 1,024,272***	***$ 1,619,973***	***$ 891,509***	***$ (110,014)***	***$ (773,813)***	***$ (1,575,876)***	***$ (2,889,325)***	***$ (3,346,548)***	***$ (3,232,420)***
Mission Memorial Park												
Mission Memorial Park Production (AF)	w			*20.80*	*26.40*	*12.80*	*22.40*	*27.00*	*24.95*	*24.89*	*17.97*	*13.67*
Mission Memorial Park NSY Over-Production (AF)	x	-	-	-	-	-	-	-	-	-	-	-
Exceeding Natural Safe Yield - Alternative Producer	y	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Operating Yield Overproduction Replenishment	z	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Mission Memorial Park	aa	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Replenishment Fund Balance	bb	$ 1,884,298	$ 4,652,874	$ (1,847,417)	$ (1,219,966)	$ (2,930,710)	$ (6,170,178)	$ (9,509,483)	$ (7,749,648)	$ (5,991,546)	$ (4,023,252)	$ (3,909,125)
Replenishment Fund Balance Forward	cc	$ -	$ 1,884,298	$ 4,652,874	$ (1,847,417)	$ (1,219,966)	$ (2,930,710)	$ (6,170,178)	$ (9,509,483)	$ (7,749,648)	$ (5,991,546)	$ (4,023,252)
Total Replenishment Assessments	dd	$ 2,349,946	$ 2,768,576	$ 5,805,632	$ 4,369,165	$ 4,464,082	$ 3,329,189	$ 2,601,104	$ 2,825,688	$ 3,217,182	$ 2,495,183	$ 114,290
Total Paid and/or Credited	ee	$ (465,648)	$ -	$ (12,305,924)	$ (3,741,714)	$ (6,174,826)	$ (6,568,657)	$ (5,940,409)	$ (1,065,852)	$ (1,459,080)	$ (526,890)	$ (162)
Grand Total Fund Balance	ff	$ 1,884,298	$ 4,652,874	$ (1,847,417)	$ (1,219,966)	$ (2,930,710)	$ (6,170,178)	$ (9,509,483)	$ (7,749,648)	$ (5,991,546)	$ (4,023,252)	$ (3,909,125)

** 2010 = 319.55 AF golf course in-lieu replenishment and 68.8 AF 4-party agmt in-lieu replenishment*
2011 = 411.1 AF golf course in-lieu replenishment
2012 = 298.2 AF golf course in-lieu replenishment
2013 = 383.4 AF golf course in-lieu replenishment
2014 = 552.4 AF golf course in-lieu capped at 540 AF
2015 = 195.0 AF golf course in-lieu
2016 = 00.06 AF golf course in-lieu
2017 = 00.00 AF golf course in-lieu

Seaside Groundwater Basin Watermaster
Replenishment Fund
Water Year 2024 (October 1 - September 30) / Fiscal Year (January 1 - December 31, 2023)
Proposed 2024 Budget

Replenishment Fund		2017	2018	2019	2020	WY 2021	WY 2022	Budget WY 2023	Totals WY 2006 Through 2023	Budget WY 2024	Projected Totals Through WY 2024
Assessment Water Year		WY 16/17	WY 17/18	WY 18/19	WY 19/20	WY 20/21	WY 21/22	WY 22/23		WY 22/23	
Unit Cost:	a	$2,872 / $718	$2,872 / $718	$2,872 / $718	$2,872 / $718	$2,947 / $737	$3,260/ $815	$3,461/ $865		$3,461/ $865	
Cal-Am Water Balance Forward	b	**$ (676,704)**	**$ (491,747)**	**$ (48,797,949)**	**$ (47,979,852)**	**$ (46,855,121)**	**$ (46,855,121)**	**$ (46,855,121)**		**$ (46,855,121)**	
Cal-Am Water Production (AF)	c	*2,029.51*	*2,229.45*	*2,120.22*	*2,245.88*	*1,664.04*	*1,648.71*		*47,689.74*		
Cal-Am Water NSY Over-Production (AF)	d	*64.40*	*374.65*	*284.85*	*334.21*	-			*14,638.57*		
Exceeding Natural Safe Yield Considering Alternative Producers	e	$ 184,957	$ 1,075,995	$ 818,097	$ 959,859	$ -	$ -	$ -	$ 33,550,034	$ -	$ 33,550,034
Operating Yield Overproduction Replenishment	f			$ 164,872	$ -	$ -	$ -	$ -	$ 1,122,753	$ -	$ 1,122,753
Total California American	g	**$ 184,957**	**$ 1,075,995**	**$ 818,097**	**$ 1,124,731**	**$ -**	**$ -**	**$ -**	**$ 34,672,786**	**$ -**	**$ 34,672,786**
CAW Credit Against Assessment	h		$ (49,382,196)	$ -	$ -	$ -	$ -	$ -	$ (81,527,907)	$ -	$ (81,527,907)
CAW Unpaid Balance	i	***$ (491,747)***	***$ (48,797,949)***	***$ (47,979,852)***	***$ (46,855,121)***	***$ (46,855,121)***	***$ (46,855,121)***	***$ (46,855,121)***	***$ (46,855,121)***	***$ (46,855,121)***	***$ (46,855,121)***
City of Seaside Balance Forward	j	**$ (3,232,420)**	**$ (3,142,500)**	**$ (3,022,249)**	**$ (2,919,806)**	**$ (2,802,831)**	**$ (2,708,828)**	**$ (2,661,183)**		**$ (2,661,183)**	
City of Seaside Municipal Production (120.28 AF)	k	*188.31*	*184.63*	*178.40*	*181.65*	*174.69*	*155.12*		*3,888.95*		
City of Seaside NSY Over-Production (AF)	l	*30.47*	*32.46*	*27.82*	*32.06*	*25.52*			*1,235.62*		
Exceeding Natural Safe Yield Considering Alternative Producers	m	$ 87,512	$ 93,225	$ 79,893	$ 92,089	$ 75,197	$ 38,116	$ -	$ 2,898,359	$ -	$ 2,898,359
Operating Yield Overproduction Replenishment	n	$ 2,409	$ 27,026	$ 22,550	$ 24,886	$ 18,806	$ 9,529	$ -	$ 203,263	$ -	$ 203,263
Total Municipal	o	$ 89,920	$ 120,251	$ 102,443	$ 116,975	$ 94,003	$ 47,645	$ -	$ 3,101,622	$ -	$ 3,101,622
City of Seaside - Golf Courses (APA - 540 AFY)											
Exceeding Natural Safe Yield - Alternative Producer	p	$ -	$ -	$ -	$ -	$ -			$ 201,406		$ 201,406
Operating Yield Overproduction Replenishment	q	$ -	$ -	$ -	$ -	$ -			$ 50,353		$ 50,353
Total Golf Courses	r	$ -		$ -	$ -	$ -			$ 251,759		$ 251,759
Total City of Seaside*	s	**$ 89,920**	**$ 120,251**	**$ 102,443**	**$ 116,975**	**$ 94,003**	**$ 47,645**	**$ -**	**$ 3,353,381**	**$ -**	**$ 3,353,381**
City of Seaside Late Payment 5%	t								$ 88,887		$ 88,887
In-lieu Credit Against Assessment	u					-	-	-	$ (6,103,451)	-	$ (6,103,451)
City of Seaside Unpaid Balance	v	***$ (3,142,500)***	***$ (3,022,249)***	***$ (2,919,806)***	***$ (2,802,831)***	***$ (2,708,828)***	***$ (2,661,183)***	***$ (2,661,183)***	***$ (2,661,183)***	***$ (2,661,183)***	***$ (2,661,183)***
Mission Memorial Park (APA - 31 AFY)											
Mission Memorial Park Production (AF)	w	*13.74*	*14.43*	*16.07*	*20.00*	*46.77*	*31.00*		*332.89*		
Mission Memorial Park NSY Over-Production (AF)	x	-	-	-	-	*15.77*	*58.00*		*73.77*		
Exceeding Natural Safe Yield - Alternative Producer	y	$ -	$ -	$ -	$ -	$ 46,488	$ 9,608		$ 56,096		$ 56,096
Operating Yield Overproduction Replenishment	z	$ -	$ -	$ -	$ -	$ 11,626	$ 2,402		$ 14,028		$ 14,028
Board Approved (5/4/22) Credit Against Assessment						(33,114)		-	$ (33,114)	-	$ (33,114)
Mission Memorial Park Unpaid Balance	aa	$ -		$ -	$ -	***$ 25,000***	***$ 12,010***		$ 28,510		$ 28,510
Total Replenishment Fund Balance	bb	**$ (3,634,247)**	**$ (51,820,198)**	**$ (50,899,658)**	**$ (49,657,952)**	**$ (49,538,949)**	**$ (49,504,294)**	**$ (49,516,304)**	**$ (49,487,794)**	**$ (49,516,304)**	**$ (49,516,304)**
Replenishment Fund Balance Forward	cc	**$ (3,909,125)**	**$ (3,634,247)**	**$ (51,820,198)**	**$ (50,899,658)**	**$ (49,657,952)**	**$ (49,538,949)**	**$ (49,504,294)**		**$ (49,516,304)**	
Total Replenishment Assessments	dd	$ 274,877	$ 1,196,246	$ 920,540	$ 1,241,706	$ 119,003	$ 59,655	$ -	$ 38,152,064	$ -	**$ 38,152,064**
Total Paid and/or Credited	ee		$ (49,382,196)				$ (25,000)	$ (3,510)	$ (87,659,868)	$ -	**$ (87,659,868)**
Funds Expended (transfer to Admin Fund)								$ (8,500)	$ (8,500)		**$ (8,500)**
Grand Total Fund Balance	ff	**$ (3,634,247)**	**$ (51,820,198)**	**$ (50,899,658)**	**$ (49,657,952)**	**$ (49,538,949)**	**$ (49,504,294)**	**$ (49,516,304)**	**$ (49,516,304)**	**$ (49,516,304)**	**$ (49,516,304)**

ATTACHMENT 7

EXECUTIVE SUMMARY
FROM THE
WY 2023 SEAWATER INTRUSION ANALYSIS REPORT

EXECUTIVE SUMMARY

This report fulfills part of the annual reporting requirements contained in the Seaside Groundwater Basin Adjudication (California American Water v. City of Seaside, Monterey County Superior Court, Case Number M66343). The annual report addresses the potential for, and extent of, seawater intrusion in the Seaside Groundwater Basin (Basin).

