RUSSELL MCGLOTHLIN (State Bar No. 208826)
BROWNSTEIN HYATT FARBER SCHRECK, LLP
1021 Anacapa Street, 2nd Floor
Santa Barbara, CA 93101
Telephone: 805.963.7000
Facsimile: 805.965.4333
rmcglothlin@bhfs.com
Attorney for Seaside Groundwater Basin Watermaster

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF MONTEREY

CALIFORNIA AMERICAN WATER,

Plaintiff,

v.

CITY OF SEASIDE, et. al. ,

Defendants.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT,

Intervenor,

MONTEREY COUNTY WATER RESOURCES AGENCY,

Intervenor,

AND RELATED CROSS ACTIONS.

Case No. M66343

Assigned for All Purposes to the Honorable Robert O'Farrell

NOTICE OF FILING OF SEASIDE BASIN WATERMASTER ANNUAL REPORT (WATER YEAR 2018)

TO ALL PARTIES AND THEIR RESPECTIVE COUNSEL OF RECORD:

PLEASE TAKE NOTICE that the Seaside Groundwater Basin Watermaster hereby files the Seaside Basin Watermaster Annual Report – 2018 ("Annual Report"). A copy of the Annual Report will be electronically served on each of the Parties by Watermaster along with a copy of this Notice. Hard copies of the Annual Report, are available upon request from the Watermaster Administrative Officer, and may be accessed electronically on the Watermaster's website,

http://seasidebasinwatermaster.org.

Dated: January 15, 2019

BROWNSTEIN HYATT FARBER SCHRECK, LLP

By: _____
Russell M. McGlothlin
Attorney for Seaside Groundwater Basin Watermaster

BROWNSTEIN HYATT FARBER SCHRECK, LLP
1021 Anacapa Street, 2nd Floor
Santa Barbara, CA 93101

SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2018

January 2, 2019

Table of Contents

SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2018

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 2018 Annual Report is being filed on or before January 15, 2019, 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
- 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.

Case Management Conferences were held before the Honorable Leslie C. Nichols (the second judge appointed to this action) in 2016, 2017, and 2018. Conference statements and transcripts of the conferences are available for viewing on the Watermaster web site at http://www.seasidebasinwatermaster.org/ under Postings and Records. The postings are organized by chronological date. Materials for the June 20, 2016 status conference are under the date June 17, 2016. Watermaster notes that the link titled "Report," accompanying the June 17, 2016 entries, includes a detailed discussion of background information and contemporary issues relevant to the management of the Basin pursuant to the decision. Other documents pertinent to conferences before Judge Nichols include the transcript of the 2016 conference (website date of entry June 16, 2016), the 2017 conference statement (website date of entry March 1, 2017), the transcript of the 2017 conference (website date of entry March 17, 2017), and the 2018 conference statement (website date of entry March 23, 2018).

A. Groundwater Extractions

The schedule summarizing the Water Year 2018 (WY 2018) 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 2018." For the purposes of this Annual Report Water Year 2018 is defined as beginning October 1, 2017 and ending on September 30, 2018.

B. Groundwater Storage

Monterey Peninsula Water Management District (MPWMD), in cooperation with

California American Water (CAW), operates the Seaside Basin Aquifer Storage and Recovery (ASR) program. Under the ASR program, CAW 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 CAW distribution system for injection and storage in the Seaside Basin at the MPWMD's Santa Margarita ASR site and CAW's Seaside Middle School ASR site. During WY 2018, 530 AF was diverted and stored in the Seaside Basin under the ASR program. Rainfall in the area was about 64% of normal, Carmel River flow was 67% of normal. WY 2018 was classified as "Below Normal" by MPWMD.

Based upon production reported for WY 2018, the following Standard Producers are entitled to Free and Not-Free Carryover Credits to 2018 in accordance with the Decision, Section III. H. 5:

Producer	Free Carryover Credit (Acre-feet)	Not-Free Carryover Credit (Acre-feet)
Granite Rock	180.68	41.32
DBO Development	341.51	62.45
Calabrese (Cypress)	14.36	1.73
CAW	182.91	270.96
City of Seaside Muni	00.00	00.00

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 2018 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 2018 under the 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.

D. Leases or Sales of Production Allocation and Administrative Actions

In WY2018 there were no transfers or assignments of water allocations. However, as documented in Attachment 13, in 2019 Security National Guarantee (SNG) intends to convert a portion of its Alternative Production allocation to Standard Allocation in order to sell that portion of its allocation to Montage Health. If that transaction is accomplished in 2019 it will be reported upon in the 2019 Annual Report.

During WY 2018 the Watermaster Board did not make any revisions to its *Rules and Regulations*. However, the mailing address for the Watermaster changed to: Seaside Basin Watermaster, P.O. Box 51502, Pacific Grove, CA 93950.

During WY 2018 the Watermaster Board was comprised of the following Members and Alternates:

MEMBER	ALTERNATE	REPRESENTING
Director Paul Bruno	N/A	Coastal Subarea Landowner
Eric Sabolsice/Christopher Cook	Nina Miller	California American Water
Director Bob Costa	N/A	Laguna Seca Subarea Landowner
Director Jeanne Byrne	Andrew Clarke	MPWMD
Mayor Mary Ann Carbone	Todd Bodem	City of Sand City
Supervisor Mary Adams	Jane Parker	Monterey County (MCWRA)
Mayor Jerry Edelen	Kristin Clark	City of Del Rey Oaks
Councilmember Dan Albert	Mayor Clyde Roberson	City of Monterey
Mayor Ralph Rubio	Dennis Alexander	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 CAW/MPWMD ASR Program operated in WY 2018 and accordingly 530 acre-feet of water was injected into the Basin as Stored Water Credits and 1,210 acre-feet was extracted.

In accordance with Section III. L. 3. j. xx, CAW and MPWMD applied to the Watermaster for Storage in the Seaside Basin of water from the Pure Water Monterey Project (PWM). The application was considered by the Watermaster at its publicly noticed October 3, 2018 meeting. No member of the public present at the meeting voiced concerns about approval of the application or PWM. After consideration and discussion, the Watermaster Board approved the application.

The Watermaster Board considered approval of a Storage and Recovery Agreement between the Watermaster, CAW, and MPWMD governing the future injection and recovery of water from PWM at its publicly noticed January 2, 2019 meeting. No member of the public present at the meeting voiced concerns about approval of the

agreement or PWM. After consideration and discussion, the Watermaster Board approved the agreement. A copy of the agreement is included in Attachment 12 of this Annual Report.

It is noted that in August of 2018, the Watermaster filed a *Notice of Lodging of Correspondence Received re Pure Water Monterey Project* with the court. The correspondence lodged contained concerns expressed by a member of the public regarding the injection of PWM water into the Basin. As noted above, none of those concerns were expressed to the Watermaster during its October 3, 2018 meeting when it considered approving the storage and recovery application submitted by CAW and MPWMD.

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.

Because the December 5, 2018 Board meeting was canceled, the Watermaster made its declaration regarding the availability of Artificial Replenishment for WY 2019 at its Board meeting of January 2, 2019. A copy of this declaration is contained in Attachment 2. In WY 2018 the Watermaster implemented another 10% water production reduction required under Section III.B.2 of the Decision. No additional water production reductions were implemented in WY 2018.

Total pumping for WY 2018 did not exceed the Operating Yield (OY) of the Basin, and exceeded the Natural Safe Yield (NSY) of the Basin by 363.21 acre-feet.

California American Water reported annual pumping quantities that exceeded its Standard Production NSY allocation by 374.64 acre-feet, and reported annual pumping quantities that did not exceed its Operating Yield allocation. The Watermaster will assess California American Water's Replenishment Assessment for this over production, as further described in Section H, below.

The City of Seaside reported annual pumping quantities that exceeded its Standard Production NSY allocation by 32.46 acre-feet, and reported annual pumping quantities that exceeded its Operating Yield allocation by 33.89 acre-feet. The City of Seaside did not exceed its Alternative Production NSY. The Watermaster will assess the City of Seaside a Replenishment Assessment for these over productions, as further described in Section H, below.

G. Watermaster Administrative Costs

The total estimated Administrative costs through the end of Fiscal Year 2018 amounted

to $80,000 including an $18,000 dedicated reserve. Costs include the Administrative Officer salary and legal counsel fees. The "Fiscal Year 2018 Administrative Fund Report" and "Fiscal Year 2018 Operations Fund Report" are provided as Attachment 3.

H. Replenishment Assessments

At its meeting of October 3, 2018 the Watermaster Board determined that the Natural Safe Yield Replenishment Assessment unit cost of $2,872 per acre-foot, and the Operating Yield Replenishment Assessment unit cost of $718 per acre-foot, which are the unit costs that were used in WY 2018, should remain the same for WY 2019.

Alternative and Standard Producers report their production amounts from the Basin to the Watermaster on a quarterly basis. Based upon the reported production for WY 2018, California American Water's Replenishment Assessment for Overproduction in excess of its share of the Natural Safe Yield is $1,075,994.80, and no overproduction in excess of its share of the Operating Yield.

The City of Seaside's Replenishment Assessment for its Municipal System for Overproduction in excess of its share of the Natural Safe Yield is $93,225.12, and for overproduction in excess of its share of the Operating Yield is $27,025.66. The City of Seaside did not exceed its Alternative Production Allocation for its Golf Course System production. A summary of the calculations for Replenishment Assessments for WY 2018 is contained in Attachment 5.

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. Copies of the budgets for Fiscal Year 2018 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

Change in Watermaster's Primary Hydrogeological Consultant

Much of the Watermaster's work is performed through contracts with hydrogeological consultants. The primary hydrogeological consultant the Watermaster has used for many years, HydroMetrics LLC, was purchased in July 2018 by the hydrogeological consulting firm of Errol L. Montgomery & Associates (Montgomery & Associates) of Tucson, Arizona.

Mr. Derrik Williams, President of the former HydroMetrics WRI, explained that he had known and worked with many of the principles of Montgomery & Associates for over 30 years, and that they are a groundwater focused company. He reported that he found Montgomery & Associates to have a highly qualified staff who have the same technical expertise and commitment to both clients and employees as HydroMetrics WRI.

The Watermaster was assured that it would continue to receive the same or better level and quality of services from Montgomery & Associates that it had been receiving from HydroMetrics WRI and that Derrik Williams (President of HydroMetrics) and Georgina King (a Senior Hydrogeologist at HydroMetrics), both of whom have performed and/or directed all of the work previously performed for the Watermaster, would continue to be the staff with whom the Watermaster would normally interact.

Based on those assurances, the Watermaster's Technical Advisory Committee and Board of Directors were comfortable with the change in ownership. Effective July 1, 2018, the Watermaster entered into a contract with Montgomery & Associates for the hydrogeological services formerly provided by HydroMetrics WRI.

Water Quality Analytical Results

Groundwater quality data continued to be collected and analyzed on a quarterly basis during WY 2018 from the enhanced network of monitoring wells. The low-flow sampling method implemented in 2009 continued to be used in 2018 and is expected to continue to be used in the future to improve the efficiency of sample collection. As discussed in the 2013 Annual Report, the Watermaster reduced the frequency of water quality sampling at SBWM-MW5 to once every 3 years.

No modifications to the quarterly data collection frequency from the enhanced network of monitoring wells were made during WY 2018.

Up until WY 2010 quarterly geophysical (induction) logging was performed at the four coastal Watermaster Sentinel wells that were installed in 2007. The induction logging results showed very little variations and trends were steady since that monitoring began, indicating that the coastal water quality conditions were not changing at this sample frequency. Therefore, beginning in WY 2010 the Court approved reducing the induction logging frequency to semi-annually at these wells.

The expanded water quality analyses begun in WY 2012 were continued in WY 2018. However, as discussed and recommended in the 2017 Annual Report (refer to Attachments 8 and 13 of the 2017 Annual Report), in WY 2018 water quality sampling was discontinued in the Watermaster's Sentinel Wells located along the coast (wells SBWM-1, SBWM-2, SBWM-3, and SBWM-4), because those water quality samples were found to not be representative of the water quality in the aquifers in which these wells were completed. Water quality sampling was continued for the 3 most coastal MPWMD monitoring wells (MSC, PCA, and FO-09).

Copies of the sampling results are contained in the report in Attachment 7.

Monitoring and Management Program Work Plan for the Upcoming Year

The 2019 Monitoring and Management Program (M&MP) Work Plan contained in Attachment 9 includes the types of basin management activities conducted in prior years as well as revisions approved by the Board at its October 3, 2018 meeting.

Other than small changes due to changes in hourly rates for some of the consultants, the following are the principle differences between the 2018 M&MP and the proposed 2019 M&MP, and their respective budgets:

Task I.2.b.3 (Collect Quarterly Water Quality Samples): In 2018 the total amount budgeted for this Task was $51,128. That cost included collecting and analyzing water quality samples from the Watermaster's Sentinel Wells. In early 2018 it was determined that water quality samples that have historically been collected from the Sentinel Wells were not representative of the quality of the water in the aquifers. Therefore, the decision was made to discontinue collecting and analyzing samples from these wells. This led to the reduction in cost for this Task to $42,083 in 2019.

Task I.3.a.1 (Update the Existing Model): $54,370 was included in the 2018 budget for this Task to have HydroMetrics update the existing groundwater model of the Seaside Basin. That work was completed in 2018 and therefore does not need to be included in the M&MP budget for 2019. This led to the reduction in cost for this Task to $0 in 2019.

Task I.3.c (Refine and/or Update the Basin Management Action Plan): $45,260 was included in the 2018 budget for this Task to have HydroMetrics update the existing Basin Management Action Plan. That work has been completed and therefore does not need to be included in the M&MP budget for 2019. This led to the reduction in cost for this Task to $0 in 2019.

Task I.3.e (Seaside Basin Geochemical Model): This was a new Task for 2018, and the amount for this Task in the 2018 budget was $50,000. The Task is being performed by MPWMD's Consultant, Pueblo Water Resources, Inc., and is expected to be completed in 2019. However, Montgomery & Associates (formerly HydroMetrics) may need to work on this task if the initial modeling results find that there could be adverse water quality impacts in the aquifers due to the introduction of water from the Monterey Peninsula Water Supply Project (desalinated water), the Pure Water Monterey Project (advance treated wastewater) and/or Aquifer Storage and Recovery Water (Carmel Basin water). If the modeling results in this finding, Montgomery & Associates may need to use the Seaside Basin groundwater model to help Pueblo Water Resources develop means/measures to mitigate such impacts. A $10,000 amount is included in the 2019 budget to cover the costs of Montgomery & Associates' work, if such work needs to be done.

The full cost of the geochemical modeling is being borne by the three proponents of the projects that intend to inject new sources of water into the Basin. These are California American Water, MPWMD, and Monterey One Water (formerly MRWPCA).

It is anticipated that if Montgomery & Associates needs to perform work on this Task in 2019, one or more of the project proponents will either pay for or reimburse the Watermaster for all of the costs to perform this work Therefore, there should be no net cost to the Watermaster for the work of this Task.

No new monitoring wells are planned for installation in 2019. Consequently, no monies are budgeted in the M&MP Capital Budget for 2019.

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 2018.

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.

Basin Management Action Plan (BMAP)

HydroMetrics LLC was hired by the Watermaster to prepare the original BMAP which contains these Sections:

- Executive Summary
- The Background and Purpose of the Plan
- The State of the Basin
- Supplemental Water Supplies (long-term water supply solutions)
- Groundwater Management Actions (to be taken as interim measures while long-term supplies are being developed)
- Recommended Management Strategies
- References

The Final BMAP was approved by the Watermaster Board at its February 2009 meeting, and the Executive Summary from the BMAP was contained in Attachment 9 of the 2009 Annual Report. That complete document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

The Watermaster was having the BMAP updated in 2018, and it was initially expected that the work would be completed in time for inclusion in this Annual Report. However, the work was still ongoing at the time this Annual Report was completed, so the results of it will be included in next year's Annual Report.

Seawater Intrusion Response Plan

HydroMetrics LLC 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/. No modifications to the SIRP were made in 2018.

Seawater Intrusion Analysis Report

The 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 fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin.

The Watermaster retained Montgomery & Associates to prepare the WY 2018 Seawater Intrusion Analysis Report (SIAR) required by the M&MP. The WY 2018 SIAR provided an analysis of data collected during that Water Year.

The 2018 SIAR reported that the evaluation of the data from the sampling and monitoring program continued to indicate that seawater intrusion was not occurring.

The SIAR is lengthy, but the full *Executive Summary Section* from it is provided in Attachment 8. A complete copy of the document is posted for viewing and downloading from the Watermaster's website at: http://www.seasidebasinwatermaster.org/. 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 9.

The Watermaster continues to analyze the data that is being gathered at the various monitoring sites in order to keep a close watch on the conditions within the Basin, as discussed under the "Enhanced Monitoring Well Network" heading above. Because none of the data indicates the presence of seawater intrusion, the Watermaster does not at this time plan to move forward with the Work Plan to investigate sources of fluctuating chlorides in the Sentinel Wells, as described in Attachment 12 of the 2017 Annual Report. However, should future data warrant it, the Watermaster may reconsider undertaking the initial phase of that Work Plan.

Groundwater Modeling

As projected in the 2017 Annual Report the Seaside Basin Groundwater Model, which had been updated in 2009, was again updated in 2018. The 2018 updated model was prepared by HydroMetrics LLC, and a Technical Memorandum describing the work that was performed is contained in Attachment 10. The cost of updating the model was shared through an agreement between the Watermaster, MPWMD, and Monterey One Water, with the Watermaster paying 50% of the cost, and those two other entities paying the other 50% of the cost.

Principle Findings from Updating the Seaside Basin Groundwater Model.

1. Simulated groundwater levels are sensitive to the specified heads along the northeastern boundary with the Salinas Valley. The behavior of the boundary was found to impact the calibration of areas of the model at some distance from the boundary. It

was found that in the absence of the most recent Salinas Valley Integrated Hydraulic Model (SVIHM), currently being developed by the USGS, assigning boundary head elevations that match the general observed average groundwater levels along the boundary is more important than capturing smaller scale seasonal fluctuations along the boundary. It is recommended that when the SVIHM has been completed, an assessment of how well it simulates historical groundwater conditions in the Seaside Basin be conducted. If it is concluded that the new data improves simulation of groundwater level in the Seaside Basin, the boundary condition can be revised using parts of the SVIHM that improve model calibration of the Seaside Basin model.

2. The model recalibration improved calibration statistics over the original 2009 model calibration. As a result, simulated groundwater levels throughout the model, as a whole, better match observed groundwater levels.

3. The groundwater model should be updated in a maximum of five years and its calibration reevaluated at that time. However, if groundwater related projects are implemented in the basin before that time, the update and calibration reevaluation may need to be performed sooner.

Coordination of Watermaster's Seaside Groundwater Model with Salinas River Basin Model

As reported in the 2017 Annual Report the Monterey County Water Resources Agency (MCWRA) is having its hydrologic model of the Salinas Valley Groundwater Basin updated. That model is referred to as the SVIHM. In 2017 the MCWRA determined that the Technical Advisory Committee (TAC) it had convened to assist in the preparation of the updated model had fulfilled its purpose, and there have not been any subsequent meetings of that TAC since then. However, if the MCWRA reconvenes its TAC, the Watermaster will participate in future meetings of that TAC in order to ensure that the SVIHM coordinates well with the Watermaster's Seaside Basin model.

Geochemical Modeling

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 consultant (Pueblo Water Resources) has been using geochemical modeling to predict the effects of injecting Carmel River water into the Seaside Groundwater Basin under the ASR program.

As mentioned above in the heading entitled *Monitoring and Management Program Work Plan for the Upcoming Year*, 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 wastewater (under the Pure Water Monterey Project) a geochemical model is being

developed by Pueblo Water Resources for use in the areas of the Basin where injection of these new water sources will occur. The geochemical modeling work is described in Attachment 11. The plan is to perform the geochemical modeling work in the following manner:

Step 1: Pueblo Water Resources will use the water quality and water delivery schedule data provided by each of the project proponents to develop and run the geochemical model. If the geochemical modeling indicated there will be no water chemistry problems then there would be no need to perform Step 2.

Step 2 (if needed): If the geochemical modeling in Step 1 indicates the potential for problems to occur, then Montgomery & Associates will use the Watermaster's Seaside Basin groundwater model, and information about injection locations and quantities, injection scheduling, etc. provided by MPWMD for each of these projects, to develop model scenarios to see if the problem(s) can be averted by changing delivery schedules and/or delivery quantities. The effect of these changes would be evaluated by Pueblo Water Resources using the geochemical model. Implementing these mitigation measures would be done under a separate task that would be created for that purpose, when and if necessary.

Work on the geochemical modeling started in May 2018. Through an agreement between the Watermaster, MPWMD, California American Water, and Monterey One Water, the work is funded entirely by the three parties that are the sponsors of the aquifer recharge projects described above, at no cost to the Watermaster.

As of the date of preparation of this 2018 Annual Report, progress on this work has been as follows:

- Initial review of the available data from these aquifer recharge projects indicated that less-than-adequate information existed for purposes of performing the geochemical modeling work. Initial work has therefore focused on filling data gaps and obtaining complete mineralogical data on the Santa Margarita formation. Data compilation to date includes the following:
- Sample collection and analysis of the effluent from the PWM pilot facility is being analyzed for both base water quality constituents and bench-scale testing for leaching potential with Santa Margarita formation mineral samples obtained in September 2018 from the construction of one of the PWM injection wells.
- The bench scale protocol described above is also being repeated using treated, potable Carmel River water from Cal-Am's Begonia Iron Removal Plant (which provides water for the ASR project and is located in Carmel Valley) to further assess findings from 2009 testing of the water supplies from that plant. This data will also be used in the overall geochemical assessment.
- Santa Margarita formation cuttings collected from the PWM injection well are being analyzed by X-Ray Diffraction (XRD) which is used to determine

minerology by shining X-Rays at a solid and measuring the diffraction pattern, as well as by conventional mineralogy assessment. The samples are being further analyzed via complete acid digestion to quantify the presence and composition of trace metals within the Santa Margarita formation matrix. Results of this assessment may lead to further analysis via Dynamic Secondary Ion Mass Spectrometry (SIMS) to further identify mineral compositions prior to geochemical interaction modeling. SIMS uses an ion stream to pulse at a surface and then measures the cast-off ions in a mass spectrometer to determine the elemental state of minerals.

It is anticipated that results from these tests will be available by the end of January 2019, at which time it will be possible to proceed with the modeling work itself. As noted in Section 6 of the Storage and Recovery Agreement contained in Attachment 12, the initial modeling work will only evaluate the impacts of introducing advance-treated wastewater from the PWM Project into the Basin. The impacts of introducing water from the other recharge projects will be separately evaluated in conjunction with developing the Storage and Recovery Agreements for those projects, in a manner similar to that described in the paragraphs below.

The planned schedule once the modeling work itself begins is as follows:

- Develop the geochemical model – estimated task duration 3 weeks
- Model mixing rations – estimated task duration 6 weeks

After these tasks have been completed on the PWM Project water (expected before the end of the first quarter of 2019) Pueblo Water Resources will provide a Technical Memorandum summarizing the results of the modeling and recommendations for additional model scenarios, if any, based on the initial output runs.

If the initial modeling work identifies mixture simulations that show undesirable geochemical reactions (i.e. mineral precipitation or gas evolution) Pueblo Water Resources will rerun those model simulations under various modifications of mix ratios and/or aquifer conditions to identify methods of mitigating the observed adverse reactions and to identify potential operational scenarios which would prevent such adverse geochemical reactions from occurring. If this work is needed, it is estimated that this phase (described above as Step 2) will have a duration of 4 to 6 weeks. Following that Pueblo Water Resources would develop an overall summary report and recommendations for process and/or operational changes to reduce or avoid adverse geochemical reactions.

A procedure similar to that described above will be used in conjunction with evaluating the impacts of introducing water from the other recharge projects into the Basin.

Sustainable Groundwater Management Act

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 and the State Department of Water Resources' (DWR)

development of regulations pertaining to requesting boundary revisions, with the intent to collaborate with these entities as appropriate.

At the State Level:

In late 2016 DWR released the final 2016 modifications to California's groundwater basin boundaries. The boundary modification request submitted by the Monterey Peninsula Water Management District (MPWMD) to remove some areas near Monterey from the Salinas Valley Groundwater Basin, and to recognize the boundaries of the Adjudicated Seaside Basin, was approved. These modifications are reflected in the basin boundary map that is now posted on the DWR website.

DWR has included new basin boundaries in its interim update of Bulletin 118, which came out in 2017. It includes the boundary of the Adjudicated Seaside Basin, as requested in the boundary modification request submitted in 2016 by the Monterey Peninsula Water Management District (MPWMD).

During 2018 DWR did not issue any new regulations, or revisions to prior regulations, that impacted the Seaside Groundwater Basin or the Watermaster. In March of 2018 the Watermaster submitted to DWR the reporting information required of it, as an adjudicated basin, under SGMA.

At the Monterey County level:

The Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) (a joint powers authority) and the Marina Coast Water District (MCWD) submitted Notifications with DWR to serve as the GSA for portions of the Monterey and the 180/400 foot aquifer Subbasins that overlapped. Subsequently, the City of Marina submitted an untimely notice to also serve as the GSA over the overlapping areas. The SVBGSA, MCWD, and the City of Marina have embarked on a process to address and resolve the overlaps. The process envisions that MCWD will carry out the Groundwater Sustainability Plan (GSP) activities within its Marina and Ord Community service areas, regardless of whether MCWD or the SVBGSA is ultimately determined by the Department of Water Resources to be the appropriate party to serve as the GSA for those areas, and either MCWD or the SVBGSA will look out for the interests of the City of Marina.

During 2018 the administrative structure of the SVBGSA was developed, and the SVBGSA continued moving ahead with GSP development. An initial conclusion was that it would be preferable for the SVBGSA to prepare separate GSPs for each subbasin, and work began in late 2018 on the preparation of those GSPs. The Watermaster is participating in the development of those GSPs through its membership on the SVBGSA's Advisory Committee, which will help ensure that there is close coordination between that agency and the Watermaster on matters of mutual interest.

K. Additional Information

This Section was added to the Annual Report beginning this year as directed by the Court in its Order Amending Judgment filed March 29, 2018. It replaces the Section that was added to the 2017 Annual Report titled "Updates to the Court" and is formatted to

contain the topic headings below, which were requested by the Court in its March 29, 2018 Order.

By email dated August 13, 2018, Judge Nichols, who replaced Judge Randall on this matter effective January 27, 2016, informed the Parties that he would soon be withdrawing as judge on the case as a result of changes to the Assigned Judges Program which caps the total number of days an assigned judge may serve. The parties to the action have now stipulated to the assignment of retired Monterey County Judge Robert O'Farrell.

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 *Seawater Intrusion Analysis Report*, which analyzes the water quality data collected under the Watermaster's sampling program, found that no seawater intrusion is being detected within the Basin. The 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 MPWSP (discussed below) becomes operational, CAW will further reduce its pumping from the Basin by 700 AFY through its 25-year overpumping repayment program. This combined with the final triennial reduction to the Operating Yield in 20210, should substantially slow, if not eliminate, declines in groundwater levels.

Planned Near and Long-term Actions of the Watermaster

Near-term actions are described in the 2019 Monitoring and Management Program discussed in Section J and Attachment 9 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 in their development of an updated hydrogeologic model of the Salinas Valley Basin, as discussed under the *Coordination of Watermaster's Seaside Groundwater Model with Salinas River Basin Model* subheading in Section J of this Annual Report
- Continuing to coordinate with the Salinas Valley Basin Groundwater Sustainability Agency to develop measures to aid in groundwater management of the Laguna Seca Subarea, as discussed under the *Sustainable Groundwater Management Act* subheading in Section J of this Annual Report.

Information Concerning the Status of Regional Water Supply Issues

Implementation of the Monterey Peninsula Water Supply Project (MPWSP) continues to be vigorously pursued by California American Water.

On September 13, 2018 the CPUC approved a modified MPWSP consisting principally of a reduced-size 6.4 mgd desalination plant (size originally proposed was 9.6 mgd with no reclaimed water), 3,500 AFY of PWM reclaimed water (previously and separately approved by the CPUC in 2017), and increased ASR water; adopting settlement agreements to resolve conflicts relating to the desalination project; issued a Certificate of Public Convenience and Necessity; and certified the combined EIR/EIS for that Project. California American Water is in the process of seeking necessary approvals from the California Coastal Commission and other permitting agencies.

Construction of the first major element of the MPWSP, the Monterey Pipeline and Pump Station (MPPS), was completed in December 2018. The MPPS will carry PWM water that is recovered after storage in the Basin, desalination water, and expanded Aquifer Storage and Recovery (ASR) water between the northern portions of the California American Water system overlying the Seaside Basin to southern portions of the system. The pipeline extends about 7 miles from the City of Seaside to the City of Pacific Grove.

Construction work is well underway on Monterey One Water's (M1W) PWM recycled water project in Marina. This project will produce approximately 3,500 AFY of advanced treated recycled water that will be delivered to the Seaside Basin for injection into the Basin and subsequent recovery and service to California American Water customers. M1W has also executed an agreement with Marina Coast Water District (MCWD) to use a MCWD pipeline that will convey the water from the PWM advanced water treatment plant to the Seaside Basin. The PWM component of the MPWSP is currently projected to become operational in late 2019. Construction of the desalination plant is currently scheduled to begin in late 2019. The desalination plant and the expanded ASR system are expected to become operational in late 2021. Detailed quarterly update reports on the MPWSP are posted on the MPWSP website at https://www.watersupplyproject.org.

On October 12, 2018, the City of Marina and the MCWD each filed petitions for writ of review before the California Supreme Court challenging the CPUC's certification of the Final EIR/EIS and issuance of the Certificate of Public Convenience and Necessity for the MPWSP. On December 12, 2018, the Petitions for Review were denied without prejudice to the filing of renewed submissions upon completion of the rehearing proceedings pending before the CPUC. A copy of the Supreme Court docket in the proceeding can be found at:
http://appellatecases.courtinfo.ca.gov/search/case/dockets.cfm?dist=0&doc_id=2266655&doc_no=S251935&request_token=NiIwLSIkXkg9WyApSCI9XE1IQDg0UDxTJiJOIzlSICAgCg%3D%3D .

Management Activities that May Bear on the Basin's Wellbeing

1. *Water Conservation.* From a water conservation standpoint, customers of Cal-Am are doing an exceptional job. California American Water'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 is being implemented by Monterey One Water (formerly Monterey Regional Water Pollution Control Agency). Cal-Am has already contracted to receive 3,500 AFY of PWM recycled water for injection into, and recovery from, the Seaside Basin by Cal-Am. Monterey One Water, in coordination with others, is looking at the potential to expand the delivery capacity of the PWM project by using additional sources of recycled water and storm water.

3. *Sustainable Groundwater Management Act.* Coordination between the Watermaster and the Salinas Valley Groundwater Basin Sustainability Agency is ongoing and is discussed in more detail under Section J of this Annual Report. That coordination will aid in groundwater management of the Laguna Seca and Corral de Tierra subareas.

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* and *Basin Management Action Plan* in 2018 (discussed in Section J) incorporated projected impacts from climate change and sea level rise.

5. Potential Replenishment of the Basin with Water Purchased from Marina Coast Water District (MCWD). As mentioned in the 2017 Annual Report and in the March 2018 Status Conference Statement, the Watermaster received an initial proposal, and later a revised proposal, from Marina Coast Water District (MCWD) (not a party to the Decision) to sell replenishment water to the Watermaster. The Watermaster Board and its Technical Advisory Committee studied the proposals but found that insufficient information was provided to determine whether they were viable. Then, in May of 2018 Watermaster staff was informed by MCWD that the revised proposal was "on hold." In September of 2018 the CPUC found that the proposal was not shown to be a reliable, secure supply at a reasonable price. Therefore, the Watermaster does not plan to take any further action on the MCWD proposal.

6. *New Technical Issues or Activities.* This is a new Section added beginning with this 2018 Annual Report, in response to the Court's request during the March 2017 Status Conference that it be updated on any new technical issues of interest to the Watermaster.

- *Electrical Resistivity Tomography in the Monterey Bay Area*.

The Watermaster has researched whether electrical resistivity tomography, which was discussed in Sections 8.2.9.1 and 8.9.2.2 of the FEIR/FEIS for the MPWSP, could be used to help detect the location of the seawater intrusion front offshore of the Seaside Groundwater Basin. The Watermaster's Technical Program Manager contacted Ms.

Rosemary Knight and Mr. Adam Pidlisecky, who were authors of the reference reports cited in the FEIR/FEIS for the ERT/AEM work described in Section 8.2.9.1.

Ms. Knight responded that she was dealing with a family medical issue and was not in a position to respond to questions at that time.

Mr. Pidlisecky had made a presentation to the Watermaster's Technical Advisory Committee on this technology several years ago, and at that time reported that the technology could not be used to locate the seawater intrusion front offshore, because the aquifers were deep and the overlying seawater in the Bay would prevent the front from being detected. When contacted again in April 2018 he responded that the technique used in the 2017 survey is not well suited to offshore work, because saltwater attenuates the signal. Having 100% saltwater overlying the seafloor, beneath which lie the aquifers, severely attenuates the signal and greatly limits the depth of investigation. He said that although people have used the technique over water, it has usually been done on a much smaller scale, only over a length of a few hundred meters as opposed to kilometers such as was done in the 2017 survey.

Based on the findings of the FEIR/FEIS and Mr. Pidlisecky's response, it continues to appear that the use of ERT/AEM technology to locate the seawater intrusion front offshore of the Seaside Groundwater Basin is not feasible.

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

Monterey One Water (M1W), formerly the Monterey Regional Water Pollution Control Agency (MRWPCA), was the lead entity in the development of a Stormwater Resource Plan (SWRP) for the Monterey Peninsula, Carmel Bay, and South Monterey Bay (Monterey Peninsula) Integrated Regional Water Management (IRWM) Planning Area. A Consultant Project Team consisting of Geosyntec Consultants, Inc. (Geosyntec), EOA, Inc. (EOA), and Denise Duffy & Associates, Inc. (DD&A) prepared the SWRP and conducted associated analyses. Preparation of the Monterey Peninsula SWRP was funded by a Proposition 1 Planning Grant and local match funds, including the locally funded Monterey Peninsula Water Recovery Study Report, the results of which are integrated into the SWRP.

The purpose of the SWRP is to identify stormwater capture project opportunities that could be utilized as new water supply sources for the Monterey Peninsula and provide additional water quality and environmental benefits. The purpose of the Monterey Peninsula Water Recovery Study, which was conducted as part of the development of this Monterey Peninsula Region SWRP, was to examine the feasibility of establishing a Peninsula-wide water recovery and reclamation system, including identifying and evaluating potential projects that could capture sources of wet and dry weather runoff within the Monterey Peninsula IRWM Planning Area for water recovery and use. The water recovery projects were specifically identified based on their potential to reduce the Peninsula's dependence on the Carmel River, Carmel Valley Alluvial Aquifer, and adjudicated Seaside Groundwater Basin. The study considered how to store, treat, and

transport potential sources of runoff prior to entering existing water and wastewater infrastructure for use, but did not identify projects that expand existing water distribution and wastewater storage, treatment, and conveyance system capacities, or determine if this will be needed.

Seven projects were selected for conceptual design in the SWRP. Six of the seven projects would have the potential to slightly increase flows to the M1W reclamation facilities, and thus have the potential of modestly augmenting wastewater flows to the M1W reclamation facilities. This could help enable the PWM project to produce a small amount of additional water for use in recharging, or reducing pumping from, the Seaside Groundwater Basin. Since these projects are in the early planning stages and are not currently funded or otherwise being pursued by project sponsors, they are considered only to be potential sources of water that M1W could use to increase the capacity of its PWM project. Thus, no specific quantities of water that would be used for the benefit of the Seaside Groundwater Basin can currently be identified for these projects. However, none of these six projects would have the capability of capturing more than a few acre-feet of stormwater per year.

The seventh project lies within the watershed of the City of Carmel-by-the-Sea and would not be of benefit to the Seaside Basin.

L. Conclusions and Recommendations

The Seaside Basin Watermaster Board has worked diligently to meet all of the Court's established deadlines. 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. At the Watermaster Board meeting held on October 3, 2018 the Board adopted the FY 2019 budgets contained in Attachment 6, which support carrying out all elements of the "Seaside Groundwater Basin Monitoring and Management Program 2019 Work Plan." That Work Plan describes the M&MP activities that will be conducted during Fiscal Year 2019. A copy of this Work Plan is contained in Attachment 9.

As described in Section J above, information from the Enhanced Monitoring Well Network is being utilized to detect any 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.

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
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
MCWD - Marina Coast Water District
MPWMD - Monterey Peninsula Water Management District
M&MP - Monitoring and Management Program
NSY - Natural Safe Yield
SGMA - Sustainable Groundwater Management Act
SIAR - Seawater Intrusion Analysis Report
SIRP - Seawater Intrusion Response Plan
SVBGSA - Salinas Valley Basin Groundwater Sustainability Agency
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 2018
(All Values in Acre-Feet [AF])

	Type	Oct	Nov	Dec	Oct-Dec 17	Jan	Feb	Mar	Jan-Mar 18	Apr	May	Jun	Apr-Jun 18	Jul	Aug	Sep	Jul-Sep 18	Reported Total	Yield Allocation	from WY 2017	for WY 2018
Coastal Subareas																					
CAW - Coastal Subareas	SPA	367.69	307.12	315.00	**989.81**	245.45	241.90	170.36	**657.71**	71.12	85.16	122.41	**278.69**	0.00	0.00	0.00	**0.00**	**1,926.21**	1,791.62	708.80	2,500.41
City of Seaside (Municipal)	SPA	16.46	13.37	14.39	**44.22**	13.05	13.64	13.31	**39.99**	16.11	16.97	16.83	**49.91**	17.39	16.23	16.89	**50.50**	**184.63**	146.99	0.00	146.99
Granite Rock Company	SPA	- -	- -	- -	**0.00**	- -	- -	- -	**0.00**	- -	- -	- -	**0.00**	- -	- -	- -	**0.00**	**0.00**	13.87	252.77	266.63
DBO Development No. 30	SPA	- -	- -	- -	**0.00**	- -	- -	- -	**0.00**	- -	- -	- -	**0.00**	- -	- -	- -	**0.00**	**0.00**	25.16	481.76	506.92
Calabrese (Cypress Pacific Inv.)	SPA	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**	3.37	12.72	16.09
City of Seaside (Golf Courses)	APA	45.04	6.11	15.49	**66.64**	1.94	26.13	8.92	**36.99**	34.42	83.58	67.24	**185.24**	88.06	71.86	63.12	**223.03**	**511.90**	540.00		540.00
Sand City	APA	0.02	0.10	0.02	**0.14**	0.08	0.19	0.15	**0.41**	0.10	0.13	0.09	**0.32**	0.09	0.06	0.06	**0.22**	**1.09**	9.00		9.00
SNG (Security National Guaranty)	APA	- -	- -	- -		0.00	0.00	0.58		- -	- -	- -		- -	- -	- -	**0.00**	**0.00**	149.00		149.00
Calabrese (Cypress Pacific Inv.)	APA	0.00	0.00	0.00	**0.00**	0.00	0.00	0.04	**0.04**	0.00	0.00	0.02	**0.02**	0.00	0.00	0.00	**0.00**	**0.07**	6.00		6.00
Mission Memorial (Alderwoods)	APA	2.31	0.46	1.02	**3.79**	0.64	0.44	0.12	**1.20**	0.22	1.86	1.25	**3.33**	3.01	2.53	0.57	**6.11**	**14.43**	31.00		31.00
Coastal Subareas Totals					**1,104.60**				**736.33**				**517.51**				**279.87**	**2,638.31**	**2,716.00**	**1,456.04**	**4,172.04**
Laguna Seca Subarea																					
CAW - Laguna Seca Subarea	SPA	24.00	18.60	23.59	**66.19**	19.19	21.63	18.47	**59.29**	19.66	27.54	31.26	**78.46**	33.52	35.04	30.74	**99.30**	**303.24**	0.00		0.00
Ryan Ranch Unit		2.29	3.97	4.20	10.46	3.66	0.93	0.00	4.59	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	15.05			
Hidden Hills Unit		10.24	5.63	9.87	25.74	7.75	8.80	7.82	24.37	8.29	10.88	12.23	**31.40**	13.60	14.61	12.26	40.47	121.98			
Bishop Unit		11.47	9.00	9.52	29.99	7.78	11.90	10.65	30.33	11.37	16.66	19.03	**47.06**	19.92	20.43	18.48	58.83	166.21			
Nicklaus Club Monterey	APA	23.00	0.00	0.00	**23.00**	0.00	2.00	0.00	**2.00**	7.00	18.00	27.00	**52.00**	35.00	22.00	9.00	**66.00**	**143.00**	251.00		251.00
Laguna Seca Golf Resort (Bishop)	APA	30.81	0.00	0.00	**30.81**	5.68	2.24	0.17	**8.10**	6.21	29.52	42.09	**77.82**	43.22	43.86	36.06	**123.13**	**239.87**	320.00		320.00
York School	APA	2.24	0.08	0.71	**3.02**	0.01	0.54	0.01	**0.56**	0.85	2.05	1.58	**4.48**	4.64	2.31	1.81	**8.76**	**16.83**	32.00		32.00
Laguna Seca County Park	APA	1.01	0.65	0.97	**2.63**	1.15	1.18	0.60	**2.93**	1.36	1.56	2.06	**4.99**	1.30	4.04	6.08	**11.42**	**21.96**	41.00		41.00
Laguna Seca Subarea Totals					**125.65**				**72.87**				**217.75**				**308.62**	**724.89**	**644.00**	**0.00**	**644.00**
Total Production by WM Producers					**1,230.26**				**809.20**				**735.26**				**588.49**	**3,363.21**	**3,360.00**	**1,456.04**	**4,816.04**
									Annual Production from APA Producers									949.13	1,379.00		
									Annual Production from SPA Producers									2,414.08	3,437.04		
																		3,363.2			
City of Seaside Golf Courses In-Lieu (MCWD source water)																					
MCWD delivery		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**			
CAW / MPWMD ASR (Carmel River Basin source water)																					
Injection		0.00	0.00	0.00	**0.00**	0.00	0.00	341.23	**341.23**	189.26	0.00	0.00	**189.26**	0.00	0.00	0.00	0.00	**530.49**			
(Recovery)		0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	(43.15)	**(43.15)**	(360.11)	(414.34)	(392.12)	(1166.57)	**-1209.72**			
Net ASR		0.00	0.00	0.00	**0.00**	0.00	0.00	341.23	**341.23**	189.26	0.00	-43.15	**146.11**	-360.11	-414.34	-392.12	**-1166.57**	**-679.23**			

Notes:
1. The Water Year (WY) begins October 1 and ends September 30 of the following calendar year. For example, WY 2018 begins on October 1, 2017, and ends on September 30, 2018.
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 July 15, 2018.
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 2018* (see Item IX B. in 12/6/2017 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.