Seawater intrusion may occur under basic hydrogeologic conditions as a wedge beneath fresh groundwater or in more complex hydrogeology with various intrusion interfaces among the different aquifers. Continued pumping in excess of recharge and freshwater inflows, coastal groundwater levels well below sea level, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Basin.

Seawater intrusion is typically identified through regular chemical analyses of groundwater which can identify geochemical changes in response to seawater intrusion. No single analysis definitively identifies seawater intrusion, however by examining various analyses it is possible to determine when fresh groundwater mixes with seawater. At low chloride concentrations, it is often difficult to identify incipient seawater intrusion. This is due to the natural variation in freshwater chemistry at chloride concentrations below 1,000 milligrams per liter (mg/L). Mixing trends between groundwater and seawater are more easily defined when chloride concentrations exceed 1,000 mg/L. Common geochemical indicators of seawater intrusion are cation and anion ratios, chloride trends, sodium/chloride ratios, and electric induction logging.

Data collected in Water Year (WY) 2023 from monitoring and production wells do not indicate that seawater intrusion is occurring within the Basin. However, induction logging has revealed small incremental increases in conductivity over time in Sentinel wells SBWM-1, 2, and 4 within the Paso Robles Formation that may be a precursor to seawater intrusion. With SBWM-1 and SBWM-2 located north of the Basin, the focus is on SBWM-4 which has the greater conductivity changes of the 3 wells and is in the Northern Coastal subarea where most of the Basin's groundwater extraction occurs. A zone of increasing conductivity in SBWM-4 is found between 140 to 200 feet below ground surface (bgs) within a coarser-grained unit of the Paso Robles Formation. Because the conductivity changes are relatively small, roughly equating to a total dissolved solids concentration of 100-200 mg/L, and the zone of increasing conductivity is confined to a specific zone in the Paso Robles Formation, no immediate action is warranted.

Since WY 2020, chloride concentrations in FO-10 Shallow, located outside and to the north of the Basin, have been elevated above historical concentrations. Five of the last 7 samples have a sodium/chloride molar ratio below 0.86, which may suggest a seawater chloride source. Of the 4 samples collected from the Shallow well in WY 2023, the first 2 were above 90 mg/L, while the May and August 2023 samples were just below 90 mg/L. Induction logging of FO-10 Deep in 2021 was inconclusive regarding the presence of seawater intrusion in the well. It

was complicated by the presence of a 1,300-foot steel pipe that has been left in the borehole since the well's construction and which is believed to be acting as a conduit across the borehole. Evidence of hydraulic connection between FO-10 Shallow and Deep wells is that the 2 wells have shown extremely similar groundwater elevations over the past 4 years. However, in WY 2023, FO-10 Deep had a 68.4 mg/L chloride decrease bringing concentrations down to those last seen 3 years ago. Regardless, the presence of this steel pipe clouds interpretation of groundwater quality results and may act as a conduit for groundwater in overlying sediments to enter underlying aquifers.

Groundwater levels below sea level, the cumulative effect of pumping in excess of recharge and freshwater inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion has the potential to occur in the Seaside Groundwater Basin.

Based on the findings of this report, the following ongoing detrimental groundwater conditions pose a direct threat of seawater intrusion:

- Both the Paso Robles and Santa Margarita aquifers in the Seaside Groundwater Basin are susceptible to seawater intrusion. The Paso Robles aquifer is in direct hydrogeologic connection with Monterey Bay, and seawater will eventually flow into it if inland groundwater levels continue to be below sea level. The Santa Margarita aquifer may not be in direct connection with Monterey Bay. If that is the case, then seawater intrusion will take longer as seawater in the Paso Robles aquifer would need to move downward through the clay rich deposits overlying the Santa Margarita aquifer before entering the aquifer itself and making its way into Santa Margarita production wells. It is not if, but when, seawater intrusion into these aquifers will occur if protective water elevations are not achieved.
- Over a number of years conductivity data from induction logging of Sentinel Wells 1, 2, and 4 have shown small but steady increases in conductivity within defined coarser-grained zones within the Paso Robles Formation. The estimated total dissolved solids (TDS) increase associated with the change in conductivity since 2019 is approximately 100 mg/L – 200 mg/L. The Secondary Drinking Water limit is 500 mg/L.
- Groundwater levels in some portions of both the Paso Robles and Santa Margarita aquifers in the Northern Coastal subarea continue to be below sea level year-round. WY 2023 fourth quarter (summer/fall) groundwater levels in the Santa Margarita aquifer are approximately 40 feet below sea level. However, pumping depressions in both the Paso Robles and Santa Margarita aquifers are slightly smaller than the previous year.
- Groundwater levels remain below protective elevations in all 3 Santa Margarita aquifer protective elevation monitoring wells (MSC deep, PCA-W Deep, and sentinel well SBWM-3), and 1 of the 3 Paso Robles protective elevation monitoring wells (MSC Shallow). All 3 Santa Margarita monitoring well groundwater elevations recovered slightly in WY 2023 since being the lowest in their historical record the previous year. Other than PCA-W Shallow, the shallow aquifer protective elevation monitoring wells have all consistently been below

protective elevations over the period of record shown on **Error! Reference source not found.** through **Error! Reference source not found.**. Elevations at PCA-W Shallow were above protective elevations from the late 1990s through 2020 but have since dropped below, though they recovered close to the protective elevation briefly in WY 2023.

The following evidence from this report demonstrates that seawater intrusion has not been detected in monitoring and production wells from which water quality samples are collected:

- Most groundwater samples for WY 2023 from depth-discreet monitoring wells generally plot in a single cluster on Piper diagrams, with no water chemistry changes toward seawater.
- In some production wells, groundwater quality plots on Piper diagrams are different than groundwater quality in monitoring wells. This may be a result of mixed water quality because these wells are perforated in both the Paso Robles and Santa Margarita aquifers. None of the production wells' groundwater qualities are indicative of seawater intrusion.
- None of the Stiff diagrams for monitoring and production wells show the characteristic chloride spike that typically indicates seawater intrusion in Stiff diagrams. The Stiff diagrams for monitoring well FO-10 Shallow show a slightly different shape than other shallow wells because of increased chloride. The stiff diagram for FO-10 Deep, which showed a spike of increased chloride in WY 2022, returned to a shape consistent with its historical shape.
- Chloride concentration trends are stable for most monitoring wells, except FO-10 Shallow and FO-10 Deep. FO-10 Shallow experienced a 13.8 mg/L decrease in chloride concentrations in WY 2023. FO-10 Deep experienced a 68.4 mg/L chloride decrease in WY 2023. The reason for this is not apparent.
- Maps of chloride concentrations for the shallow aquifer do not show chlorides increasing toward the coast. Santa Margarita aquifer chloride concentration maps show that the highest chloride concentrations are limited to coastal monitoring wells PCA-West Deep and MSC Deep, but these are not indicative of seawater intrusion since their concentrations are less than 155 mg/L and they do not have increasing trends.

Other important findings from the analysis contained in this report include the following:

- Due to its distance from the coast, seawater intrusion is not an issue of concern in the Laguna Seca subarea. However, groundwater levels in the eastern Laguna Seca subarea have historically declined at rates of 0.6 feet per year in the shallow aquifers, and up to 4 feet per year in the deep aquifers. These declines have occurred since 2001 despite triennial reductions in allowable pumping and CAWC ceasing pumping its Ryan Ranch and Bishop wells. The cause of the declines is due to the subarea's limited groundwater inflows and natural recharge compounded by the influence of wells pumping east of the Basin. Since WY 2021, groundwater elevations in the area have appeared to experience some stabilization and

recovery, potentially correlated with a cessation of pumping at California American Water Company's (CAWC) Ryan Ranch and Bishop wells.

- Native groundwater production in the Basin for WY 2023 was 2,173 acre-feet, which is 698 acre-feet less than WY 2022 and 827 acre-feet less than the Decision-ordered Operating Yield for WY 2023 of 3,000 acre-feet. In addition to WY 2023 being an above average year for rainfall, recovery of 3,458 acre-feet of recycled water from Pure Water Monterey project (PWM) and use of recycled water at the Bayonet/Blackhorse Golf Courses helped offset pumping of native groundwater. Native groundwater production was below the Decision-estimated Natural Safe Yield of 3,000 acre-feet for the fourth year in a row.

The following recommendations should be implemented to monitor and track seawater intrusion.

- Induction logging in the very bottom of SBWM-3 was hampered by the lost transducer and steel cable in the bottom of the well. Given increased conductivity occurring within the Paso Robles aquifer in SBWM-1, 2, and 4, the transducer and cable should be fished out prior to conducting the fall 2024 induction logging so a complete log of conductivity can be obtained.
- EKI and MCWD GSA (Marina Coast Water District Groundwater Sustainability Agency) should be informed that Sentinel wells SBWM-1 and SBWM-2 are starting to show an increase in conductivity in defined coarser-grained zones in the Paso Robles Aquifer. These wells are located outside of the Basin and are within the Marina Subarea of the Monterey Subbasin.
- It is recommended that options for verifying seawater intrusion occurring in the Paso Robles Formation at or near SBWM-4 be evaluated in WY 2024. This may involve finding a site for a new monitoring well, adapting an existing well, induction logging a nearby monitoring well, or some other solution. If the fall 2024 induction logging results confirm increasing conductivity, the Watermaster should see if it would be feasible to monitor groundwater quality in the affected zone.
- It is recommended that FO-10 Shallow and FO-10 Deep be destroyed and replaced to maintain continuous water quality monitoring and to prevent cross contamination between the Paso Robles and Santa Margarita aquifers, and the overlying Dune Sands. These wells are located outside of the Basin, so destruction would need to be performed by the well owner, MPWMD, and replacement wells would need to be installed by the MCWD GSA.
- It is important to remain vigilant and to closely monitor groundwater quality even though seawater intrusion has not yet been observed in monitoring or production wells in the Basin. As outlined in the most recent Basin Management Action Plan (M&A, 2018a), it is important that the Watermaster continue to promote projects to obtain replenishment water for the Basin that is not extracted out as water supply.
- Based on the WY 2020's SIAR recommendation, groundwater elevation data from the Carmel River water Aquifer Storage and Recovery (ASR) project and PWM monitoring wells are now

incorporated into the analysis of groundwater elevations if available. Groundwater level data from PWM monitoring wells are typically available for the second quarter of the water year, but fourth quarter data from are less likely to be posted online at GeoTracker at the time of reporting. Inclusion of groundwater level data from ASR monitoring wells is reliant on direct transmittal from applicable monitoring entity and is not always provided in time for reporting. As these and any future projects are implemented, groundwater levels, groundwater flow directions, and potentially groundwater quality will change in response. It is important data from monitoring wells associated with these projects continue to be evaluated in future SIARs.

- Seawater intrusion is a threat to the Basin, and data must be collected and analyzed regularly to identify incipient intrusion. Maps, graphs, and analyses like those found in this report should continue to be developed every year.

ATTACHMENT 8

SEASIDE GROUNDWATER BASIN
2024 MONITORING AND MANAGEMENT PROGRAM

Seaside Groundwater Basin
2024 Monitoring and Management Program

The tasks outlined below are those that are anticipated to be performed during 2024. Some Tasks listed below are specific to 2024, while other Tasks are recurring such as data collection, database entry, and Program Administration Tasks.

Within the context of this document the term "Consultant" refers either to a firm providing professional engineering or other types of technical services, or to the Monterey Peninsula Water Management District (MPWMD). The term "Contractor" refers to a firm providing construction or field services such as well drilling, induction logging, or meter calibration.

M.1 Program Administration

M. 1. a Project Budget and Controls ($0)	Consultants will provide monthly or bimonthly invoices to the Watermaster for work performed under their contracts with the Watermaster. Consultants will perform maintenance of their internal budgets and schedules, and management of their subconsultants. The Watermaster will perform management of its Consultants.
M. 1. b Assist with Board and TAC Agendas ($0)	Watermaster staff will prepare Board and TAC meeting agenda materials. No assistance from Consultants is expected to be necessary to accomplish this Task.
M. 1. c., M. 1. d, & M.1.e Preparation for and Attendance at Meetings, and Peer Review of Documents and Reports ($19,530)	The Consultants' work will require internal meetings and possibly meetings with outside governmental agencies and the public. For meetings with outside agencies, other Consultants, or any other parties which are necessary for the conduct of the work of their contracts, the Consultants will set up the meetings and prepare agendas and meeting minutes to facilitate the meetings. These may include planning and review meetings with Watermaster staff. The costs for these meetings will be included in their contracts, under the specific Tasks and/or subtasks to which the meetings relate. The only meeting costs that will be incurred under Tasks M.1.c, M.1.d, and M.1.e will be: • Those associated with attendance at TAC meetings (either in person or by videoconference connection), including providing periodic progress reports to the Watermaster for inclusion in the agenda packets for the TAC meetings, when requested by the Watermaster to do so. These progress reports will typically include project progress that has been made, problem identification and resolution, and planned upcoming work. • From time-to-time when Watermaster staff asks Consultants to make special presentations to the Watermaster Board and/or the TAC, and which are not included in the Consultant's contracts for other tasks. Appropriate Consultant representatives will attend TAC meetings (either in person or by videoconference connection) when requested to do so by Watermaster Staff, but will not be asked to prepare agendas or meeting minutes. As necessary, Consultants may provide oral updates to their progress reports (prepared under Task M.1.d) at the TAC meetings. When requested by the Watermaster staff, Consultants may be asked to

	assist the TAC and the Watermaster staff with peer reviews of documents and reports prepared by various other Watermaster Consultants and/or entities.
M. 1. f QA/QC ($0)	A Consultant (MPWMD) will provide general QA/QC support over the Seaside Basin Monitoring and Management Program. These costs are included in the other tasks.
M.1.g Prepare Documents for SGMA Reporting ($2,540)	Section 10720.8 of the Sustainable Groundwater Management Act (SGMA) requires adjudicated basins to submit annual reports. Most of the documentation that needs to be reported is already generated by the Watermaster in conjunction with preparing its own Annual Reports. However, some information such as changes in basin storage is not currently generated and will require consultant assistance to do so. This task will be used to obtain this consultant assistance, as needed.

I. 2 Comprehensive Basin Production, Water Level and Water Quality Monitoring Program

I. 2. a. Database Management	
I. 2. a. 1 Conduct Ongoing Data Entry and Database Maintenance/ Enhancement ($22,700)	The database will be maintained by a Consultant (MPWMD) performing this work for the Watermaster. MPWMD will enter new data into the consolidated database, including water production volumes, water quality and water level data, and such other data as may be appropriate. Other than an annual reporting of data to another Watermaster Consultant at the end of the Water Year, as mentioned in Task I.4.c below, no reporting of water level or water quality data during the Water Year is required. However, MPWMD will promptly notify the Watermaster of any missing data or data collection irregularities that were encountered. Under this Task, when requested MPWMD will also respond to requests from consultants and others for data from the database. At the end of the Water Year MPWMD will prepare an annual water production, water level, and water quality tabulation in Access format and will provide the tabulation to another Watermaster Consultant who will use that data in the preparation of the SIAR under Task No. I.4.c of the Monitoring and Management Program. No enhancements to the database are anticipated during 2024. A separate consultant will maintain the Watermaster's website.
I. 2. a. 2 Verify Accuracy of Production Well Meters ($0)	To ensure that water production data is accurate, the well meters of the major producers were verified for accuracy during 2009 and again during 2015. No additional work of this type is anticipated during 2024.
I. 2. b. Data Collection Program	
I. 2. b. 1 Site Representation and Selection ($0)	The monitoring well network review that was started in 2008 has been completed, and sites have been identified where future monitoring well(s) could be installed, if it is deemed necessary to do so in order to fill in data gaps. No further work of this type is anticipated in 2024.

I. 2 b. 2 Collect Water Levels ($21,128)	Each of the monitoring wells will be visited on a regular basis. Water levels will be determined by either taking manual water levels using an electric sounder, or by dataloggers. The wells where the use of dataloggers is feasible or appropriate have been equipped with dataloggers. All of the other wells will be manually measured. This Task includes the purchase of one datalogger and parts for the datalogger to keep in inventory as a spare if needed.
I. 2. b. 3 Collect Water Quality Samples. ($38,446)	As discussed in the 2018 Annual Report, water quality data will be collected quarterly from certain of the monitoring wells, but is no longer being collected from the four coastal Sentinel Wells. Because many years of data have shown essentially no change in aquifer water quality, beginning in WY2023 the frequency of induction logging of the Sentinel Wells was reduced to once per year. As discussed in the 2012 Annual Report, water quality analyses were expanded to include barium and iodide ions. Since these analyses have created more than 10 years of data, as discussed in the 2022 Annual Report the analyses were no longer being performed starting in WY 2023. They will only be resumed if the other water quality parameters are indicative of seawater intrusion. As discussed in the 2021 Annual Report, the frequency of sampling of SBWM-5 (the Camp Huffman well) has been reduced over the years. It is being sampled once every five years beginning in WY 2022. Water quality data may come from water quality samples that are taken from these wells and submitted to a State Certified analytic laboratory for general mineral and physical suite of analyses, or the data may come from induction logging of these wells and/or other data gathering techniques. The Consultant or Contractor selected to perform this work will make this judgment based on consideration of costs and other factors. Sampling equipment sits in the water column and may periodically need to be replaced or repaired. Accordingly, an allowance to perform maintenance on previously installed equipment has been included in this Task. Also, in the event a sampling pump fails or is found to be no longer adequate due to declining groundwater levels, an allowance of $945 to purchase a replacement sampling pump has been included in this Task.
I. 2. b. 4 Update Program Schedule and Standard Operating Procedures. ($0)	All recommendations from prior reviews of the data collection program have been implemented. No additional work of this type is anticipated in 2024.
I. 2. b. 5 Monitor Well Construction ($0)	A well to replace Monitoring Well FO-9 Shallow, which in 2021 was found to have a leaking casing, was installed in 2023. No other monitoring wells are expected to be constructed in 2024.