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 2018 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 2019 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:

Nicklaus Club Monterey	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	2,245.49 acre-feet*
Seaside (Municipal)	146.99 acre-feet**
Granite Rock	235.86 acre-feet***
D.B.O. Development 30	429.12 acre-feet****
Cypress (Calabrese).....	19.46 acre-feet*****

Laguna Seca Subarea Standard Producers:

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

---

* Total is the 2018 base allocation of 1,791.62 acre-feet plus 182.91 of not free carryover plus 270.96 free carryover.
California American Water has a positive balance of 144.78 acre-feet of stored water credit at WY-end 2018 from Basin extractions exceeding injections since WY 2010 under the CAW/MPWMD ASR Program, formalized through a Storage Agreement in 2012.

** Total is the 2019 base allocation of 146.99 acre-feet.

*** Total includes 180.68 acre-feet of "free" carryover and 41.32 acre-feet of "not-free" carryover credit from previous water years ***capped at the producers storage allocation of 222.0 acre-feet***, plus the 2019 base allocation of 13.87 acre-feet.

**** Total includes 341.51 acre-feet of "free" carryover plus 62.45 acre-feet of "not-free" carryover credit from previous water years ***capped at the producers storage allocation of 403.96 acre-feet***, plus the 2019 base allocation of 25.16 acre-feet.

***** Total includes 14.36 acre-feet of "free" carryover and 1.73 acre-feet of "not-free" carryover credit from previous water years plus the 2019 base allocation of 3.37 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 31,770 acre-feet.
Total Usable Storage Space in the Laguna Seca Subarea is 20,260 acre-feet.
Total Usable Storage Space in the entire Seaside Groundwater Basin is 52,030 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%	28,733
City of Seaside (Municipal)	6.36%	7.42%	2,357
Granite Rock Company	0.60%	0.70%	222
DBO Development No. 27	1.09%	1.27%	404
Calabrese (Cypress Pacific Investors LLC)	0.15%	0.17%	54
SUBAREAS TOTAL	**85.75%**	**100.00%**	**31,770**
Laguna Seca Subarea			
California American Water (3)	45.13%	100.00%	20,260
SUBAREA TOTAL	**45.13%**	**100%**	**20,260**
BASIN TOTAL		**100%**	**52,030**

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.

February 3, 2010
Revised January 15, 2015

ATTACHMENT 3

WATERMASTER ADMINISTRATIVE AND OPERATIONS COSTS

Seaside Groundwater Basin Watermaster

Budget vs. Actual Administrative Fund

Fiscal Year (January 1 - December 31, 2018)
Balance through November 30, 2018

	2018 Adopted Revised Budget	Contract Amount	Year to Date Revenue / Expenses
Available Balances & Assessments			
Dedicated Reserve	-		-
FY (Rollover)	42,000.00		32,782.94
Admin Assessments	40,000.00		40,000.00
Available	**82,000.00**		**72,782.94**
Expenses			
Contract Staff	40,000.00	40,000.00	30,350.00
Legal Advisor	24,000.00	24,000.00	19,155.00
Filing fees and postage			226.42
Total Expenses	**64,000.00**	**64,000.00**	**49,731.42**
Total Available	18,000.00		
Dedicated Reserve	18,000.00		18,000.00
Net Available	**-**		**5,051.52**

Seaside Groundwater Basin Watermaster

Budget vs. Actual Monitoring & Management - Operations Fund

Fiscal Year (January 1 - December 31, 2017)

Balance through November 30, 2017

	2017 Adopted Amended Budget	Contract Encumbrance	Year to Date Revenue/Expenses
Available Balances & Assessments			
Operations Fund Assessment	$ 100,000.00	$ -	$ 100,000.00
Pass Through 2017	-	4,788.00	2,664.00
FY 2016 Rollover	270,965.98	-	270,965.98
Total Available	**$ 370,965.98**	**$ 4,788.00**	**$ 373,629.98**
Appropriations & Expenses			
GENERAL			
Technical Project Manager	$ 60,000.00	$ 60,000.00	$ 37,300.00
Contingency @ 20% (not including TPM)	12,091.00	$ -	-
Total General	**$ 72,091.00**	**$ 60,000.00**	**$ 37,300.00**
CONSULTANTS (Hydrometrics; Todd Groundwater; Web Site Database)			
Program Administration	$ 26,276.00		
Production/Lvl/Qlty Monitoring	2,400.00	$ 23,800.00	$ 19,658.46
Basin Management Action Plan	48,881.76		
Seawater Intrusion Analysis Report	20,890.00	20,890.00	17,893.75
Total Consultants	**$ 98,447.76**	**$ 44,690.00**	**$ 37,552.21**
MPWMD			
Production/Lvl/Qlty Monitoring	$ 52,558.00	53,454.00	16,495.00
Pass Through 2017	-	4,788.00	2,310.00
Basin Management	-		-
Seawater Intrusion	896.00	-	-
Direct Costs	-	-	-
Total MPWMD	**$ 53,454.00**	**$ 58,242.00**	**$ 18,805.00**
CONTRACTOR (Martin Feeney)			
Production/Lvl/Qlty Monitoring	**$ 36,203.80**	**$ 36,203.80**	**35,660.58**
Reserve			-
Transfer Out to Capital Fund			-
Total Appropriations & Expenses	**$ 260,196.56**	**$ 199,135.80**	**$ 129,317.79**
Total Available	**110,769.42**		**244,312.19**

ATTACHMENT 4

REPLENISHMENT ASSESSMENT UNIT COST DETERMINATION FOR WATER YEAR 2019

SEASIDE GROUNDWATER BASIN WATERMASTER

TO: Board of Directors

FROM: Laura Dadiw, Administrative Officer

DATE: October 3, 2018

SUBJECT: Unit Cost for Water Year 2018/19 Over Production Replenishment Assessment Amounts

---

RECOMMENDATION:
It is recommended that the Board approve a Proposed Replenishment Assessment Unit Cost of $2,872 for Operating Yield Overproduction and $718 (25% of $2,872) for Natural Safe Yield Over Production for Water Year 2019 (October 1, 2018 - September 30, 2019).

On August 21, 2018 the Budget and Finance Committee approved the proposed Unit Cost for Water Year 2018/19 Over Production Replenishment Assessment Amounts and recommended board approval.

SUMMARY:
The Replenishment Assessment Unit Cost is used to calculate the Replenishment Assessments that are charged to any Standard Producer that exceeds its allocations (both Operating Yield and Natural Safe Yield allocations) during the Water Year.

Per page 33 of the Decision, *"The per acre-foot amount of the Replenishment Assessments shall be determined and declared by Watermaster in October of each Water Year in order to provide Parties with advance knowledge of the cost of Over-Production in that Water Year."* Thus, the per acre-foot amount determined by the Board on or before October of 2018 will be used to calculate Replenishment Assessments for pumping that occurs during the Water Year which begins on October 1, 2018 and ends on September 30, 2019.

BACKGROUND:
For each of the three Water Years 2014, 2015, and 2016, the Board adopted a unit cost of $2,702/AF. This unit cost was developed starting with Water Year 2014 by taking the average of the Base Unit Cost ($/AF) listed in Table 1 for each project [$3,507+$1,800+$2,000+$3,500)/4], as the Replenishment Assessment Unit Cost. The Water Year 2014 unit cost was carried over to the two subsequent Water Years because no updated cost data was available for the projects listed in Table 1, and no other viable projects could be identified. For Water Year 2016/17 the Budget and Finance Committee updated the basis from which the annual calculation of the Unit Cost of replenishment water is established, a blended cost of a reduced size desalination plant for the Monterey Peninsula Water Supply Project and groundwater replenishment provided by the Pure Water Monterey Project [($4,591+$2,025+$2,000)/3] = $2,872 (see Table 2).

DISCUSSION:
Due to the lack of more supportable data the recommendation is to continue using $2,872, the average of the Base Unit Cost ($/AF) listed in Table 2 for each project [($4,591+$2,025+$2,000)/3] as the Operating Yield Over Production Replenishment Assessment Unit Cost for the Water Year 2018/2019. The Natural Safe Yield Replenishment Assessment Unit Cost is 25% of that amount, or $718.

ATTACHMENTS:
Table 1: Water Year 2014 Unit Cost Calculation Data
Table 2: Updated Unit Cost Data

Table 1

WATER YEAR 2014 (October 1, 2013-September 30, 2014)

ANTICIPATED UNIT COSTS OF REPLENISHMENT WATER FOR THE SEASIDE BASIN

POTENTIAL SOURCE OF REPLENISHMENT WATER	POTENTIAL DATE REPLENISH-MENT WATER COULD BECOME AVAILABLE	POTENTIAL VOLUME OF WATER THAT COULD BE SUPPLIED BY THE PROJECT (AFY) [1]	LEVEL OF PROJECT DEVELOP-MENT	CONTINGENCY INCLUDED IN BASE UNIT COST [2] (%)	BASE UNIT COST ($/AF)	BASE UNIT COST YEAR	ADDITIONAL CONTINGENCY ADDED TO REFLECT LEVEL OF PROJECT DEVELOPMENT [3] (%)	UNIT COST INCLUDING ADDITIONAL CONTINGENCY ($/AF)	UNIT COST INFLATED @ 3% FROM COST BASIS YEAR TO YEAR REPLENISH-MENT WATER COULD BECOME AVAILABLE ($/AF)	VOLUME-WEIGHTED AVG %
Monterey Peninsula Water Supply Project (Regional Desalination) [4]	2018	9,752	Project Report	30%	$3,507	2012	0%	$3,507	$4,188	56.53%
Seaside Basin ASR Expansion [5]	2015	1,000	Conceptual	11%	$1,800	2012	39%	$2,502	$2,734	5.80%
Regional Urban Water Augmentation Project [6]	2017	3,000	Design	5%	$2,000	2013	10%	$2,200	$2,476	17.39%
Groundwater Replenishment Project (GWRP) [7]	2017	3,500	Conceptual	50%	$3,500	2017	0%	$3,500	$3,500	20.29%
Total Quantity of Replenishment Water (AFY) the Listed Projects Could Cumulatively Potentially be Able to Produce Within the Next 10 Years [8] =										**17,252**

FOOTNOTES:

(1) For the Monterey Peninsula Water Supply Project this is the total amount of water from this source which could potentially come to the CAW distribution system. 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 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 5). For the RUWAP this is the total amount of water that this project is expected to produce. Only a portion of this amount might be used as in-lieu replenishment of the Seaside Basin. For the GWRP this is the quantity of water that is being considered at this time by CAW for inclusion in its Monterey Peninsula Water Supply Project.

(2)(3) The following Contingency percentages were considered reasonable for the indicated levels of project development: Conceptual Level - 50%, Project Report Level - 30%, and Design Level - 15%. The sum of the values in the columns titled "Contingency Included in Base Unit Cost" and "Additional Contingency Added to Reflect Level of Project Development" equals the Contingency appropriate for the project's level of development.

(4) Project data based on documents provided by Cal Am and MPWMD.

(5) Project data provided by MPWMD. 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.

(6) Project data provided by MCWD.

(7) Project data provided by MRWPCA. MRWPCA reported that the GWRP quantity being used in the current CEQA documentation is 3,500 AFY, but that the project could potentially supply 6,500 AFY or more. The unit cost would be lower if a quantity larger than 3,500 AFY were produced.

(8) This value is the cumulative production capacity of all of the Potential Sources of Replenishment Water that listed in this table, and is used only to determine the "Volume-Weighted Average." It is not the amount of water that is expected to be available to the Seaside Basin.

Table 2

WATER YEAR 2017 (October 1, 2016-September 30, 2017)

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

POTENTIAL SOURCE OF REPLENISHMENT WATER	POTENTIAL DATE REPLENISH-MENT WATER COULD BECOME AVAILABLE	POTENTIAL VOLUME OF WATER THAT COULD BE SUPPLIED BY THE PROJECT (AFY) [1]	BASE UNIT COST ($/AF)	BASE UNIT COST YEAR
Regional Desalination[2]	2020	6,250	$6,147	2019
Groundwater Replenishment Project (Pure Water Monterey)[2]	2018	3,500	$1,811	2018
Monterey Peninsula Water Supply Project (Combined Regional Desalination with Groundwater Replenishment Project)	GWRP in 2018 Regional Desalination in 2020	9,750	$4,591	
Seaside Basin ASR Expansion[3]	2020	1,000	$2,025	2016
Regional Urban Water Augmentation Project[4]	2018	1,400-1,700	$2,000	2018

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 3). For the GWRP this is the quantity of water that is being planned at this time by CAW for inclusion in its Monterey Peninsula Water Supply Project.

(2) Base unit cost data based on PUC filing documents and provided by Dave Stoldt of MPWMD .

(3) Base unit cost data provided by MPWMD. 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 provided by MCWD.

ATTACHMENT 5

REPLENISHMENT ASSESSMENT CALCULATIONS FOR WY 2018

WATERMASTER PRODUCER ALLOCATIONS WATER YEAR 2018 IN ACRE-FEET (AF)

INCLUDING A 10% TRIENNIEL REDUCTION FOR 100% OF THIS WATER YEAR

Initial Basin-Wide Operating Yield[1]	3360.00	Coastal Operating Yield[2]	2716.00
Natural Safe Yield (NSY)[1]	3000.00	Laguna Seca Operating Yield[2]	644.00

ALTERNATIVE PRODUCER ALLOCATIONS

Coastal Subarea[3]	AF	Laguna Seca Subarea[3]	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[3]	735.00	Total[3]	644.00

ALTERNATIVE PRODUCER AMOUNT PUMPED WY 2018

Coastal Subarea[4]	AF	Laguna Seca Subarea[4]	AF	Total Alternative Producer WY 2018 Production
Seaside (Golf)	511.90	Nicklaus Club Monterey	143.00	
SNG	0.00	Bishop	239.87	
Calabrese	0.07	York School	16.83	
Mission Memorial (Alderwood)	14.43	Laguna Seca County Park	21.96	
Sand City	1.09			
Total[4]	527.47	Total[4]	421.65	949.13

STANDARD PRODUCER ALLOCATIONS

Coastal Operating Yield Available to Standard Producers (AF)	1981.00	Laguna Seca Operating Yield Available to Standard Producers (AF)	0.00

Coastal Subarea	Standard Producer Allocations		AF Available to This Producer
	Base Water Right %[4]	Weighted %[5]	
California American Water (CAW)	77.55%	90.44%	1791.62
Seaside (Municipal)	6.36%	7.42%	146.99
Granite Rock	0.60%	0.70%	13.87
D.B.O. Development No. 30	1.09%	1.27%	25.16
Calabrese (Cypress Pacific Investors LLC)	0.15%	0.17%	3.37
Total	85.75%	100.0%	1981.00

Laguna Seca Subarea	Standard Producer Allocations		AF Available to This Producer
	Base Water Right %[4]	Weighted %[5]	
CAW	45.13%	100.00%	0.00
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	Free Carryover Credits from Prior Water Year	Not-Free Carryover Credits from Prior Water Year	Water Rights Transferred / Sold DBO to CAW 710 Amador	Water Rights Transferred / Sold DBO to CAW 2 Upper Ragsdale	Total Producer NSY (AF) (NSY Available + Free Carryover Credits)	Total Authorized Production Current WY (Base Water Right Plus All Carryover)[6]	Actual AF Pumped by Producer in WY 2018	Free Carry over Credits to WY 2019	Not-Free Carry over Credits to WY 2019	Stored Water Credits to WY 2019
		NSY 3000 - 949.13 AF =	WY 2018 APA Pumped 949.11 AF 2050.87										
California American Water	1791.62	90.44%	180.60	0.00	706.49	0.16	2.15	182.91	2500.41	2229.45	182.91	270.96	144.78
Seaside (Municipal)	146.99	7.42%	152.17	0.00	0.00	0.00	0.00	152.17	146.99	184.63	0.00	0.00	0.00
Granite Rock	13.87	0.70%	14.36	166.32	86.45	0.00	0.00	180.68	266.63	0.00	180.68	41.32	0.00
D.B.O. Development No. 30	25.16	1.27%	26.05	317.77	166.30	(0.16)	(2.15)	341.51	506.92	0.00	341.51	62.45	0.00
Calabrese (Cypress Pacific Investors LLC)	3.37	0.17%	3.49	10.87	1.85	0.00	0.00	14.36	16.09	0.00	14.36	1.73	0.00
Total	1981.00	100.00%	376.67	494.97	961.07	0.00	0.00	871.63	3437.04	2414.08	719.46	376.46	144.78

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.
(6) Base Water Right plus Free and Not Free Carryover Credit = 2018 Production Allocation capped at storage allocation (see 2018 Declaration from 12/6/2017 Watermaster board meeting)
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).

CALCULATION OF REPLENISHMENT ASSESSMENTS WATER YEAR 2018

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) 2018 Replenisment Assessments as follows:

2018 Replenishment Assessment NSYO Unit Charge =	$2,872.00	
2018 Replenishment Assessment OSYO Unit Charge =	$718.00	
2018 Natural Safe Yield (NSY) Available to Standard Producers =	2,050.87	AF (3,000 AF NSY - 949.13 Alternative Producers 2018 Production)

Standard Producers	WY 2018 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	2,229.45	90.44%	1,854.80	374.65	$ 1,075,994.80	2,500.41	-	$ -	$ 1,075,994.80
Seaside (Municipal)	184.63	7.42%	152.17	32.46	93,225.12	146.99	37.64	27,025.66	120,250.78
Granite Rock	-	0.70%	14.36	-	-	266.63	-	-	-
D.B.O. Development No. 30	-	1.27%	26.05	-	-	506.92	-	-	-
Calabrese (Cypress Pacific Inv.)	-	0.17%	3.49	-	-	16.09	-	-	-
Total Production	**2,414.08**	**100.00%**	2,050.87	**407.10**	**$ 1,169,219.92**	**3,437.04**	**37.64**	**$ 27,025.66**	**$ 1,196,245.58**

Alternative Producers	WY 2018 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)	511.90	N/A	540.00	0.00	$ -	540.00	0.00	$ -	$0
Security National Guaranty	-	N/A	149.00	0.00	-	149.00	0.00	-	-
Calabrese (Cypress Pacific Inv.)	0.07	N/A	6.00	0.00	-	6.00	0.00	-	-
Mission Memorial (Alderwoods)	14.43	N/A	31.00	0.00	-	31.00	0.00	-	-
City of Sand City	1.09	N/A	9.00	0.00	-	9.00	0.00	-	-
Nicklaus Club Monterey	143.00	N/A	251.00	0.00	-	251.00	0.00	-	-
Laguna Seca Golf Resort (Bishop)	239.87	N/A	320.00	0.00	-	320.00	0.00	-	-
York School	16.83	N/A	32.00	0.00	-	32.00	0.00	-	-
Laguna Seca County Park	21.96	N/A	41.00	0.00	-	41.00	0.00	-	-
Total Production	**949.13**	**N/A**	**1,379.00**	**0.00**	**$ -**	**1,379.00**	**0.00**	**$ -**	**$0**

ATTACHMENT 6

WATERMASTER BUDGETS FOR 2019

Seaside Groundwater Basin Watermaster
Fiscal Year 2019 Administrative Fund Budget

	2018 Adopted Revised Budget	2018 Estimated Total	2019 Budget
Assessment Income			
Reserve/Rollover*	$ 42,000	$ 42,000	$ 23,000
Administrative Assessment	40,000	40,000	77,000
Totals	82,000	82,000	100,000
Expenditures			
Contractual Services - Administrative	40,000	33,500	50,000
Legal Services**	17,000	23,500	25,000
Total Expenses	57,000	57,000	75,000
Total Available	25,000	25,000	25,000
Less Reserve	25,000	25,000	25,000
Net Available	$ -	$ -	$ -

** Note: The reserve/rollover balance of $23,000 was determined upon completion by Watermaster staff of a detailed reconciliation from 2006 through July 2018 of the Administrative Fund financial records held at the Watermaster office against the Administrative Fund financial records held by the City of Seaside - the Watermaster fiscal agent.*

*** August 1, 2018 board action to amend 2018 Administrative Fund Budget to include $10,000 additional for legal services for unanticipated expenses and $10,000 reduction in contract services for no net change in the bottom line.*

Seaside Groundwater Basin Watermaster
Fiscal Year 2019 Monitoring & Management Plan
Operations Budget

Monitoring and Management Program Operations Budget
For Tasks to be Undertaken in 2019

Task	Subtask	Sub-Subtask	Cost Description	CONSULTANTS & CONTRACTORS[3]			Total
				MPWMD	Private Consultants	Contractors	
			Labor				
			Technical Project Manager	$0	$50,000	$0	$50,000
M.1 Program Administration							
	M.1.a		Project Budget and Controls	$0	$0	$0	$0
	M.1.b		Assist with Board and TAC Agendas	$0	$0	$0	$0
	M.1.c & M.1.d		Preparation for and Attendance at Meetings[8]	$0	$11,500	$0	$11,500
	M.1.e		Peer Review of Documents and Reports[8]	$0	$7,500	$0	$7,500
	M.1.f		QA/QC	$0	$0	$0	$0
	M.1.g		SGMA Documentation Preparation	$0	$2,140	$0	$2,140
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/Enhancement	$14,604	$2,400	$0	$17,004
		I. 2. a. 2.	Verify Accuracy of Production Well Meters	$0	$0	$0	$0
	I. 2. b.		Data Collection Program				
		I. 2. b. 1.	Site Representation and Selection[7]	$0	$0	$0	$0
		I. 2. b. 2.	Collect Monthly Water Levels[6]	$3,726	$0	$0	$3,726
		I. 2. b. 3.	Collect Quarterly Water Quality Samples[1][5][6]	$24,542	$0	$17,541	$42,083
		I. 2. b. 4.	Update Program Schedule and Standard Operating Procedures.	$0	$0	$0	$0
		I. 2. b. 5.	Monitor Well Construction[7]	$0	$0	$0	$0
		I. 2. b. 6.	Reports	$3,576	$0	$0	$3,576
		I. 2. b. 7.	CASGEM Data Submittal for Watermaster's Voluntary Wells	$2,384	$0	$0	$2,384
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
		I. 3. a. 2	Develop Protective Water Levels[12]	$0	$0	$0	$0
		I. 3. a. 3	Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions[10]	$0	$20,000	$0	$20,000
	I. 3. b.		Complete Preparation of Basin Management Action Plan	$0	$0	$0	$0
	I. 3. c.		Refine and/or Update the Basin Management Action Plan	$0	$0	$0	$0
	I. 3. d		Evaluate Coastal Wells for Cross-Aquifer Contamination Potential	$0	$0	$0	$0
	I. 3. e		Seaside Basin Geochemical Model[13]	$0	$10,000	$0	$10,000
I.4 Seawater Intrusion Contingency Plan							
	I. 4. a.		Oversight of Seawater Intrusion Detection and Tracking	$0	$0	$0	$0
	I. 4. b.		Provide focused area hydrogeologic investigation for Sand City Public Works	$0	$0	$0	$0
	I. 4. c.		Annual Report- Seawater Intrusion Analysis	$1,192	$21,550	$0	$22,742
	I. 4. d.		Complete Preparation of Seawater Intrusion Response Plan[2]	$0	$0	$0	$0
	I. 4. e.		Refine and/or Update the Seawater Intrusion Response Plan[2][9]	$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 2018. If it Does Become Necessary, Use of Contingency Funds or a Budget Modification Will Likely be Necessary)			
		TOTALS CONSULTANTS & CONTRACTORS		**$50,024**	**$125,090**	**$17,541**	
						SUBTOTAL not including Technical Program Manager =	$142,655
						Contingency (not including Technical Program Manager) @ 10%[4] =	$14,266
						Technical Program Manager =	$50,000

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.
(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 approximately 10% be included in the Budget.
(5) Includes $1,000 to maintain equipment previously installed for this purpose, and $2,000 to purchase a new sampling pump if an existing one needs to be replaced. Also includes lab costs to analyze for barium and iodide ions in certain of these wells as was done in preceding years
(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. Includes the purchase and installation of one new and/or replacement datalogger at a price of $700, plus $50 for installation parts, to keep in inventory as a spare if needed.
(7) No additional monitoring well is expected to be constructed in 2019.
(8) 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 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) Since the Model and BMAP were updated in 2018, this Task would only be used if there were other issues the Board wished to evaluate and which were not covered in the updated BMAP.
(11) The Model was updated and recalibrated in 2018, so no costs for this Task are anticipated in 2019.

Seaside Groundwater Basin Watermaster
Fiscal Year 2019 Monitoring & Management Plan
Capital Fund Budget

No Capital projects are anticipated to be undertaken in 2019, so this budget is $0.

ATTACHMENT 7

WATER QUALITY ANALYTICAL RESULTS

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

5 HARRIS COURT, BLDG. G
POST OFFICE BOX 85
MONTEREY, CA 93942-0085 • (831) 658-5600
FAX (831) 644-9560 • http://www.mpwmd.dst.ca.us

October 25, 2018

Bob Jaques
Technical Program Manager
Seaside Groundwater Basin Watermaster
83 Via Encanto
Monterey, CA 93940

Subject: Water Year 2018 Data Transmittal

Dear: Mr. Jaques

This letter transmits the groundwater-quality and groundwater-level data collected for the Seaside Groundwater Basin Watermaster (Watermaster) during Water Year (WY) 2018. The attached data transferal incorporates the data that were collected and reported for each quarter during the period from October 1, 2017 through September 30, 2018. This data was collected and is being provided to the Watermaster for information purposes, and is in compliance with the monitoring protocols described in the Watermaster's *Seaside Basin Monitoring and Management Program* (SBMMP, revision date September 5, 2006), which was prepared in response to the court decision filed March 27, 2006 (as amended by February 9, 2007 filing) in the Seaside Basin adjudication case. This data has been prepared by the Monterey Peninsula Water Management District (District) on behalf of the Watermaster.

Water-sample collection from the MPWMD coastal monitor wells for WY 2018 was accomplished by the Low-Flow Method. After the monitor wells were purged, water samples for laboratory analyses were collected before water had passed through the flow-through cell and all sample containers were filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. During purging and sampling, the tubing remained filled with water to minimize possible changes in water chemistry upon contact with the atmosphere. When portable systems were used, they were placed carefully into the well and lowered into the screen zone as slowly as possible. Placement of the portable pump can disturb the groundwater flow conditions resulting in non-equilibrium conditions. As a result, longer purge times and greater purge volumes are necessary to achieve indicator parameter stabilization. In general, this may require that after installation, the portable pump remain in place for a minimum of 1-2 hours to allow settling of solids and re-establishment of horizontal flow through the screen zone. If initial turbidity readings were excessive (>50 NTU), pumping was halted and the well was allowed to rest for another 1-2 hours before initiating pumping again. Water levels were monitored during sampling to insure excessive drawdowns were not occurring to verify the sample volume was being collected from the aquifer and not the water stored in the casing. The devices used are capable of measuring water

levels to 0.01-foot precision.

Static, non-pumping, water-level measurements were taken for basin monitor wells and basin producer active and inactive wells during WY 2018 and are also included in this data transmittal. Static water levels are collected so these measurements will more closely approximate ambient groundwater-level conditions, and facilitate the plotting and trend analysis of well water-level hydrographs. Occasionally, water-level measurements have been collected and reported while the well was in operation. In some cases, this may be due to the fact that the well cannot be taken offline in order to collect a static water-level measurement because of pumping demand requirements. These occurrences have been recorded in the comments section the data transmittal. These water-level data were collected primarily with manual water-level sounding devices by producers or by the MPWMD on behalf of the Watermaster. Some monitor wells are equipped with continuous water level recording transducers. In these cases the transducer files were downloaded and provided to Montgomery & Associates for inclusion in their Seawater Intrusion Analysis Report for WY 2018.

All data transmitted in this letter have been through the QA/QC process and entered into the Watermaster's database according the protocols outlined in the RFS between the District and the Watermaster. All lab results submitted to the Watermaster are included in this data transfer. The enclosed data are an export from the Watermaster database. In 2017 the Watermaster TAC decided to stop sampling the sentential wells for water quality due to the large screened intervals and the lack of an area to discharge large amounts of purge water. It was determined through conductivity logging that the water quality sample collected with the bomb sampling methods did not accurately represent the groundwater quality.

Please accept this letter and enclosure as a summary and transfer of data collected by MPWMD and Watermaster Producers for WY 2018. The District will also forward an electronic version of this report so that it can be posted to the Watermaster website.

Sincerely,

Jonathan Lear

Jonathan Lear PG, CHg
Senior Hydrogeologist

Enclosures: WY 2018 Water Quality and Water Level Data

Seaside Basin Monitoring and Management Plan
Water Level Data for WY 2018

Bay Ridge (Watermaster No. 226)

Owner: California American Water

Well Type: Producer

Southern Inland

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	380	545.92	165.92	off
10/26/2017	387.0	545.92	158.92	off
11/30/2017	384.0	545.92	161.92	off
12/28/2017	381.0	545.92	164.92	off
01/25/2018	379.0	545.92	166.92	off
02/22/2018	381.4	545.92	164.52	off
03/29/2018	378.5	545.92	167.42	off
04/26/2018	379.3	545.92	166.62	off
05/31/2018	442.2	545.92	103.72	on
06/28/2018	386.0	545.92	159.92	off
07/26/2018	443.2	545.92	102.72	on
08/30/2018	389.7	545.92	156.22	off
09/27/2018	436.4	545.92	109.52	on

Bishop #3 (Watermaster No. 262)

Owner: CAW

Well Type: Producer

Southern Inland

Aquifer Unit:

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	276	420.58	144.58	off
10/26/2017	275.0	420.58	145.58	off
11/30/2017	270.0	420.58	150.58	off
12/28/2017	269.0	420.58	151.58	off

01/25/2018	267.0	420.58	153.58	off
02/22/2018	203.0	420.58	217.58	off
03/29/2018	268.0	420.58	152.58	off
04/26/2018	271.2	420.58	149.38	off
05/31/2018	358.3	420.58	62.28	on
06/28/2018	274.0	420.58	146.58	off
07/26/2018	278.0	420.58	142.58	off
08/30/2018	279	420.58	141.58	off
09/27/2018	270.8	420.58	149.78	off

Blue Larkspur-East End (Watermaster No. 143)

Southern Inland

Owner: Laguna Seca Resorts

Well Type: Monitor

Aquifer Unit:

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/03/2017	115.81	253.29	137.48	
01/24/2018	114.90	253.29	138.39	
03/30/2018	115.38	253.29	137.91	
06/27/2018	115.02	253.29	138.27	
09/18/2018	116.20	253.29	137.09	

CalAm Granite Construction (Watermaster No. 242)

Southern Inland

Owner: California American Water

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/03/2017	135.24	226.43	91.19	
01/23/2018	135.39	226.43	91.04	
03/30/2018	135.32	226.43	91.11	
06/27/2018	135.32	226.43	91.11	
09/18/2018	135.30	226.43	91.13	

CDM MW#4 (Watermaster No. 238)

Southern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Qod

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	15.17	18.69	3.52	
10/27/2017	14.69	18.69	4.00	
11/29/2017	14.32	18.69	4.37	
12/28/2017	14.76	18.690	3.93	
02/07/2018	14.53	18.69	4.16	
03/07/2018	14.50	18.69	4.19	
03/27/2018	14.65	18.69	4.04	
05/01/2018	14.58	18.69	4.11	
05/29/2018	14.92	18.69	3.77	
06/26/2018	15.24	18.69	3.45	
07/24/2018	15.35	18.69	3.34	
08/30/2018	15.59	18.69	3.10	
09/17/2018	15.23	18.69	3.46	

CDM MW-1 (Watermaster No. 251)

Northern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Qod/Qar

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/25/2017	89.8	95.53	5.73	
10/27/2017	89.28	95.53	6.25	
12/27/2017	89.59	95.53	5.94	
02/08/2018	88.82	95.53	6.71	
03/08/2018	88.99	95.53	6.54	Combo lock gone
03/29/2018	89.50	95.53	6.03	

05/02/2018	89.32	95.53	6.21
05/29/2018	89.89	95.53	5.64
06/26/2018	90.17	95.53	5.36
07/24/2018	90.54	95.53	4.99
08/31/2018	90.73	95.53	4.80
09/17/2018	90.48	95.53	5.05

CDM MW-2 (Watermaster No. 252)

Northern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Qod/Qar

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/25/2017	60.79	68.83	8.04	
10/27/2017	59.22	68.83	9.61	
12/27/2017	59.79	68.83	9.04	
02/08/2018	59.20	68.83	9.63	
03/08/2018	59.40	68.83	9.43	
03/29/2018	59.81	68.83	9.02	
05/02/2018	59.72	68.83	9.11	
05/29/2018	60.52	68.83	8.31	
06/26/2018	60.85	68.83	7.98	
07/24/2018	61.21	68.83	7.62	
08/31/2018	61.40	68.83	7.43	
09/17/2018	61.08	68.83	7.75	

CDM MW-3 (Watermaster No. 239)

Southern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Qod/Qar

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	32.32	33.81	1.49	

10/26/2017	31.65	33.81	2.16
11/29/2017	31.50	33.81	2.31
12/18/2017	31.60	33.81	2.21
02/07/2018	32.13	33.81	1.68
03/07/2018	32.59	33.81	1.22
03/27/2018	31.03	33.81	2.78
05/01/2018	31.97	33.81	1.84
05/29/2018	32.79	33.81	1.02
06/26/2018	33.61	33.81	0.20
07/24/2018	33.76	33.81	0.05
08/30/2018	32.53	33.81	1.28
09/17/2018	33.21	33.81	0.60

Cypress Pacific Production (Watermaster No. 150) — **Southern Coastal**

Owner: Paul Bruno

Well Type: Producer

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	46.97	50.23	3.26	
10/26/2017	46.73	50.23	3.50	
11/19/2017	46.81	50.23	3.42	
12/28/2017	46.73	50.23	3.50	
02/07/2018	46.37	50.23	3.86	
03/07/2018	46.22	50.23	4.01	
03/27/2018	46.23	50.23	4.00	
05/01/2018	47.28	50.23	2.95	On
05/29/2018	46.73	50.23	3.50	
06/26/2018	46.99	50.23	3.24	
07/24/2018	47.27	50.23	2.96	off
09/05/2018	47.39	50.23	2.84	

09/17/2018	47.46	50.23	2.77	off

Del Monte Test (Watermaster No. 231)

Northern Coastal

Owner: California American Water

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	28	32.62	4.62	off
10/26/2017	30.0	32.62	2.62	off
11/30/2017	28.2	32.62	4.42	off
12/21/2017	28.1	32.62	4.52	off
01/25/2018	28.9	32.62	3.72	off
02/22/2018	30.0	32.62	2.62	off
03/29/2018	30.0	32.62	2.62	off
04/26/2018	29.0	32.62	3.62	off
05/31/2018	31.0	32.62	1.62	off
06/28/2018	30.0	32.62	2.62	off
07/26/2018	29.0	32.62	3.62	off
08/30/2018	30	32.62	2.62	
09/27/2018	29	32.62	3.62	

Design Ctr. (Watermaster No. 167)

Southern Coastal

Owner: City of Sand City

Well Type: Producer

.quifer Unit: Qod/Qar/QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	13.59	21.34	7.75	
10/26/2017	13.47	21.34	7.87	
11/29/2017	13.76	21.34	7.58	
12/28/2017	13.73	21.34	7.61	
02/08/2018	13.46	21.34	7.88	

03/07/2018	13.21	21.34	8.13
03/27/2018	13.47	21.34	7.87
05/01/2018	13.52	21.34	7.82
05/29/2018	13.68	21.34	7.66
06/26/2018	13.40	21.34	7.94
07/24/2018	13.40	21.34	7.94
08/30/2018	13.89	21.34	7.45
09/17/2018	13.89	21.34	7.45

FO-01-Deep (Watermaster No. 116)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/02/2017	341.99	362.57	20.58	
01/24/2018	342.22	362.57	20.35	
04/02/2018	342.07	362.57	20.50	
06/27/2018	342.19	362.57	20.38	
09/17/2018	342.39	362.57	20.18	

FO-01-Shallow (Watermaster No. 115)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/02/2017	203.64	362.61	158.97	
01/24/2018	203.77	362.61	158.84	
04/02/2018	203.88	362.61	158.73	
06/27/2018	203.87	362.61	158.74	
09/17/2018	203.92	362.61	158.69	

FO-03-Deep (Watermaster No. 127)

Southern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/03/2017	637.33	774.74	137.41	
01/24/2018	637.19	774.74	137.55	
04/02/2018	637.28	774.74	137.46	
06/27/2018	637.29	774.74	137.45	
09/18/2018	637.34	774.74	137.40	

FO-04-Deep (W) (Watermaster No. 130)