I. 2. b. 6 **Reports** **($3,680)**	This task was essentially eliminated starting in 2020 by having the data collected by MPWMD under tasks I.2.b.1, I.2.b.2, and I.2.b.3 reported in the SIAR under Task I.4.c. The work remaining under this task is for MPWMD to prepare and provide the data appendix to the Consultant that prepares the SIAR. No formalized reporting on a quarterly basis is required. However, MPWMD will promptly notify the Watermaster and the Consultant that prepares the SIAR of any missing data or data collection irregularities in the water quality and water level data collected under Tasks I.2.b.2 and I.2.b.3.
I.2.b.7 **CASGEM Data Submittal** **($4,200)**	On the Watermaster's behalf MPWMD will compile and submit data on the Watermaster's "Voluntary Wells" into the State's CASGEM groundwater management database. The term "Voluntary Well" refers to a well that is not currently having its data reported into the CASGEM system, but for which the Watermaster obtains data. This will be done in the format and on the schedule required by the Department of Water Resources under the Sustainable Groundwater Management Act.
I. 3 Basin Management	
I. 3. a. **Enhanced Seaside Basin Groundwater Model** **(Costs listed in subtasks below)**	The Watermaster and its consultants use a Groundwater Model for basin management purposes.
I.3.a.1 **Update the Existing Model** **($0)**	The Model, described in the report titled "Groundwater Flow and Transport Model" dated October 1, 2007, was updated in 2009 in order to develop protective water levels, and to evaluate replenishment scenarios and develop answers to Basin management questions. The Model was again updated in 2014. In 2018 the Model was recalibrated and updated. No further work of this type is anticipated in 2024.
I. 3. a. 2 **Develop Protective Water Levels** **($0)**	A series of cross-sectional models was created in 2009 in order to develop protective water levels for selected production wells, as well as for the Basin as a whole. This work is discussed in Hydrometrics' November 2009 report titled *"Seaside Groundwater Basin Modeling and Protective Groundwater Elevations,"* which is the October 21, 2009 posting on the Watermaster's website. As discussed in Attachment 10 of the 2013 Annual Report, further work was started in 2013 to refine these protective water levels, but it was found that the previously developed protective water levels were reasonable. Protective water levels will be updated, if appropriate, as part of the work of Task I.3.c.

I. 3. a. 3 **Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions ($40,000)**	Modeling performed to date indicates that the solution to the problem of water levels in the Seaside Basin being below Protective Water Levels will be to inject replenishment water. Two projects are planned that have the potential to provide additional water for Basin replenishment. The first is the Pure Water Monterey Expansion (PWMX) Project for which construction bids were solicited in 2023 and is projected to become operational in 2025. The PWMX Project will increase the capacity of the existing 3,500 AFY PWM Project by 2,250 AFY. The second is the Monterey Peninsula Water Supply Project's (MPWSP) desalination plant which is still in the design and permitting stage with no currently projected implementation date. Growth is built into each of these projects' plant capacity, and the full capacity of these plants will likely not all be needed for some years into the future. During the time period that these projects would have excess capacity, they could potentially provide water for Basin replenishment. Montgomery & Associates agrees that injection is the quickest way to bring groundwater levels up in the Seaside Basin. Modeling performed in 2022 and 2023 found that between 1,000 and 4,600 AFY of replenishment water will need to be needed, depending on future water demands and rainfall. Modeling performed in 2014, 2015, and 2016 led to the conclusion that groundwater levels in parts of the Laguna Seca Subarea will continue to fall, even if all pumping within that subarea is discontinued, because of the influence of pumping from areas near to, but outside of, the Basin boundary. The Groundwater Sustainability Plan for Corral de Tierra area of the Monterey Subbasin includes projects to help to alleviate this problem, but they are unlikely to completely alleviate it. This Task includes a $40,000 allowance to perform further modeling or analyses pertaining to Basin management issues if so directed by the Watermaster Board.
I. 3. b. **Complete Preparation of Basin Management Action Plan ($0)**	The Watermaster's Consultant completed preparation of the Basin Management Action Plan (BMAP) in February 2009. The BMAP serves as the Watermaster's long-term seawater intrusion prevention plan. The Sections that are included in the BMAP are: Executive Summary Section 1 – Background and Purpose Section 2 – State of the Seaside Groundwater Basin Section 3 – Supplemental Water Supplies Section 4 –Groundwater Management Actions Section 5 – Recommended Management Strategies Section 6 – References

I. 3. c. **Refine and/or Update the Basin Management Action Plan** **($0)**	In 2019 the BMAP was updated based on new data and knowledge that has been gained since it was prepared in 2009. No further work of this type is anticipated in 2024. However, although no funds are budgeted for this Task in 2024, since the Groundwater Sustainability Plan (GSP) for the adjacent Monterey Subbasin of the Salinas Valley Groundwater Basin was completed in early 2022, at some point it may be appropriate to further update the BMAP to reflect the impacts of implementing that GSP.
I. 3. d. **Evaluate Coastal Wells for Cross-Aquifer Contamination Potential** **($0)**	If seawater intrusion were to reach any of the coastal wells in any aquifer, and if a well was constructed without proper seals to prevent cross-aquifer communication, or if deterioration of the well led to casing leakage, it would be possible for the intrusion to flow from one aquifer to another. An evaluation of this was performed in 2012 and is described in Attachment 10 of the 2012 Annual Report. In 2021 the Watermaster TAC examined the feasibility of performing conductivity profiling of certain of the near-coastal wells that were evaluated in the 2012 Memorandum, as a method of determining if any of those wells was allowing downward migration of intruded water from the shallow dunes aquifer to enter the Paso Robles aquifer. However, it was concluded that conditions in those wells would make it infeasible to perform such work. No further work of this type is anticipated in 2024.
I.3. e. **Seaside Basin Geochemical Model** **($10,000)**	When new sources of water are introduced into an aquifer, with each source having its own unique water quality, there can be chemical reactions that may have the potential to release minerals which have previously been attached to soil particles, such as arsenic or mercury, into solution and thus into the water itself. This has been experienced in some other locations where changes occurred in the quality of the water being injected into an aquifer. MPWMD's consultants used geochemical modeling to predict the effects of injecting Carmel River water into the Seaside Groundwater Basin under the ASR program. In order to predict whether there will be groundwater quality changes that will result from the introduction of desalinated water and additional ASR water (under the Monterey Peninsula Water Supply Project) and advance-treated water (under the Pure Water Monterey Project) geochemical evaluations, and potentially modeling, will be performed in the areas of the Basin where injection of these new water sources will occur. In 2019 a geochemical evaluation of introducing advance-treated water from the Pure Water Monterey Project was performed. That evaluation concluded that there would be no adverse geochemical impacts as a result of introducing that water into the Basin. A similar evaluation of the impact

I.3. e. **Seaside Basin Geochemical Model** **(Continued)**	of introducing ASR water also concluded that there would be no adverse geochemical impacts. An evaluation of introducing desalinated water will be performed, if the Monterey Peninsula Water Supply Project's desalination plant proceeds into the construction phase. If the geochemical evaluation of injecting desalinated water indicates the potential for problems to occur, then Montgomery and Associates may use the Watermaster's updated groundwater model, and information about injection locations and quantities, injection scheduling, etc. provided by MPWMD and/or California American Water for this project, to develop model scenarios to see if the problem(s) can be averted by changing delivery schedules and delivery quantities. This Task includes an allowance of $10,000 to have Montgomery and Associates perform such modeling, if necessary. If the modeling predicts that there may be adverse impacts from introducing desalinated water, measures to mitigate those impacts will be developed under a separate task that will be created for that purpose when and if necessary.

I. 4 Seawater Intrusion Response Plan (formerly referred to as the Seawater Intrusion Contingency Plan)

I. 4. a. **Oversight of Seawater Intrusion Detection and Tracking** **($0)**	Consultants will provide general oversight over the Seawater Intrusion detection program under the other Tasks in this Work Plan.
I. 4. c. **Annual Report- Seawater Intrusion Analysis** **($28,020)**	At the end of each water year, a Consultant will reanalyze all water quality data. Water level and water quality data will be provided to the Consultant by another Consultant (MPWMD) in MS Access format. The Consultant will put this data into a report format and will include it as an attachment to the Seawater Intrusion Analysis Report. If possible, semi-annual chloride concentration maps will be produced for each aquifer in the basin. Time series graphs, trilinear graphs, and stiff diagram comparisons will be updated with new data. The induction logs will be analyzed to identify changes in seawater wedge locations. All analyses will be incorporated into an annual report that follows the format of the initial historical data report. Potential seawater intrusion will be highlighted in the report, and if necessary, recommendations will be included. The annual report will be submitted for review by the TAC and the Board. Modifications to the report will be incorporated based on input from these bodies, as well as Watermaster staff.
I. 4. e. **Refine and/or Update the Seawater Intrusion Response Plan** **($0)**	At the beginning of 2009, and again in 2021, it was thought that it might be beneficial or necessary to perform work to refine the SIRP and/or to update it based on new data or knowledge that was gained subsequent to the preparation of the SIRP. However, this did not prove to be necessary, and no further work of this type is anticipated in 2024.

I. 4. f. **If Seawater Intrusion is Determined to be Occurring, Implement Contingency Response Plan** **($0)**	The SIRP will be implemented if seawater intrusion, as defined in the SIRP, is determined by the Watermaster to be occurring.

ATTACHMENT 9

SUMMARY OF FLOW DIRECTION/FLOW VELOCITY ANALYSES

SUMMARY OF FLOW DIRECTION/FLOW VELOCITY ANALYSES

Prepared by Robert Jaques, P.E., Technical Program Manager, Seaside Basin Watermaster
Updated September 8, 2023

EXECUTIVE SUMMARY

Groundwater modeling of the Seaside Basin performed in early 2022 was done to estimate the direction, velocity of movement, and potential inland distances of movement of seawater intrusion, if it were to occur along the coastline of Monterey Bay.

The analysis was based on the assumption that in 2024 several water supply/water replenishment projects would come on-line. These included the Pure Water Monterey Expansion Project, Cal Am's overpumping replenishment payback program, and the use of recycled water to irrigate the Seaside Golf Courses.

A "worst case" scenario was evaluated to see what would occur if the 2024 water supply/replenishment projects were delayed or not implemented, and existing groundwater conditions otherwise stayed the same. In this worst case scenario seawater would move inland from the coast at a rate of about 250 feet per year, and could reach major production wells in about a decade.

The analysis used a cyclical repetition of historical hydrology to simulate future rainfall patterns. It did not assess the impacts that would result if future years have longer and more frequent drier weather and drought periods. An analysis of recent hydrologic data indicates that this is beginning to occur. If this trend continues, the inland rate of movement of seawater intrusion would increase.

BACKGROUND

In February 2022 Montgomery & Associates performed groundwater modeling to estimate the velocities, time scales, and travel distances that seawater intrusion, if it were to occur, would move inland from locations along the coastline in the Northern Coastal Subarea of the Seaside Basin. The analysis considered both current conditions and projected potential future conditions. A Technical Memorandum dated February 25, 2022 was prepared providing a detailed discussion of the analysis. This Summary provides a condensed version of that Technical Memorandum as well as information provided to the Watermaster's Board at its September 7 and October 5, 2022 meetings.

In the Seaside Basin aquifers the distance offshore of the interface between fresh groundwater and seawater (the seawater intrusion front) is currently unknown. However, this analysis can provide a range of potential seawater intrusion travel rates from the coastline under different potential Basin conditions, and as such can provide insights into the time scales and distances at which further inland intrusion could occur, if early signs of seawater intrusion were to be detected in coastal monitoring wells.

ANALYSIS

Scenarios

A "Baseline Scenario" was analyzed to evaluate the movement of seawater assuming the operation only of currently planned projects with no additional replenishment water added to the Basin. For Water Years (WY) 2018 through WY2021 the analysis was based on actual measured pumping, Aquifer Storage and Recovery (ASR) and Pure Water Monterey (PWM) injection, and hydrology (rainfall). For WY 2022 through WY 2050 it was based on projected future pumping, currently planned projects, and a repeat of the historical hydrology from the period between WY 1988 and WY 2016. The analysis also took into account projected sea level rise.

The Baseline Scenario was based on the following assumptions:

- Water supply and demand forecasts in MPWMD's September 2019 *"Supply and Demand for Water on the Monterey Peninsula"*
- Cal-Am's 25 year 700 AFY plan to replenish the Basin for its historical overpumping begins in WY 2024
- The Pure Water Monterey (PWM) Expansion project begins operation in WY 2024
- The City of Seaside's replacement of groundwater with recycled water for golf course irrigation begins in WY 2024
- The construction of the Security National Guaranty and Campus Town developments in the City of Seaside occur as currently planned
- No proposed Groundwater Sustainability Plan projects are implemented in the neighboring subbasins

Groundwater Levels at Coastal Monitoring Wells

Six monitoring wells have been used for establishing protective elevations against seawater intrusion in the Basin. The protective elevation monitoring wells are shown in Figure 1.There are two wells (Shallow and Deep) at both PCA-West and MSC. Annually averaged groundwater elevations in these protective elevation wells under the Baseline Scenario are shown in Figure 2, which clearly shows the beneficial impact of these water supply/replenishment projects.

At all of the protective elevation monitoring wells except for CDM MW-4, groundwater levels rise steadily starting in WY 2024 (when the PWM Expansion, Cal-AM replenishment repayment, and Seaside Golf Course recycled water projects are assumed to begin) through WY 2033. After WY 2033 groundwater levels begin to either level off or drop to varying degrees in response to wetter and drier periods in the hydrologic cycle. CDM MW-4 is located in the Southern Coastal Subbasin, which is geologically separated from the Northern Coastal Subbasin where the other five protective elevation wells are located. For this reason it is not affected by these projects.

Groundwater levels drop markedly in the last several years of the modeling period (WY 2046 through WY2050) due to the impacts of a simulated multi-year drought during which both ASR and PWM injection are greatly reduced and Cal-Am begins recovering banked ASR water credits to meet their system demands. The last 2 years of this period also coincides with the assumed end of Cal-Am's replenishment repayment period, after which Cal-Am can return to pumping their full native groundwater rights.