Southern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	113.62	167.44	53.82	
10/26/2017	113.92	167.44	53.52	
12/07/2017	114.58	167.44	52.86	
12/31/2017	112.93	167.44	54.51	
01/02/2018	114.44	167.44	53.00	
01/30/2018	114.36	167.44	53.08	
03/08/2018	113.87	167.44	53.57	Top off this!
03/27/2018	113.72	167.44	53.72	
05/02/2018	113.22	167.44	54.22	
05/29/2018	113.63	167.44	53.81	
06/27/2018	114.15	167.44	53.29	
07/24/2018	114.51	167.44	52.93	
08/31/2018	114.92	167.44	52.52	
09/18/2018	115.02	167.44	52.42	

FO-04-Shallow (E) (Watermaster No. 129)

Southern Inland

Owner: MPWMD

Aquifer Unit: QTc

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	113.42	168.23	54.81	
10/26/2017	113.61	168.23	54.62	
12/07/2017		168.23		Hung up
12/31/2017	112.84	168.23	55.39	
01/02/2018		168.23		Hung up
01/30/2018	113.72	168.23	54.51	
03/08/2018	112.90	168.23	55.33	Still some gunk
03/27/2018	112.76	168.23	55.47	Still debris
05/02/2018	112.12	168.23	56.11	
05/29/2018	113.18	168.23	55.05	
06/27/2018	114.00	168.23	54.23	punched through debris
07/24/2018	114.23	168.23	54.00	Still has debris to punch through
08/31/2018	114.71	168.23	53.52	Took many tries
09/18/2018	114.67	168.23	53.56	Punched through debris

FO-05-Deep (Watermaster No. 132)

Southern Inland

Owner: MPWMD

Aquifer Unit: Tsm

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	322.13	479.29	157.16	
01/23/2018	318.56	479.29	160.73	
02/07/2018	318.95	479.29	160.34	
03/30/2018	318.28	479.29	161.01	
05/15/2018	320.31	479.29	158.98	

06/27/2018	322.17	479.29	157.12	
08/27/2018	323.21	479.29	156.08	Download datalogger.
09/18/2018	323.06	479.29	156.23	
10/02/2018	322.82	479.29	156.47	

FO-05-Shallow (Watermaster No. 131)

Southern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	249.46	478.97	229.51	
01/23/2018	247.46	478.97	231.51	
02/07/2018	247.10	478.97	231.87	
03/30/2018	246.83	478.97	232.14	
05/15/2018	247.90	478.97	231.07	
06/27/2018	249.78	478.97	229.19	
08/27/2018	251.02	478.97	227.95	Download datalogger.
09/18/2018	251.00	478.97	227.97	
10/02/2018	250.95	478.97	228.02	

FO-06-Deep (Watermaster No. 134)

Southern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	236.39	470.62	234.23	
01/23/2018	233.22	470.62	237.40	
03/30/2018	232.50	470.62	238.12	
06/27/2018	235.98	470.62	234.64	
09/18/2018	237.08	470.62	233.54	

FO-06-Shallow (Watermaster No. 133)

Southern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	237.98	470.13	232.15	
01/23/2018	237.03	470.13	233.10	
03/30/2018	236.73	470.13	233.40	
06/27/2018	237.96	470.13	232.17	
09/18/2018	238.77	470.13	231.36	

FO-07-Deep (Watermaster No. 119)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/25/2017	492.53	470.15	-22.38	
10/25/2017	493.18	470.15	-23.03	
12/06/2017	494.09	470.15	-23.94	
12/27/2017	493.92	470.15	-23.77	
02/06/2018	492.98	470.15	-22.83	
03/06/2018	490.77	470.15	-20.62	
03/28/2018	482.33	470.15	-12.18	
04/30/2018	487.77	470.15	-17.62	
05/14/2018	487.58	470.15	-17.43	
06/26/2018	488.76	470.15	-18.61	
07/24/2018	492.84	470.15	-22.69	
08/20/2018	494.64	470.15	-24.49	
08/29/2018	495.39	470.15	-25.24	
09/17/2018	496.16	470.15	-26.01	

10/01/2018	496.35	470.15	-26.20

FO-07-Shallow (Watermaster No. 118)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/25/2017	459.72	470.18	10.46	
10/25/2017	459.21	470.18	10.97	
12/06/2017	458.41	470.18	11.77	
12/27/2017	458.29	470.18	11.89	
02/06/2018	457.71	470.18	12.47	
03/06/2018	458.03	470.18	12.15	
03/28/2018	457.99	470.18	12.19	
04/30/2018	458.44	470.18	11.74	
05/14/2018	458.71	470.18	11.47	
06/26/2018	459.28	470.18	10.90	
07/24/2018	459.96	470.18	10.22	
08/20/2018	460.18	470.18	10.00	
08/29/2018	460.42	470.18	9.76	
09/17/2018	460.49	470.18	9.69	
10/01/2018	459.84	470.18	10.34	

FO-08-Deep (Watermaster No. 121)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/25/2017	400.57	378.1	-22.47	
12/27/2017	401.16	378.1	-23.06	
02/06/2018	400.35	378.1	-22.25	

03/07/2018	398.36	378.1	-20.26
03/28/2018	391.24	378.1	-13.14
05/02/2018	394.97	378.1	-16.87
05/14/2018	395.33	378.1	-17.23
06/26/2018	396.53	378.1	-18.43
07/24/2018	400.15	378.1	-22.05
08/20/2018	401.78	378.1	-23.68
08/30/2018	402.36	378.1	-24.26
09/17/2018	403.35	378.1	-25.25
10/01/2018	403.53	378.1	-25.43

FO-08-Shallow (Watermaster No. 120)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/25/2017	379.06	378.04	-1.02	
12/27/2017	378.82	378.04	-0.78	
02/06/2018	378.48	378.04	-0.44	
03/07/2018	378.59	378.04	-0.55	
03/28/2018	378.25	378.04	-0.21	
05/02/2018	378.17	378.04	-0.13	
05/14/2018	378.32	378.04	-0.28	
06/26/2018	379.54	378.04	-1.50	
07/24/2018	380.41	378.04	-2.37	
08/20/2018	380.91	378.04	-2.87	
08/30/2018	381.22	378.04	-3.18	
09/17/2018	381.64	378.04	-3.60	
10/01/2018	381.77	378.04	-3.73	

FO-09-Shallow (Watermaster No. 111)

Northern Coastal

Owner: MPWMD

Aquifer Unit: QTc/Tp

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/02/2017	116.69	118.89	2.20	
10/23/2017	116.67	118.89	2.22	
01/24/2018	115.96	118.89	2.93	
03/19/2018	115.71	118.89	3.18	
03/21/2018	115.51	118.89	3.38	
05/02/2018	115.77	118.89	3.12	
05/30/2018	116.89	118.89	2.00	
06/26/2018	118.38	118.89	0.51	
07/24/2018	119.31	118.89	-0.42	
08/13/2018	119.50	118.89	-0.61	Quarterly sample
09/17/2018	120.24	118.89	-1.35	
10/01/2018	120.29	118.89	-1.40	

FO-10-Deep (Watermaster No. 114)

Northern Coastal

Owner: MPWMD

Aquifer Unit: Tp

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/20/2017	213.36	201.03	-12.33	
09/25/2017	213.66	201.03	-12.63	
10/25/2017	212.88	201.03	-11.85	
12/09/2017	211.92	201.03	-10.89	
12/27/2017	212.51	201.03	-11.48	
02/12/2018	211.33	201.03	-10.30	
03/08/2018	209.70	201.03	-8.67	

03/28/2018	210.21	201.03	-9.18	
04/30/2018	210.82	201.03	-9.79	
05/29/2018	211.99	201.03	-10.96	
06/26/2018	213.01	201.03	-11.98	
07/24/2018	214.40	201.03	-13.37	
08/29/2018	214.89	201.03	-13.86	
09/05/2018	214.89	201.03	-13.86	SBWM annual Standard Panel
09/17/2018	215.03	201.03	-14.00	

FO-10-Shallow (Watermaster No. 113)

Northern Coastal

Owner: MPWMD

Aquifer Unit: QTc

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/20/2017	213.70	200.84	-12.86	
09/25/2017	214.02	200.84	-13.18	
10/25/2017	213.03	200.84	-12.19	
12/09/2017	212.04	200.84	-11.20	
12/27/2017	211.62	200.84	-10.78	
02/12/2018	211.72	200.84	-10.88	
03/08/2018	211.80	200.84	-10.96	
03/28/2018	211.23	200.84	-10.39	
04/30/2018	211.82	200.84	-10.98	
05/29/2018	213.08	200.84	-12.24	
06/26/2018	214.02	200.84	-13.18	
07/24/2018	215.09	200.84	-14.25	
08/29/2018	214.81	200.84	-13.97	
09/05/2018	215.08	200.84	-14.24	SBWM annual Standard Panel
09/17/2018	215.28	200.84	-14.44	

FO-11-Deep (Watermaster No. 123)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tp

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/25/2017	337.74	332.96	-4.78	
10/25/2017	336.90	332.96	-3.94	
12/09/2017	336.07	332.96	-3.11	
12/27/2017	336.66	332.96	-3.70	
02/08/2018	336.42	332.96	-3.46	
03/08/2018	335.60	332.96	-2.64	
03/28/2018	336.28	332.96	-3.32	
04/30/2018	336.79	332.96	-3.83	
05/29/2018	337.93	332.96	-4.97	
06/26/2018	340.19	332.96	-7.23	
07/24/2018	341.50	332.96	-8.54	
08/29/2018	342.26	332.96	-9.30	
09/17/2018	342.73	332.96	-9.77	

FO-11-Shallow (Watermaster No. 122)

Northern Inland

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/25/2017	359.88	332.93	-26.95	
10/25/2017	358.85	332.93	-25.92	
12/09/2017	357.87	332.93	-24.94	
12/27/2017	358.59	332.93	-25.66	
02/08/2018	359.86	332.93	-26.93	
03/08/2018	359.98	332.93	-27.05	

03/28/2018	358.86	332.93	-25.93
04/30/2018	359.24	332.93	-26.31
05/29/2018	360.98	332.93	-28.05
06/26/2018	362.49	332.93	-29.56
07/24/2018	363.22	332.93	-30.29
08/29/2018	363.21	332.93	-30.28
09/17/2018	363.18	332.93	-30.25

Hilby MGT (Watermaster No. 244)

Owner: California American Water

Well Type: Monitor

Southern Coastal

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	239.6	248.04	8.44	off
10/26/2017	NA	248.04		no access
11/30/2017	NA	248.04		no access
12/21/2017	NA	248.04		no access
01/25/2018	241.5	248.04	6.54	off
02/22/2018	242.0	248.04	6.04	off
03/29/2018	242.0	248.04	6.04	off
04/26/2018	242.0	248.04	6.04	off
05/31/2018	242.0	248.04	6.04	off
06/28/2018	NA	248.04		blocked
07/26/2018	241.0	248.04	7.04	off
08/30/2018	243	248.04	5.04	
09/27/2018	252	248.04	-3.96	Data Suspect from CalAm

Justin Court (Watermaster No. 135)

Southern Inland

Owner: California American Water

Aquifer Unit: QTc

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/03/2017	143.24	240.28	97.04	
01/23/2018	143.40	240.28	96.88	
03/30/2018	143.31	240.28	96.97	
06/27/2018	143.27	240.28	97.01	
09/18/2018	143.16	240.28	97.12	

K-Mart (Watermaster No. 125)

Southern Coastal

Owner: MPWMD

Aquifer Unit: Qod/Qar

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	23.30	30.65	7.35	
10/26/2017	23.29	30.65	7.36	
12/07/2017	23.41	30.65	7.24	
12/29/2017	23.31	30.65	7.34	
02/09/2018	23.01	30.65	7.64	
03/07/2018	23.03	30.65	7.62	
03/27/2018	22.97	30.65	7.68	
05/02/2018	23.47	30.65	7.18	
05/29/2018	23.25	30.65	7.40	
06/27/2018	23.27	30.65	7.38	Added 0.99' to adjust read to top c
07/24/2018	23.37	30.65	7.28	Added 0.99' to adjust read to top c
09/17/2018	23.57	30.65	7.08	Added 0.99' to adjust read to top c

LS Driving Range (Watermaster No. 141)

Southern Inland

Owner: County of Monterey

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
06/27/2018		488.34		Obstructed at ~ 270'
09/05/2018	350.28	488.34	138.06	Pulled broken pump.
09/18/2018	350.53	488.34	137.81	
10/22/2018	351.02	488.34	137.32	Deployed new pump. No water pr

LS Golf Old #12 (Watermaster No. 144)

Southern Inland

Owner: Laguna Seca Resorts

Well Type: Producer

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	226.5	368.02	141.52	
11/01/2017	220	368.02	148.02	
12/01/2017	214	368.02	154.02	
01/01/2018	209	368.02	159.02	
02/01/2018	208	368.02	160.02	
03/01/2018	206.5	368.02	161.52	
04/01/2018	229	368.02	139.02	
05/01/2018	229	368.02	139.02	
06/01/2018	226	368.02	142.02	
07/01/2018	225	368.02	143.02	
08/01/2018	222	368.02	146.02	
09/01/2018	217	368.02	151.02	

LS No. 1 Subdivision (Watermaster No. 142)

Southern Inland

Owner: Laguna Seca Resorts

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/03/2017	139.06	277.13	138.07	
01/24/2018	138.30	277.13	138.83	
03/30/2018	138.33	277.13	138.80	
06/27/2018	138.06	277.13	139.07	
09/18/2018	139.40	277.13	137.73	

LS Pistol Range (Watermaster No. 136)

Southern Inland

Owner: County of Monterey

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/27/2017	291.02	514.39	223.37	
01/23/2018	291.36	514.39	223.03	
02/07/2018	291.03	514.39	223.36	
04/02/2018	290.80	514.39	223.59	
05/15/2018	290.89	514.39	223.50	
06/27/2018	291.02	514.39	223.37	
09/18/2018	291.75	514.39	222.64	
10/02/2018	291.71	514.39	222.68	

LSRA #2 (Watermaster No. 196)

Southern Inland

Owner: Monterey County Parks Department

Well Type: Producer

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	179	390.9	211.90	

11/01/2017	177	390.9	213.90
12/01/2017	176	390.9	214.90
01/01/2018	175	390.9	215.90
02/01/2018	178	390.9	212.90
03/01/2018	177	390.9	213.90
04/01/2018	175	390.9	215.90
05/01/2018	181	390.9	209.90
06/01/2018	179	390.9	211.90
07/01/2018	200	390.9	190.90
08/01/2018	195	390.9	195.90
09/01/2018	180	390.9	210.90

Luxton (Watermaster No. 243)

Northern Coastal

Owner: California American Water

Aquifer Unit: QTc

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	94.3	89.12	-5.18	off
10/26/2017	95.0	89.12	-5.88	off
11/30/2017	94.9	89.12	-5.78	off
12/21/2017	95.0	89.12	-5.88	off
01/25/2018	95.0	89.12	-5.88	off
02/22/2018	95.0	89.12	-5.88	off
03/29/2018	94.0	89.12	-4.88	off
04/26/2018	93.0	89.12	-3.88	off
05/31/2018	93.0	89.12	-3.88	off
06/28/2018	93.0	89.12	-3.88	off
07/26/2018	93.0	89.12	-3.88	off
08/30/2018	93	89.12	-3.88	off
09/27/2018	96.5	89.12	-7.38	off

Luzern #2 (Watermaster No. 159)

Northern Coastal

Owner: California American Water

Aquifer Unit: QTc/Tsm

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	195	156.99	-38.01	on
10/26/2017	195.0	156.99	-38.01	on
11/30/2017	184.5	156.99	-27.51	off
12/21/2017	179.1	156.99	-22.11	off
01/25/2018	NA	156.99		rehab
02/22/2018	NA	156.99		blocked
03/29/2018	179.0	156.99	-22.01	off
04/26/2018	176.0	156.99	-19.01	off
05/31/2018	175.0	156.99	-18.01	off
06/28/2018	176.0	156.99	-19.01	off
07/26/2018	175.0	156.99	-18.01	off
08/30/2018	189	156.99	-32.01	on
09/27/2018	195	156.99	-38.01	on

Military (Watermaster No. 151)

Northern Coastal

Owner: California American Water

Aquifer Unit: QTc

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	160.2	135.8	-24.40	off
10/26/2017	161.0	135.8	-25.20	off
11/30/2017	NA	135.8		NA
12/21/2017	160.1	135.8	-24.30	off
01/25/2018	159.9	135.8	-24.10	off
02/22/2018	161.0	135.8	-25.20	off

03/29/2018	154.0	135.8	-18.20	off
04/26/2018	152.0	135.8	-16.20	off
05/31/2018	155.0	135.8	-19.20	off
06/28/2018	154.0	135.8	-18.20	off
07/26/2018	157.0	135.8	-21.20	off
08/30/2018	161	135.8	-25.20	off
09/27/2018	165	135.8	-29.20	off

MMP monitor (Watermaster No. 154)

Northern Coastal

Owner: Mission Memorial Park

Aquifer Unit: QTc

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	341.06	315.42	-25.64	on
10/27/2017	346.14	315.42	-30.72	on
11/29/2017	346.26	315.42	-30.84	off
12/28/2017	346.52	315.42	-31.10	off
02/08/2018	344.50	315.42	-29.08	on
03/07/2018	340.62	315.42	-25.20	off
03/29/2018	337.60	315.42	-22.18	off
04/30/2018	331.51	315.42	-16.09	off
05/29/2018	334.71	315.42	-19.29	on
06/26/2018	337.00	315.42	-21.58	on
07/24/2018	343.93	315.42	-28.51	off
08/30/2018	344.79	315.42	-29.37	off
09/17/2018	350.29	315.42	-34.87	on

MSC - Shallow (Watermaster No. 101)

Northern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	76.91	80.1	3.19	
10/26/2017	76.88	80.1	3.22	
11/29/2017	77.53	80.1	2.57	
12/28/2017	77.99	80.1	2.11	
01/24/2018	76.66	80.1	3.44	
03/07/2018	76.60	80.1	3.50	
03/19/2018	75.81	80.1	4.29	
05/01/2018	75.96	80.1	4.14	
05/30/2018	76.66	80.1	3.44	
06/26/2018	77.60	80.1	2.50	
07/24/2018	78.35	80.1	1.75	
08/13/2018	78.04	80.1	2.06	Quarterly sample
08/30/2018	79.66	80.1	0.44	
09/17/2018	79.18	80.1	0.92	
10/01/2018	78.49	80.1	1.61	

MSC-Deep (Watermaster No. 102)

Northern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	99.2	80.29	-18.91	
10/26/2017	99.58	80.29	-19.29	
11/29/2017	100.58	80.29	-20.29	
12/28/2017	100.97	80.29	-20.68	

01/24/2018	99.60	80.29	-19.31	
03/07/2018	98.88	80.29	-18.59	
03/19/2018	94.84	80.29	-14.55	
05/01/2018	93.32	80.29	-13.03	
05/30/2018	94.69	80.29	-14.40	
06/26/2018	95.78	80.29	-15.49	
07/24/2018	98.62	80.29	-18.33	
08/13/2018	99.28	80.29	-18.99	Quarterly sample
08/30/2018	102.00	80.29	-21.71	
09/17/2018	102.19	80.29	-21.90	
10/01/2018	101.40	80.29	-21.11	

MW-BW-08-A (Watermaster No. 240)

Southern Coastal

Owner: U.S.A. Fort Ord

Aquifer Unit: Qod/Qar

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/02/2017	59.79	205.18	145.39	
12/07/2017	60.07	205.18	145.11	
12/28/2017	59.98	205.18	145.20	
02/08/2018	60.01	205.18	145.17	
03/08/2018	60.80	205.18	144.38	
03/27/2018	60.10	205.18	145.08	
05/01/2018	59.86	205.18	145.32	
05/30/2018	59.99	205.18	145.19	
06/27/2018	60.12	205.18	145.06	
07/24/2018	60.19	205.18	144.99	
08/30/2018	60.29	205.18	144.89	
09/17/2018	60.33	205.18	144.85	

MW-BW-09-180 (Watermaster No. 241)

Southern Coastal

Owner: U.S.A. Fort Ord

Aquifer Unit: QTc

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/02/2017	211.23	206.22	-5.01	
12/07/2017	211.49	206.22	-5.27	
12/28/2017	211.27	206.22	-5.05	
02/08/2018	211.16	206.22	-4.94	
03/08/2018	211.17	206.22	-4.95	
03/27/2018	211.32	206.22	-5.10	
05/01/2018	211.06	206.22	-4.84	
05/30/2018	211.18	206.22	-4.96	
06/27/2018	211.29	206.22	-5.07	
07/24/2018	211.34	206.22	-5.12	
08/30/2018	211.45	206.22	-5.23	
09/17/2018	211.37	206.22	-5.15	

Ord Grove #2 (Watermaster No. 153)

Northern Coastal

Owner: California American Water

Aquifer Unit: QTc/Tsm

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	370	232.39	-137.61	on
10/26/2017	370.0	232.39	-137.61	on
11/30/2017	370.3	232.39	-137.91	on
12/21/2017	362.1	232.39	-129.71	on
01/25/2018	360.0	232.39	-127.61	on
02/22/2018	368.0	232.39	-135.61	on
03/29/2018	364.0	232.39	-131.61	on

04/26/2018	315.0	232.39	-82.61	off
05/31/2018	384.0	232.39	-151.61	on
06/28/2018	373.0	232.39	-140.61	off
07/26/2018	388.0	232.39	-155.61	on
08/30/2018	376	232.39	-143.61	on
09/27/2018	382	232.39	-149.61	on

Ord Grove Test (Watermaster No. 107)

Northern Coastal

Owner: California American Water

Aquifer Unit: QTc/Tsm

Well Type: Monitor

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	341.42	294.00	-47.42	on
10/27/2017	343.29	294.00	-49.29	
11/29/2017	343.76	294.00	-49.76	on
12/28/2017	344.27	294.00	-50.27	on
02/06/2018	344.08	294.00	-50.08	
03/07/2018	343.97	294.00	-49.97	on
03/29/2018	340.53	294.00	-46.53	on
04/30/2018	322.15	294.00	-28.15	off
05/14/2018	320.73	294.00	-26.73	
06/26/2018	339.62	294.00	-45.62	on
07/24/2018	341.38	294.00	-47.38	on
08/21/2018	342.88	294.00	-48.88	on
08/30/2018	343.33	294.00	-49.33	on
09/17/2018	344.15	294.00	-50.15	on. 2" pipe unscrewed and leaning
10/02/2018	344.05	294.00	-50.05	on. Screwed it back on again.

Ord Terrace-Shallow (Watermaster No. 109)

Northern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm (upper)

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/20/2017	261.32	228.68	-32.64	
09/26/2017	261.19	228.68	-32.51	
10/27/2017	263.17	228.68	-34.49	
11/29/2017	263.88	228.68	-35.20	
12/28/2017	264.02	228.68	-35.34	
02/06/2018	263.93	228.68	-35.25	
03/07/2018	263.32	228.68	-34.64	
03/29/2018	259.61	228.68	-30.93	
04/30/2018	255.72	228.68	-27.04	
05/14/2018	254.26	228.68	-25.58	
06/26/2018	258.98	228.68	-30.30	
07/24/2018	261.23	228.68	-32.55	
08/21/2018	262.98	228.68	-34.30	
08/30/2018	263.50	228.68	-34.82	
09/05/2018	263.98	228.68	-35.30	SBWM annual Standard Panel
09/17/2018	264.65	228.68	-35.97	
10/02/2018	265.08	228.68	-36.40	

Paralta (Watermaster No. 169)

Northern Coastal

Owner: California American Water

Well Type: Producer

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	304.0	324.49	20.49	on
10/26/2017	367.0	324.49	-42.51	on

11/30/2017	367.2	324.49	-42.71	on
12/21/2017	363.5	324.49	-39.01	on
01/25/2018	349.4	324.49	-24.91	off
02/22/2018	370.0	324.49	-45.51	on
03/29/2018	322.0	324.49	2.49	off
04/26/2018	329.0	324.49	-4.51	off
05/31/2018	338.0	324.49	-13.51	off
06/28/2018	336.0	324.49	-11.51	off
07/26/2018	347.0	324.49	-22.51	off
08/30/2018	351	324.29	-26.71	off
09/27/2018	356	324.29	-31.71	off

Paralta Test Well (Watermaster No. 108)

Northern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	340.21	330.72	-9.49	
10/26/2017	347.39	330.72	-16.67	on
12/07/2017	346.81	330.72	-16.09	on
12/28/2017	346.70	330.72	-15.98	on
02/07/2018	345.22	330.72	-14.50	
03/07/2018	338.65	330.72	-7.93	on
03/29/2018	326.52	330.72	4.20	off
04/30/2018	335.22	330.72	-4.50	off
05/15/2018	336.64	330.72	-5.92	
06/26/2018	338.36	330.72	-7.64	off
07/24/2018	343.13	330.72	-12.41	off
08/21/2018	345.44	330.72	-14.72	off
09/17/2018	346.14	330.72	-15.42	off

10/02/2018	345.80	330.72	-15.08	off

Pasadera Golf - Main Gate (Watermaster No. 208)

Southern Inland

Owner: Pasadera Country Club, LLC

Well Type: Producer

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	226.5	345.42	118.92	
10/01/2017	226.5	345.42	118.92	
11/01/2017	220	345.42	125.42	
12/01/2017	214	345.42	131.42	
01/01/2018	209	345.42	136.42	
02/01/2018	208	345.42	137.42	
03/01/2018	206.5	345.42	138.92	
04/01/2018	229	345.42	116.42	
05/01/2018	229	345.42	116.42	
06/01/2018	226	345.42	119.42	
07/01/2018	225	345.42	120.42	
08/01/2018	222	345.42	123.42	
09/01/2018	217	345.42	128.42	

Pasadera Golf - Paddock (Watermaster No. 204)

Southern Inland

Owner: Pasadera Country Club, LLC

Well Type: Producer

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
02/15/2018	215.17	359.69	144.52	Installed datalogger
05/15/2018	226.27	359.69	133.42	Download datalogger
08/21/2018	233.74	359.69	125.95	Download datalogger, well on.

PCA Production (Watermaster No. 171)

Northern Coastal

Owner: Security National Guaranty Inc

Aquifer Unit: QTc

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	67.6	72.63	5.03	
11/01/2017	67.65	72.63	4.98	
12/01/2017	67.6	72.63	5.03	
01/01/2018	67	72.63	5.63	
02/01/2018	68.6	72.63	4.03	
03/01/2018	67.96	72.63	4.67	
04/01/2018	68.3	72.63	4.33	
05/01/2018	68	72.63	4.63	
06/01/2018	69	72.63	3.63	
07/01/2018	69.2	72.63	3.43	
08/01/2018	69	72.63	3.63	
09/01/2018	68.5	72.63	4.13	

Playa #3 (Watermaster No. 162)

Northern Coastal

Owner: California American Water

Aquifer Unit: QTc

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	NA	53.02		No Reading
09/30/2017	52	53.02	1.02	off
10/26/2017	50.5	53.02	2.52	off
11/30/2017	50.4	53.02	2.62	off
12/21/2017	58.2	53.02	-5.18	off
01/25/2018	49.9	53.02	3.12	off
02/22/2018	49.0	53.02	4.02	off

03/29/2018	50.0	53.02	3.02	off
04/26/2018	50.0	53.02	3.02	off
05/31/2018	50.0	53.02	3.02	off
06/28/2018	50.0	53.02	3.02	off
07/26/2018	119.0	53.02	-65.98	on
08/30/2018	110	53.02	-56.98	on
09/27/2018	52	53.02	1.02	off

Plumas #4 (Watermaster No. 177) — **Southern Coastal**

Owner: California American Water

Aquifer Unit: Tsm

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	254.8	161.48	-93.32	on
10/26/2017	254.0	161.48	-92.52	on
11/30/2017	254.4	161.48	-92.92	on
12/21/2017	249.0	161.48	-87.52	on
01/25/2018	117.5	161.48	43.98	off
02/22/2018	115.0	161.48	46.48	off
03/29/2018	113.0	161.48	48.48	off
04/26/2018	113.0	161.48	48.48	off
05/31/2018	237.0	161.48	-75.52	on
06/28/2018	247.0	161.48	-85.52	off
07/26/2018	253.0	161.48	-91.52	on
08/30/2018	254	161.48	-92.52	on
09/27/2018	118	161.48	43.48	off

Plumas Test 1990 (Watermaster No. 124)

Southern Coastal

Owner: MPWMD

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	108.00	157.83	49.83	
10/27/2017	107.95	157.83	49.88	on
12/07/2017	108.43	157.83	49.40	on
12/28/2017	108.80	157.83	49.03	on
02/08/2018	108.88	157.83	48.95	off
03/08/2018	107.58	157.83	50.25	off
03/27/2018	108.01	157.83	49.82	off
05/01/2018	107.28	157.83	50.55	off
05/29/2018	107.77	157.83	50.06	on
06/26/2018	108.48	157.83	49.35	on
07/24/2018	108.93	157.83	48.90	on, DDW wants cap on sounding t
08/08/2018	109.04	157.83	48.79	on, Initial DTW prior to working on
08/08/2018	108.98	157.78	48.80	on, New RP after working on way
08/30/2018	112.40	157.83	45.43	
09/17/2018	109.47	157.83	48.36	on

Robley Deep (South) (Watermaster No. 140)

Southern Inland

Owner: County of Monterey

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	398.71	566.44	167.73	
01/23/2018	394.72	566.44	171.72	
03/30/2018	394.06	566.44	172.38	
06/27/2018	398.90	566.44	167.54	

09/18/2018	399.62	566.44	166.82

Robley Shallow (North) (Watermaster No. 139)

Southern Inland

Owner: County of Monterey

Well Type: Monitor

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	319.12	566.54	247.42	
01/23/2018	322.42	566.54	244.12	
03/30/2018	320.33	566.54	246.21	
06/27/2018	322.19	566.54	244.35	
09/18/2018	324.03	566.54	242.51	

Ryan Ranch #11 (Watermaster No. 215)

Southern Inland

Owner: California American Water

Well Type: Producer

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	198	307.59	109.59	off
10/26/2017	187.0	307.59	120.59	off
11/30/2017	192.0	307.59	115.59	off
12/28/2017	195.0	307.59	112.59	off
01/25/2018	193.0	307.59	114.59	off
02/22/2018	184.4	307.59	123.19	off
03/29/2018	179.0	307.59	128.59	off
04/26/2018	177.0	307.59	130.59	off
05/31/2018	176.4	307.59	131.19	off
06/28/2018	176.0	307.59	131.59	off
07/26/2018	173.8	307.59	133.79	off
08/30/2018	174	307.59	133.59	off
09/27/2018	173.7	307.59	133.89	off

Ryan Ranch #7 (Watermaster No. 213)

Southern Inland

Owner: California American Water

Well Type: Producer

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	400	294	-106.00	on
10/26/2017	265.0	294	29.00	off
11/30/2017	256.0	294	38.00	off
12/28/2017	390.0	294	-96.00	on
01/25/2018	270.0	294	24.00	off
02/22/2018	161.0	294	133.00	off
03/29/2018	167.6	294	126.40	off
04/26/2018	165.4	294	128.60	off
05/31/2018	163.6	294	130.40	off
06/28/2018	162.6	294	131.40	off
07/26/2018	162.2	294	131.80	off
08/30/2018	161.2	294	132.80	off
09/27/2018	164.6	294	129.40	off

Ryan Ranch #8 (Watermaster No. 216)

Southern Inland

Owner: California American Water

Well Type: Producer

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	200	306.86	106.86	off
10/26/2017	189.0	306.86	117.86	off
11/30/2017	195.0	306.86	111.86	off
12/28/2017	197.0	306.86	109.86	off
01/25/2018	195.0	306.86	111.86	off
02/22/2018	185.0	306.86	121.86	off

03/29/2018	179.7	306.86	127.16	off
04/26/2018	178.0	306.86	128.86	off
05/31/2018	176.7	306.86	130.16	off
06/28/2018	176.1	306.86	130.76	off
07/26/2018	175.1	306.86	131.76	off
08/30/2018	147.4	306.86	159.46	off
09/27/2018	169.4	306.86	137.46	off

Sand City Corp Yard (Watermaster No. 165)

Southern Coastal

Owner: City of Sand City

Well Type: Producer

.quifer Unit: Qod/Qar/QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	42.49	47.25	4.76	339 us/cm
10/26/2017	41.63	47.25	5.62	1090 us/cm
11/29/2017	41.91	47.25	5.34	560 us/cm
12/28/2017	42.49	47.25	4.76	1391 us/cm
02/08/2018	41.90	47.25	5.35	1666 us/cm
03/07/2018	41.60	47.25	5.65	1002 us/cm
03/27/2018	41.50	47.25	5.75	1255 us/cm
05/01/2018	41.95	47.25	5.30	980 us/cm, off
05/29/2018	42.33	47.25	4.92	1047 us/cm
06/26/2018	42.26	47.25	4.99	1310 us/cm
07/24/2018	42.18	47.25	5.07	1260us/cm, off
09/04/2018	42.87	47.25	4.38	1404 us/cm
09/17/2018	42.32	47.25	4.93	1670 us/cm, off

Seaside Golf - Coe (Watermaster No. 189)

Northern Coastal

Owner: City of Seaside

Well Type: Producer

Aquifer Unit: QTc

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	106.5	110.15	3.65	
11/01/2017	106.77	110.15	3.38	
12/01/2017	105.94	110.15	4.21	
01/01/2018	104.93	110.15	5.22	
02/01/2018	104.87	110.15	5.28	
03/01/2018	104.91	110.15	5.24	
04/01/2018	104.58	110.15	5.57	
05/01/2018	110.86	110.15	-0.71	
06/01/2018	107.35	110.15	2.80	
07/01/2018	109.14	110.15	1.01	
08/01/2018	109.36	110.15	0.79	
09/01/2018	112.21	110.15	-2.06	

Seaside Golf - Reservoir (Watermaster No. 187)

Northern Coastal

Owner: City of Seaside

Well Type: Producer

Aquifer Unit: Qc, Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	431	417.44	-13.56	
11/01/2017	407.92	417.44	9.52	
12/01/2017	405.36	417.44	12.08	
01/01/2018	403.36	417.44	14.08	
02/01/2018	404.31	417.44	13.13	
03/01/2018	403.96	417.44	13.48	
04/01/2018	406.2	417.44	11.24	

05/01/2018	411.33	417.44	6.11
06/01/2018	412.5	417.44	4.94
07/01/2018	414.13	417.44	3.31
08/01/2018	415.51	417.44	1.93
09/01/2018	411.61	417.44	5.83

Seaside Muni #3 (Watermaster No. 174)

Northern Coastal

Owner: City of Seaside

Well Type: Producer

Aquifer Unit: QTc, Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	269.98	307.19	37.21	
11/01/2017	270.48	307.19	36.71	
12/01/2017	210.16	307.19	97.03	
01/01/2018	270.43	307.19	36.76	
02/01/2018	269.92	307.19	37.27	
03/01/2018	269.79	307.19	37.40	
04/01/2018	269.44	307.19	37.75	
05/01/2018	269.48	307.19	37.71	
06/01/2018	270.98	307.19	36.21	
07/01/2018	270.89	307.19	36.30	
08/01/2018	269.84	307.19	37.35	
09/01/2018	269.52	307.19	37.67	

Seaside Muni #4 (Watermaster No. 173)

Northern Coastal

Owner: City of Seaside

Well Type: Producer

Aquifer Unit: QTc, Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
10/01/2017	338.4	312.12	-26.28	
11/01/2017	338.7	312.12	-26.58	

12/01/2017	339.1	312.12	-26.98
01/01/2018	339.2	312.12	-27.08
02/01/2018	339.5	312.12	-27.38
03/01/2018	338.2	312.12	-26.08
04/01/2018	336.4	312.12	-24.28
05/01/2018	337.1	312.12	-24.98
06/01/2018	338	312.12	-25.88
07/01/2018	338.3	312.12	-26.18
08/01/2018	339	312.12	-26.88
09/01/2018	339.7	312.12	-27.58

Seca Place (Watermaster No. 138)

Southern Inland

Owner: County of Monterey

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	261.13	427.59	166.46	
01/23/2018	265.98	427.59	161.61	
03/30/2018	264.82	427.59	162.77	
06/27/2018	270.33	427.59	157.26	
09/18/2018	272.09	427.59	155.50	

Target Well (Watermaster No. 152)

Northern Coastal

Owner: DBO Development

Well Type: Producer

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/26/2017	60.38	44.42	-15.96	
12/07/2017	60.80	44.42	-16.38	
12/28/2017	61.44	44.42	-17.02	
02/08/2018	61.68	44.42	-17.26	

03/07/2018	61.40	44.42	-16.98
03/27/2018	58.00	44.42	-13.58
05/03/2018	56.77	44.42	-12.35
05/29/2018	57.66	44.42	-13.24
06/26/2018	58.58	44.42	-14.16
07/24/2018	61.21	44.42	-16.79
08/30/2018	61.60	44.42	-17.18
09/17/2018	64.39	44.42	-19.97

Toro #3 (Watermaster No. 303)

Southern Inland

Owner: Cal-Am

Aquifer Unit: QTc

Well Type: Producer

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/28/2017	207	499	292.00	off
10/26/2017	208	499	291.00	off
11/30/2017	206	499	293.00	off
12/28/2017	207	499	292.00	off
01/25/2018	207	499	292.00	off
02/22/2018	209.4	499	289.60	off
03/29/2018	209.4	499	289.60	off
04/26/2018	207.5	499	291.50	off
05/31/2018	209.4	499	289.60	off
06/28/2018	209.5	499	289.50	off
07/26/2018	211.0	499	288.00	off
08/27/2018	211.6	499	287.40	
09/25/2018	211.9	499	287.10	

York Rd-West (Watermaster No. 137)

Southern Inland

Owner: County of Monterey

Well Type: Monitor

Aquifer Unit: Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/27/2017	321.72	490.28	168.56	
01/23/2018	320.90	490.28	169.38	
02/07/2018	320.63	490.28	169.65	
03/30/2018	320.09	490.28	170.19	
05/15/2018	320.10	490.28	170.18	Download datalogger
06/27/2018	320.49	490.28	169.79	
08/27/2018	322.58	490.28	167.70	Download datalogger.
09/18/2018	322.42	490.28	167.86	
10/02/2018	322.40	490.28	167.88	

York School 2001 (Watermaster No. 212)

Southern Inland

Owner: York School

Well Type: Producer

Aquifer Unit: QTc/Tsm

All Values in Feet

Date Measured	Depth To Water	Ref Point	Water Elevation	Comments
09/27/2017	270.87	384.3	113.43	on
10/25/2017	271.91	384.3	112.39	on
11/27/2017	220.77	384.3	163.53	off
12/29/2017	219.80	384.3	164.50	off
02/12/2018	220.30	384.3	164.00	off
03/27/2018	219.72	384.3	164.58	off
05/01/2018	222.65	384.3	161.65	off
05/30/2018	236.12	384.3	148.18	off
06/27/2018	224.83	384.3	159.47	off
07/24/2018	277.83	384.3	106.47	on

Seaside Basin Monitoring Water Quality Data for WY 2018

<0.1 = Not detected above detection limit of 0.1 mg/L all values in mg/L unless otherwise noted

Cypress Pacific Production — WM No. 150

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180905_16-02	9/5/18	94	112	31	5.8	287	92	0.1	189	<0.1	1.09	0.067	<0.1	0.15	0.5	7.4	720	1180
171026_21-01	10/26/17	48	86	25	<1	200	56	0.1	135	< 0.1	0.325	0.045	<0.1	< 0.05	0.3	7.4	506	850

Del Monte Test — WM No. 231

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
calam	9/13/18	23	48	8.2	3.1	120	14	0.17	54	<0.44	3.9	0.083	<0.06	<0.046	0.19		240	390

FO-09-Deep — WM No. 112

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180813_16-01	8/13/18	26	57	4	3.7	122	4	0.1	71	0.0	0.517	0.006	<0.1	0.07	0.2	6.1	223	433
180502_41-01	5/2/18	27	55	4	3.8	120	2	<0.1	70	<0.1	0.39	<0.01	<0.1	0.07	0.2	6.0	289	426
180319_34-01	3/19/18	29	64	4	4.8	98	<1	<0.1	71	<0.1	0.998	<0.01	<0.1	0.07	0.5	6.2	294	415
180124_43-01	1/24/18	27	56	4	4.61	106	1	0.0	72	< 0.1	0.657	0.012	0.14	0.10	0.2	6.3	271	416
171023_17-01	10/23/17	27	52	4	3.9	121	1	0.1	71	<0.1	0.827	0.015	0.05	0.08	0.3	6.2	260	425

FO-09-Shallow — WM No. 111

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180813_16-02	8/13/18	24	33	5	3.6	82	16	<0.1	58	0.2	0.336	<0.01	<0.1	0.04	0.1	6.5	240	348
180502_41-02	5/2/18	26	36	5	3.8	79	14	<0.1	52	0.1	0.307	<0.01	<0.1	0.05	0.1	6.7	246	331
180319_34-02	3/19/18	25	35	5	4.0	80	14	<0.1	54	0.1	0.146	<0.01	<0.1	<0.05	0.1	6.8	223	324

<0.1 = Not detected above detection limit of 0.1 mg/L — all values in mg/L unless otherwise noted

SPL Id.	Date	Ca+	Na+	Mg+	K+	HCO3-	SO4-	F-	Cl-	NO3-	Fe2+	Mn2+	HPO4-	B	Br-	pH	TDS	EC (us/cm)
180124_43-02	1/24/18	26	39	6	4.31	80	14	0.1	53	0.1	0.17	0.013	<0.1	0.06	0.1	6.6	231	330
171023_17-02	10/23/17	25	35	5	3.8	82	13	0.1	53	< 0.1	0.03	<0.01	<0.1	< 0.05	0.1	6.5	234	336

FO-10-Deep — WM No. 114

SPL Id.	Date	Ca+	Na+	Mg+	K+	HCO3-	SO4-	F-	Cl-	NO3-	Fe2+	Mn2+	HPO4-	B	Br-	pH	TDS	EC (us/cm)
		Major Cations				Major Anions					Minor Ions					Physical		
180905_20-01	9/5/18	22	41	4	3.6	83	17	0.2	54	0.1	0.399	0.021	0.4	0.05	0.1	7.9	254	325

FO-10-Shallow — WM No. 113

SPL Id.	Date	Ca+	Na+	Mg+	K+	HCO3-	SO4-	F-	Cl-	NO3-	Fe2+	Mn2+	HPO4-	B	Br-	pH	TDS	EC (us/cm)
		Major Cations				Major Anions					Minor Ions					Physical		
180905_20-02	9/5/18	18	41	2	2.6	66	13	<0.1	44	0.5	0.921	0.021	<0.1	0.04	0.1	8.2	217	260

LS Golf New #12 — WM No. 203

SPL Id.	Date	Ca+	Na+	Mg+	K+	HCO3-	SO4-	F-	Cl-	NO3-	Fe2+	Mn2+	HPO4-	B	Br-	pH	TDS	EC (us/cm)
		Major Cations				Major Anions					Minor Ions					Physical		
180904_13-03	9/4/18	146	141	35	5.8	299	202	0.5	244	0.2	0.344	0.043	0.1	0.12	0.6	7.0	1020	1562

LSRA #1 — WM No. 197

SPL Id.	Date	Ca+	Na+	Mg+	K+	HCO3-	SO4-	F-	Cl-	NO3-	Fe2+	Mn2+	HPO4-	B	Br-	pH	TDS	EC (us/cm)
		Major Cations				Major Anions					Minor Ions					Physical		
AC16198	9/6/18	17	106	12	2.6	91.9	19	0.17	143	4.9	<0.030	19	0.99	64	0.12	6.1	425	690
180904_13-01	9/4/18	24	111	15	3.0	112	19	0.2	146	1.1	0.523	0.013	0.9	0.10	0.4	6.6	429	690

Luzern #2 — WM No. 159

SPL Id.	Date	Ca+	Na+	Mg+	K+	HCO3-	SO4-	F-	Cl-	NO3-	Fe2+	Mn2+	HPO4-	B	Br-	pH	TDS	EC (us/cm)
		Major Cations				Major Anions					Minor Ions					Physical		
calam	9/6/18	69	99	19	4.7	200	90	0.26	160	2.9	0.039	0.017	<0.06	0.16	0.62		600	990

<0.1 = Not detected above detection limit of 0.1 mg/L all values in mg/L unless otherwise noted

Mission Memorial — WM No. 156

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180905_16-01	9/5/18	41	72	12	3.6	137	45	0.1	91	2.9	0.007	<0.01	0.1	0.03	0.2	7.3	383	620

MSC - Shallow — WM No. 101

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180813_16-06	8/13/18	18	34	5	2.9	80	15	0.1	46	0.2	0.036	<0.01	<0.1	0.03	0.1	7.1	214	308
180501_33-02	5/1/18	19	35	5	2.8	80	14	0.1	45	0.2	0.025	<0.01	<0.1	<0.05	0.1	7.1	217	306
180319_34-04	3/19/18	18	33	5	3.1	80	14	0.1	46	0.2	<0.01	<0.01	<0.1	<0.05	0.1	7.1	211	290
180124_43-04	1/24/18	19	34	5	2.8	84	14	0.1	46	0.3	0.029	< 10	<0.1	< 0.05	0.1	6.8	203	307
171023_17-04	10/23/17	20	35	5	3.1	79	14	0.2	45	<0.1	0.018	<0.01	<0.1	<0.05	0.1	7.1		314

MSC-Deep — WM No. 102

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180813_16-05	8/13/18	57	106	15	4.8	281	15	0.3	153	<0.1	5.32	0.109	<0.1	0.11	0.4	7.4	529	889
180501_33-01	5/1/18	71	117	17	5.0	290	28	0.3	150	<0.1	7.08	0.111	<0.1	0.12	0.5	7.4	571	957
180319_34-03	3/19/18	64	112	16	5.2	283	23	0.3	152	<0.1	4.89	0.113	<0.1	0.12	0.4	7.3	560	928
180124_43-03	1/24/18	58	113	16	5.03	279	19	0.3	151	< 0.1	5.49	0.13	<0.1	0.12	0.4	7.4	540	928
171023_17-03	10/23/17	65	110	17	5.2	288	32	0.4	155			0.111		0.12	0.4	7.3	560	

Ord Grove #2 — WM No. 153

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
calam	9/6/18	60	87	17	4.4	210	61	0.17	120	7.6	<0.014	0.017	<0.06	0.12	0.44		510	850
180710_08-01	7/10/18	66	95	18	4.5	176	65	0.1	128	2.0	<0.01	0.017	<0.1	0.16	0.4	7.1	520	863

<0.1 = Not detected above detection limit of 0.1 mg/L all values in mg/L unless otherwise noted

Ord Terrace-Shallow — WM No. 109

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180905_20-04	9/5/18	72	83	16	4.6	251	38	<0.1	105	1.1	0.064	0.012	<0.1	0.08	0.3	7.4	474	760

Pasadera Golf - Paddock — WM No. 204

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180904_13-02	9/4/18	135	121	33	5.2	304	194	0.6	192	0.6	1.77	0.042	0.1	0.11	0.5	6.9	897	1399

PCA East Deep — WM No. 106

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180703_14-01	7/3/18	57	101	12	4.2	199	42	0.3	116	0.7	0.04	0.157	<0.1	0.11	0.3	7.4	509	797

PCA-E Shallow — WM No. 105

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180905_20-03	9/5/18	18	42	5	2.5	80	9	<0.1	50	0.5	0.194	<0.01	0.0	0.03	0.1	7.7	211	288

PCA-W Deep — WM No. 104

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180813_16-03	8/13/18	81	111	17	5.1	386	42	<0.1	159	<0.1	25.9	0.286	<0.1	0.11	0.4	6.2	660	1109
180501_33-03	5/1/18	87	109	18	5.2	381	41	0.2	156	<0.1	26.1	0.288	<0.1	0.12	0.5	6.1	686	1106
180319_34-05	3/19/18	86	114	18	5.4	372	41	0.3	159	<0.1	23.6	0.282	<0.1	0.13	0.4	6.1	683	1129
180207_51-01	2/7/18	88	124	18	5.61	381	41	0.3	159	<0.1	21.2	0.288	<0.1	0.14	0.3	6.2	668	1110
171023_17-05	10/23/17	90	116	20	5.6	355	41	0.3	159	<0.1	20.4	0.27	<0.1	0.15	0.3	6.3	640	1115

<0.1 = Not detected above detection limit of 0.1 mg/L all values in mg/L unless otherwise noted

PCA-W Shallow — WM No. 103

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180813_16-04	8/13/18	20	35	5	2.6	84	11	<0.1	48	0.7	0.776	0.004	<0.1	0.03	0.1	6.8	206	315
180501_33-04	5/1/18	21	37	5	2.3	84	11	<0.1	47	0.6	0.339	<0.01	<0.1	<0.05	0.1	6.6	211	321
180319_34-06	3/19/18	20	35	5	2.4	83	11	0.1	47	0.7	0.352	<0.01	<0.1	<0.05	0.1	6.8	211	321
180124_43-05	1/24/18	22	38	6	2.8	84	11	0.1	47	0.7	1.77	0.012	<0.1	< 0.05	0.1	6.9	214	314
171023_17-06	10/23/17	22	38	6	2.8	85	11	0.1	47	0.6	2.08	< 0.10	<0.1	<0.05	0.1	6.9	200	324

Playa #3 — WM No. 162

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
calam	9/13/18	56	93	16	4.3	150	91	0.13	120	5.7	<0.014	0.014	<0.06	0.12	0.63		490	810

Plumas #4 — WM No. 177

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
calam	9/13/18	53	130	23	4.4	160	81	0.19	200	9.1	<0.014	<0.0045	<0.06	<0.046	0.45		580	1000

Ryan Ranch #7 — WM No. 213

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
calam	9/6/18	100	140	29	6.4	280	180	0.59	210	<0.44	1.2	0.21	0.26	0.16	0.77		860	1400

Sand City Corp Yard — WM No. 165

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180904_13-06	9/4/18	30	271	6	5.0	165	155	4.1	276	5.7	<0.01	0.032	<0.1	1.22	0.8	7.5	900	1529

<0.1 = Not detected above detection limit of 0.1 mg/L all values in mg/L unless otherwise noted

York School 2001 **WM No. 212**

		Major Cations				Major Anions					Minor Ions					Physical		
SPL Id.	Date	Ca^{+}	Na^{+}	Mg^{+}	K^{+}	HCO_3^{-}	SO_4^{-}	F^{-}	Cl^{-}	NO_3^{-}	Fe^{2+}	Mn^{2+}	HPO_4^{-}	B	Br^{-}	pH	TDS	EC (us/cm)
180904_13-04	9/4/18	36	156	29	4.4	73	34	0.2	331	1.3	<0.01	<0.01	0.3	0.07	0.9	6.6	783	1252

ATTACHMENT 8

EXECUTIVE SUMMARY
FROM THE
WY 2018 SEAWATER INTRUSION ANALYSIS REPORT

1 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.

Seawater intrusion may occur in 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 fresh water 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 Seaside Groundwater 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 looking at various analyses we can ascertain 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 fresh water 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.

Based on an evaluation of geochemical indicators for Water Year 2018 and prior, no seawater intrusion has historically been or is currently observed in existing monitoring and production wells in the Seaside Groundwater Basin.

Data which indicate that seawater intrusion is not occurring are described in the bulleted items below:

- All groundwater samples for Water Year 2018 from depth-discreet monitoring wells plot generally in a single cluster on Piper diagrams, with no water chemistry changes towards seawater.
- Groundwater quality plot on Piper diagrams in some of the production wells is different than the water quality in the monitoring wells. This may be a result of mixed water quality from both shallow and deep zones in which these wells are

perforated. 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.

- Overall, chloride concentration trends were stable for most monitoring wells, with no increases greater than 10 mg/L.

- Sodium/chloride molar ratios in the monitoring wells remained constant or increased over the past year.

- Maps of chloride concentrations for the shallow aquifer do not show chlorides increasing towards the coast. The deep aquifer maps show that higher chloride concentrations are limited to coastal monitoring wells PCA-West Deep and MSC Deep, but these are indicative of seawater intrusion.

- Induction logging data at the coastal Sentinel Wells do not show large changes over time that are indicative of seawater intrusion.

The following groundwater level and production data suggest that conditions in the basin continue to provide a potential for seawater intrusion:

- All deep groundwater in the Northern Coastal subarea is below sea level. The 2nd quarter (winter/spring) deep aquifer coastal groundwater levels are more than 12 feet below sea level and the 4th quarter (summer/fall) levels are more than 25 feet below sea level. These are similar to the historic low levels observed in Water Year 2016 at the end of the recent drought.

- Groundwater levels remain below protective elevations in all deep target monitoring wells (MSC deep, PCA-W, and sentinel well SBWM-3). Currently, only one of the three shallow wells' groundwater levels are above protective elevations: CDM-MW4. Since 1997, PCA-W shallow groundwater levels has been above protective elevations but has just fallen below its protective elevation this fall; probably due to increased shallow aquifer production that started in 2015. As observed historically, MSC shallow groundwater levels remains below protective elevations.

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

four feet per year in the deep aquifers. These declines have occurred since 2001, despite triennial reductions in allowable pumping. The cause of the declines is due in part to the Natural Safe Yield of the subarea being too high and in part due to the influence of wells to the east of the Seaside Basin. Since 2014, however, the rate of decline is less and now appears close to stabilizing.

Native groundwater production in the Seaside Groundwater Basin for Water Year 2018 was 3,363.4 acre-feet, which is 314 acre-feet more than Water Year 2017. This amount is 3.4 acre-feet more than the Decision-ordered Operating Yield of 3,360 acre-feet per year that is required between October 1, 2017 and September 30, 2020.

Based on the findings of this report, there are no specific recommendations that relate to the collection of groundwater data from existing wells used in the seawater intrusion analysis, other than to continue analyzing and reporting on groundwater quality, groundwater levels, and production each year. However, as projects that recharge and recover water into the Basin are implemented, groundwater levels and thus groundwater flow directions will change, and possibly groundwater quality too. It is important that data from new monitoring wells are reported to the Watermaster and taken into consideration in future SIARs.

ATTACHMENT 9

SEASIDE GROUNDWATER BASIN
2019 MONITORING AND MANAGEMENT PROGRAM

Seaside Groundwater Basin
2019 Monitoring and Management Program

The tasks outlined below are those that are anticipated to be performed during 2019. Some Tasks listed below are specific to 2019, 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 **Preparation for and Attendance at Meetings** **($11,500)**	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 and M.1.d will be: • Those associated with attendance at TAC meetings (either in person or by teleconference 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 when requested to do so by Watermaster Staff (either in person or by teleconference connection), 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.
M. 1. e **Peer Review of Documents and Reports** **($7,500)**	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 ($2,140)	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 ($17,004)	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. Another Consultant will periodically post database information to the Watermaster's website, so it will be accessible to the public and other interested parties. No enhancements to the database are anticipated during 2019.
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 2019.

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 2019.
I. 2 b. 2 Collect Monthly Manual Water Levels ($3,726)	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.** **($42,083)**	Water quality data will be collected quarterly from certain of the monitoring wells, but will no longer be collected from the four coastal Sentinel Wells. Discontinuing water quality sampling in those wells is the result of the finding made in 2018 that the water quality samples being extracted from those wells are not representative of the aquifer. Those wells were designed for the purpose of electric induction logging, and will therefore continue to be induction logged twice a year in WY 2019. In 2012 water quality analyses were expanded to include barium and iodide ions, to determine the potential benefit of performing these additional analyses. These two parameters have been useful in analyzing seawater intrusion potential in other vulnerable coastal groundwater basins, and are briefly mentioned in the Watermaster's annual Seawater Intrusion Analysis Reports. These parameters were added to the annual water quality sampling list for the four Watermaster Sentinel wells (SBWM-1, SBWM-2, SBWM-3, and SBWM-4), and also for the 3 most coastal MPWMD monitoring wells (MSC, PCA, and FO-09). Barium and iodide analyses will continue being performed on the 3 most coastal MPWMD monitoring wells in 2019, but will no longer be performed on the Watermaster's coastal Sentinel Wells as discussed above. 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. Under this Task in 2013 retrofitting to use the low-flow purge approach for getting water quality samples was completed on all of the wells that are sampled. This 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 is found to be no longer adequate due to declining groundwater levels, or if a sampling pump needs to be installed on a Sentinel Well, an allowance to purchase a replacement sampling pump has been included in this Task. Improvements to the QA/QC program for the water quality sampling work were adopted in mid-2017 and will be included in this work in 2019.
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 2019.
I. 2. b. 5 **Monitor Well Construction** **($0)**	An additional monitoring well was installed in 2009. No further work of this type is anticipated in 2019.

I. 2. b. 6 Reports ($3,576)	The groundwater level and water quality monitoring will be conducted on a monthly, quarterly, semi-annual or annual basis, as described in the Consultant's Scope of Work. Reports summarizing data collected and analyzed will be submitted to the Watermaster on a schedule to be established during the year, and will consist of: 1. A review of the water quality and water level data at the end of each quarter of the Water Year, including tabularized data summaries of the WQ/WL data twice per year, once for the Q1 and Q2 period and once for the Q3 and Q4 period, so this data can be posted to WATERMASTER's website. No reporting on a quarterly basis is required but the Consultant will promptly notify the Watermaster of any missing data or data collection irregularities that were encountered during the quarterly reporting period. 2. An annual report summarizing the water quality and water level data for the Water Year, and containing tables of this data for the complete Water Year. The report will include a brief cover letter describing any missing data or data collection irregularities that were encountered during the reporting period, and any recommendations for changes to be made to the data collection program.
I.2.b.7 CASGEM Data Submittal ($2,384)	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 2019.
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' "Seaside Groundwater Basin Protective Water Elevations Technical Memorandum." In 2013 further work was started 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 ($20,000)**	In 2009 the updated Model was used to evaluate different scenarios to determine such things as the most effective methods of using supplemental water sources to replenish the Basin and/or to assess the impacts of pumping redistribution. This work is described in HydroMetrics' "Seaside Groundwater Basin Groundwater Model Report." In 2010, and again in 2013, HydroMetrics used the updated Model to develop answers to some questions associated with Basin management. 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. Additional modeling work may be performed in 2019 to further examine this situation. This Task includes a $20,000 allowance to perform modeling or other work to develop answers to basin management questions, 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)**	During 2018 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 2019.
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 had compromised these seals, it would be possible for the intrusion to flow from one aquifer to another. An evaluation of this was completed in 2012 and is described in MPWMD's Memorandum titled "Summary of Seaside Groundwater Basin Cross-Aquifer Contamination Wells Investigation Process and Conclusions" dated August 8, 2012. This Memorandum did not recommend performing any further work on this matter at this time, other than to incorporate into the Watermaster's Database data from wells that were newly identified by the work performed in 2012. That data has now been incorporated into the Database, and no further work by the Watermaster on this matter is anticipated. In late 2017 a request was made to MPWMD to destroy one of its no-longer-used monitoring wells that is perforated in multiple aquifers (Well PCA-East Multiple). MPWMD performed this work in 2018. No further work of this type is anticipated in 2019.

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 have been using 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 wastewater (under the Pure Water Monterey Project) a geochemical model was developed in 2018 and is being used in the areas of the Basin where injection of these new water sources will occur. If the geochemical modeling 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 for each of these projects, 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 these new sources of 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. b. **Focused Hydrogeologic Evaluation** **($0)**	MPWMD attempted to compile historical and current water quality data in the coastal area to provide more in-depth evaluation of conditions in the shallow Dune Sand/Aromas Sand aquifer in the vicinity of the Sand City Public Works well, where unique water quality conditions and variability have recently been observed as discussed at TAC meetings. However, it was found that no historical water quality data from Cal Am's now-abandoned wells existed, and consequently it was not possible to answer the question of why water quality in the Sand City Public Works well differs from water quality in other wells in the Basin. The Sand City desalination plant could be affecting water quality in this area, but without the prior water quality data from now-abandoned wells, this could not be determined. The results of this work were summarized in 2013 in a brief Technical Memorandum prepared by MPWMD with conclusions and recommendations, and no further work on this matter is planned.
I. 4. c. **Annual Report- Seawater Intrusion Analysis** **($22,742)**	At the end of each water year, a Consultant will reanalyze all water quality data. 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 annual EM 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. d **Complete Preparation of Seawater Intrusion Response Plan** **($0)**	The Watermaster's Consultant (HydroMetrics) completed preparation of the long-tem Seawater Intrusion Response Plans (SIRP) in February 2009. The Sections that are included in the SIRP are: Section 1 – Background and Purpose Section 2 – Consistency with Other Documents Section 3 – Seawater Intrusion Indicators and Triggers Section 4 –Seawater Intrusion Contingency Actions Section 5 - References No further work on the SIRP is anticipated in 2019.
I. 4. e. **Refine and/or Update the Seawater Intrusion Response Plan** **($0)**	At the beginning of 2009 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 2019.
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 Plan, is determined by the Watermaster to be occurring.

ATTACHMENT 10

2018 SEASIDE GROUNDWATER MODEL UPDATE TECHNICAL MEMORANDUM

HydroMetrics WRI
1814 Franklin St, Suite 501
Oakland, CA 94612

TECHNICAL MEMORANDUM

To: Seaside Groundwater Basin Watermaster
Technical Advisory Committee

From: Pascual Benito, Georgina King, and Derrik Williams

Date: January 14, 2019

Subject: 2018 Seaside Groundwater Model Update

Background and Scope

The Watermaster's first Basin Management Action Plan (BMAP) was completed in February 2009 (HydroMetrics LLC, 2009a). 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 Seaside Basin Watermaster (Watermaster) a logical set of actions that can be undertaken to manage the basin to its Safe Yield. Over the nine years since the BMAP was completed, the Watermaster has collected much groundwater level and quality data, and conducted various studies to improve the understanding of the basin.

At the time the 2009 BMAP was prepared, a groundwater model had not yet been developed for the basin, and the analysis contained in the BMAP was completed using analytical methods. Following the BMAP recommendation that a groundwater model be constructed to assist with groundwater management decisions, a calibrated model was completed in November 2009 (HydroMetrics LLC, 2009b). The model simulated groundwater conditions in the basin between January 1987 and December 2008. In 2014, the model was updated with data through September 2013 (HydroMetrics WRI, 2014) but not recalibrated because its accuracy was still acceptable. The 2014 update found that the uncalibrated portion of the model (January 2009 – September 2013) tended to simulate higher groundwater levels than measured levels. Periodic recalibration of the model is necessary to ensure the model simulates groundwater levels within an acceptable industry standard accuracy. When simulated groundwater levels are not accurate this reduces the accuracy of all output from the model such as groundwater storage and water budget.

This technical memorandum documents (1) the update of the Seaside Basin groundwater model that extends the model simulation period through 2017, and (2) recalibration of the model using all the groundwater level data that has been added to the model since 2008. In extending the model timeframe, new pumping and recharge input data for the extended period, and new groundwater level data used to measure model calibration were added to the model.

Data Collection and Input to Model

PUMPING

Updated monthly records of groundwater pumping from wells in the model area were provided by Monterey Peninsula Water Management District (MPWMD), Cal Water Service, and Marina Coast Water District (MCWD) for the period between 2014 and 2017.

Figure 1 shows the total monthly pumping for the entire model period of 1987-2017. The pumping pattern of the updated period between 2014 and 2017 is similar to the lower pumping that was observed in the 1992/93 drought. No new wells were added to the model for the updated period as no new municipal production wells were drilled and put into production between 2014 and 2017.

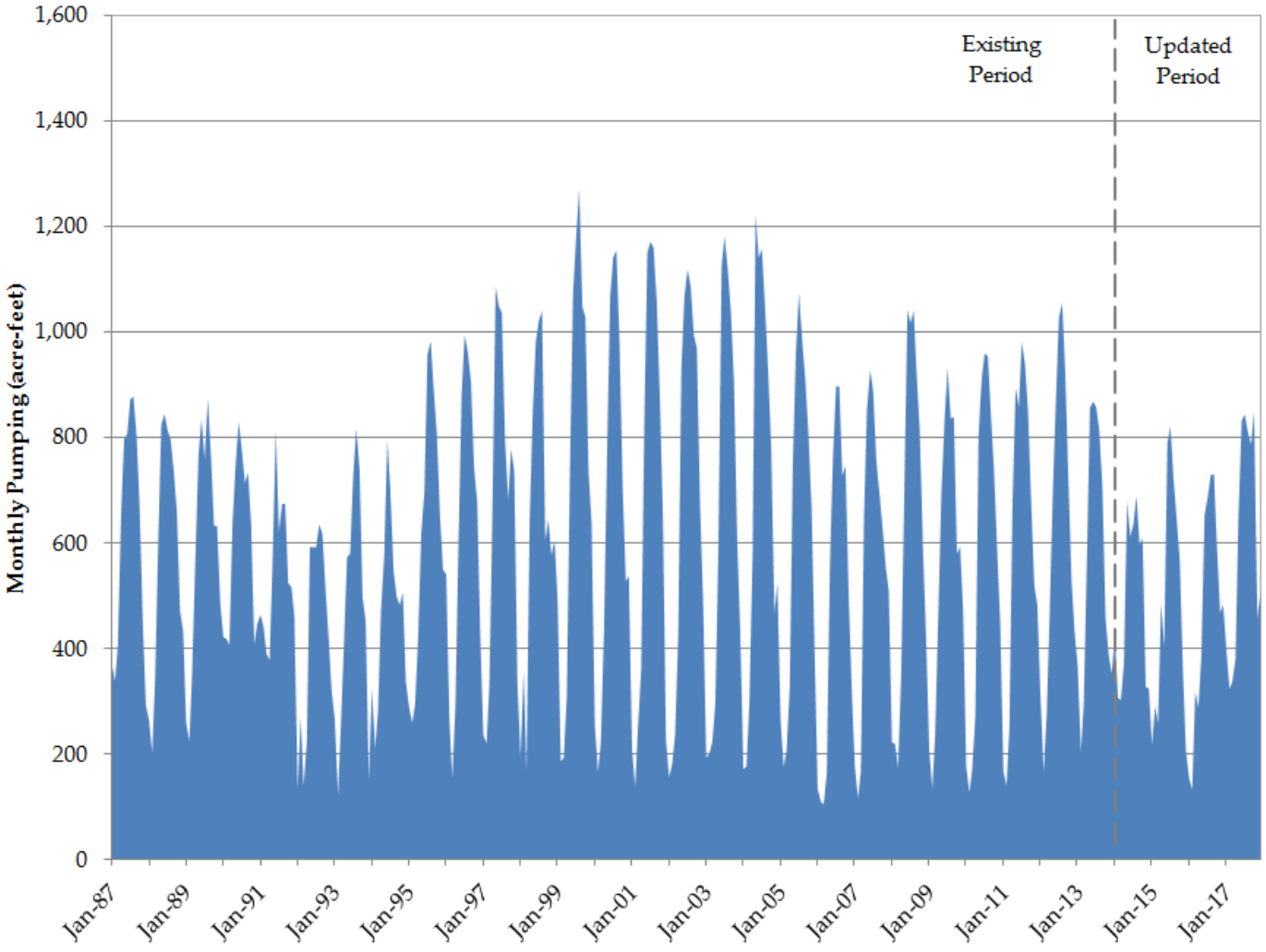


Figure 1: Total Monthly Pumping

DEEP GROUNDWATER RECHARGE

The amount of deep groundwater recharge added to the model each month is estimated by a soil moisture balance model. The documentation of this model can be found in the Seaside Basin Modeling and Protective Groundwater Elevations Report (HydroMetrics, 2009a). The inputs to the soil moisture balance model include:

- Water system deliveries
- Precipitation
- Evapotranspiration
- Land use
- Soil types
- Recharge pond and septic information

The soil moisture balance model was updated by supplying updated input data to extend the model period through the end of 2017. System loss data were obtained from MPWMD for Cal-Am water delivered to customers. Precipitation data were downloaded from the Utah Climate Center to extend the Monterey (Coop No. 45795) and Salinas (Coop No. 47668) station data. Monthly evapotranspiration data were downloaded for the Castroville CIMIS station.

As the soil moisture balance model uses average monthly evapotranspiration rates, 2009-2017 evapotranspiration data for the Castroville CIMIS station was evaluated to determine if it varied from average monthly rates used previously in the model. It was found that average monthly evapotranspiration for the updated period was similar to previous years and thus, average monthly evapotranspiration rates for the updated model were assumed to be the same as for the 1987-2008 original model calibration period.

The number of septic tanks in use and the land use throughout the model domain were assumed to be the same because land use has not changed substantially from the General Plan land use used in the original model. The amount of runoff percolation occurring in the recharge ponds is estimated in the soil moisture balance model as a proportion of precipitation.

Figure 2 shows the estimated total monthly deep groundwater recharge that is input into the model for every month between 1987 and 2017. The greatest recharge takes place during winter months when deep percolation of rainfall occurs. Less recharge takes place during the dry portion of the year when recharge is dependent upon system losses and irrigation return flow. This seasonal pattern is consistent throughout the entire simulation period, including the updated model period.

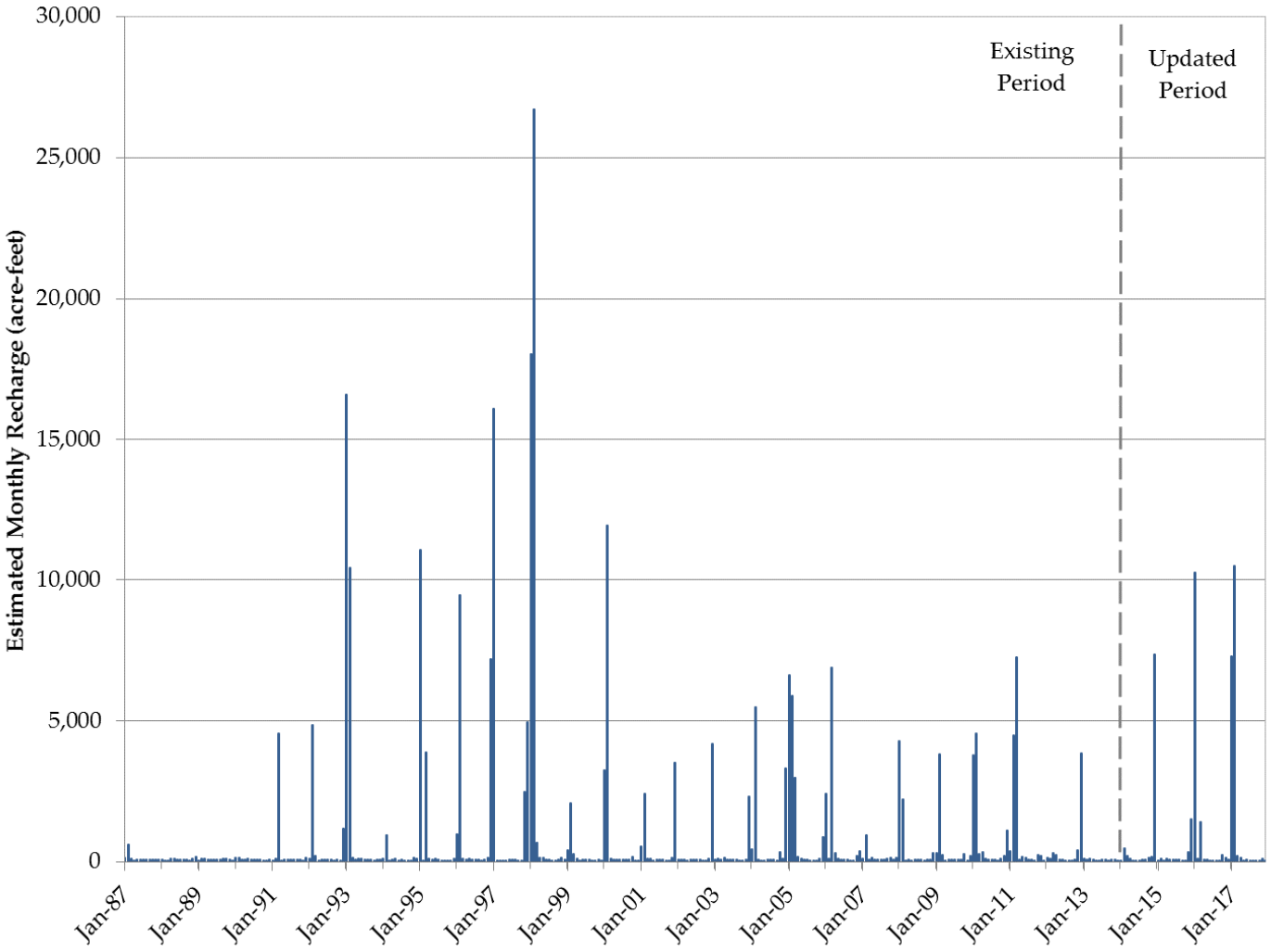


Figure 2: Estimated Monthly Recharge

GROUNDWATER LEVEL OBSERVATIONS

An updated set of groundwater level observations from wells in the Seaside Basin were provided by MPWMD, MCWD, and the Monterey County Water Resources Agency (MCWRA). The dataset covers the updated model period of 2014-2017. Observations collected from wells that were pumping at the time of measurement (pumping temporarily lowers the groundwater level at the well location) and other questionable values were removed from the dataset.

The updated groundwater level data were used to assess the performance of the updated groundwater model. Performance of the model was evaluated by comparing the model's simulated groundwater elevations to the observed groundwater elevations that were provided. This process is described in greater detail in the Model Recalibration section below.

MODEL BOUNDARY WITH SALINAS VALLEY

Groundwater flows freely into and out of the Salinas Valley along the model's northeastern boundary. The boundary with Salinas Valley was simulated as a specified head boundary condition with the MODFLOW Constant Head (CHD) package. This option assigns a set of specified (or known) groundwater elevation heads to each model cell along the northwestern boundary. The specified groundwater elevations vary spatially along the boundary and can also be made to vary with time according to changing conditions. If simulated groundwater elevations in the model are higher than the assigned boundary elevations, water will flow out of the model towards the Salinas Valley. If simulated groundwater elevations in the model are lower than the assigned boundary elevations, water will flow from the Salinas Valley into the model.

For the original model calibration in 2009 (HydroMetrics LLC, 2009b), the groundwater elevations assigned to the model cells along the northeastern boundary were derived from results of the Salinas Valley Integrated Groundwater Surface Water Model (SVIGSM) (Montgomery Watson, 1997). WRIME Inc., the consultant updating the SVIGSM for Monterey County Water Resources Agency, provided estimated groundwater elevations from a number of the SVIGSM nodes that were near the regional model boundary and these were interpolated onto the regional model boundary cells ("the 1997 SVIGSM results"). In 2009, the SVIGSM calibrated results were available only through model year 1994, so the SVIGSM groundwater heads from the last month of 1994 were repeated through the end of the calibration model period, 2008, for each boundary cell.

In 2010, WRIME, Inc. provided updated SVIGSM results ("2010 SVIGSM Results") that covered a longer time period extending to 2004, and these new results were used to update the specified heads along the northeastern boundary as part of a modeling study looking at the impacts from the Regional Project as described in the Final Environmental Impact Report (EIR) for the Coastal Water Project (HydroMetrics Water Resources Inc., 2010).

In the Seaside Basin model's 2014 update, the Seaside Basin model was updated to extend through years 2005-2013. SVIGSM model results were not available for these years, so to approximate the groundwater elevations along the northeastern boundary for this period, the final 12 months of available 2010 SVIGSM results (from year 2004) were applied to each of the remaining years from January 2005 through December 2013. This is illustrated in graph form on Figure 3 as the higher elevation blue line.

At the time of the 2014 Seaside Basin model update, no sensitivity analysis had yet been performed for the northeastern boundary condition to evaluate if and how changes to the specified heads along this boundary might impact model results. Given that the boundary is over four miles away from the nearest Seaside Basin production wells located in the central portion of the Northern Coastal subarea, it was thought that impacts from the boundary would be greatest in areas adjacent to the boundary, and would have less impact on areas further away.

In preparation for the model recalibration described in this Technical Memorandum, a limited sensitivity analysis of the northeastern boundary condition was carried out by applying consecutive changes in specified groundwater heads along the boundary for different durations of time, and assessing how this impacted groundwater levels in different areas of the model. It was found that changes in specified boundary heads of more than 10-20 feet over multi-year periods resulted in changes to groundwater levels and regional gradients in large areas of the model including areas not directly adjacent to the boundary, such as the Northern Coastal subarea. Because of the length and large cross-sectional area of the northeastern boundary, large changes in the specified heads over sustained periods of time can change the regional groundwater levels and gradients, the location of the groundwater divide, and also the spatial and temporal distribution of wet and dry cells in the model.

With this understanding, the original 1997 SVIGSM model and the newer 2010 SVIGSM model head values along the northeastern boundary were compared against one another, as shown for an example model boundary cell in Figure 3. For the same time periods, the newer updated 2010 SVIGSM head values that were used to update the model in 2014 were significantly higher than the earlier 1997 SVGISM model head values, by as much as 35 feet during some periods.

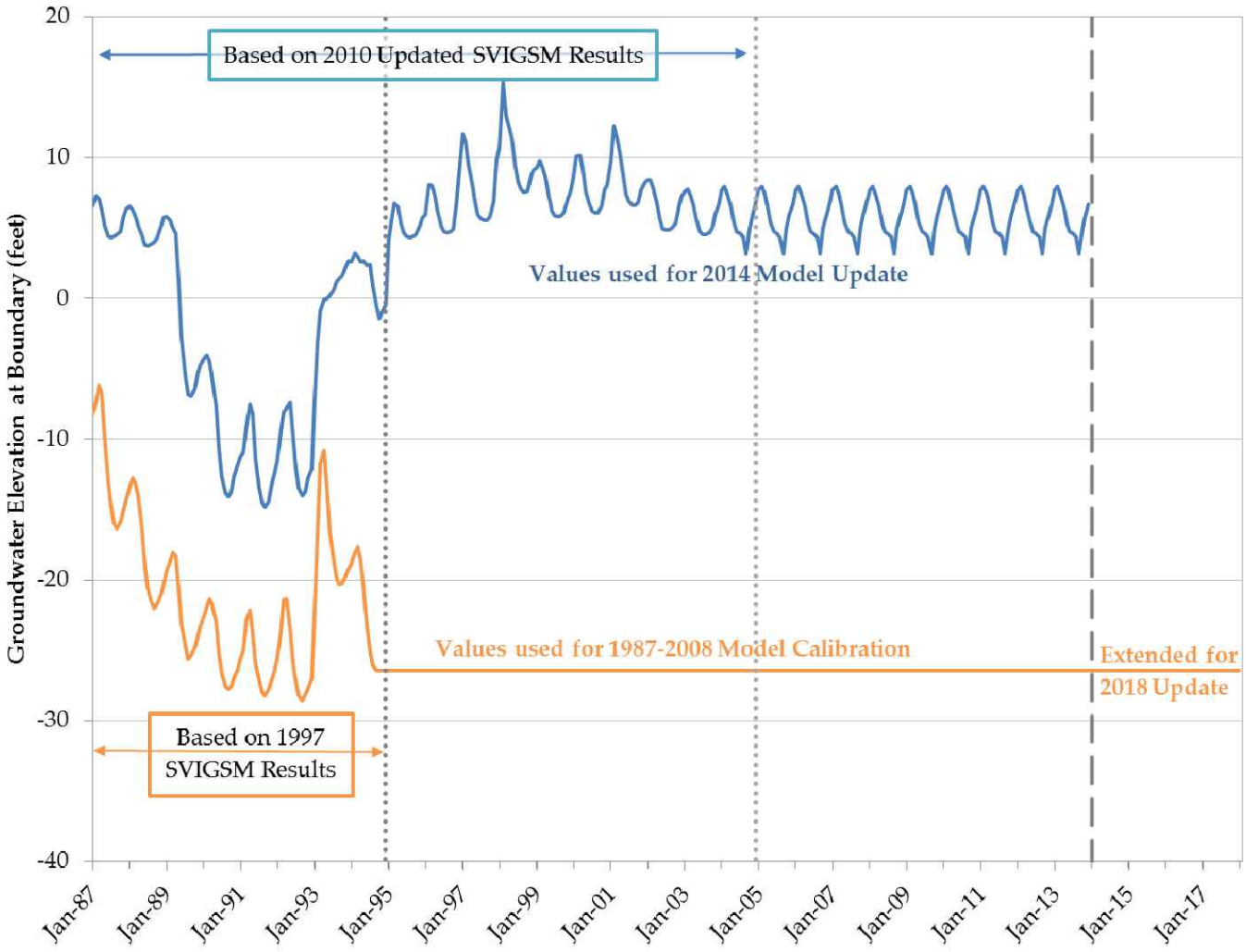


Figure 3: Groundwater Elevations at an Example Northeastern Boundary Cell

The two SVIGSM model results (1997 and 2010) were compared against measured groundwater levels in wells located along and adjacent to the northeastern boundary. Historical and current groundwater level data for these wells were compiled from a number of sources, including the Fort Ord environmental remediation monitoring wells, the California Department of Water Resources CASGEM program, and Marina Coast Water District's production wells.