Figure 1. Locations of Protective Elevation Wells

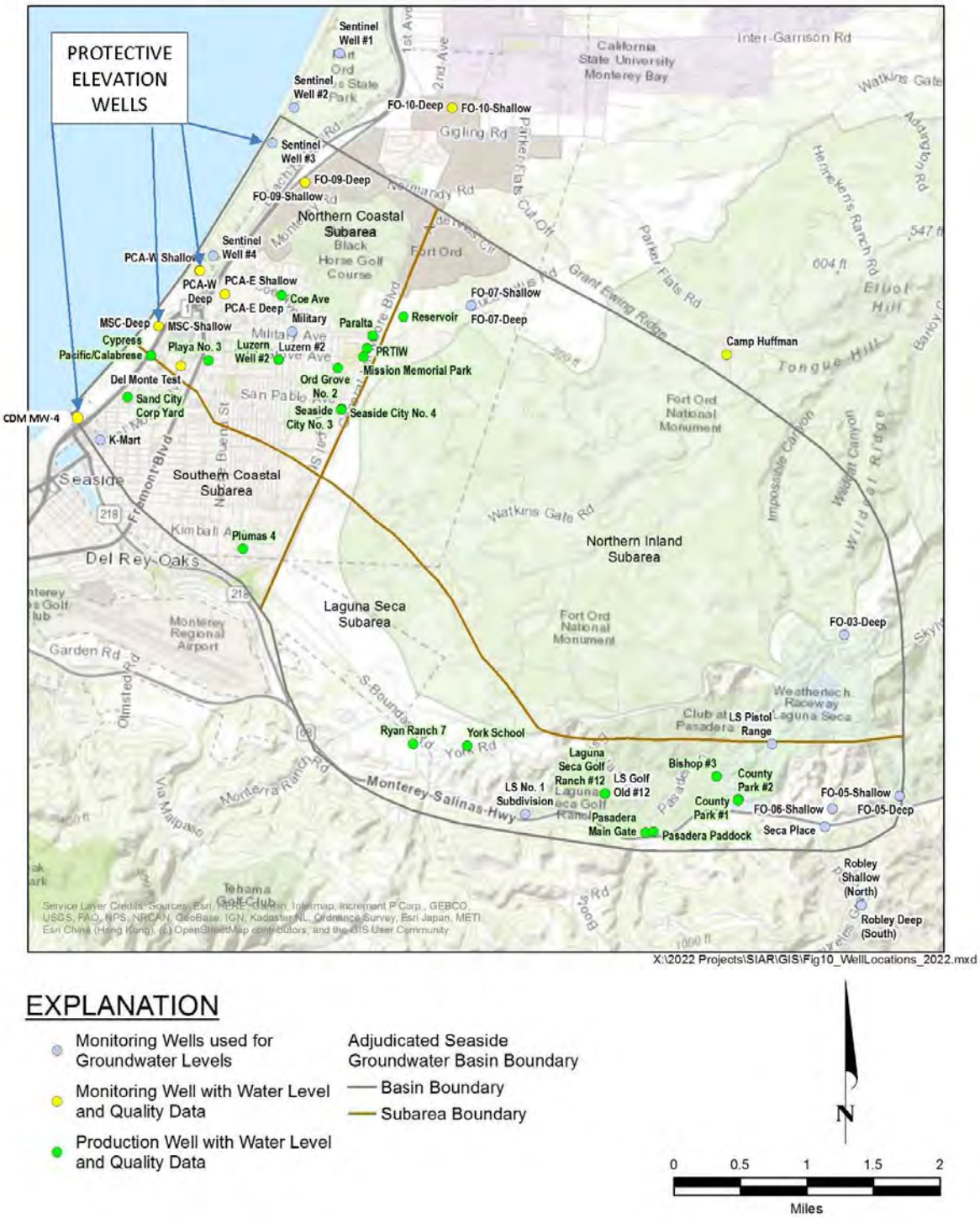


Figure 2. Groundwater Elevations in the Protective Elevation Wells

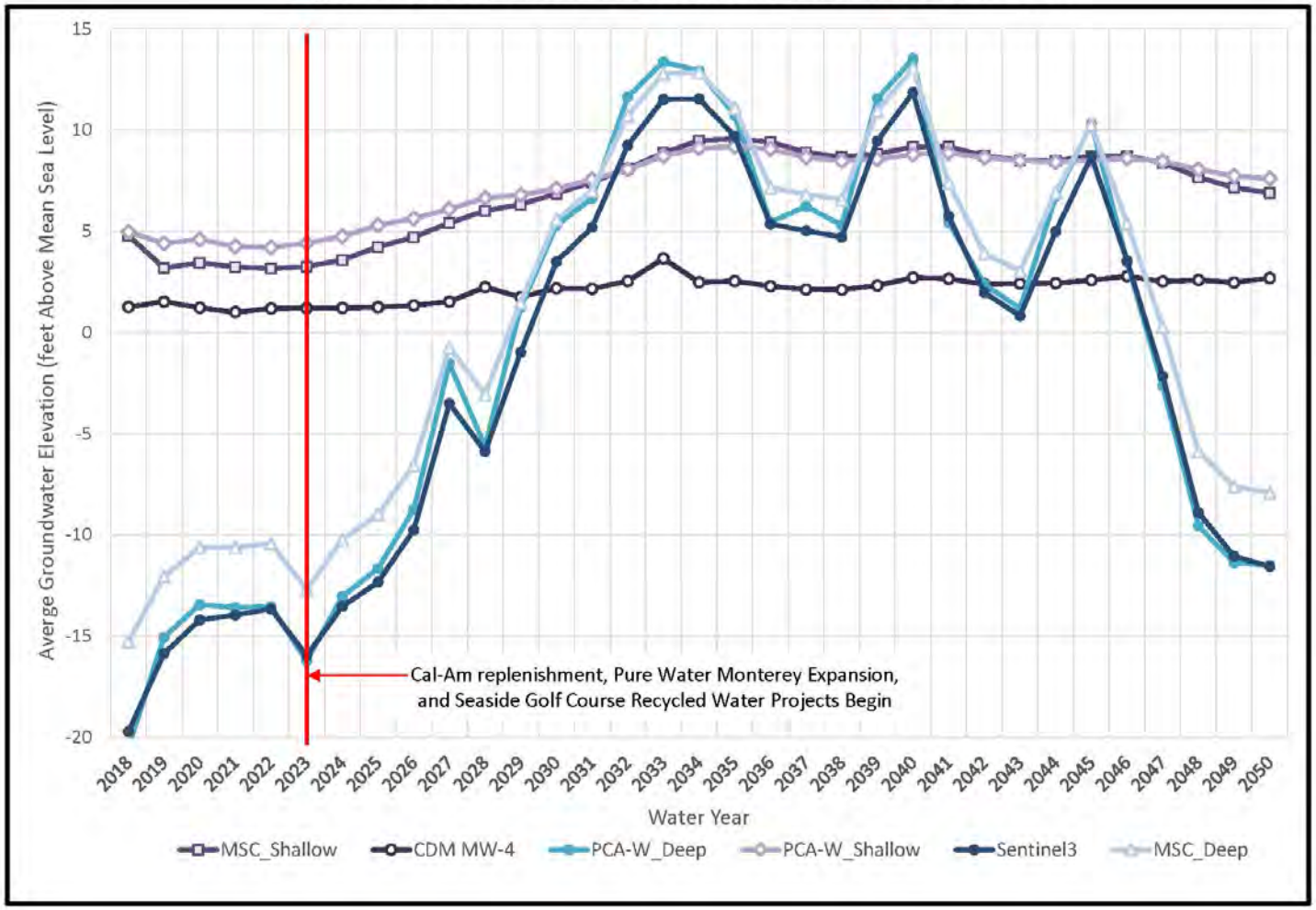


Figure 2 makes it clear that groundwater levels at the protective elevation wells will rise when the new water supply/replenishment projects begin operation, but that those groundwater levels will fall once the drought period returns, and in particular once Cal Am can resume its normal pumping level that is allowed by the Adjudication Decision (assumed to occur in 2049).

Depending on groundwater levels in the Basin along the coast, groundwater in the aquifer may flow inland from the Bay or may flow offshore toward the Bay.

Change in Flows Between the Basin and Monterey Bay

Figure 3 shows the estimated annual flows of groundwater to and from the Seaside Basin and Monterey Bay. Positive values are flows from the Bay into the Basin. Negative values are flows from the Basin into the Bay.

Prior to the projected start-up of the three water supply/replenishment projects in WY 2024, in the Northern Coastal Subarea there is a net inflow of water from the Bay. This may or may not be seawater intrusion, because there may be freshwater stored offshore in the aquifer. However, this represents a condition that would increase the potential for seawater intrusion. In WY 2024, when the three water supply/replenishment projects begin, groundwater levels begin to rise and flows change direction and become outflows of groundwater from the Basin into the Bay. The net outflow reaches a peak in WY 2033 following a series of above normal and extremely wet years. Thereafter, the flow to the Bay begins to decrease due to a multi-year drought in the hydrologic cycle.

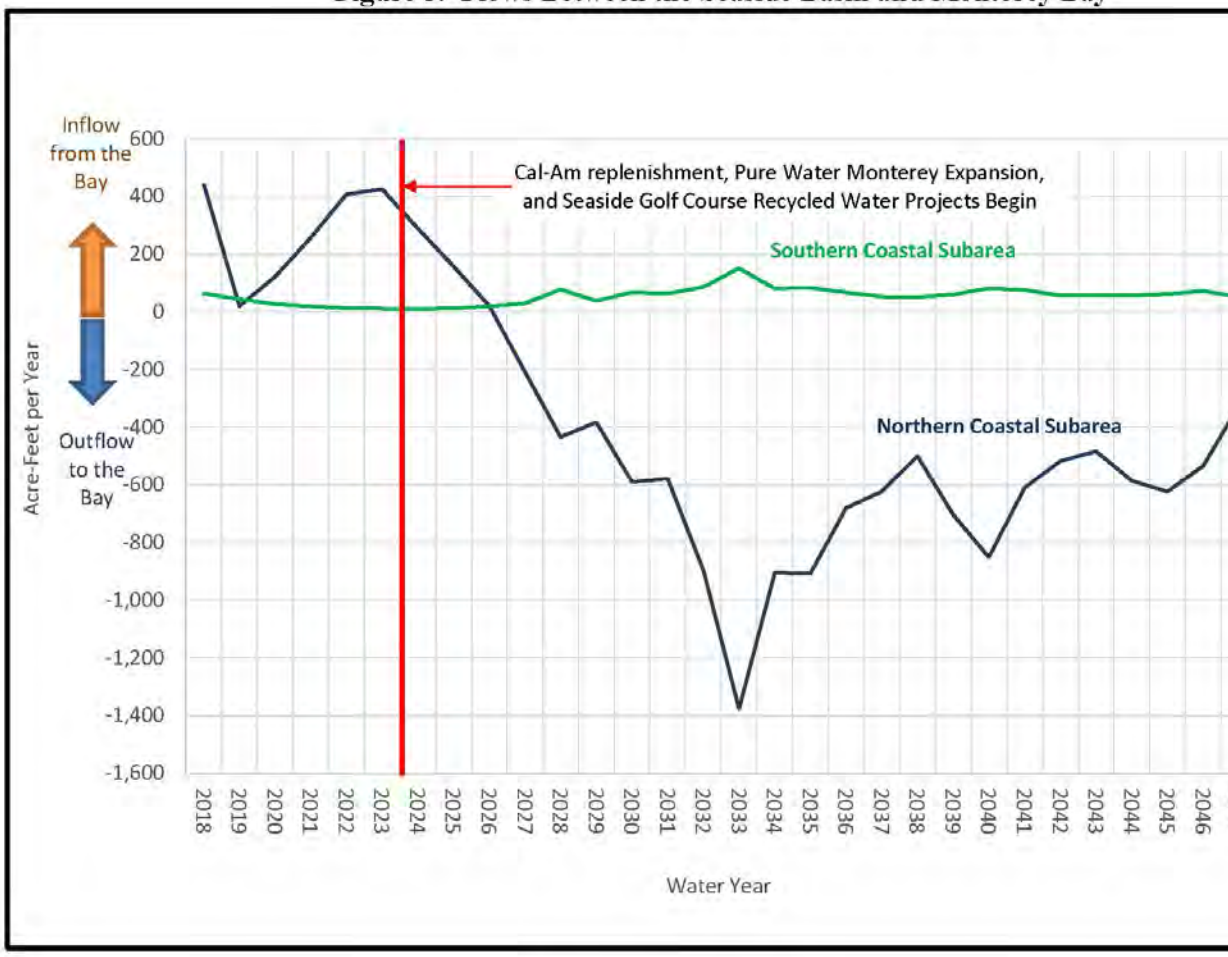
As expected, due to the geologic separation of the Northern and Southern Coastal Subareas, Figure 3 shows that groundwater levels in the Southern Coastal Subarea are unaffected by the water supply/replenishment projects in the Northern Coastal Subarea. Water levels in the only protective elevation well in the Southern Coastal Subarea (CDM MW-4) are already at or above the protective elevation.

Methodology and Porosity

The movement of groundwater is very sensitive to the porosity (the openness or tightness) of the aquifer through which the groundwater is flowing. Because the porosity of the aquifer was not a calibrated parameter in the groundwater Model, a reasonable range of aquifer porosities was used to develop upper and lower estimates of seawater intrusion travel times from the coastline to varying distances inland. A porosity of 8% was used to represent the higher range of potential travel velocities, and a porosity of 16% was used to represent a lower range of potential velocities.

The methodology used for this analysis is referred to as "particle tracking." Particles were simulated as being released into the groundwater every 500 feet along the entire length of the coastline of the Seaside Basin. The model tracked the individual flow paths of the particles throughout the 33-year period of the Baseline Scenario, ending in September 2050.

Figure 3. Flows Between the Seaside Basin and Monterey Bay



Particle tracking is not a substitute for full seawater intrusion modeling, which is a more complex methodology. However, it presents a range of potential groundwater travel rates under different Basin conditions, and thereby provides insight into the time scales and distances at which inland intrusion could occur.

Results of the Analysis

A zoomed-in view of the area of fastest inland movement of seawater intrusion (the Lower Paso Robles aquifer) is shown on the inset map on the left side of Figure 4. The graph on the right side of the figure shows the average annual inland velocity (in feet per year) where the fastest inland movement of water from Monterey Bay was found to occur.

The numbered bullet points on the map and the graph in Figure 4 represent time periods under different operational and hydrologic conditions in the Basin as follows:

1. This first period represents the Basin under current operations before the water supply/replenishment projects begin in WY 2024 and is reflective of multi-year drought conditions preceding that date. Inland groundwater levels are at their lowest, creating conditions of maximum seawater intrusion potential and the highest inland flow velocity (as high as 250 feet inland per year). On the inset map this period is shown as the red color-coded portion of the particle paths.