The comparison of the two SVIGSM model results along the boundary showed that the heads from the earlier 1997 SVIGSM model results used for the original 2009 Seaside Basin model calibration much more closely match observed groundwater levels along the boundary over the extended model period through 2017. Using the 2010 SVIGSM heads did not allow for improvement in model calibration and for this reason, the much higher 2010 SVIGSM heads, used in the groundwater model since 2010, were replaced with the original 1997 SVIGSM heads. The head value for the last month of 1994 in the 1997

SVIGSM model were applied to all subsequent months through December 2017, as shown in Figure 3. Even without the annual seasonal variation in the extended period from 1994 through 2017, it was found matching the overall average head elevations along the boundary was critical to recalibrating the model.

Model Recalibration

Calibration Approach

Calibrating the groundwater flow model involved successive attempts to match model output to measured data from the calibration period. Relatively uncertain and sensitive parameters such as horizontal and vertical hydraulic conductivities, were varied over a reasonable range of values. Simulated hydraulic heads were compared against available observed groundwater elevations. The model was considered calibrated when simulated groundwater levels matched the measured groundwater levels within an industry standard acceptable measure of accuracy, and when successive calibration attempts did not notably improve the calibration statistics. Acceptable measures of model accuracy are described on pages 122 and 123.

Prior to varying the 2009 calibrated model parameters such as hydraulic conductivity and storage coefficients, a limited sensitivity analysis was carried out on two model inputs that had not previously undergone calibration, 1) the specified head boundary with the Salinas Valley (as described in the previous section), and 2) the deep groundwater recharge estimated using a soil moisture balance model.

The sensitivity of the groundwater model to changes in applied recharge was evaluated by making incremental changes to the soil properties in the soil moisture balance model. Both the rooting depth and the soil runoff curve numbers (CN) are soil parameters that influence the percentage of rainfall that runs off or infiltrates to become recharge. Rooting depth is the typical depth of the root zone and the soil runoff curve number is a coefficient that reduces precipitation to runoff. The soil balance model was run with a range of soil rooting depth (between 12-80 inches) and a range of CN parameter values to create different groundwater recharge input data sets for the groundwater model, and the sensitivity of the changes on simulated groundwater levels was evaluated. It was found that in general the model was much more sensitive to long-term average groundwater elevations along the Salinas Valley boundary than to changes in the soil runoff properties, and as such, recalibration efforts were focused first on recalibrating the Salinas Valley boundary as described in the previous section.

Calibration Results

After updating the Salinas Valley boundary conditions as described above, the updated groundwater model was re-run and the calibration results improved to the same level of calibration as the original 1987-2008 calibration period. This indicates that the revision of the northern boundary condition provides for better simulation of groundwater levels than the model was able to achieve with the higher 2010 SVIGSM heads. Many of the simulated groundwater levels that had been diverging from the observed values in the

2014 model update better matched observed values. At this stage, a calibration tool called Parameter Estimation (PEST) (Watermark Numerical Computing, 2004) was used to determine if further significant improvements could be made by adjusting model parameters.

MODEL PARAMETER MODIFICATIONS

Model hydraulic parameters are adjusted during model calibration to improve the model's ability to simulate known conditions. Calibration runs of the model with PEST consisted of modifying the distribution and magnitude of horizontal hydraulic conductivity, vertical hydraulic conductivity, and specific storage values. This process was conducted in the 2009 model calibration.

For this 2018 recalibration of the model, hydraulic parameter modifications resulted in measurable, but not significant, improvements in the calibration statistics. In some cases, small improvements were gained in matching groundwater levels of some wells, while other wells showed decreases in accuracy. It was determined that the existing calibrated parameters should be kept and that the recalibration of groundwater elevations at the Salinas Valley boundary was sufficient to return the model to its original performance and accuracy, without the need to modify hydraulic parameters.

GROUNDWATER ELEVATION CALIBRATION

Groundwater flow model calibration is evaluated by comparing simulated groundwater elevations with observed groundwater elevations from monitoring and production wells. Hydrographs of simulated groundwater elevations should generally match the trends and fluctuations observed in measured hydrographs. Furthermore, the average errors between observed and simulated groundwater elevations should be relatively small and unbiased. Unbiased means that simulated groundwater levels should not be either all higher or all lower than the observed values. For wells screened over multiple model layers, simulated groundwater levels in each of the layers were weighted by layer transmissivity and averaged before comparing with measured data.

Example hydrographs showing both observed and simulated groundwater elevations are shown in Figure 4 through Figure 7. These example hydrographs were selected to demonstrate the model's accuracy in various parts of the Seaside Groundwater Basin. The hydrographs show that the updated model accurately simulates both the magnitude of groundwater fluctuations and trends observed in monitoring well data throughout the basin. A complete set of hydrographs showing both observed and simulated groundwater elevations are included in Appendix A.

Various graphical and statistical methods can be used to demonstrate the magnitude and potential bias of the calibration errors. Figure 8 shows all simulated groundwater elevations plotted against observed groundwater elevations for each month in the updated calibration period. Results from an unbiased model will scatter around a dashed line with a slope of 45° on Figure 8. If the model has a bias such as consistently exaggerating or underestimating groundwater level differences, the results will diverge from this line.

The dashed line drawn on Figure 8 demonstrates that the results suggest that in general the model results are not biased towards overestimating or underestimating average groundwater level differences.

The four statistical measures used to evaluate calibration are the mean error (ME), the mean absolute error (MAE), the standard deviation of the errors (STD), and the root mean squared error (RMSE). These statistical measures are included on Figure 8. These statistical measures take into consideration all wells in the model with groundwater level data.

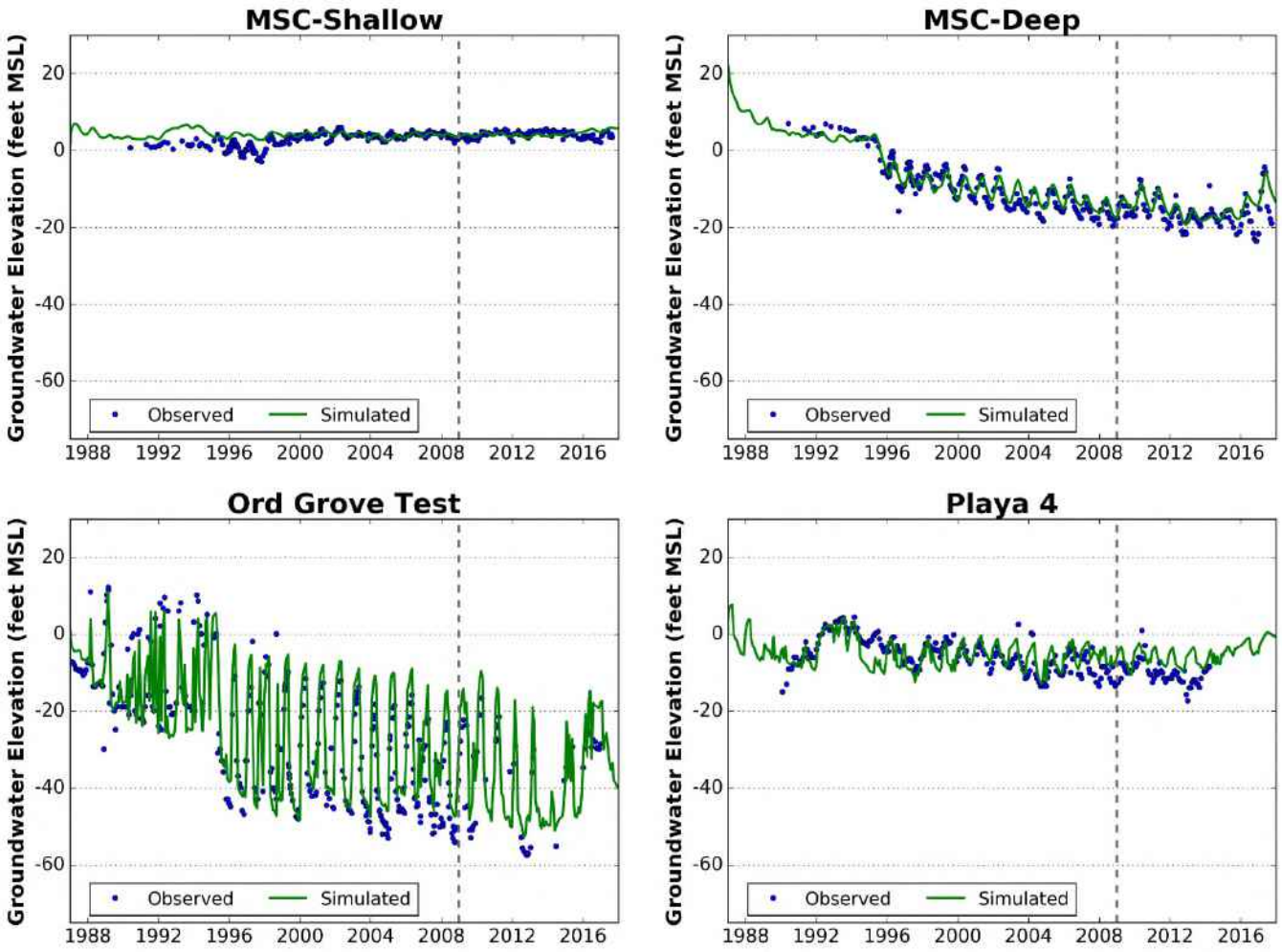


Figure 4: Hydrographs – Northern Coastal Subarea

Right of the dashed line represents the model period added as part of this model update

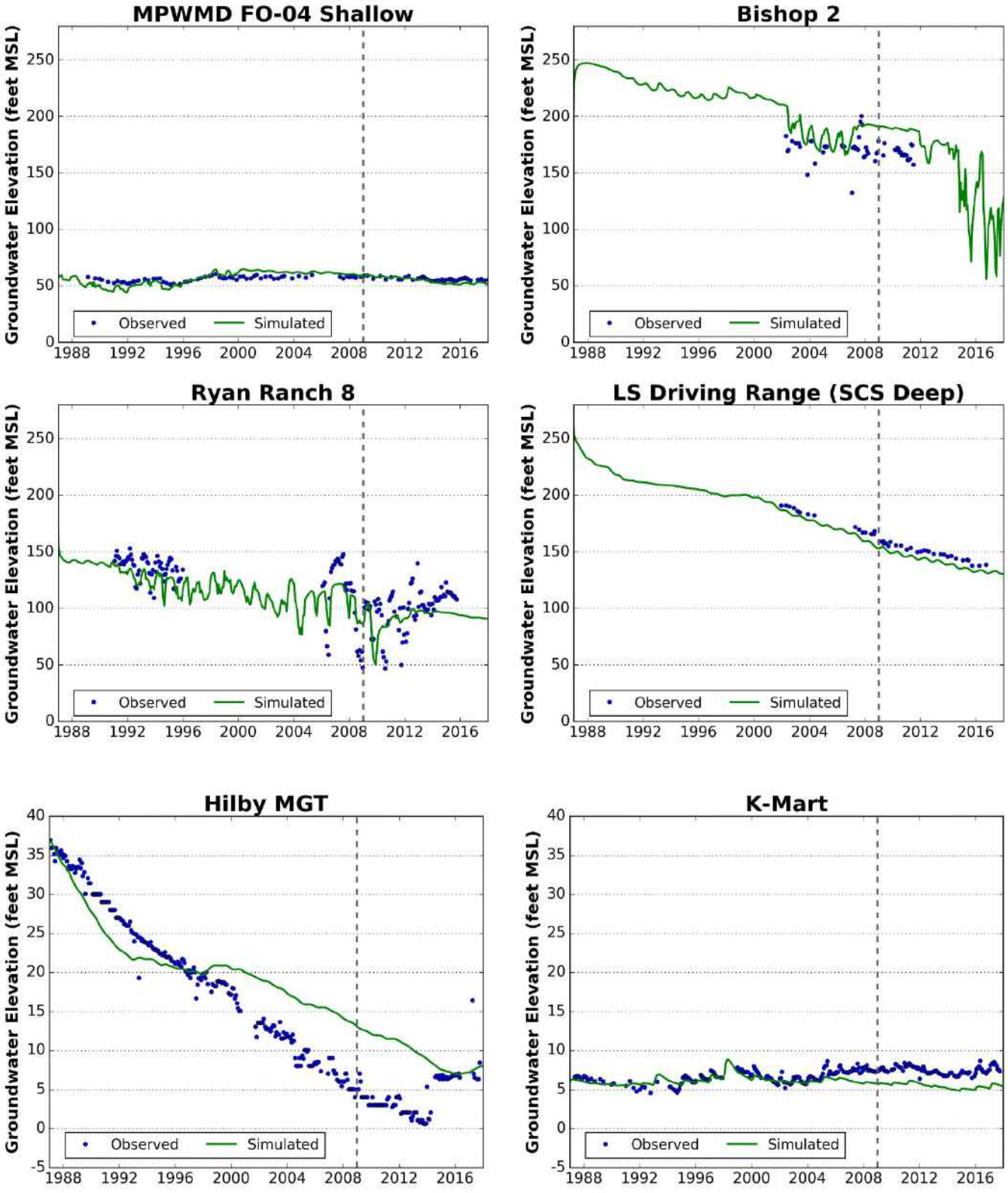


Figure 5: Hydrographs – Laguna Seca Subarea

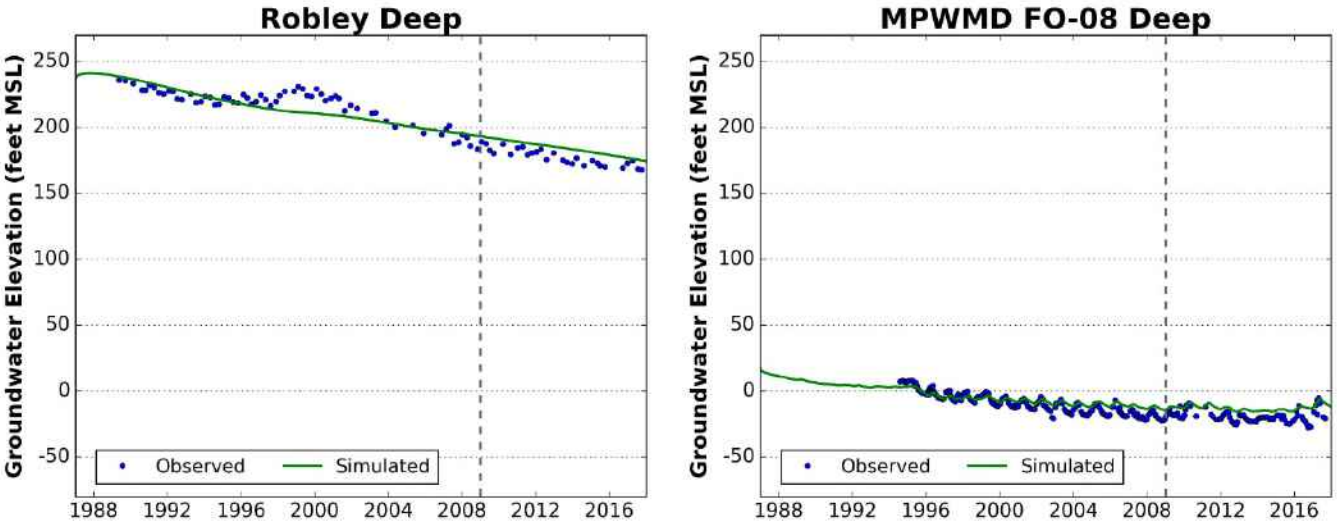
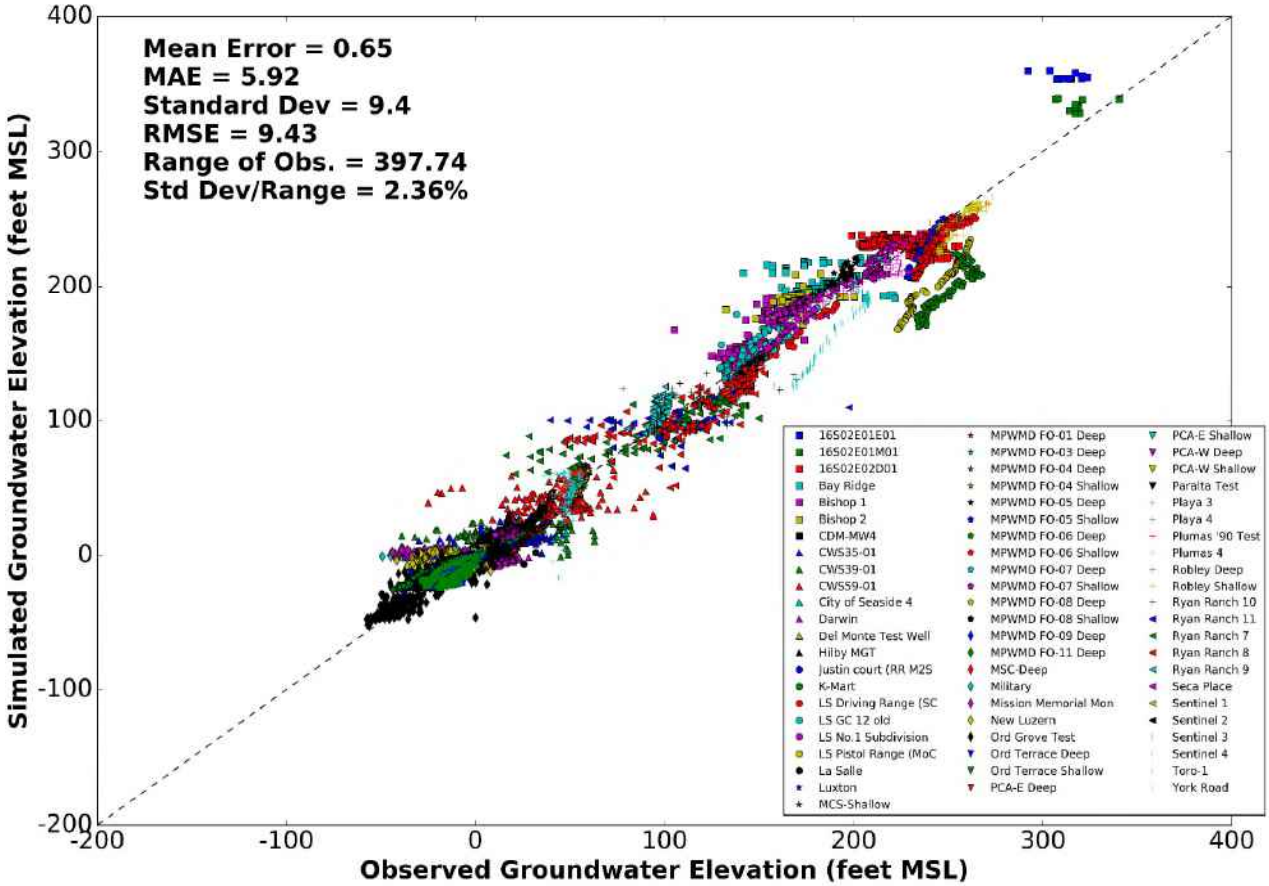


Figure 6: Hydrographs – Southern Coastal Subarea Right of the dashed line represents the model period added as part of this model update

Figure 7: Hydrographs – Outside Seaside Groundwater Basin



Right of the dashed line represents the model period added as part of this model update

Figure 8: Simulated Versus Observed Groundwater Elevations - All Data (1987–2017)

The mean error is the average error between measured and simulated groundwater elevations for data on Figure 8..

$$ME = \frac{1}{n}\sum_{i=1}^{n}\left(h_m - h_s\right)_i$$

Where h_m is the measured groundwater elevation, h_s is the simulated groundwater elevation, and n is the number of observations.

The mean absolute error is the average of the absolute differences between measured and simulated groundwater elevations.

$$MAE = \frac{1}{n}\sum_{i=1}^{n}\left|h_m - h_s\right|_i$$

The standard deviation of the errors is one measure of the spread of the errors around the 45º line on Figure 8. The population standard deviation is used for these calculations.

$$STD = \sqrt{\frac{n\sum_{i=1}^{n}\left(h_m - h_s\right)_i^2 - \left(\sum_{i=1}^{n}\left(h_m - h_s\right)\right)_i^2}{n^2}}$$

The RMSE is similar to the standard deviation of the error. It also measures the spread of the errors around the 45º line on Figure 8, and is calculated as the square root of the average squared errors.

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(h_m - h_s\right)_i^2}$$

As a measure of successful model calibration, Anderson and Woessner (1992) state that the ratio of the spread of the errors to the total head range in the system should be small to ensure that the errors are only a small part of the overall model response. As a general rule, the RMSE should be less than 10% of the total head range in the model.

The RMSE for the entire simulation period is 9.4 feet. This is approximately 2.4% of the total range of observed groundwater elevations of 397.7 feet.

Table 1 provides a comparison of calibration statistics for both the original 2009 model and the 2018 recalibrated model. The table shows that overall, the 2018 updated and recalibrated model simulates groundwater levels better than the 2009 model.

Table 1: Comparison of 2009 Model Calibration and 2018 Recalibration Statistics

Statistical Measure	2009 Calibration	2018 Recalibration
Mean Error	2.18	0.65
Mean Absolute Error (MAE)	7.4	5.9
Standard Deviation	12.9	9.4
Root Mean Squared Error (RMSE)	12.9	9.4
Standard Deviation/Range	2.9%	2.4%

A second general rule that is occasionally used is that the absolute value of the mean error should be less than 5% of the total head range in the model. The mean error for the entire simulation period is 0.65 feet. This is approximately 0.2% of the range of observed groundwater elevations. These results indicate that the model is in good calibration after the model update and recalibration of the Salinas Valley boundary condition.

A second graph type used to evaluate bias in model results is shown on Figure 9. This figure shows observed groundwater elevations versus model residual (observed elevation minus simulated elevation) for the entire model period. A residual value of zero would indicate the model exactly simulating the observed groundwater elevation. Residual values greater than zero indicate that the model has underestimated observed groundwater levels, and residuals less than zero indicate the model has overestimated the observed groundwater level. Results from a non-biased simulation will appear as a cloud of residual points evenly distributed both above and below zero model residual line. Results that do not cluster around the zero residual line show potential model bias. Results that display a trend instead of a random cloud of points may suggest additional model bias.

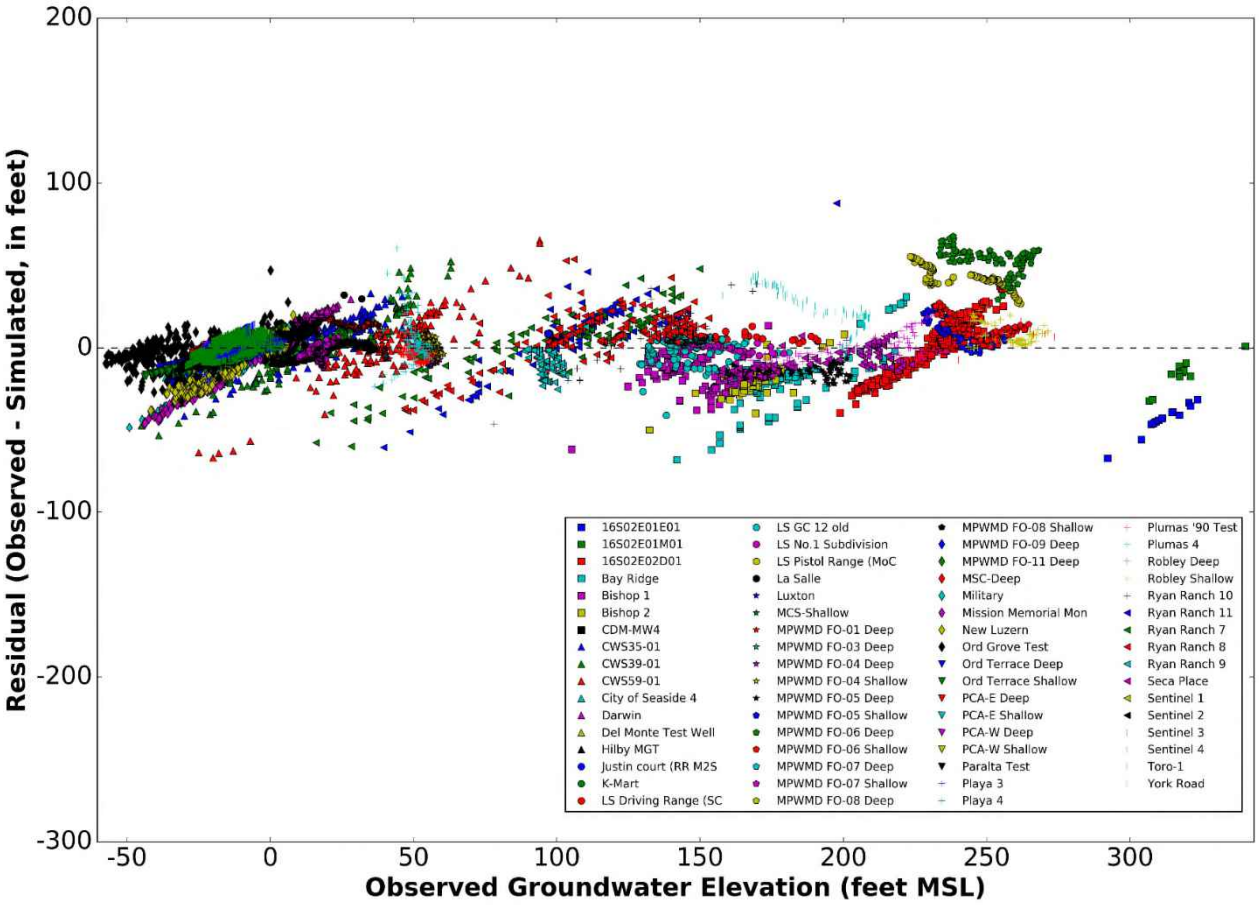


Figure 9: Observed Groundwater Elevations Versus Model Residual - All Data (1987–2013)

The residuals plotted on Figure 9 show that overall the calibrated model is not strongly biased to either overestimating or underestimating observed groundwater levels. There are, however, some individual wells that show bias towards overestimation or underestimation, as well as some wells that show trends that may indicate other types of model bias. There are a number of individual well hydrographs in Appendix A with simulated groundwater levels that do not correspond well with observed levels. Generally, these are production wells that are screened in multiple aquifers/model layers, e.g., Northern Coastal Subarea wells: Military, Mission Memorial Monitor (former production well), and City of Seaside 3. Without field spinner (flow) testing to determine how much groundwater each aquifer is contributing to the well, only an estimate of each aquifer's contribution can be simulated by the model. The difference in modeled levels and observed levels can be attributed to this estimate not being correct and/or the model layers in this area requiring refinement. For example, , some production wells, such as City of Seaside 3 and City of Seaside 4, are located in the same model cell, and as such because of the model grid resolution, the model cannot accurately resolve the different groundwater level behavior at both wells.

As there is a mix of well simulated and less well simulated wells in the same area, there is confidence that the model is simulating groundwater levels acceptably in those areas,

and that there no locational bias. Monitoring wells such as MSC-Shallow, MSC-Deep, Ord Grove Test, Del Monte Test, show much better correlation between simulated and observed groundwater levels. These wells are screened in a single aquifer/model layer which provides much more certainty in assigning it to a model layer.

Appendix A includes hydrographs for all wells so that it is clear that some wells are less well calibrated than others. It is impossible to simulate every well accurately, and thus the statistical measures described above have ranges of statistics that are considered acceptable. Statistical ranges such as the RMSE should be less than 10% of the total head range in the model, and the absolute value of the mean error should be less than 5% of the total head range in the model acknowledge that some wells will be less well calibrated than others.

Conclusions

1. Simulated groundwater levels are sensitive to the specified heads along the northeastern boundary with the Salinas Valley. The behavior of the boundary was found to impact the calibration of areas of the model at some distance from the boundary. It was found that in the absence of the most recent Salinas Valley Integrated Hydraulic Model (SVIHM), currently being developed by the USGS, assigning boundary head elevations that match the general observed average groundwater levels along the boundary is more important than capturing smaller scale seasonal fluctuations along the boundary. It is recommended that when the SVIHM has been completed, an assessment of how well it simulates historical groundwater conditions in the Seaside Basin be conducted. If it is concluded that the new data improves simulation of groundwater level in the Seaside Basin, the boundary condition can be revised using parts of the SVIHM that improve model calibration of the Seaside Basin model.

2. The model recalibration improved calibration statistics over the original 2009 model calibration. As a result, simulated groundwater levels throughout the model, as a whole, better match observed groundwater levels.

3. The groundwater model should be updated in a maximum of five years and its calibration reevaluated at that time. However, if groundwater related projects are implemented in the basin before that time, the update and calibration reevaluation may need to be performed sooner.

References

Anderson, M.P., and W.W. Woessner. 1992. *Applied groundwater modeling, simulation of flow and advective transport,* Academic Press, Inc., San Diego, California, 381 p.

HydroMetrics LLC. 2009a. *Basin Management Action Plan. Seaside Groundwater Basin, Monterey County, California*, prepared for Seaside Groundwater Basin Watermaster. February.

HydroMetrics LLC. 2009b. *Seaside Groundwater Basin Modeling and Protective Groundwater Elevations*, prepared for Seaside Groundwater Basin Watermaster. November.

HydroMetrics WRI. 2010. *Technical Memorandum – Model Scenario 2 – Final EIR Regional Project*, for Seaside Groundwater Basin Technical Advisory Committee. March 23.

HydroMetrics WRI. 2014. *Technical Memorandum – 2014 Seaside Groundwater Model Update*, prepared for Seaside Groundwater Basin Watermaster. July 31.

Montgomery Watson, 1997. *Salinas Valley Integrated Ground Water and Surface Model Update - Final Report*, prepared for Monterey County Water Resources Agency. May 1997.