2. This is the period when the water supply/replenishment projects come online in WY 2024 and after the multi-year drought period ends. Groundwater is still moving inland from the coast, but at increasingly slower velocities as groundwater levels in the Basin rise. This is shown as the orange and yellow segments on the particle path map.

3. This period represents a transition period when flows reverse from inflow from the Bay to outflow toward the Bay. Groundwater levels are at their highest as a result of five back-to-back extremely wet and above-normal wet years.

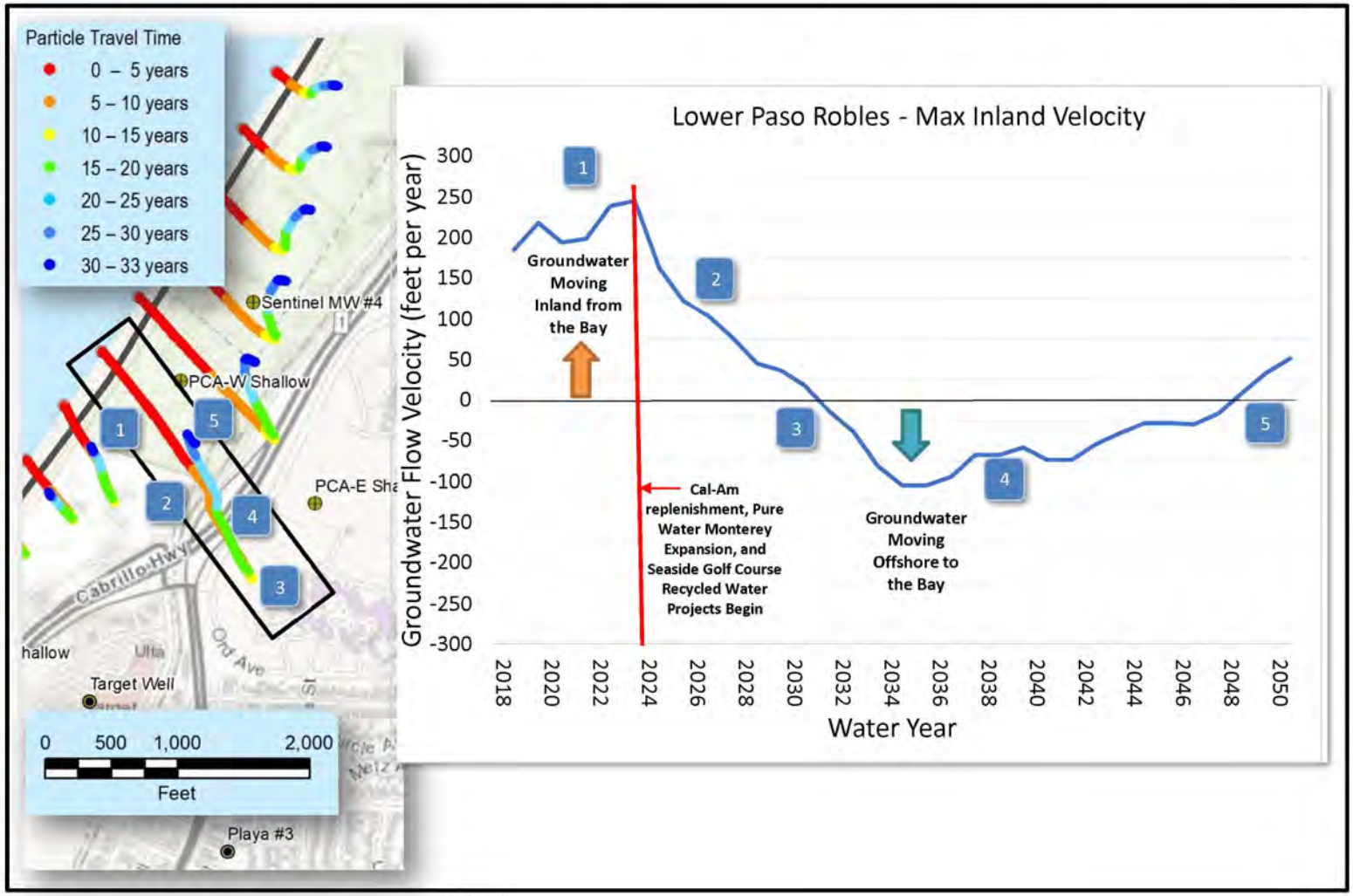
4. This period represents conditions when flows are still toward the Bay, but the velocity of flow begins to decrease after a series of dry and critically dry years.

5. This final period represents the effects of a new multi-year drought. Groundwater begins to move inland from the Bay, though at a much slower rate than during the earlier inland flow period, ending at rate of 50 feet of inland travel per year in WY 2050.

Potential Inland Travel Times of Seawater Interface Along a Preferential Flow Path

The seawater-to-freshwater interface of seawater intrusion occurs not as a uniform front moving inland across the entire coastline at one rate, but as a diffused transition zone between freshwater and full-strength seawater. This seawater interface transition zone can be characterized by the distance between the leading edge of this zone (where the salinity level is much lower than full strength seawater, but above the native groundwater salinity) and a midpoint between the leading

Figure 4. Area of Fastest Inland Movement of Seawater Intrusion (the Lower Paso Robles aquifer)



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edge and full-strength seawater. A transition zone width of 2,000 feet was assumed in this analysis. The midpoint would have a very high salinity concentration much greater than that desired for the Basin. The analysis found that the pathways with the greatest inland flow velocities from the Bay were in the Lower Paso Robles aquifer.

A "worst case" scenario was evaluated to see what would occur if the 2024 water supply/replenishment projects were delayed or not implemented, and existing groundwater conditions otherwise stayed the same. In this scenario, and with an assumed porosity of 8%, the seawater interface would move inland from the coast at a rate of 250 feet per year. The travel velocity will accelerate closer to an active production well because of the cone of depression that forms around a pumping well. Figure 5 shows a graph of distance traveled inland from the coastline versus travel time under this worst case scenario. The names of several production and monitoring wells in the area are shown, placed vertically at their respective distances inland from the coastline. In this scenario it could take as little as four years between when the leading edge of seawater interface is detected at a coastal monitoring well (such as PCA-W) and when the leading edge would reach some of the small production wells located near to the coast. It could take on the order of eleven years for the leading edge to reach a large production well further inland, such as Cal Am's Playa 3 well which is located 2,800 feet from the coastline.

Because a number of assumptions had to be made to perform this analysis, these estimates of the rate of inland movement of seawater should be taken only as order-of-magnitude values to provide a sense of the possible scale of travel times and distances. No data is currently available on the offshore location of the freshwater-seawater interface, nor of the width of the transition zone. Similarly, there is limited data available to estimate the aquifer porosities. Recently obtained data from a tracer study performed for PWM indicates that porosity in that part of the Basin may be as low as 5%. This would result in a much higher groundwater movement velocity than the 8% value that was assumed for this analysis. Thus, while the assumed 8% porosity value was considered representative of an aquifer with fast groundwater movement velocities, it may not necessarily represent the fastest travel rates that could occur.

Climate Change

As discussed above, significant future changes in climate can have a significant impact on the movement of groundwater within the Basin. The graphs in Figure 6 depict the differences in hydrologic conditions between the past 100 years and the past 50 years, based on a statistical analysis of data from the Carmel River Basin. In the 100 year graph, there were periods of normal rainfall 25% of the time, and critically dry periods only occurred 13% of the time. In comparison, during the last 50 years the periods of normal rainfall dropped to only 16% of the time, and critically dry periods increased to 22% of the time. Compared to the 100 year data the 50 year data showed a slight increase (from 38% to 40%) for the above normal periods, but the below normal periods increased from 37% to 44%. Overall the data indicates a clear trend toward having a higher percentage of below normal and critically dry years.

Figure 7 shows that in the most recent 35 year period, normal rainfall occurred 17% of the time (nearly the same as during the 50 year period), but above normal periods decreased to 34% of the time and below normal periods increased to 48% of the time.

Figure 5. Potential Maximum Inland Travel Times and Distances in the Lower Paso Robles Aquifer