APPENDIX A: HYDROGRAPHS

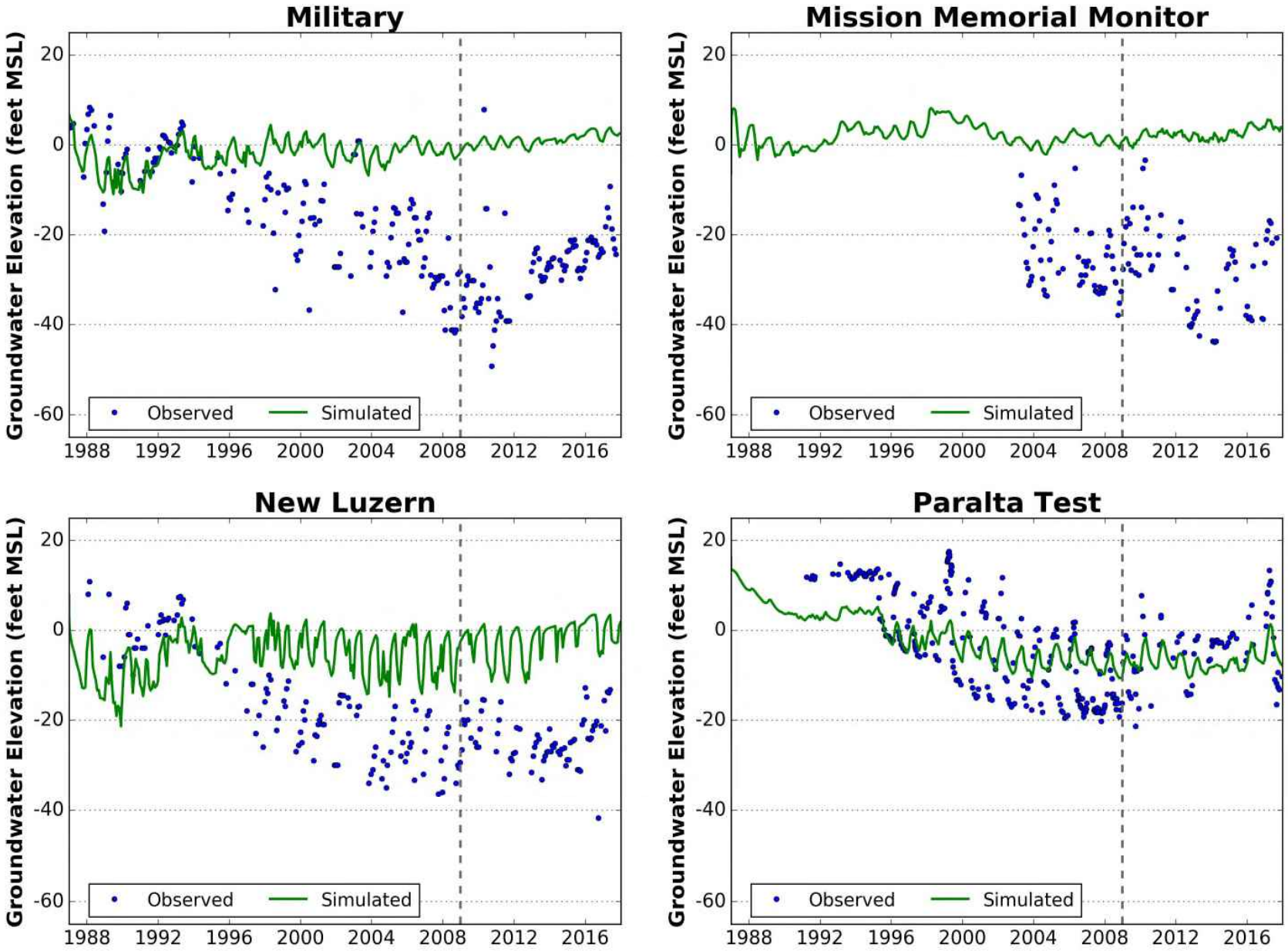


Figure A1: Northern Coastal Subarea Hydrographs

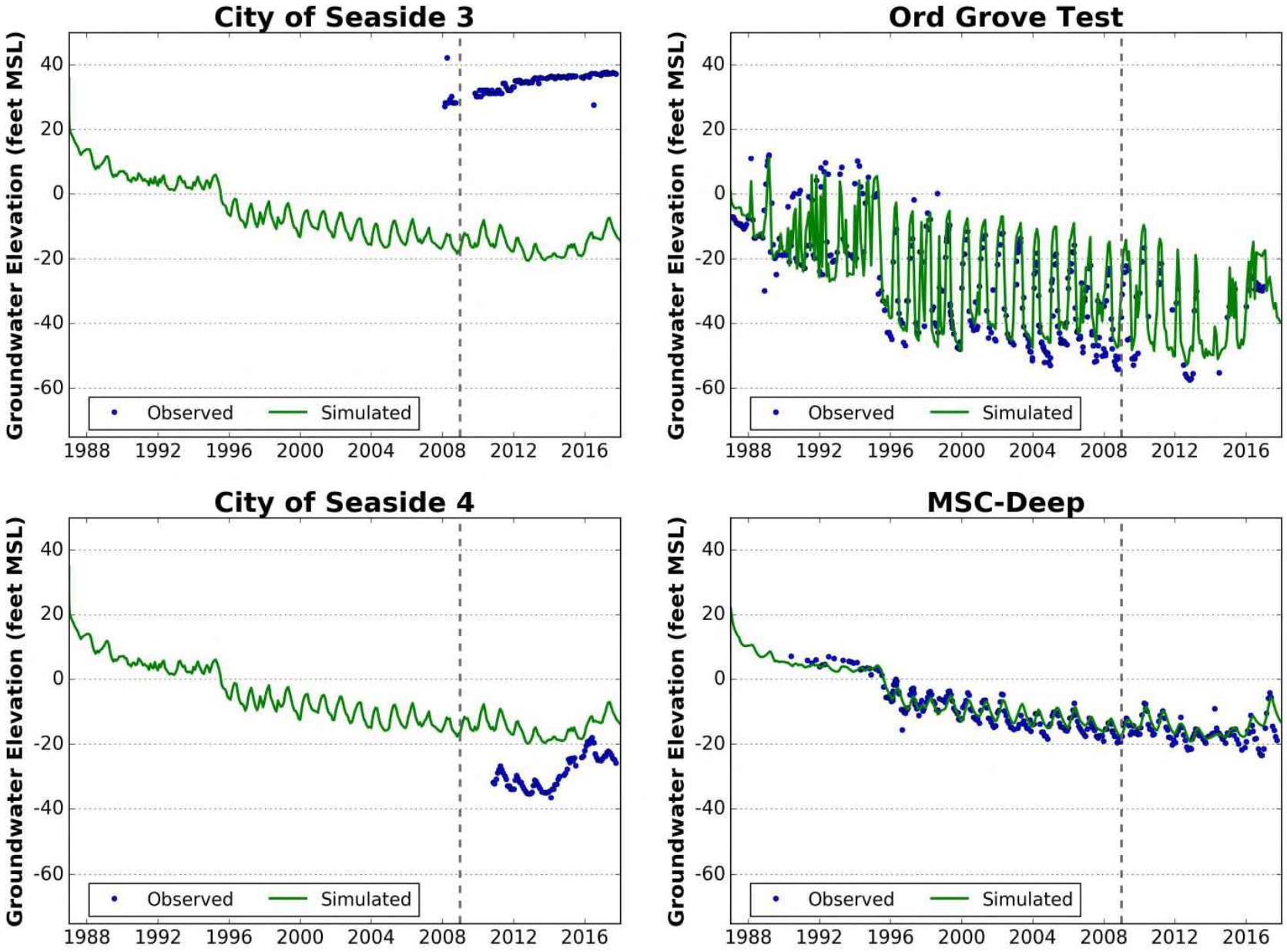


Figure A2: Northern Coastal Subarea Hydrographs

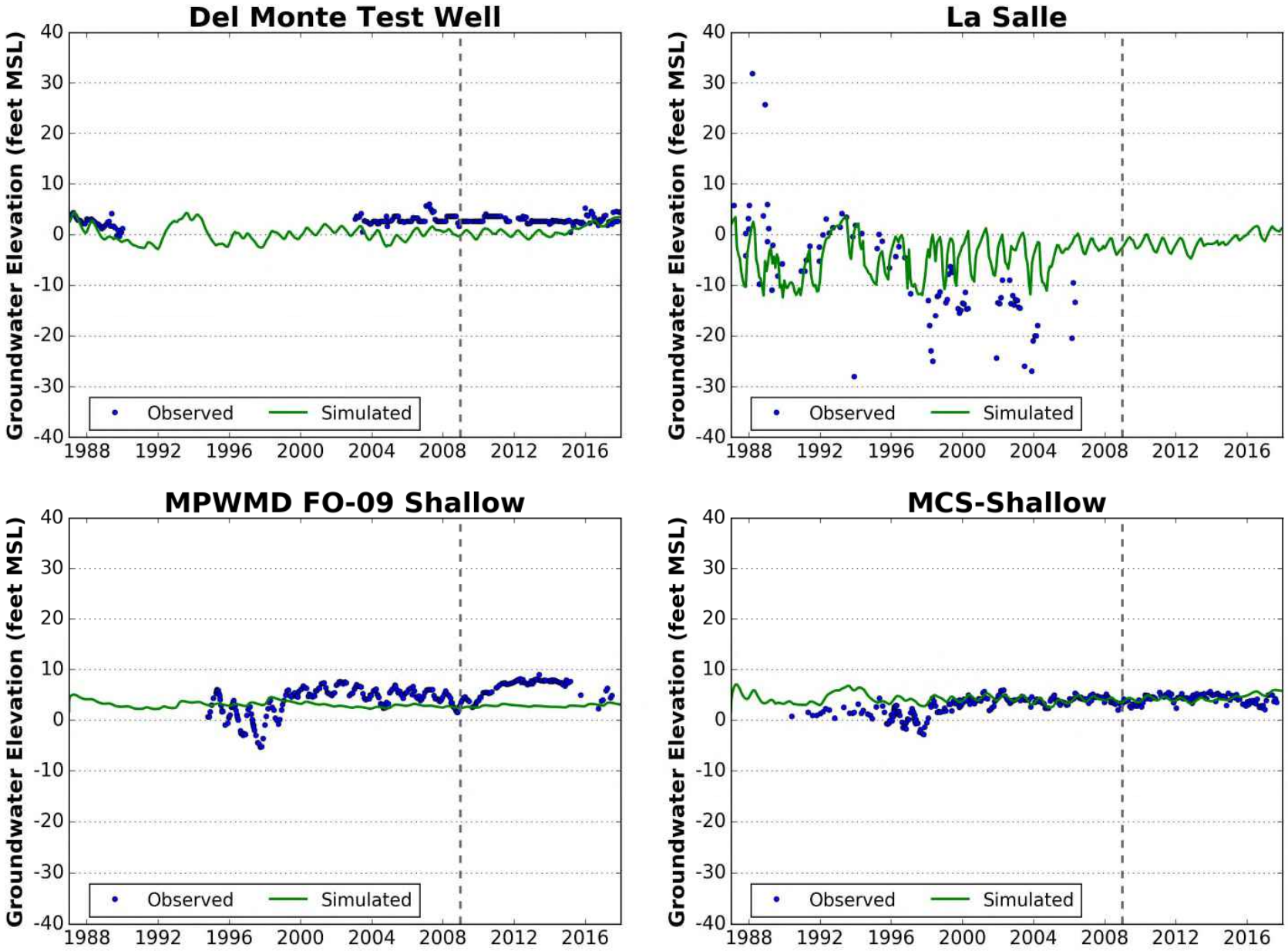


Figure A3: Northern Coastal Subarea Hydrographs

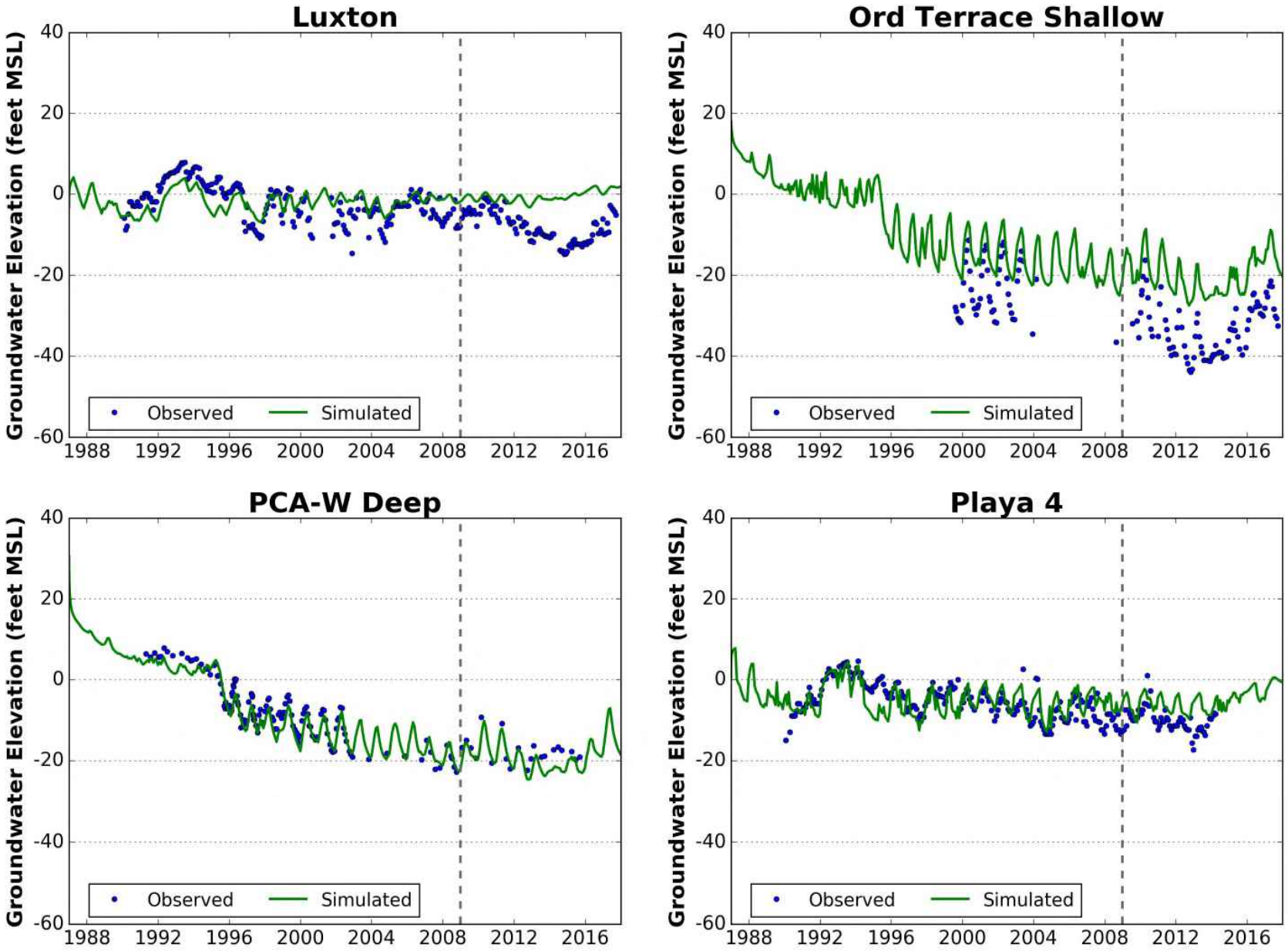
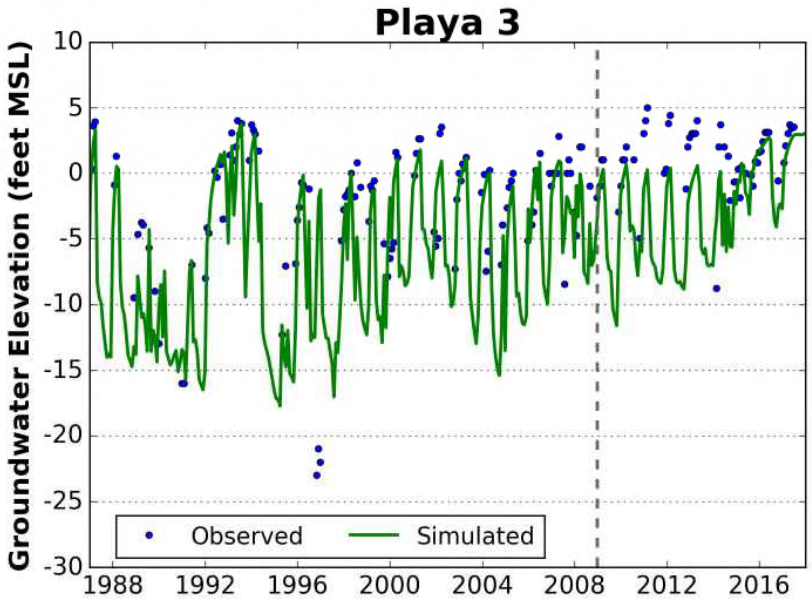
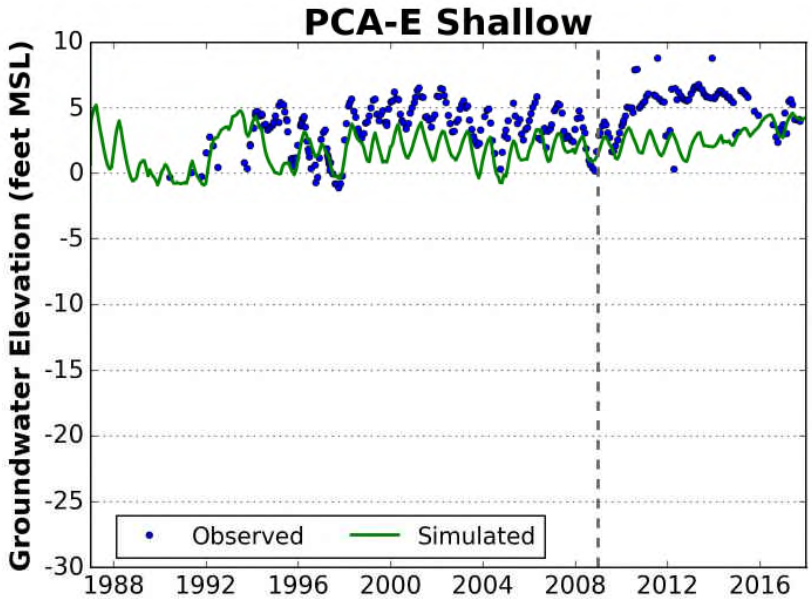