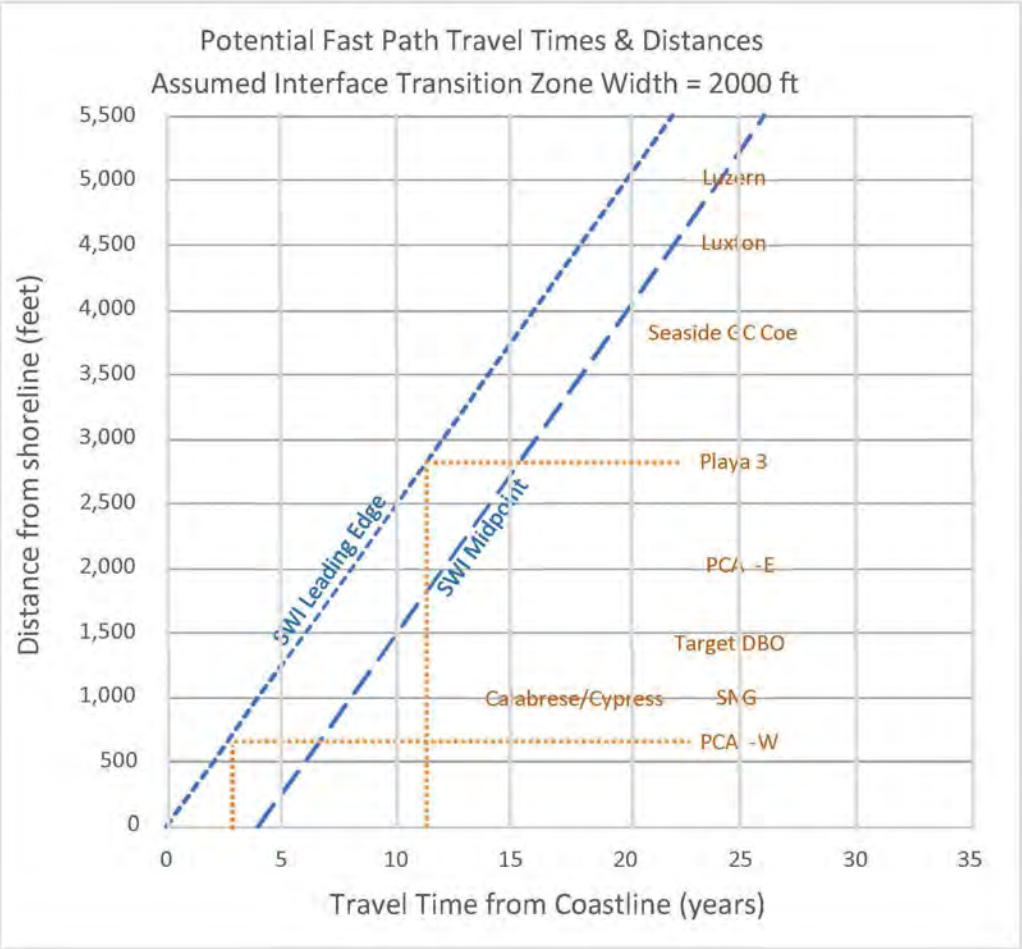


Figure 6. Climate Change During the Past 100 Years and the Past 50 Years

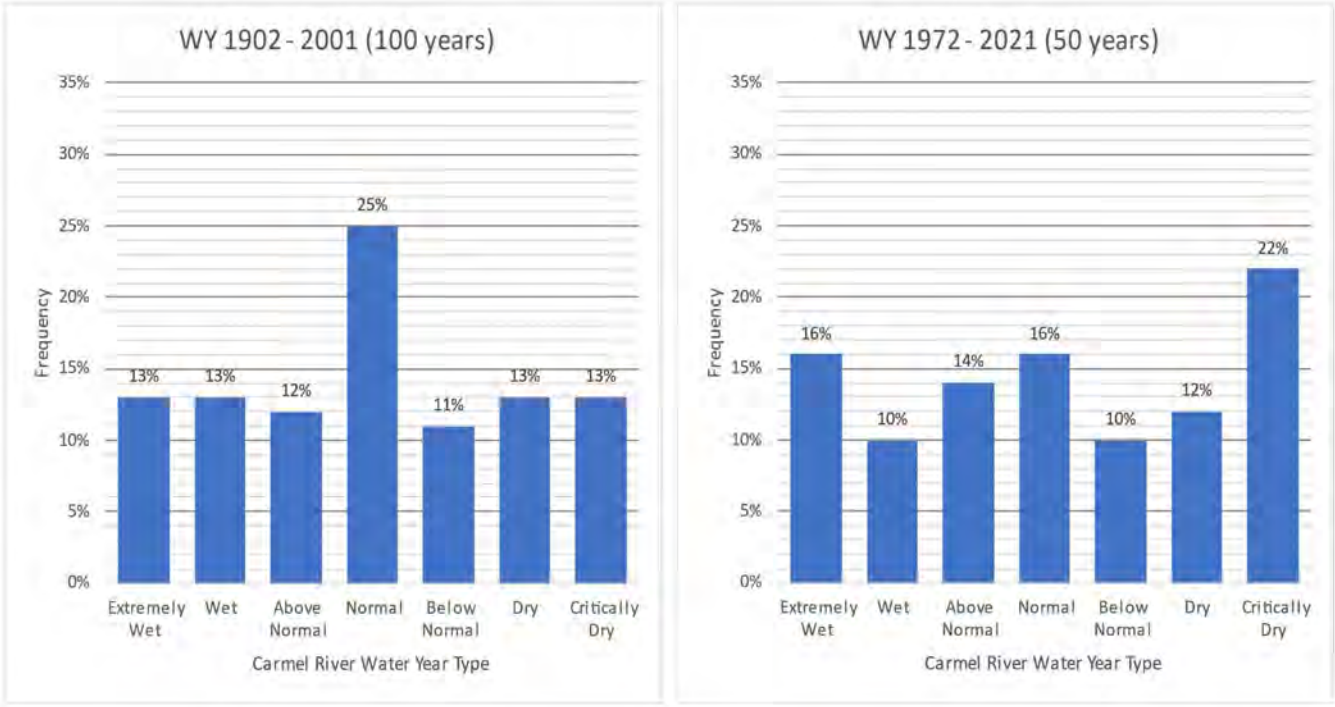
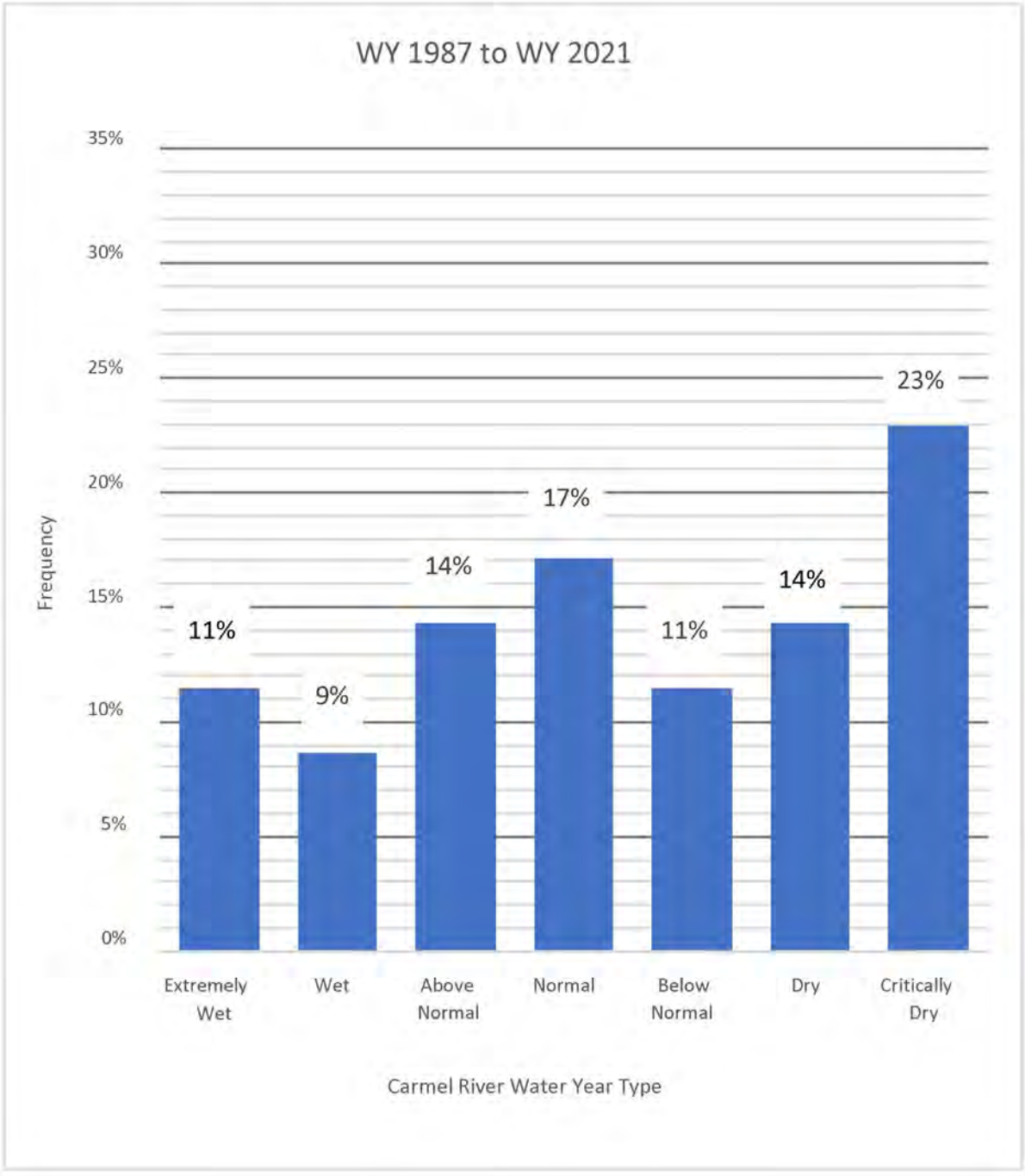


Figure 7. Climate Change During the Last 35 Years



PRINCIPAL CONCLUSIONS

1. The most significant inland flow of seawater intrusion occurs in the Lower Paso Robles aquifer in the Northern Coastal Subarea. The fastest travel times are concentrated in line with the main pumping depression caused by production wells. These velocities decrease as groundwater levels rise, and can reverse to an offshore flow direction if groundwater levels become high enough.

2. Maximum inland flow velocities of up to 250 feet per year can occur under current and near-term Basin conditions. If water supply/replenishment projects are not implemented, once seawater reaches the shoreline it could reach the closest inland Cal-Am production wells in about a decade.

3. Using a future hydrologic cycle with longer and/or more frequent periods of drought would show a higher rate of inland movement of seawater intrusion.

4. Given the unknowns about future hydrologic conditions, it is unlikely that anything useful would be learned from performing further flow direction/flow velocity analyses using the supply and demand quantities in the Cal Am UWMP. Droughts have a greater impact on seawater intrusion than do supply and demand quantities.

5. If there is a desire to evaluate the impacts of a more severe or drier climate scenario, it would first be necessary to develop such a scenario. How that would be done, and how accurate it would be, would be problematic.