Figure A4: Northern Coastal Subarea Hydrographs





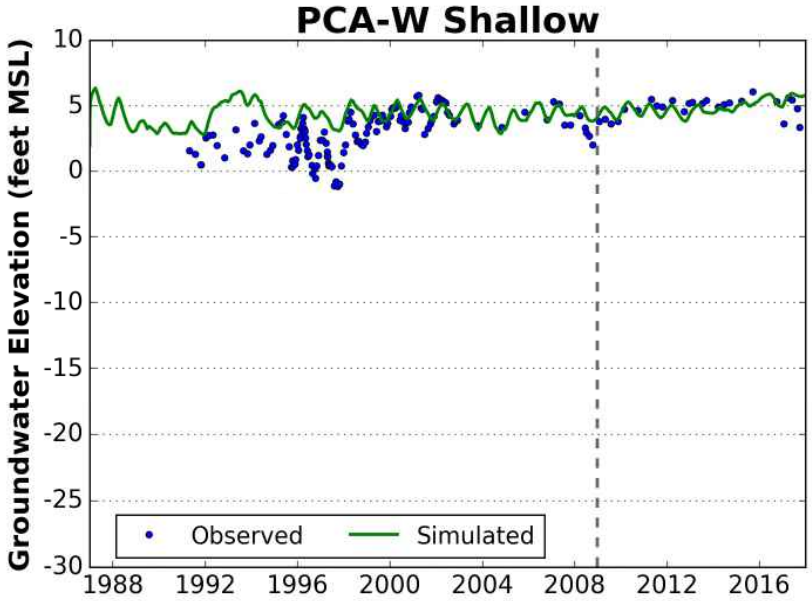


Figure A5: Northern Coastal Subarea Hydrographs

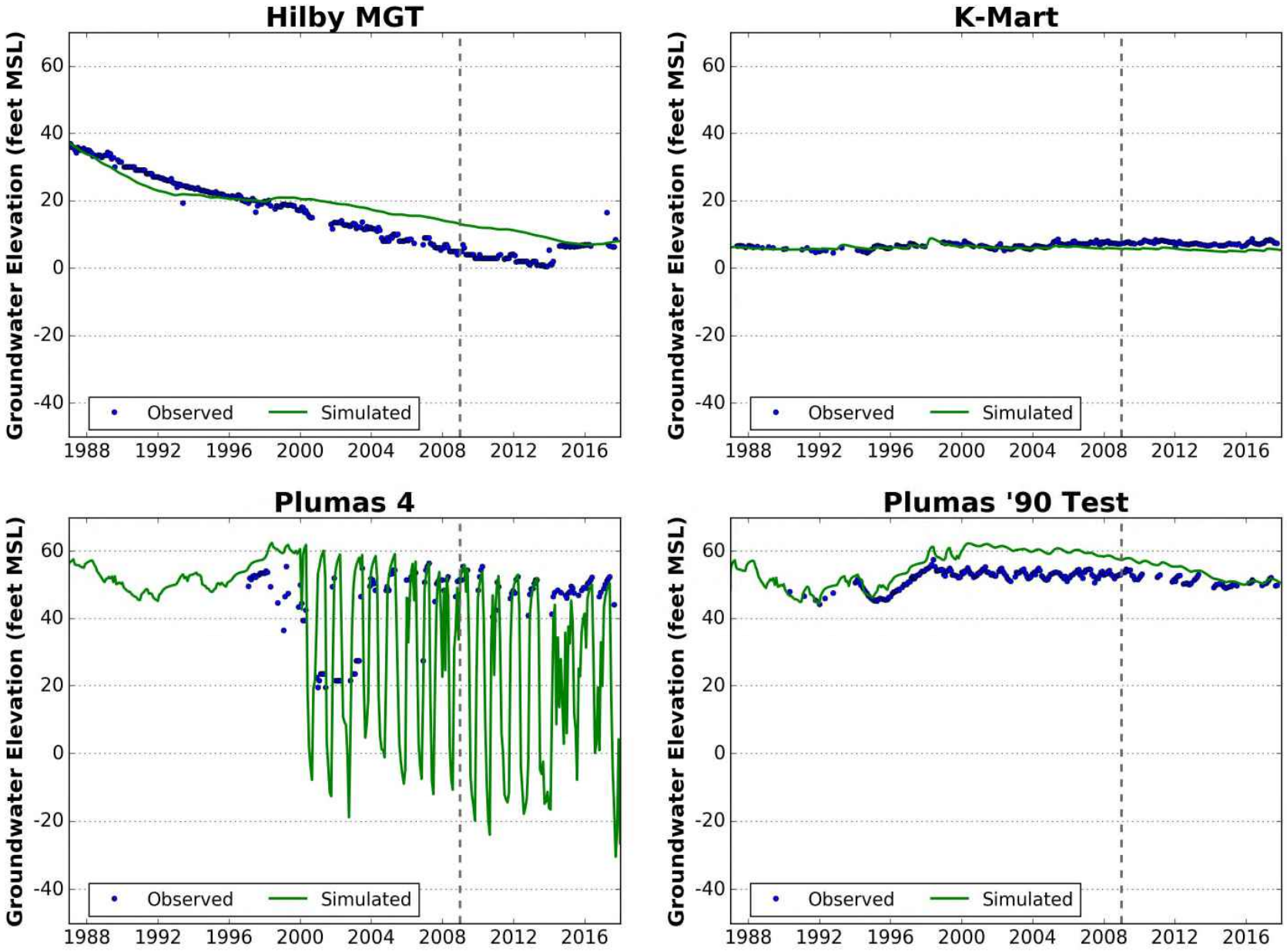


Figure A6: Southern Coastal Subarea Hydrographs

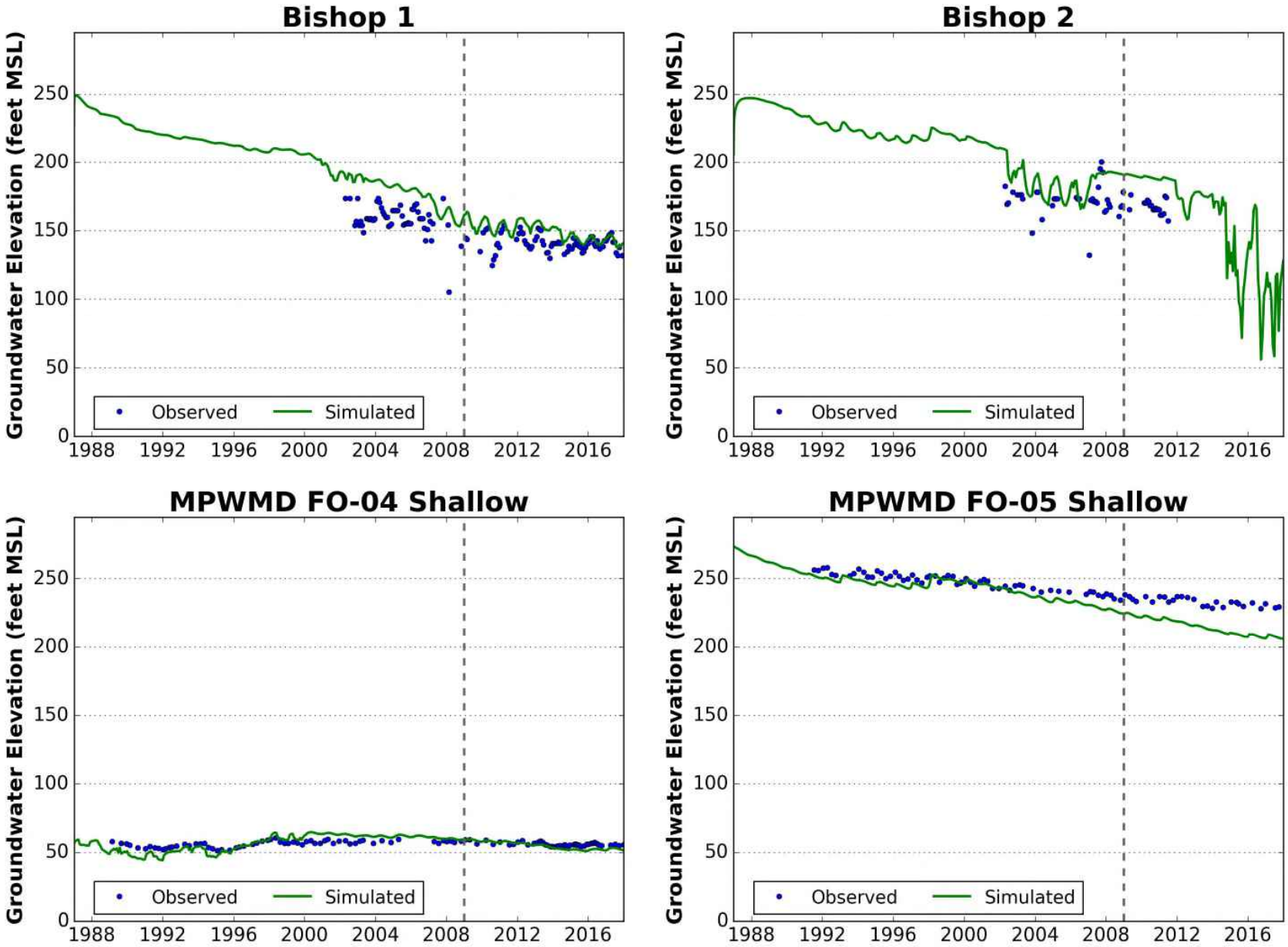


Figure A7: Southern Coastal Subarea Hydrographs

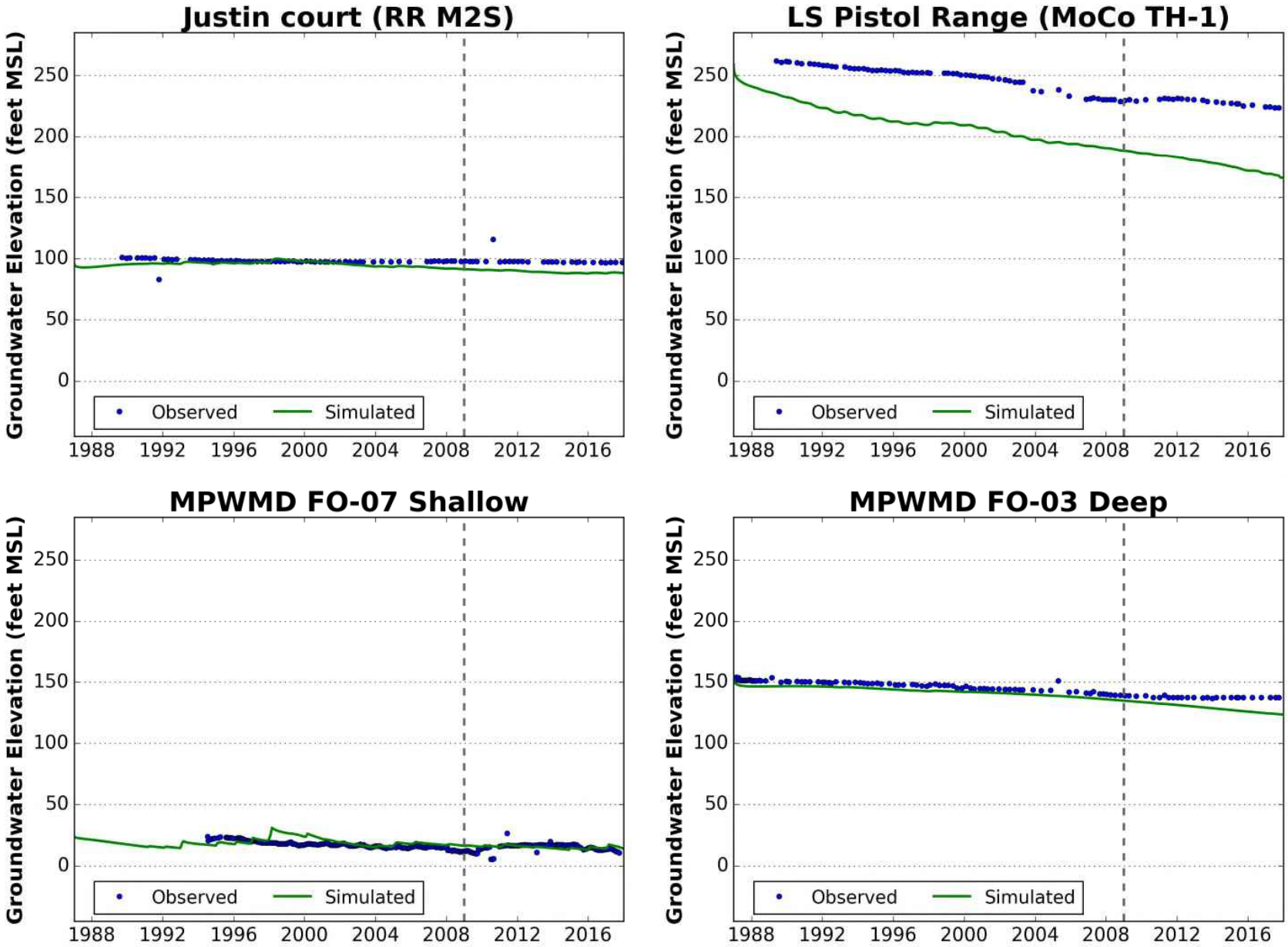


Figure A8: Laguna Seca Subarea Hydrographs

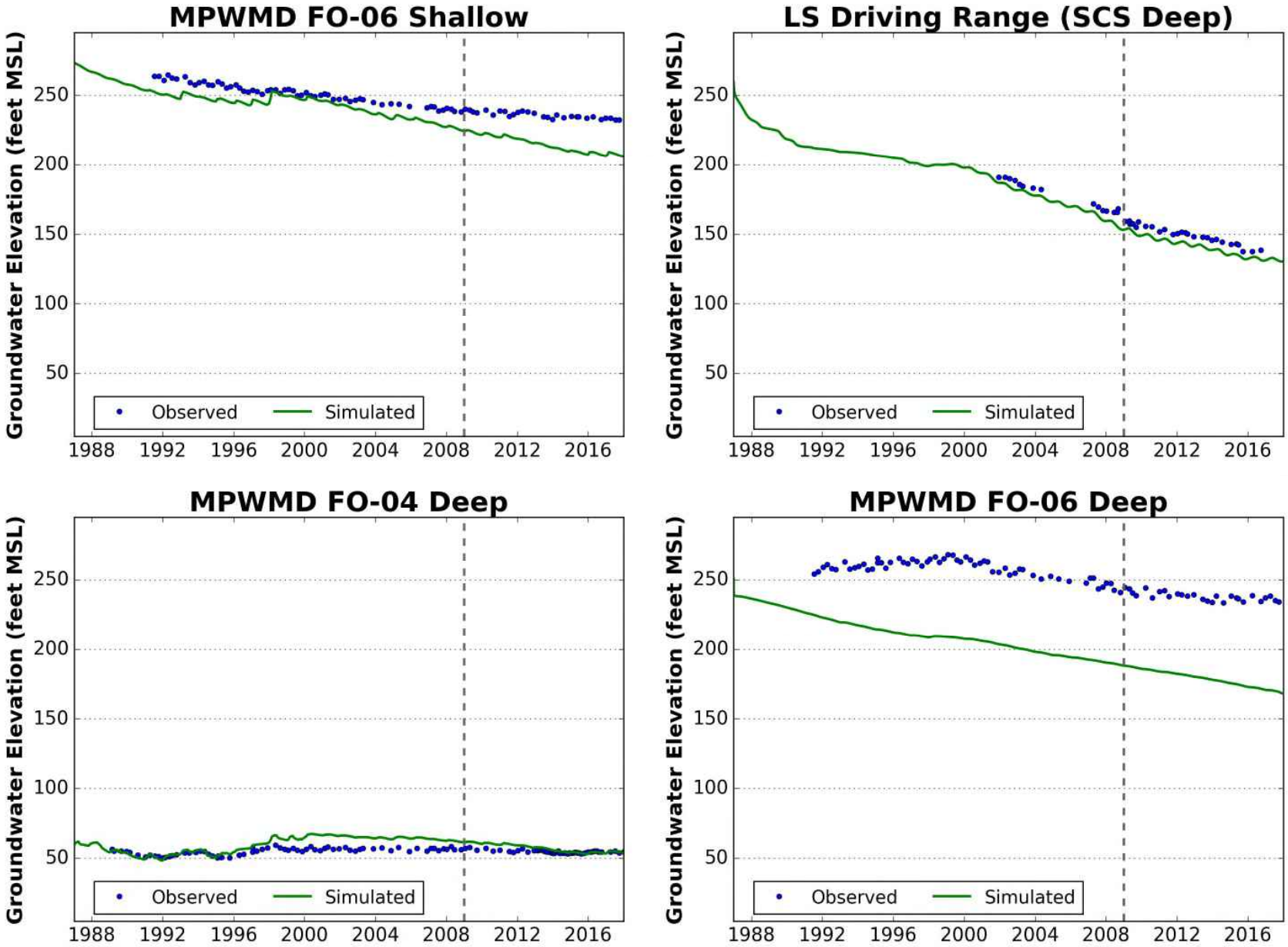


Figure A9: Laguna Seca Subarea Hydrographs

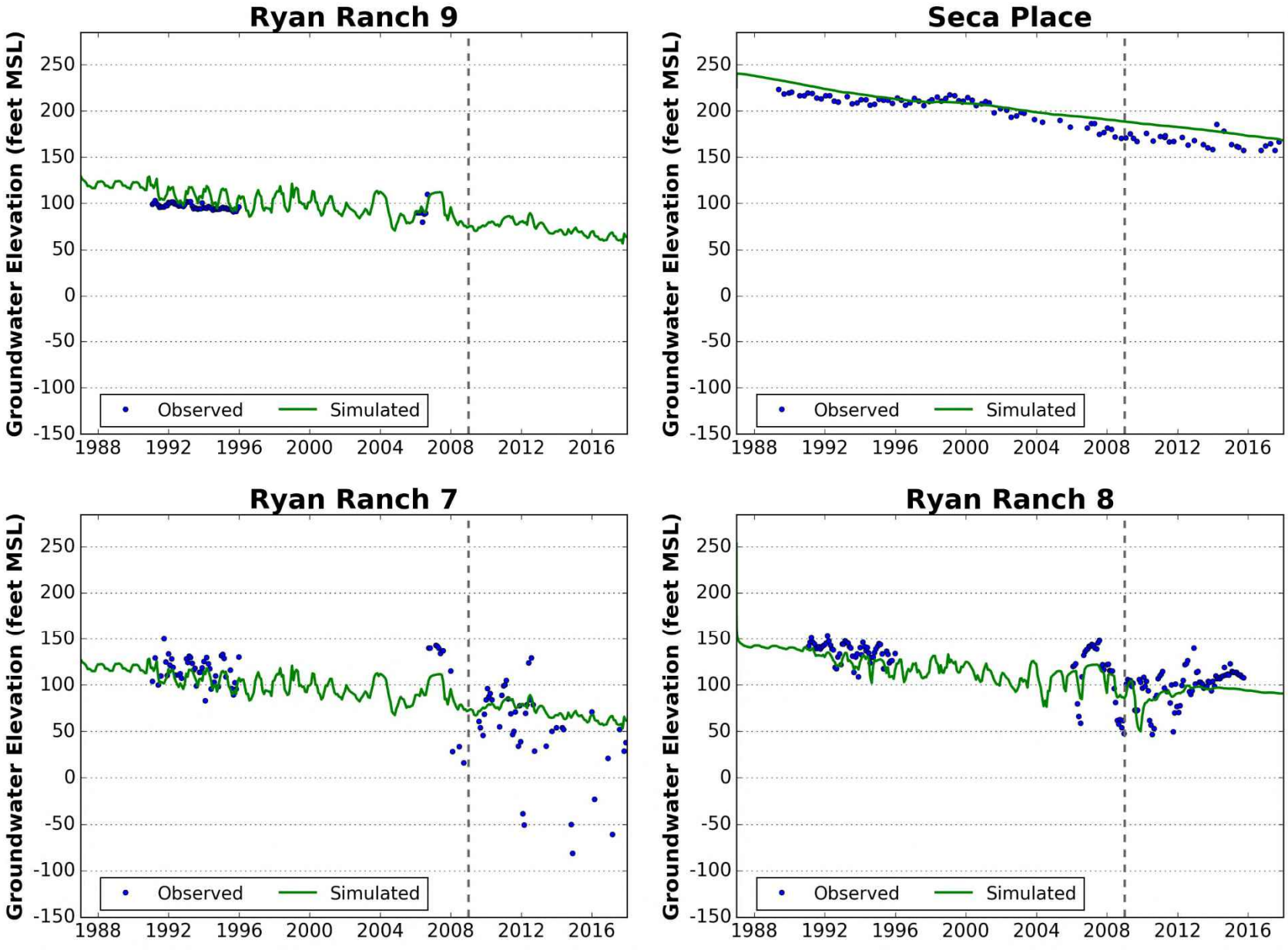


Figure A10: Laguna Seca Subarea Hydrographs

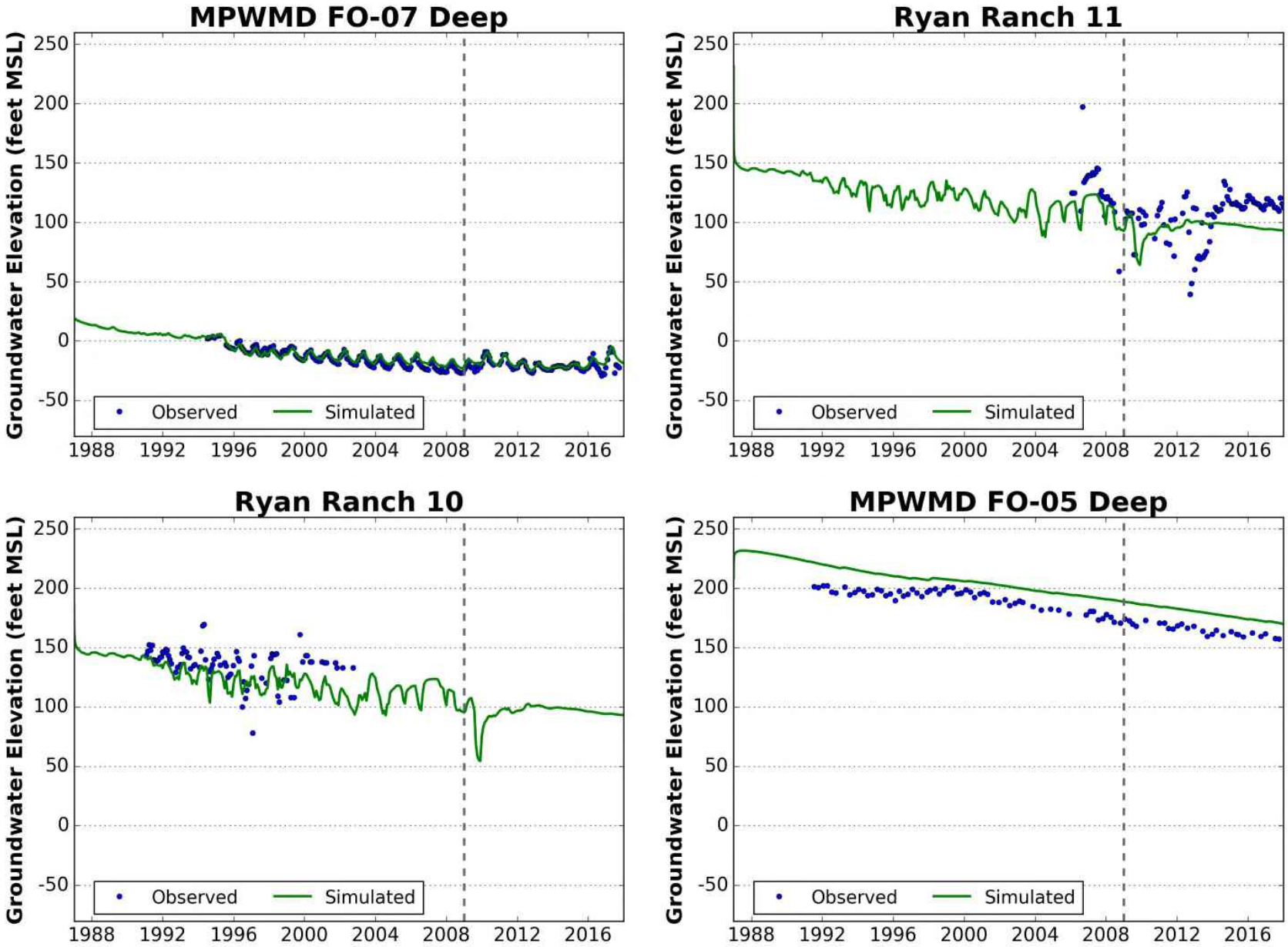


Figure A11: Laguna Seca Subarea Hydrographs

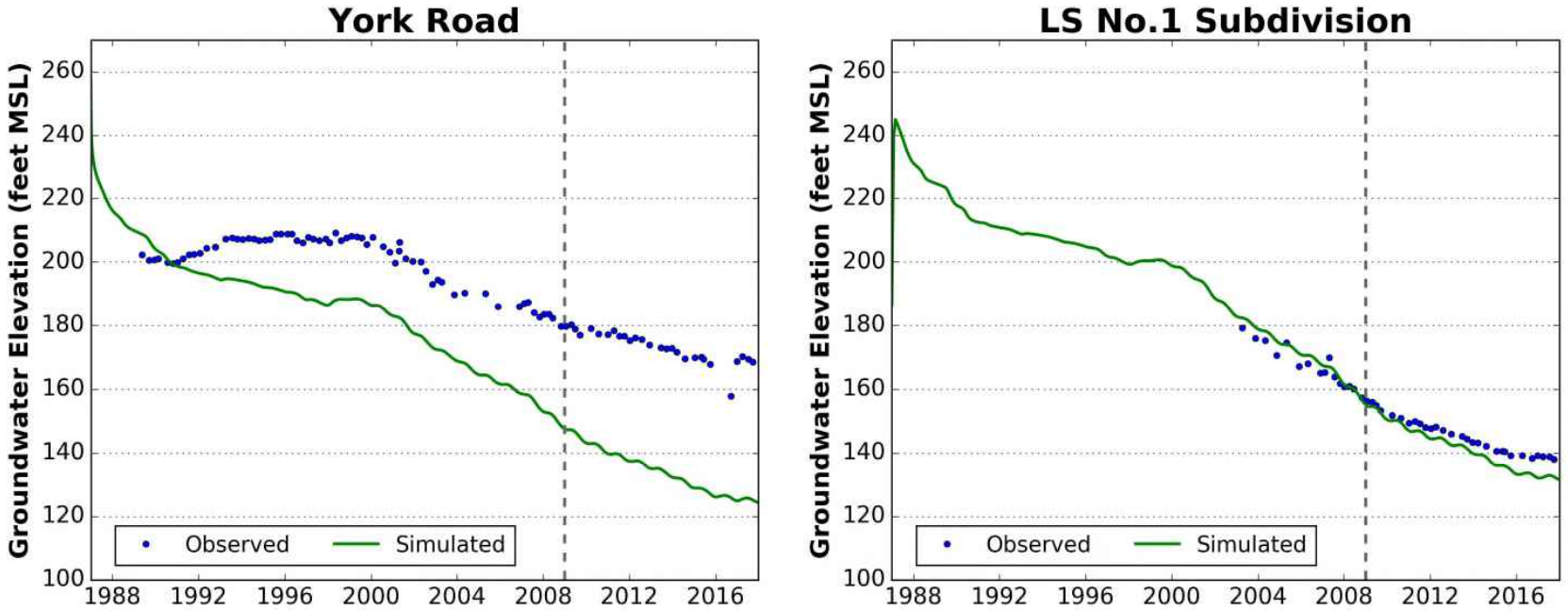


Figure A12: Laguna Seca Subarea Hydrographs

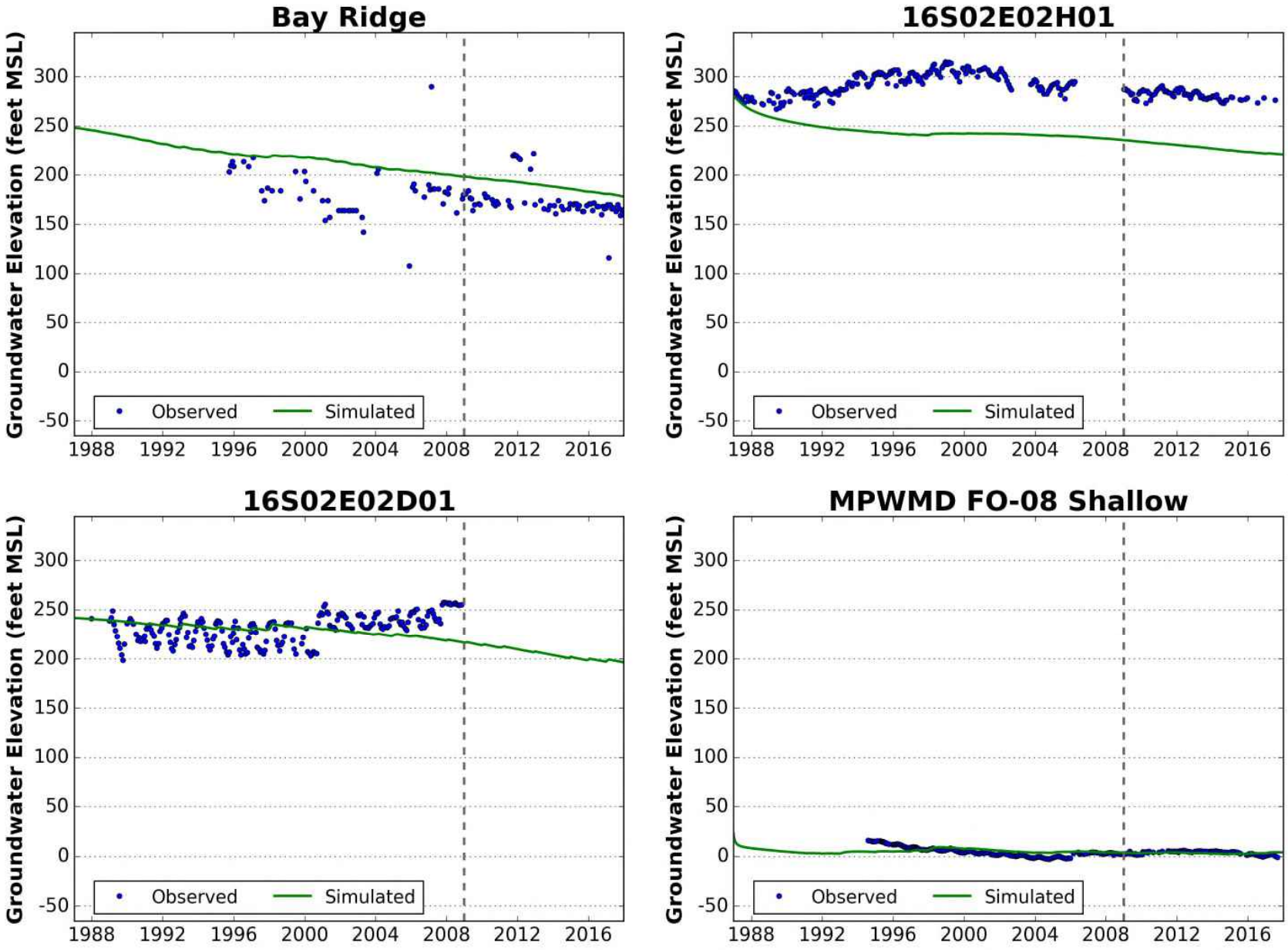


Figure A13: Hydrographs from Wells Outside of the Seaside Groundwater Basin

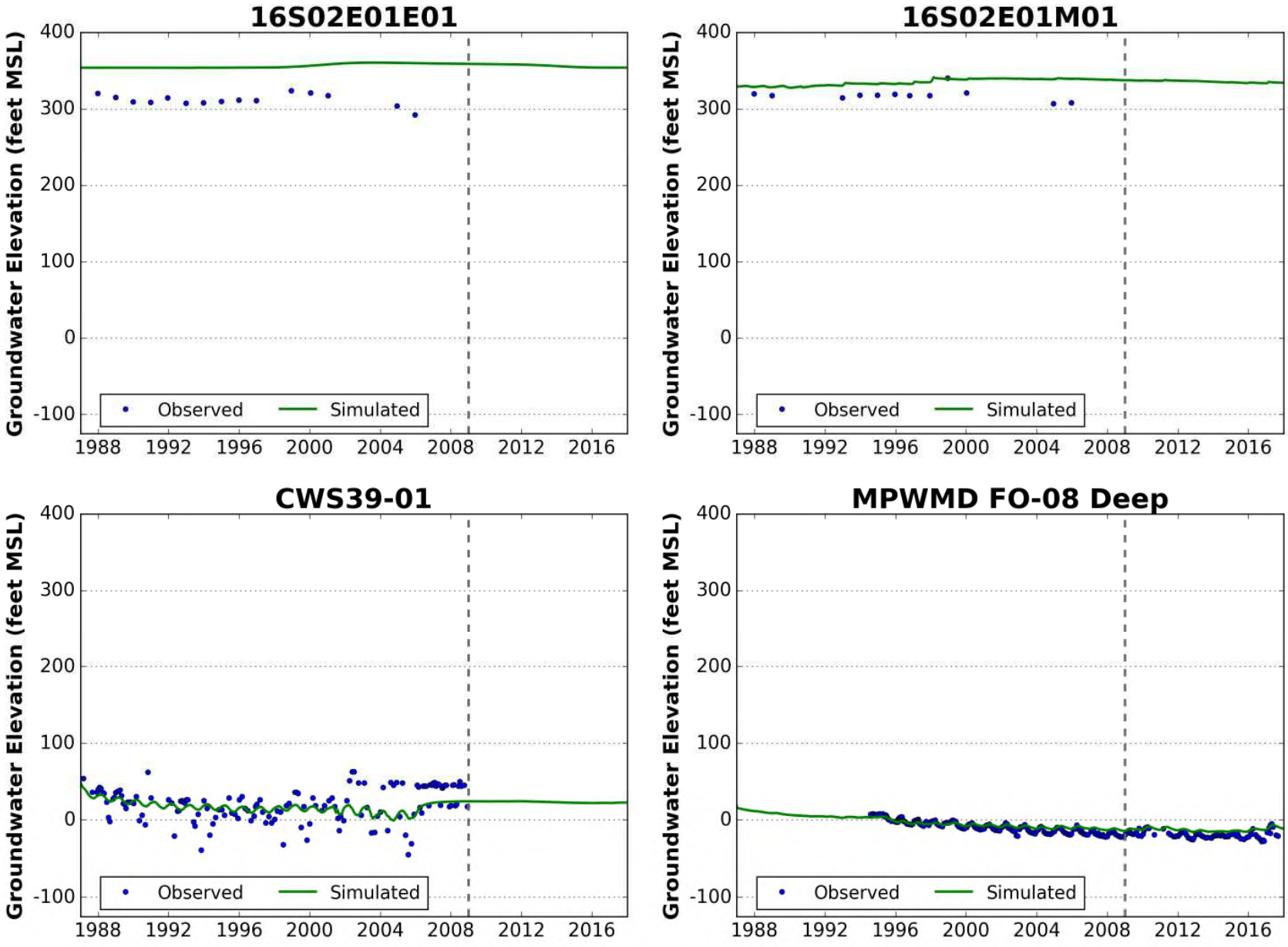


Figure A14: Hydrographs from Wells Outside of the Seaside Groundwater Basin

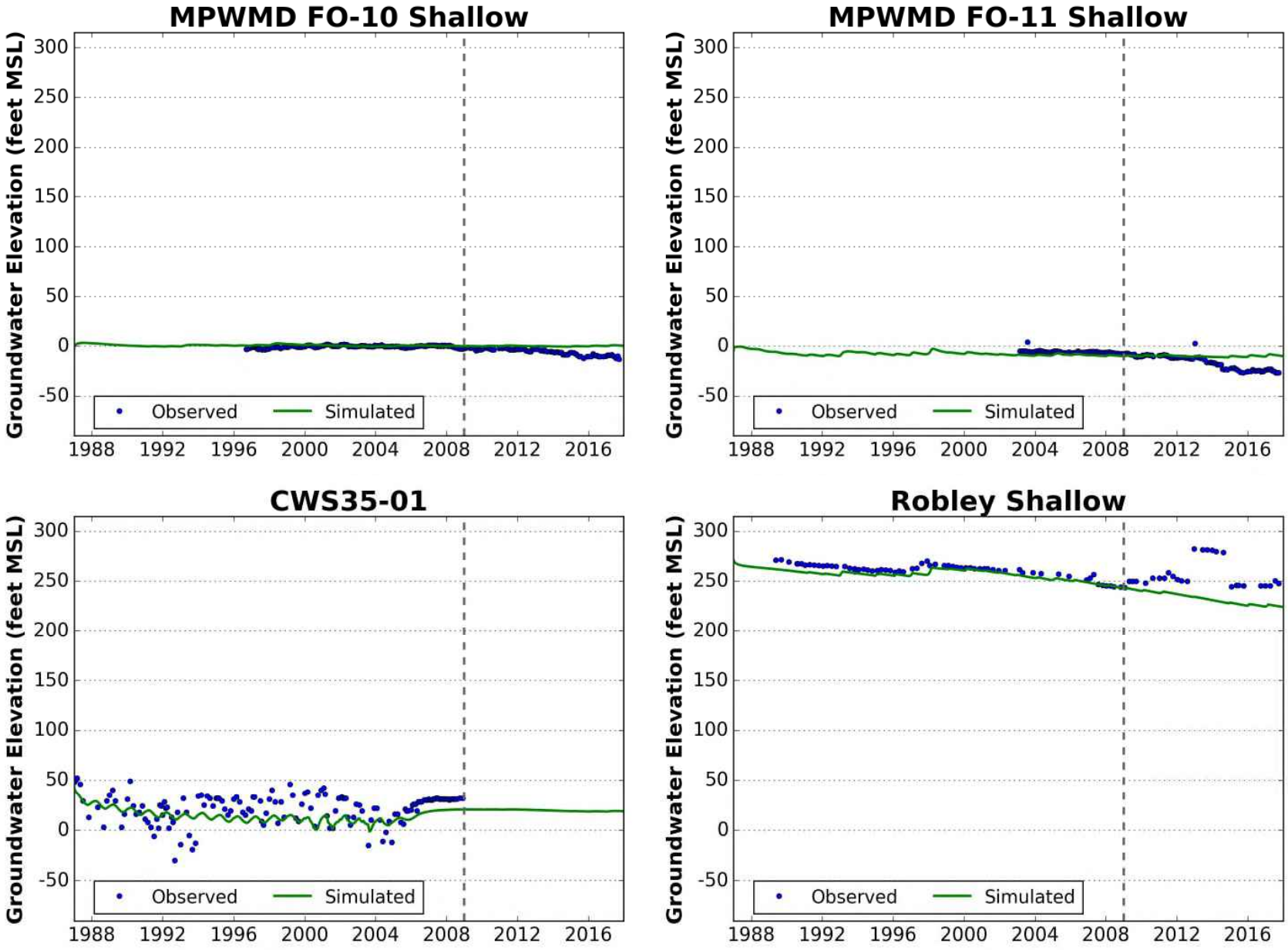
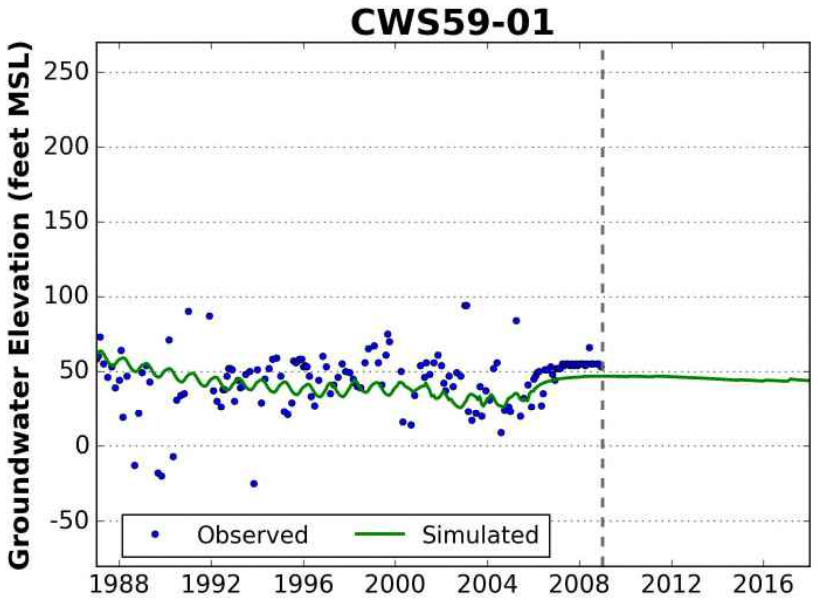
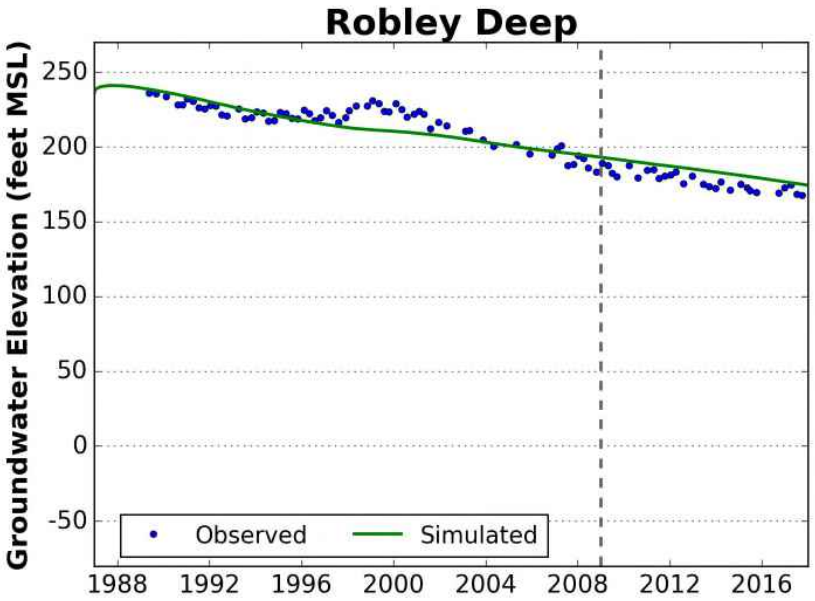


Figure A15: Hydrographs from Wells Outside of the Seaside Groundwater Basin





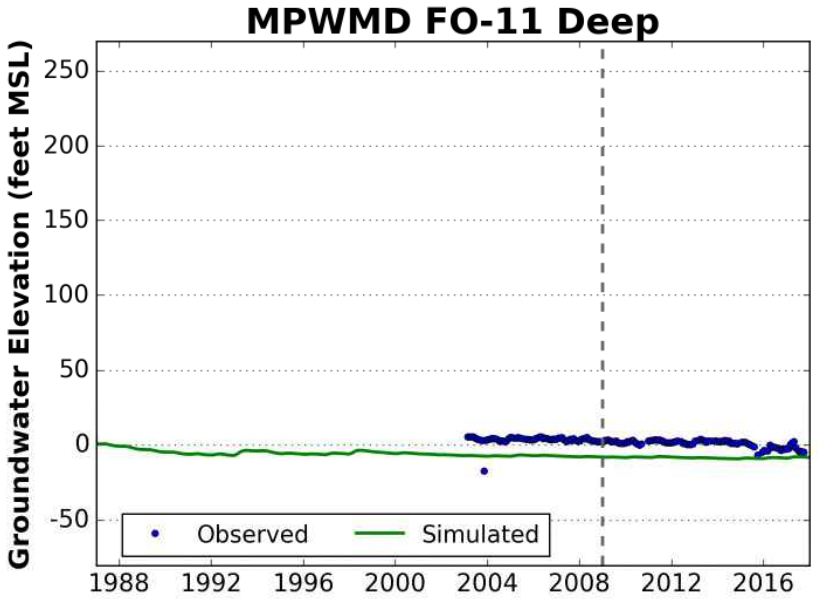


Figure A16: Hydrographs from Wells Outside of the Seaside Groundwater Basin

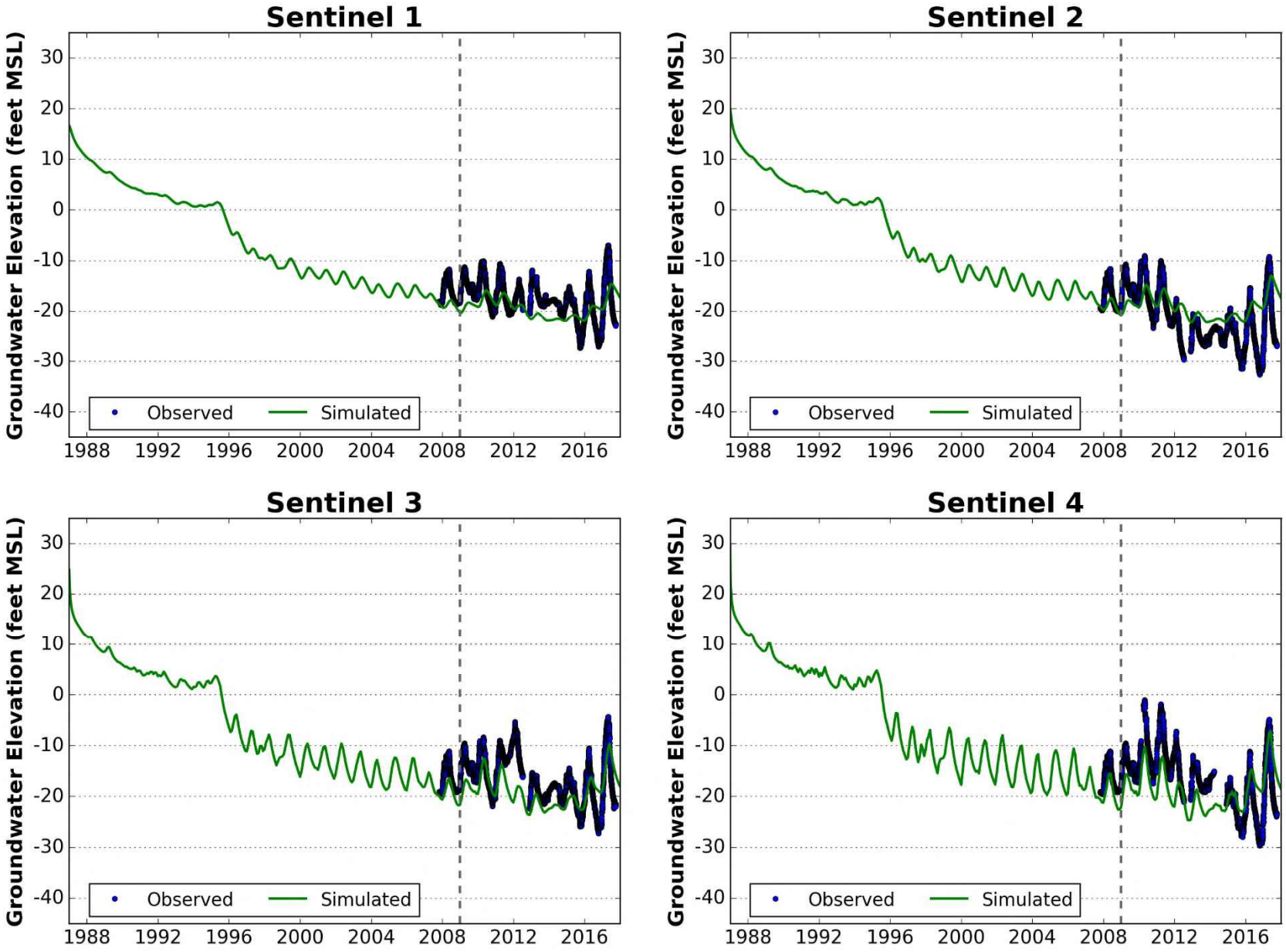


Figure A17: Hydrographs for Sentinel Wells

ATTACHMENT 11

GEOCHEMICAL MODELING

November 17, 2017
Project No. 12-0048

Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, California 93942

Attention: Mr. Jonathan Lear, Senior Hydrogeologist

Subject: Proposal for Seaside Groundwater Basin Geochemical Interaction Evaluation

Dear Mr. Lear:

In accordance with your request, Pueblo Water Resources, Inc. (PWR) is pleased to submit this proposal to provide a geochemical interaction evaluation of various managed aquifer recharge (MAR) projects currently planned to be implemented in the Seaside Groundwater Basin (SGB). Presented in this proposal is a detailed scope of work, estimated costs, and schedule to provide the requested services.

PURPOSE AND SCOPE

The purpose of the proposed work is to perform an initial geochemical interaction modeling assessment of various active and proposed MAR projects in the SGB. The only currently active MAR project is the Monterey Peninsula ASR Project, which injects treated excess Carmel River System water into 4 existing ASR wells (ASR-1 through ASR-4). Proposed MAR projects include the Pure Water Monterey and Monterey Peninsula Water Supply Project (MPWSP), which would inject advanced treated recycled water and desalinated seawater, respectively, into future injection wells in the SGB. The proposed activities and programs related to MAR in the SGB will ultimately result in the mixing and interaction of the following 4 waters:

- Santa Margarita Sandstone aquifer native groundwater
- Treated and disinfected Carmel River System water
- Treated water from the Pure Water Monterey project
- Desalinated seawater from the MPWSP

All of these waters will mix together in various proportions at various times within the geologic matrix of the Santa Margarita Sandstone aquifer (Tsm) within the SGB. The intermixing of these 4 waters and their individual and combined reactions with the minerals in the Tsm formation will result in a variety of geochemical reactions – these reactions may be beneficial (e.g., stabilization of water quality and reduction in corrosivity) or potentially problematic (e.g., precipitation of cementitous scales or evolution of gasses) – and would alter the quality of the

water recovered from the ASR wells and California American Water's (CAW) other municipal production wells in the SGB.

It is therefore prudent to investigate these geochemical reactions and to identify the potential for adverse reactions; and if present, to identify measures to avoid such adverse conditions. The investigation proposed herein will address these issues through a stepwise approach as discussed below.

Scope of Services

The above scenarios can be analyzed through utilization of geochemical simulations from various interaction models and chemical equilibrium databases. A geochemical interaction model has been developed by PWR in recent years to address the interaction of the Tsm mineralogy with Carmel River System waters and Native Tsm groundwater to address these same issues, and will be expanded to cover the more complex interactions of the 4 proposed project waters. PWR's existing geochemical model is based on the USGS geochemical interaction software PHREEQC-2, version 2.15.2697 combined with the robust Lawrence Livermore National Laboratory (LLNL) geochemical equilibrium database.

Implementation of the investigation will include the following tasks, which are structured to allow assessment of results at each step and provide the opportunity to modify the investigation or drop specific lines of analysis due to either fatal flaws or findings of no potential significance. A brief overview of the proposed scope or work by task is presented below:

Task 1 – Water Chemistry Data Compilation

Characterize the complete composition and character of the 4 water sources via laboratory and field analyses, or in the case of waters that do not currently exist (ie MPWSP desal plant water and Pure Water Monterey project effluent), quantitative process modeling estimations of water quality parameters (note that these process modeling estimations are not part of our services and would be provided by the project proponent's engineers). The initial step in this effort will be the preparation of a list of water chemistry parameters necessary for geochemical interaction modeling and a request for data for the injection source waters from the Pure Water Monterey and MPWSP project sponsors (MRWPCA and CAW, respectively). Data gaps will be identified and a Sampling and Analysis Plan (SAP) will be developed to fill any data gaps.

Task Deliverable: A Technical Memorandum (TM) summarizing the available water quality data for each of the project sources, and a SAP to fill-in missing data. *Note that no costs for collection of field or laboratory data are budgeted in this task. If additional sampling is necessary, such costs are assumed to be the responsibility of the respective source water generators or project proponents.*

Task Duration: 4 weeks

Task 2 – Aquifer Mineralogy Data Compilation

Characterize the mineral composition of the Tsm aquifer via empirical laboratory analysis of well cuttings and/or core samples. These data already exist for two of the ASR project wells (ASR-2 and ASR-3) that characterize the Tsm aquifer mineralogy at the two ASR facilities (Santa Margarita and Seaside Middle School, respectively); however, similar data will be needed for the Pure Water Monterey and MPWSP well facilities, and will need to be coordinated with the construction of the new wells for these projects. In addition, the older/existing mineralogical data may be incomplete for purposes of this new modeling effort. To maximize the quality and quantity of data available for this work, detailed protocols for sample collection and analytical testing will be provided.

Task Deliverable: A TM summarizing the mineral characterization of the Tsm, and protocol for the sample collection and analysis of upcoming Tsm mineralogy samples. *Note that no costs for field or laboratory analyses are budgeted for this task; but are reportedly included in the current budgets for the construction of the monitoring well for the Pure Water Monterey project in May 2018.*

Task Duration: 2 weeks

Task 3 – Geochemical Model Development

Develop a geochemical interaction model based on the data derived from Tasks 1 and 2 above, combined with the geochemical equilibrium databases discussed previously.

To complete this work, the existing model will be upgraded and expanded, including the addition of the most recent French Geological Survey (BRGM) Thermoddem V1.1 database and the Swiss (ETH Zurich) CHEMDATA17 database. The upgrades will allow further analysis of water quality stabilization, more accurate identification of sulfate/carbonate/siliceous scaling, and assessment of corrosivity issues in recovered waters.

Task Deliverable: A summary of model base and primary settings will be provided if requested.

Task Duration: 3 weeks

Task 4 – Model Mixing Ratios

Upon completion of Task 3, PWR will model a number of mixing ratios of the four water types. For the purpose of planning, there will be 21 mixtures of various percentage mixtures of the four water types; **Table 1** outlines the mixing ratios that will initially be modeled. The matrix of water mixtures presented in **Table 1** were chosen through discussions with MPWMD staff to bracket the potential extreme case mixing scenarios that might occur during program operations; this methodology should identify potential problem areas to avoid early in the investigation, which will allow additional efforts to analyze these scenarios if warranted.

PWR will analyze the geochemical stability of each of the individual waters, and perform the modeling of the proposed intermixing scenarios described above. The results of the

modeling will be analyzed and interpreted with specific attention to potentially adverse geochemical interactions such as mineral scale formation, gas evolution, and leaching/mobilization of deleterious compounds within the Tsm formation.

Task Deliverable: A TM summarizing the results of the geochemical interaction modeling, and recommendations for additional model scenarios based on the initial output runs.

Task Duration: 6 weeks

Table 1. Summary of Mix Ratios for Geochemical Modeling

Mix No.	% Native Tsm Water	% Treated Carmel River Water	% Reclaimed PWM Water	% Desal Water
1	100	0	0	0
2	0	100	0	0
3	0	0	100	0
4	0	0	0	100
5	66	33	0	0
6	66	0	33	0
7	66	0	0	33
8	33	66	0	0
9	0	66	33	0
10	0	66	0	33
11	33	0	66	0
12	0	33	66	0
13	0	0	66	33
14	33	0	0	66
15	0	33	0	66
16	0	0	33	66
17	55	15	15	15
18	15	55	15	15
19	15	15	55	15
20	15	15	15	55
21	25	25	25	25

Task 5 – (Optional Task) Additional Focused Analysis

Based on the results of Task 4 above, PWR will identify those mixture simulations that show undesirable geochemical reactions (ie mineral precipitation or gas evolution) and will re-run those model simulations under various modifications of mix ratios and/or aquifer conditions

to identify methods of mitigating the observed adverse reactions and to identify potential operational scenarios which would prevent such adverse geochemical reactions from occurring.

Task Deliverable: A TM summarizing the results of the supplemental modeling and recommendations for project design and/or operational changes associated with enhancing recovered water quality or avoiding adverse geochemical reactions.

Task Duration: 4-6 weeks

Task 6 – Reporting

Upon the conclusion of tasks 1-5, PWR will develop an overall summary report and recommendations for process and/or operational changes for each project to reduce or avoid adverse geochemical reactions. PWR will also participate in two technical workshops with project stakeholders to discuss the impacts to the various regional projects, and participate in one presentation to the Watermaster Board to address questions and present findings.

Task Duration: 4 weeks

Task 7 – Project Management and Meetings

Provide routine project management, including invoicing, schedule management, project coordination and communication. This will include one intermediate and one final presentation of the evaluation findings and recommendations to the SGB Water Master Technical Advisory Committee (TAC).

Task Duration: Ongoing

Services Not Included

It should be noted that completion of this project will require services which are not included in our proposal; the costs for these items are presumed to be paid for by the project proponents under the provisions of the Storage Agreement. These items include (but are not limited to) the following:

- Laboratory fees;
- Construction of site facilities;
- Permit fees;
- Cost of water, electricity, or other utilities;
- Any other items not specifically included in PWR's scope of services.

ESTIMATED FEES AND SCHEDULE

Based on the scope of services presented herein, we estimate the fees for our services will be approximately *$51,365*, which will be billed on a time-plus-expenses basis in accordance with our current Fee Schedule (attached). An estimated fee summary worksheet is attached summarizing the estimated man-hours and costs per task/work item. The spreadsheet also identifies the cost total including Optional Task 5, as well as a 10 percent contingency which has been noted in the attached budget summary in the event that unforeseen project complications or constraints arise (total with optional task and 10% contingency is *$68,679*). We recommend the contingency be held for authorization by District staff upon written justification by PWR.

We understand that in order to authorize this work, your Board must first approve a formal contract amendment. Based on our current workload, we believe that we can commence work within two weeks of your authorization and that the work will be completed within approximately 4 months.

We appreciate the opportunity to provide ongoing assistance to the District on this important community water-supply project. If you require additional information regarding this or other matters, please contact me.

Sincerely,

PUEBLO WATER RESOURCES, INC.

Stephen P. Tanner, P.E.
Principal Engineer

SPT.rcm

Attachments: Cost Estimation Spreadsheet
2018 Fee Schedule

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Professional Services for SGB Geochemical Interaction Evaluation

PUEBLO water resources

PWR Project No.: 12-0048

ESTIMATED FEE SUMMARY

LABOR		Principal Professional	Senior Professional	Drafting	WP	Hours by Task	Estimated Task Cost
	Hourly Fee	$205	$185	$115	$95		
Task No.	Task Description						
1	Water Chemistry Data Compilation	22	-	-	12	34	$5,650
2	Aquifer Mineralogy Compilation	38	-	-	-	38	$7,790
3	Geochemical Model Development	48	-	-	-	48	$9,840
4	Model Mixing Ratios	67	-	-	-	67	$13,735
5	Additional Focused Analysis (OPTIONAL)	54	-	-	-	54	$11,070
6	Reporting	48	-	-	-	48	$9,840
7	PM and Meetings	22	-	-	-	22	$4,510
		-	-	-	-	0	$0
		-	-	-	-	0	$0
		-	-	-	-	0	$0
	Hours by Labor Category:	299	0	0	12		
	Costs by Labor Category:	$61,295	$0	$0	$1,140		
					Total Labor Hours (not inc. Optional Task):	257	
					Total Labor Costs (not inc. Optional Task):	$51,365	
					Total Labor Hours (inc. Optional Task):	311	
					Total Labor Costs (inc. Optional Task):	$62,435	

OTHER DIRECT COSTS (ODC's)				
Item	Units	Unit Price	No. of Units	Fee
Vehicle	Daily	$75		$0
Travel Per Diem	Daily	$150		$0
				$0
				$0
				$0
			Subtotal ODCs:	$0

OUTSIDE SERVICES					
Task No.	Item	Units	Unit Price	No. of Units	Fee
					$0
					$0
					$0
					$0
					$0
Subtotal Outside Services:					$0
Subtotal Outside Services w/ Markup (15%):					$0

COST SUMMARY	
Labor (not inc. Optional Task)	$51,365
Other Direct Costs	$0
Outside Services	$0
Subtotal (not inc. Optional Task):	$51,365
10 % Contingency (not inc. Optional Task)	$5,137
TOTAL ESTIMATED PROJECT COST (not inc. Optional Task):	$56,502
Task 5 (Optional)	$11,070
Subtotal (inc. Optional Task):	$62,435
10 % Contingency (inc. Optional Task)	$6,244
TOTAL ESTIMATED PROJECT COST (inc. Optional Task):	$68,679

PUEBLO WATER RESOURCES, INC
2018 FEE SCHEDULE

Professional Services

Principal Professional.....$205/hr
Senior Professional.....$190/hr
Project Professional.....$175/hr
Staff Professional.....$145/hr
Technician.....$135/hr
Illustrator.....$120/hr
Word Processing.....$100/hr

Other Direct Charges

Subcontracted Services..... Cost Plus 15%
Outside Reproduction..... Cost Plus 15%
Travel Expenses.....Cost Plus 15%
Per Diem*.....$150/day
Vehicle $75/day

Equipment Charges

Drilling Fluid Test Kit..... $100/day, $400/week
Field Water Quality Meter (Hach DR890)..... $75/day, $275/week
Orion ORP/pH/Temp Probe..... $75/day, $275/week
Water Level Probes (In-Situ Mini-Troll/Level Troll).....$100/day, $300/week
Fuji Ultrasonic Flowmeter.....$200/day, $750/week

*Regionally and seasonally specific to project.

ATTACHMENT 12

STORAGE AND RECOVERY AGREEMENT

AGREEMENT FOR STORAGE AND RECOVERY OF NON-NATIVE WATER FROM THE SEASIDE GROUNDWATER BASIN

THIS AGREEMENT is made and entered into on_____, _____, by and between the SEASIDE BASIN WATERMASTER (the "WATERMASTER"), California-American Water Company (the "PRODUCER"), and the Monterey Peninsula Water Management District (the "DISTRICT") as follows:

Recitals

1. The WATERMASTER was created by the Amended Decision of the Monterey County Superior Court, filed February 9, 2007, Case No. M66343 (the "Decision"). This Decision was made for the purposes of managing and protecting the Seaside Groundwater Basin ("Basin") for the benefit of the businesses, individuals, and public agencies that overlie or extract groundwater from the Basin. PRODUCER and DISTRICT are parties to the Decision.

2. In February of 2010, the WATERMASTER, in accordance with Section III.3.L.3.j.xix and III.H.2 of the Decision, allocated 28,784 acre-feet of Storage in the Coastal and Northern Inland Subareas to the PRODUCER. In accordance with Section III.H.3 of the Decision, PRODUCER may use its Storage Allocation for the benefit of its customers and for other purposes as PRODUCER deems appropriate.

3. Section III.H.1 of the Decision states that the Parties shall be permitted to utilize available Storage space for "bona fide Groundwater Storage Projects." Further, Section III.Q of the Decision states that: (a) DISTRICT can store water for the benefit of DISTRICT in the Basin; and (b) the Decision preserves DISTRICT's statutory right to store water in subterranean reservoirs.

4. The PRODUCER and WATERMASTER have an existing *Agreement for Storage and Recovery of Non-Native Water from the Seaside Groundwater Basin* dated October 21, 2011, which authorizes PRODUCER to store 2,426 acre-fee per year of Non-Native water in, and to subsequently recover that stored water from, the Basin.

5. In accordance with the *Water Purchase Agreement for Pure Water Monterey Project* made by and between PRODUCER, DISTRICT, and MONTEREY ONE WATER ("M1W") (formerly the Monterey Regional Water Pollution Control Agency) dated September 19, 2016 (the "WPA"), incorporated herein by this reference, the DISTRICT will deliver for the benefit of PRODUCER advanced treated recycled water from the Pure Water Monterey project (the "AWT Water") to the Basin for injection, storage, and recovery from the Basin.

6. PRODUCER and DISTRICT have applied to the WATERMASTER for permission to, using PRODUCER's Storage Allocation, Store the AWT Water in, and subsequently recover that Stored Water from, the Basin.

7. Under the authorities granted to the WATERMASTER by the Decision, on October 3, 2018 the WATERMASTER approved the application of the PRODUCER and the DISTRICT and hereby grants permission to the PRODUCER and the DISTRICT to store Non-Native water/AWT Water in, and to recover that stored water from, the Basin, as described in and subject to the Terms and Conditions contained in this Agreement.

Terms and Conditions

NOW, THEREFORE, in consideration of the foregoing and the mutual promises contained herein, the parties hereto agree to the following terms and conditions:

1. Definitions. Unless otherwise specifically defined herein, the defined terms shall be given the same definition and meaning set forth in the Decision, as listed in Attachment A.

2. Storage Quantity. The PRODUCER is authorized to store, by means of direct injection by DISTRICT or M1W, 6,000 acre-feet per year of the AWT Water in the Basin, which includes AWT Water used to backflush an injection well that percolates into the ground. The DISTRICT is authorized, using the PRODUCER's Storage Allocation, to store by means of direct injection up to 4,000 acre-feet of the AWT Water for the PRODUCER's future use (the "Reserve Water"). In the event the WATERMASTER revises the Total Usable Storage Space of the Basin in accordance with Section III.H.4 of the Decision, or if one or more Alternative Producers converts entirely or in part from an Alternative Production Allocation to a Standard Production Allocation in accordance with Section III.B.3.e of the Decision, the PRODUCER's Storage Allocation may change, and this may affect the storage quantity authorized by this Agreement; however, any reduction in storage quantity will not result in a corresponding reduction in the amount of AWT Water actually stored at the time of the change. In such instance this Agreement will be modified to reflect these changes. Further, the parties may agree by written amendment to this Agreement to revise the storage quantities authorized herein.

3. Storage Location(s). The storage of water authorized under paragraph 2 above will be performed at the following location(s): see Attachment B.

4. Recovery Location(s). PRODUCER is authorized to recover the AWT Water stored at the location(s) described under paragraph 3 above, which recovery must be performed within the same Subarea of the Basin as the location(s) within which it was stored. PRODUCER will recover the AWT Water at the following location(s), or at such other locations as may be approved by WATERMASTER upon written request by PRODUCER or DISTRICT:

   A. Ord Grove Well #2, 1987 Park Ct., Seaside (Santa Margarita)
   B. Paralta Well, 2104 Paralta Ave., Seaside (Santa Margarita)

C. Luzern Well #2, 1984 Luzern St., Seaside (Paso Robles)
D. Playa Well #3, 1237 Playa Ave., Seaside (Paso Robles)
E. Plumas Well #4, 1453 Plumas Lane, Seaside (Paso Robles)
F. Santa Margarita ASR-1, 1910 General Jim Moore Blvd, Seaside (Santa Margarita)
G. Santa Margarita ASR-2, 1910 General Jim Moore Blvd, Seaside (Santa Margarita)
H. Seaside Middle School ASR-3, 2111 General Jim Moore Blvd, Seaside (Santa Margarita)
I. Seaside Middle School ASR-4, 2111 General Jim Moore Blvd, Seaside (Santa Margarita)
J. Fitch Park ASR-5, General Jim Moore Blvd, Seaside (Santa Margarita)
K. Fitch Park ASR-6, General Jim Moore Blvd, Seaside (Santa Margarita)

5. Recovery Quantity. The PRODUCER is initially authorized to recover (Extract) the full amount of the AWT Water actually Stored in accordance with this Agreement. However, due to the hydrogeologic characteristics of the Seaside Basin, naturally occurring losses of Stored Water may result in the WATERMASTER reducing the percentage of Stored Water that may be Extracted. Should the WATERMASTER determine that this needs to be done, this Agreement will be modified to reflect the reduced quantity of water that the PRODUCER may recover, and the technical basis for this determination will be provided to all PRODUCERs.

6. Water Quality. The DISTRICT hereby certifies that prior to the AWT Water being introduced into the Basin for Storage in accordance with this Agreement, all such water will meet all of the requirements imposed on the DISTRICT or M1W by permits and/or approvals issued to the DISTRICT or M1W by the California Regional Water Quality Control Board and any other water quality standards imposed by any other government entity, including without limitation the California Department of Public Health and the Monterey County Department of Environmental Health.

DISTRICT shall ensure that the water quality characteristics of the AWT Water that will be stored under this Agreement meet the "Water Treatment Guarantee" as defined in the WPA, which definition is incorporated herein by this reference, which characteristics are considered by all parties to this Agreement to not pose a threat of harm to the Basin.

DISTRICT agrees that prior to injecting any AWT Water into the Basin for Storage, it must provide to the WATERMASTER the geochemical interaction modeling assessment (including any recommended mitigation measures) ("Modeling Assessment") contemplated by the February 10, 2018 *Memorandum of Agreement Between the Seaside Basin Watermaster, the Monterey Peninsula Water Management District, California American Water Company, and Monterey One Water to Share in the Costs of Performing Geochemical Modeling of the Seaside Basin Groundwater Basin* (see Attachment C). If the Modeling Assessment recommends implementation of mitigation measures to avoid a Material Injury (as defined in the Decision) resulting from the injection of AWT Water into the Basin, DISTRICT must, prior to the initial injection of AWT Water, demonstrate

to the reasonable satisfaction of WATERMASTER that sufficient measures will be implemented to avoid Material Injury.

The Parties expect that desalinated water will not be present/injected into the Basin prior to the initial injection of AWT Water, therefore, in that case, any mitigation measures to be implemented prior to the initial injection of AWT Water shall not include any measures recommended as a result of the presence/injection of desalinated water. Any mitigation measures to be required as a result of the injection of desalinated water into the Basin will be addressed at the time a Storage and Recovery Agreement for desalinated water is presented to the WATERMASTER for consideration.

7. Carryover and Stored Water Credits. In accordance with Section III.F of the Decision, if during a particular Water Year the PRODUCER does not Extract from the Basin a total quantity equal to the PRODUCER's Standard Production Allocation for the particular Water Year, the PRODUCER may establish Carryover Credits, up to the total amount of the PRODUCER's Storage Allocation.

   However, in accordance with the Decision in no circumstance may the sum of the PRODUCER's Stored Water Credits and Carryover Credits exceed the PRODUCER's available Storage Allocation. Further, in accordance with Section III.H.5 of the Decision, unused (not Extracted) Stored Water Credits may be carried over from year to year, but due to the hydrogeologic characteristics of the Seaside Basin, naturally occurring losses of Stored Water may require Watermaster to discount the percentage of Stored Water that may be Extracted.

8. Measurement and Reporting of Extractions and Storage. In accordance with Section III.J of the Decision, the DISTRICT shall ensure that adequate measuring devices are installed, maintained, and used on all AWT Water injection facilities, and the PRODUCER shall ensure that adequate measuring devices are installed, maintained, and used on all of PRODUCER's Extraction facilities, as required by the WATERMASTER's Rules and Regulations and this Agreement.

   Beginning on the initial delivery of AWT Water to the Basin for Storage in accordance with this Agreement, the DISTRICT shall provide to the WATERMASTER a monthly injection report containing the following data for the preceding month:
   - The quantity of AWT Water that was injected by the DISTRICT for delivery to PRODUCER (defined as "Company Water" in the WPA, which definition is incorporated herein by this reference)
   - The quantity of AWT Water that was injected by the DISTRICT as Reserve Water
   - The location(s) where the water was injected

   Beginning on the initial delivery of Company Water by the DISTRICT to the PRODUCER in accordance with the WPA, the PRODUCER shall provide to the WATERMASTER, as part of each monthly Production Report, data for the reporting period stating:
   - The quantity of Company Water that was recovered (Extracted)
   - The location(s) where the Company Water was recovered (Extracted)

9. Indemnification. The PRODUCER shall assume the defense of, indemnify and hold harmless, the WATERMASTER, its officers, agents and employees from all claims, liability, loss, damage or injury of any kind, nature or description arising directly or indirectly from actions or omissions by the PRODUCER or any of its officers, agents, employees, or independent contractors relating to this Agreement, excepting claims, liability, loss, damage or injury which arise from the willful or negligent acts, omissions, or activities of an officer, agent or employee of the WATERMASTER.

   The DISTRICT shall assume the defense of, indemnify and hold harmless, the WATERMASTER, its officers, agents and employees from all claims, liability, loss, damage or injury of any kind, nature or description arising directly or indirectly from actions or omissions by the DISTRICT or any of its officers, agents, employees, or independent contractors relating to this Agreement, excepting claims, liability, loss, damage or injury which arise from the willful or negligent acts, omissions, or activities of an officer, agent or employee of the WATERMASTER.

10. Successors and Assigns. This Agreement, and all the terms and conditions hereof, shall apply to and bind the successors and assigns of the respective parties hereto; provided that the PRODUCER and the DISTRICT shall not assign this Agreement without prior written consent of the WATERMASTER.

11. Further Cooperation. Each of the parties agree to reasonably cooperate with each other, and to execute and deliver to the other all such documents and instruments, and to take such further actions, as may reasonably be required to give effect to the terms and conditions of this Agreement.

12. Interpretation. It is agreed and understood by the parties hereto that this Agreement has been arrived at through negotiation and that no party is to be deemed the party which prepared this Agreement within the meaning of Civil Code §1654. The provisions of this Agreement shall be interpreted in a reasonable manner to effect the purpose of the parties and this Agreement.

13. Disputes. If any dispute under this Agreement arises the parties shall first meet and confer in a good faith attempt to resolve the matter between themselves. Each partyshall make all reasonable efforts to provide to the other parties all the information that the party has in its possession that is relevant to the dispute, so that all parties will have ample information with which to reach a decision. If the dispute is not resolved by meeting and conferring, the matter shall be submitted to the Court for resolution pursuant to the Court's reserved jurisdiction as set forth in the Decision.

14. Modification. This Agreement may be amended, altered or modified only by a writing, specifying such amendment, alteration or modification, executed by authorized representatives of each of the parties hereto.

15. Attorney's Fees and Costs. In the event it should become necessary for any party to enforce

any of the terms and conditions of this Agreement by means of court action or administrative enforcement, the prevailing party/parties, in addition to any other remedy at law or in equity available to such party, shall be awarded from the non-prevailing party/parties all reasonable costs and reasonable attorney's fees in connection therewith, including the fees and costs of experts reasonably consulted by the attorneys for the prevailing party/parties.

16. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall be deemed to constitute one and the same instrument.

17. Written Notice. Written notice shall be deemed to have been duly served if delivered in person or by mail to the individuals and at the addresses listed below:

A. WATERMASTER: Administrative Officer
Seaside Basin Watermaster
P.O. Box 51502
Pacific Grove, CA 93950

B. PRODUCER: Director of Operations
California American Water
511 Forest Lodge Road, Suite 100
Pacific Grove, CA 93950

C. DISTRICT: General Manager
Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, CA 93940

18. Conflicts with the Decision. The Parties believe this Agreement to be consistent with the terms of the Decision and agree that the PRODUCER's and DISTRICT's rights under this Agreement are subject to the Decision and in the event of any conflict between the provisions of this Agreement and the Decision, the Decision shall control.

19. Entire Agreement. This Agreement constitutes the entire and complete agreement between the parties regarding the subject matter hereof, and supersedes all prior or contemporaneous negotiations, understandings or agreements of the parties, whether written or oral, with respect to such subject matter.

20. Term. This Agreement shall be effective on the date it has been executed by all Parties and shall be coterminous with the WPA.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement consisting of seven (7) pages and three (3) attachments in triplicate on the date hereinabove written.

WATERMASTER

By_____
Paul Bruno
Chairperson

PRODUCER

By_____
Garry Hofer
Vice President, Operations

DISTRICT

By_____
David Stoldt
General Manager

ATTACHMENT A

DEFINITIONS
(Excerpted from the Decision)

"Artificial Replenishment" means the act of the WATERMASTER, directly or indirectly, engaging in or 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 shall also include 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.

"Carryover" means that portion of a Party's Production Allocation that is not Extracted from the Basin during a particular Water Year. Each acre-foot of Carryover establishes an acre-foot of Carryover Credit.

"Carryover Credit(s)" means the quantity of Water established through Carryover, that a Party is entitled to Produce from the Basin pursuant to Section III.F.

"Extraction," "Extractions," "Extracting," "Extracted," and other variations of the same noun or verb, mean pumping, taking, diverting or withdrawing Groundwater by any manner or means whatsoever from the Seaside Basin.

"Groundwater" means all Water beneath the ground surface in the Seaside Basin, including Water from Natural Replenishment, Artificial Replenishment, Carryover, and Stored Water.

"Natural Replenishment" means all processes by which Water may become a part of the Groundwater supply of the Seaside Basin without the benefit of the Physical Solution and the coordinated management it provides. Groundwater that occurs in the Seaside Basin as a result of the Physical Solution, which is not Natural Replenishment, includes, but is not limited to Storage, Carryover, and Artificial Replenishment.

"Non-Native Water" means all Water that would not otherwise add to the Groundwater supply through natural means or from return flows from surface applications other than intentional Spreading.

"Physical Solution" means the efficient and equitable management of Groundwater resources within the Seaside Basin, as prescribed by this Decision, to maximize the reasonable and beneficial use of Water resources in a manner that is consistent with Article X, Section 2 of the California Constitution, the public interest, and the basin rights of the Parties, while working to bring the Production of Native Water to Natural Safe Yield.

"Producer" means a Party possessing a Base Water Right.

"Standard Production Allocation" is the amount of Groundwater that a Producer participating in this allocation method may Produce from a Subarea of the Seaside Basin as provided in Section III.B.2, which is determined by multiplying the Base Water Right by the Operating Yield.

"Storage" means the existence of Stored Water in the Seaside Basin.

"Storage Allocation" means that quantity of Stored Water in acre feet that a Party is allowed to Store in the Coastal Subarea or the Laguna Seca Subarea at any particular time.

"Storage Allocation Percentage" means the percentage of Total Usable Storage Space allocated to each Producer proceeding under the Standard Production Allocation. Producers proceeding under the Alternative Production Allocation are not allocated Storage rights and, consequently, their share of the Total Usable Storage Space is apportioned to the Producers proceeding under the Standard Production Allocation. Pursuant to the terms of Section III.B.3, Parties proceeding under the Alternative Production Allocation enjoy a one-time right to change to the Standard Production Allocation. Due to the recalculation of the Storage Allocation Percentage necessitated when a Party changes to the Standard Production Allocation, the WATERMASTER will maintain the up-to-date Seaside Basin Storage Allocation Percentages.

"Storage and Recovery Agreement" means an agreement between WATERMASTER and a Party for Storage pursuant to Section III.L.3.j.xx.

"Store" and other variations of the same verb refer to the activities establishing Stored Water in the Seaside Basin.

"Stored Water" means (1) Non-Native Water introduced into the Seaside Basin by a Party or any predecessors-in-interest by Spreading or Directly Injecting that Water into the Seaside Basin for Storage and subsequent Extraction by and for the benefit of that Party or their successors-in-interest; (2) Groundwater within the Seaside Basin that is accounted for as a Producer's Carryover; or (3) Non-Native water introduced into the Basin through purchases by the WATERMASTER, and used to reduce and ultimately reverse Over-Production.

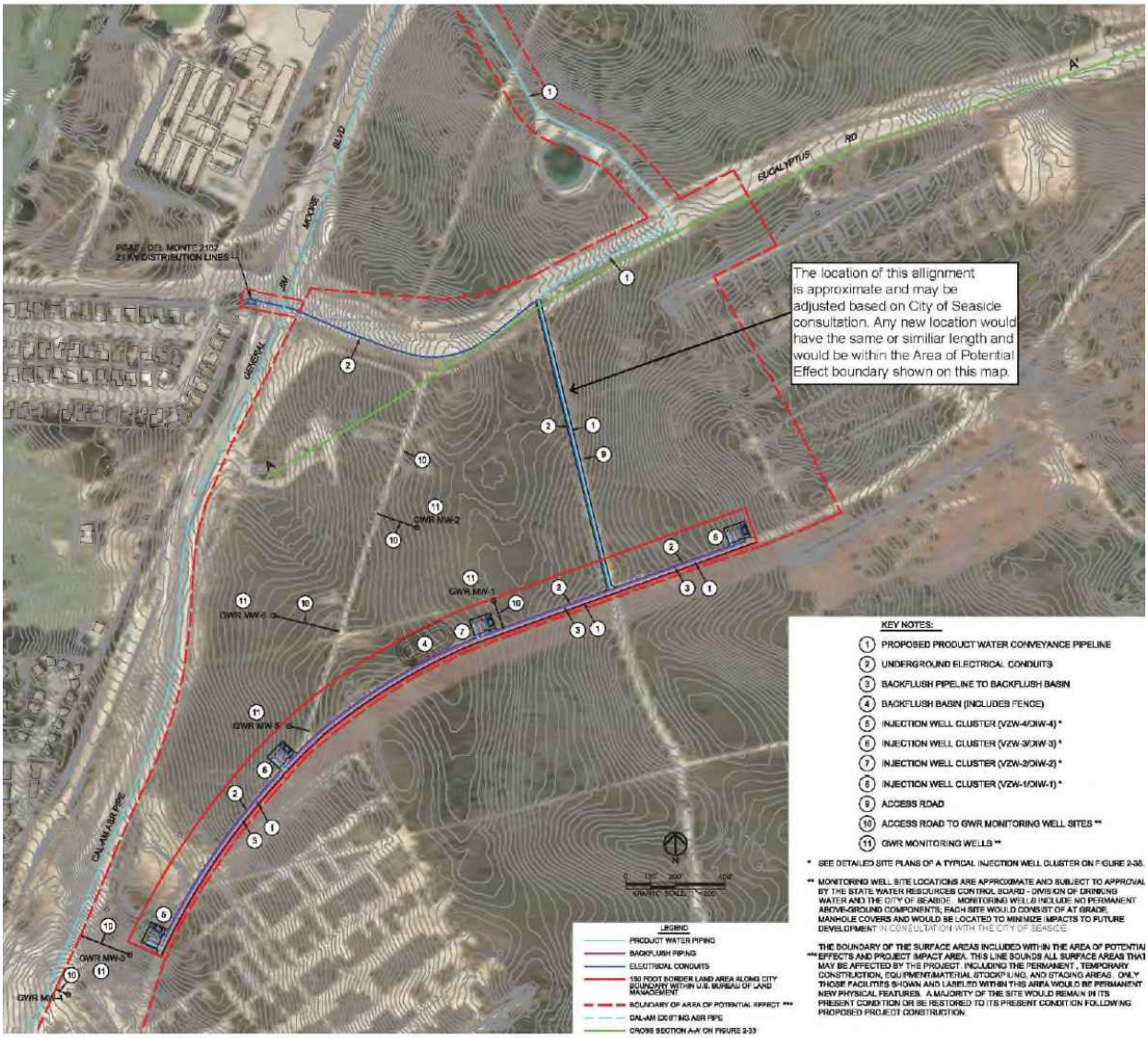
"Stored Water Credit" means the quantity of Stored Water augmenting the Basin's Retrievable Groundwater Supply, which is attributable to a Party's Storage and further governed by this Decision and a Storage and Recovery Agreement.

"Total Useable Storage Space" means the maximum amount of space available in the Seaside Basin that can prudently be used for Storage as shall be determined and modified by WATERMASTER pursuant to Section III.L.3.j.xix, less Storage space which may be reserved by the WATERMASTER for its use in recharging the Basin.

ATTACHMENT B

Delivery Point

AWT Water will be injected by DISTRICT or M1W into the Seaside Groundwater Basin using new injection wells. The proposed new Injection Well Facilities will be located east of General Jim Moore Boulevard, south of Eucalyptus Road in the City of Seaside, including up to eight injection wells (four deep injection wells, four vadose zone wells, in pairs identified as #5, #6, #7, and #8 in the figure below), six monitoring wells, and back-flush facilities.



ATTACHMENT C

MODELING AGREEMENT

MEMORANDUM OF AGREEMENT

BETWEEN THE SEASIDE BASIN WATERMASTER, THE MONTEREY PENINSULA WATER MANAGEMENT DISTRICT, CALIFORNIA AMERICAN WATER COMPANY, AND MONTEREY ONE WATER

TO SHARE IN THE COSTS OF PERFORMING GEOCHEMICAL MODELING OF THE SEASIDE BASIN GROUNDWATER BASIN

THIS AGREEMENT is made and entered into this 10th day of February, 2018, by and between the SEASIDE BASIN WATERMASTER, hereinafter referred to as the "WATERMASTER", and the MONTEREY PENINSULA WATER MANAGEMENT DISTRICT, hereinafter referred to as the "DISTRICT", CALIFORNIA AMERICAN WATER COMPANY, hereinafter referred to as "CAWC," and MONTEREY ONE WATER, hereinafter referred to as "M1W," as follows.

In this Agreement the terms "Party" and "Parties" refer to the WATERMASTER, the DISTRICT, CAWC, and/or M1W, either individually or collectively.

RECITALS:

A. The WATERMASTER was established for the purposes of administering and enforcing the provisions of the Amended Decision filed February 9, 2007 in Case No. M66343, California Superior Court, Monterey County ("Amended Decision").

B. Section L.3.j.xxi of the Judgment states in part "The Watermaster will monitor and perform or obtain engineering, hydrogeologic, and scientific studies concerning all characteristics and workings of the Seaside Basin, and all natural and human-induced influences on the Seaside Basin, as they may affect the quantity and quality of Water available for Extraction, that are reasonably required for the purposes of achieving prudent management of the Seaside Basin in accord with the provisions of this Decision."

C. Section L.3.j.xxiii of the Judgment states in part "The Watermaster will take any action within the Seaside Basin, including, but not limited to, capital expenditures and legal actions, which in the discretion of Watermaster is necessary or desirable to accomplish any of the following:

- Prevent contaminants from entering the Groundwater supplies of the Seaside Basin, which present a significant threat to the Groundwater quality of the Seaside Basin, whether or not the threat is immediate;
- Remove contaminants from the Groundwater supplies of the Seaside Basin presenting a significant threat to the Groundwater quality of the Seaside Basin;
- Determine the existence, extent, and location of contaminants in, or which may enter, the Groundwater supplies of the Seaside Basin;
- Determine Persons responsible for those contaminants; and
- Perform or obtain engineering, hydrologic, and scientific studies as may be reasonably required for any of the foregoing purposes.

D. The DISTRICT, CAWC, and M1W intend to submit application(s) to the WATERMASTER for Storage of Non-Native Water in the Seaside Basin ("Application(s)") in accordance with Section III.L.3.j.xx of the Amended Decision, which states in part: "The Watermaster will review applications for Storage in the Seaside Basin, regulate the Storage of Non-Native Water in the Seaside Basin, and issue Storage and Recovery Agreements, all as provided below. All applications for Storage in the Seaside Basin shall be considered and voted on before a noticed meeting of the Watermaster. However, all such applications shall be approved absent the issuance of findings that a Material Injury to the Seaside Basin or Producers will or is likely to occur as a result of the proposed Storage program and no reasonable conditions could be imposed to eliminate such risk. If a Storage application is approved, the Watermaster shall issue a Storage and Recovery Agreement. The Storage and Recovery Agreement may include, among other possible elements and/or provisions, the following conditions to avoid Material Injury: … (4) the particular Water quality characteristics that are required pursuant to the Storage and Recovery Agreement… and any other terms and conditions deemed necessary to protect the Seaside Basin and those areas affected by the Seaside Basin."."

E. The DISTRICT, CAWC, and M1W propose to store Non-Native Water from the following sources: (1) ASR water produced by the DISTRICT; (2) desalinated seawater produced by CAWC's Monterey Peninsula Water Supply Project ("Desal Water"), and water produced by M1W's Pure Water Monterey project ("PWM Water"). As part of carrying out its duties and responsibilities under the Amended Decision, the WATERMASTER has requested that the Application(s) include a geochemical interaction modeling assessment investigating the potential for adverse geochemical reactions resulting from the introduction of these waters into the Seaside Basin and, if applicable, identifying measures to avoid such adverse reactions.

Terms and Conditions

In consideration of the mutual promises contained herein, the WATERMASTER, the DISTRICT, CAW, and M1W hereby agree to the following terms and conditions:

A. Work to be performed. The DISTRICT will contract directly with its consultant, Pueblo Water Resources, Inc. ("Consultant"), to perform modeling of the proposed groundwater storage and recovery projects to assess the geochemical interaction effects of introducing the non-native water from these projects into the native water in the Basin ("Work"). The Scope of Work and the estimated costs to perform this work are described in Attachment 1 to this Agreement. The DISTRICT will invite the staff of each of the Parties to this Agreement to attend any key milestone meetings and conference calls that are held between the DISTRICT and its Consultant as the Work is being performed, in order to enable each of the Parties to stay abreast of the work, raise pertinent questions in a timely manner, and provide input as appropriate.

The Parties hereto understand, as stated in Attachment 1, that it is difficult for the Consultant to accurately estimate the costs to perform the Work, and that the costs listed in the Estimated Fee Summary of Attachment 1 are the Consultant's best estimates. In the event it is determined, during the course of the Work, that the cost to complete the Work will be greater than the total cost listed in the Estimated Fee Summary, the Parties agree to meet and confer to reach agreement on a revised cost that will be shared as described in paragraph B below, so that the Work can be completed. Agreement on said revised cost shall not be binding on any Party unless and until that Party formalizes its agreement to the revised cost in writing to each of the other Parties.

B. Costs to be shared. The $68,679 cost to be shared is contained in the Estimated Fee Summary of Attachment 1. This cost will be shared in the following percentages:
Watermaster share = 0% ($0)
District share = 33 and 1/3% ($22,893)
CAWC share = 33 and 1/3% ($22,893)
M1W share = 33 and 1/3% ($22,893)

(In the event a revised cost is agreed to, as described in paragraph A above, these dollar figures will change).

As noted under the heading "Services Not Included" in Attachment 1, certain items are not included in the Consultant's scope of work or estimated costs. These items include:

- Laboratory fees
- Construction of site facilities
- Permit fees
- Cost of water, electricity, or other utilities, and
- Any other items not specifically included in the Consultant's scope of services.

The parties agree that the DISTRICT, CAWC, and M1W will each undertake and pay for these activities for their individual projects.

C. **Documents to be provided.** The DISTRICT will ensure that: (1) After completion of Tasks 1, 2, 3, 4, and 5, as described in Attachment 1, a Technical Memorandum or summary report will be prepared by the Consultant and provided by the DISTRICT to each of the other Parties, and (2) After completion of Task 6 an overall summary report will be prepared by the Consultant and provided by the DISTRICT to each of the other Parties.

D. **Payment of costs and reimbursement to the DISTRICT.** The DISTRICT will make progress payments to the Consultant as it satisfactorily performs the Work. After the satisfactory completion of the work, the DISTRICT will provide to CAWC and M1W copies of the invoices received from and payments made to the Consultant. Within 45 days of receiving those documents, CAWC and M1W will reimburse the DISTRICT for their respective shares of those costs.

E. **Term of Agreement.** The term of this Agreement shall commence on the date of its execution by all Parties, and shall continue in effect until the DISTRICT has been reimbursed as described in paragraph D above.

F. **Hold Harmless.** Under this Agreement the Parties do hereby agree to indemnify, defend, and hold the other Parties, their respective Board members, officers, employees, agents, and representatives harmless from and against any and all liability, claims, suits, actions, damages, and causes of action of any kind arising out of the indemnifying Party's use of the Work in the planning, design, and construction, operation, and maintenance of the indemnifying Party's projects.

G. **Venue**. This Agreement shall be governed by the laws of the state of California. The Parties agree that venue for any litigation arising out of this Agreement shall be exclusively vested in the state courts of the County of Monterey, or the United States District Court for the Northern District of California. Further, the prevailing Party shall be entitled to reasonable attorney fees and costs.

H. **Miscellaneous**. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall be deemed to constitute one and the same instrument. Paragraph headings are for convenience only and shall not be used in interpreting this Agreement. All Attachments to this Agreement are incorporated herein. This Agreement constitutes the entire agreement between the Parties with respect to the subject matter herein and may only be modified in a writing executed by all Parties. Each Party acknowledges that it participated in the drafting of this Agreement and agrees that any ambiguity herein shall not be construed against any Party as the drafter of the Agreement.

I. **Notices**. Written notice shall be deemed to have been duly served if delivered in person or by mail to the individuals and at the addresses listed below:

A. WATERMASTER: Technical Program Manager
Seaside Basin Watermaster
P.O. Box 51502
Pacific Grove, CA 93950

B. DISTRICT: General Manager
Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, CA 93940

C. CAWC: Operations Manager, Central Division
California American Water
511 Forest Lodge Road, Suite 100
Pacific Grove, CA 93950

D. M1W: General Manager
Monterey One Water
5 Harris Court, Building D
Monterey, CA 93940

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the dates shown below.

WATERMASTER

Date: 2/10/18

By: _____
Ralph Rubio, Chair, Board of Directors

DISTRICT

Date: 2/12/18

By: _____
David Stoldt, General Manager

CAWC

Date: 2/7/18

By: _____
Eric Sabolsice, Director of Operations

MHW

Date: 2-14-18

By: _____
Paul Sciuto, General Manager

6

ATTACHMENT 1

Scope of Work and Cost

to

Perform Modeling
of Proposed Groundwater Recharge Projects to Assess the Geochemical Interaction Effects of Introducing Non-native Water from Those Projects into the Native Water in the Basin

November 17, 2017
Project No. 12-0048

Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, California 93942

Attention: Mr. Jonathan Lear, Senior Hydrogeologist

Subject: Proposal for Seaside Groundwater Basin Geochemical Interaction Evaluation

Dear Mr. Lear:

In accordance with your request, Pueblo Water Resources, Inc. (PWR) is pleased to submit this proposal to provide a geochemical interaction evaluation of various managed aquifer recharge (MAR) projects currently planned to be implemented in the Seaside Groundwater Basin (SGB). Presented in this proposal is a detailed scope of work, estimated costs, and schedule to provide the requested services.

PURPOSE AND SCOPE

The purpose of the proposed work is to perform an initial geochemical interaction modeling assessment of various active and proposed MAR projects in the SGB. The only currently active MAR project is the Monterey Peninsula ASR Project, which injects treated excess Carmel River System water into 4 existing ASR wells (ASR-1 through ASR-4). Proposed MAR projects include the Pure Water Monterey and Monterey Peninsula Water Supply Project (MPWSP), which would inject advanced treated recycled water and desalinated seawater, respectively, into future injection wells in the SGB. The proposed activities and programs related to MAR in the SGB will ultimately result in the mixing and interaction of the following 4 waters:

- Santa Margarita Sandstone aquifer native groundwater
- Treated and disinfected Carmel River System water
- Treated water from the Pure Water Monterey project
- Desalinated seawater from the MPWSP

All of these waters will mix together in various proportions at various times within the geologic matrix of the Santa Margarita Sandstone aquifer (Tsm) within the SGB. The intermixing of these 4 waters and their individual and combined reactions with the minerals in the Tsm formation will result in a variety of geochemical reactions – these reactions may be beneficial (e.g., stabilization of water quality and reduction in corrosivity) or potentially problematic (e.g., precipitation of cementitous scales or evolution of gasses) – and would alter the quality of the

water recovered from the ASR wells and California American Water's (CAW) other municipal production wells in the SGB.

It is therefore prudent to investigate these geochemical reactions and to identify the potential for adverse reactions; and if present, to identify measures to avoid such adverse conditions. The investigation proposed herein will address these issues through a stepwise approach as discussed below.

Scope of Services

The above scenarios can be analyzed through utilization of geochemical simulations from various interaction models and chemical equilibrium databases. A geochemical interaction model has been developed by PWR in recent years to address the interaction of the Tsm mineralogy with Carmel River System waters and Native Tsm groundwater to address these same issues, and will be expanded to cover the more complex interactions of the 4 proposed project waters. PWR's existing geochemical model is based on the USGS geochemical interaction software PHREEQC-2, version 2.15.2697 combined with the robust Lawrence Livermore National Laboratory (LLNL) geochemical equilibrium database.

Implementation of the investigation will include the following tasks, which are structured to allow assessment of results at each step and provide the opportunity to modify the investigation or drop specific lines of analysis due to either fatal flaws or findings of no potential significance. A brief overview of the proposed scope or work by task is presented below:

Task 1 – Water Chemistry Data Compilation

Characterize the complete composition and character of the 4 water sources via laboratory and field analyses, or in the case of waters that do not currently exist (ie MPWSP desal plant water and Pure Water Monterey project effluent), quantitative process modeling estimations of water quality parameters (note that these process modeling estimations are not part of our services and would be provided by the project proponent's engineers). The initial step in this effort will be the preparation of a list of water chemistry parameters necessary for geochemical interaction modeling and a request for data for the injection source waters from the Pure Water Monterey and MPWSP project sponsors (MRWPCA and CAW, respectively). Data gaps will be identified and a Sampling and Analysis Plan (SAP) will be developed to fill any data gaps.

Task Deliverable: A Technical Memorandum (TM) summarizing the available water quality data for each of the project sources, and a SAP to fill-in missing data. *Note that no costs for collection of field or laboratory data are budgeted in this task. If additional sampling is necessary, such costs are assumed to be the responsibility of the respective source water generators or project proponents.*

Task Duration: 4 weeks

Task 2 – Aquifer Mineralogy Data Compilation

Characterize the mineral composition of the Tsm aquifer via empirical laboratory analysis of well cuttings and/or core samples. These data already exist for two of the ASR project wells (ASR-2 and ASR-3) that characterize the Tsm aquifer mineralogy at the two ASR facilities (Santa Margarita and Seaside Middle School, respectively); however, similar data will be needed for the Pure Water Monterey and MPWSP well facilities, and will need to be coordinated with the construction of the new wells for these projects. In addition, the older/existing mineralogical data may be incomplete for purposes of this new modeling effort. To maximize the quality and quantity of data available for this work, detailed protocols for sample collection and analytical testing will be provided.

Task Deliverable: A TM summarizing the mineral characterization of the Tsm, and protocol for the sample collection and analysis of upcoming Tsm mineralogy samples. *Note that no costs for field or laboratory analyses are budgeted for this task; but are reportedly included in the current budgets for the construction of the monitoring well for the Pure Water Monterey project in May 2018.*

Task Duration: 2 weeks

Task 3 – Geochemical Model Development

Develop a geochemical interaction model based on the data derived from Tasks 1 and 2 above, combined with the geochemical equilibrium databases discussed previously.

To complete this work, the existing model will be upgraded and expanded, including the addition of the most recent French Geological Survey (BRGM) Thermoddem V1.1 database and the Swiss (ETH Zurich) CHEMDATA17 database. The upgrades will allow further analysis of water quality stabilization, more accurate identification of sulfate/carbonate/siliceous scaling, and assessment of corrosivity issues in recovered waters.

Task Deliverable: A summary of model base and primary settings will be provided if requested.

Task Duration: 3 weeks

Task 4 – Model Mixing Ratios

Upon completion of Task 3, PWR will model a number of mixing ratios of the four water types. For the purpose of planning, there will be 21 mixtures of various percentage mixtures of the four water types; **Table 1** outlines the mixing ratios that will initially be modeled. The matrix of water mixtures presented in **Table 1** were chosen through discussions with MPWMD staff to bracket the potential extreme case mixing scenarios that might occur during program operations; this methodology should identify potential problem areas to avoid early in the investigation, which will allow additional efforts to analyze these scenarios if warranted.

PWR will analyze the geochemical stability of each of the individual waters, and perform the modeling of the proposed intermixing scenarios described above. The results of the

modeling will be analyzed and interpreted with specific attention to potentially adverse geochemical interactions such as mineral scale formation, gas evolution, and leaching/mobilization of deleterious compounds within the Tsm formation.

Task Deliverable: A TM summarizing the results of the geochemical interaction modeling, and recommendations for additional model scenarios based on the initial output runs.

Task Duration: 6 weeks

Table 1. Summary of Mix Ratios for Geochemical Modeling

Mix No.	% Native Tsm Water	% Treated Carmel River Water	% Reclaimed PWM Water	% Desal Water
1	100	0	0	0
2	0	100	0	0
3	0	0	100	0
4	0	0	0	100
5	66	33	0	0
6	66	0	33	0
7	66	0	0	33
8	33	66	0	0
9	0	66	33	0
10	0	66	0	33
11	33	0	66	0
12	0	33	66	0
13	0	0	66	33
14	33	0	0	66
15	0	33	0	66
16	0	0	33	66
17	55	15	15	15
18	15	55	15	15
19	15	15	55	15
20	15	15	15	55
21	25	25	25	25

Task 5 – (Optional Task) Additional Focused Analysis

Based on the results of Task 4 above, PWR will identify those mixture simulations that show undesirable geochemical reactions (ie mineral precipitation or gas evolution) and will re-run those model simulations under various modifications of mix ratios and/or aquifer conditions

to identify methods of mitigating the observed adverse reactions and to identify potential operational scenarios which would prevent such adverse geochemical reactions from occurring.

Task Deliverable: A TM summarizing the results of the supplemental modeling and recommendations for project design and/or operational changes associated with enhancing recovered water quality or avoiding adverse geochemical reactions.

Task Duration: 4-6 weeks

Task 6 – Reporting

Upon the conclusion of tasks 1-5, PWR will develop an overall summary report and recommendations for process and/or operational changes for each project to reduce or avoid adverse geochemical reactions. PWR will also participate in two technical workshops with project stakeholders to discuss the impacts to the various regional projects, and participate in one presentation to the Watermaster Board to address questions and present findings.

Task Duration: 4 weeks

Task 7 – Project Management and Meetings

Provide routine project management, including invoicing, schedule management, project coordination and communication. This will include one intermediate and one final presentation of the evaluation findings and recommendations to the SGB Water Master Technical Advisory Committee (TAC).

Task Duration: Ongoing

Services Not Included

It should be noted that completion of this project will require services which are not included in our proposal; the costs for these items are presumed to be paid for by the project proponents under the provisions of the Storage Agreement. These items include (but are not limited to) the following:

- Laboratory fees;
- Construction of site facilities;
- Permit fees;
- Cost of water, electricity, or other utilities;
- Any other items not specifically included in PWR's scope of services.

ESTIMATED FEES AND SCHEDULE

Based on the scope of services presented herein, we estimate the fees for our services will be approximately *$51,365*, which will be billed on a time-plus-expenses basis in accordance with our current Fee Schedule (attached). An estimated fee summary worksheet is attached summarizing the estimated man-hours and costs per task/work item. The spreadsheet also identifies the cost total including Optional Task 5, as well as a 10 percent contingency which has been noted in the attached budget summary in the event that unforeseen project complications or constraints arise (total with optional task and 10% contingency is *$68,679*). We recommend the contingency be held for authorization by District staff upon written justification by PWR.

We understand that in order to authorize this work, your Board must first approve a formal contract amendment. Based on our current workload, we believe that we can commence work within two weeks of your authorization and that the work will be completed within approximately 4 months.

We appreciate the opportunity to provide ongoing assistance to the District on this important community water-supply project. If you require additional information regarding this or other matters, please contact me.

Sincerely,

PUEBLO WATER RESOURCES, INC.

Stephen P. Tanner, P.E.
Principal Engineer

SPT.rcm

Attachments: Cost Estimation Spreadsheet
2018 Fee Schedule

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
Professional Services for SGB Geochemical Interaction Evaluation

PUEBLO water resources

PWR Project No.: 12-0048

ESTIMATED FEE SUMMARY

LABOR		Principal Professional	Senior Professional	Drafting	WP	Hours by Task	Estimated Task Cost
	Hourly Fee	$205	$185	$115	$95		
Task No.	Task Description						
1	Water Chemistry Data Compilation	22	-	-	12	34	$5,650
2	Aquifer Mineralogy Compilation	38	-	-	-	38	$7,790
3	Geochemical Model Development	48	-	-	-	48	$9,840
4	Model Mixing Ratios	67	-	-	-	67	$13,735
5	Additional Focused Analysis (OPTIONAL)	54	-	-	-	54	$11,070
6	Reporting	48	-	-	-	48	$9,840
7	PM and Meetings	22	-	-	-	22	$4,510
		-	-	-	-	0	$0
		-	-	-	-	0	$0
		-	-	-	-	0	$0
	Hours by Labor Category:	299	0	0	12		
	Costs by Labor Category:	$61,295	$0	$0	$1,140		

Total Labor Hours (not inc. Optional Task):	257
Total Labor Costs (not inc. Optional Task):	$51,365
Total Labor Hours (inc. Optional Task):	311
Total Labor Costs (inc. Optional Task):	$62,435

OTHER DIRECT COSTS (ODC's) Item	Units	Unit Price	No. of Units	Fee
Vehicle	Daily	$75		$0
Travel Per Diem	Daily	$150		$0
				$0
				$0
				$0
			Subtotal ODCs:	$0

OUTSIDE SERVICES Task No.	Item	Units	Unit Price	No. of Units	Fee
					$0
					$0
					$0
					$0
					$0
Subtotal Outside Services:					$0
Subtotal Outside Services w/ Markup (15%):					$0

COST SUMMARY	
Labor (not inc. Optional Task)	$51,365
Other Direct Costs	$0
Outside Services	$0
Subtotal (not inc. Optional Task):	$51,365
10 % Contingency (not inc. Optional Task)	$5,137
TOTAL ESTIMATED PROJECT COST (not inc. Optional Task):	$56,502
Task 5 (Optional)	$11,070
Subtotal (inc. Optional Task):	$62,436
10 % Contingency (inc. Optional Task)	$6,244
TOTAL ESTIMATED PROJECT COST (inc. Optional Task):	$68,679

12-0048_SGB_Geochem_Modeling_costs_draft_2017-11-17.xls 11/17/2017

PUEBLO WATER RESOURCES, INC
2018 FEE SCHEDULE

Professional Services

Principal Professional	$205/hr
Senior Professional	$190/hr
Project Professional	$175/hr
Staff Professional	$145/hr
Technician	$135/hr
Illustrator	$120/hr
Word Processing	$100/hr

Other Direct Charges

Subcontracted Services	Cost Plus 15%
Outside Reproduction	Cost Plus 15%
Travel Expenses	Cost Plus 15%
Per Diem*	$150/day
Vehicle	$75/day

Equipment Charges

Drilling Fluid Test Kit	$100/day, $400/week
Field Water Quality Meter (Hach DR890)	$75/day, $275/week
Orion ORP/pH/Temp Probe	$75/day, $275/week
Water Level Probes (In-Situ Mini-Troll/Level Troll)	$100/day, $300/week
Fuji Ultrasonic Flowmeter	$200/day, $750/week

*Regionally and seasonally specific to project.

PUEBLO WATER RESOURCES, INC • 4478 Market Street, Suite 705 • Ventura, CA 93003
805.644.0470 • 805.644.0480 FAX

ATTACHMENT 13

DOCUMENTS PERTAINING TO INTENDED PARTIAL ALLOCATION CONVERSION

ANTHONY LOMBARDO & ASSOCIATES
A PROFESSIONAL CORPORATION

ANTHONY L. LOMBARDO
KELLY MCCARTHY SUTHERLAND
JENNIFER M. PAVLET
CODY J. PHILLIPS

144 W. GABILAN STREET
SALINAS, CA 93901
(831) 751-2330
FAX (831) 751-2331

December 4, 2018

File No.: 5008.000

Via email only
Laura Dadiw
Administrative Officer
Seaside Groundwater Basin Watermaster
PO Box 51502
Pacific Grove, CA 93950

Re: SNG/Montage Health

Dear Mr. Evans:

Our office represents Montage Health, who has contracted with Security National Guaranty, LLC (SNG) to purchase 5.07 acre feet of SNG's adjudicated water right in the Seaside Basin. SNG holds an Alternative Production Allocation (APA) water right of 149 acre feet annually (afa) per Table 2 of the amended decision. In order for Montage Health to purchase the desired 5.07 acre feet from SNG, 11 acre feet of SNG's APA must be converted to a Standard Production Allocation.
We are contacting you to inform you that our client has recently submitted an application to Monterey Peninsula Water Management District amending the distribution limit for an existing Cal-Am water system within the City of Monterey (Ryan Ranch subunit). Should they be successful in obtaining the amendment, they intend to proceed with the aforementioned partial conversion of the APA to Standard Production Allocation.

While it is necessary for the Watermaster to record such a conversion for basin accounting purposes, our understanding is that no discretionary permit from the Board would be required to proceed with the conversion.

We therefore respectfully request confirmation that no action by the Watermaster Board is necessary to effectuate this transaction, and that the parties may proceed with the conversion as proposed.

Please contact me with any questions.

Sincerely,

Anthony L. Lombardo
ALL/CP

SEASIDE GROUNDWATER BASIN WATERMASTER

P.O. Box 51502, Pacific Grove, CA 93950
(831) 641-0113

December 13, 2018

Anthony L. Lombardo
144 W. Gabilan Street
Salinas, CA 93901

Re: SNG/Montage Health

Dear Mr. Lombardo,

The Seaside Groundwater Basin Watermaster (Watermaster) is in receipt of your letter dated December 4, 2018. Your letter informs us that Montage Health will be purchasing 5.07 acre-feet of Security National Guaranty, LLC (SNG) adjudicated water right in the Seaside Basin. Montage Health has submitted an application to the Monterey Peninsula Water Management District amending the distribution limit for an existing California American water system within the City of Monterey (Ryan Ranch subunit) and within the boundaries of the Seaside Groundwater Basin.

As you are aware, the Seaside Groundwater Basin is adjudicated by the Amended Decision (Decision) entered in the case California American Water Company v. City of Seaside et al., Monterey Superior Court Case No. GNM66343. SNG holds a 149 acre-foot Alternative Production Allocation (APA) water right per Table 2 of the Decision. Watermaster confirms SNG has the right to convert all or part of the APA right to a Standard Production Allocation (SPA) right; in this case 11 acre-feet APA converted to 5.07 acre-feet SPA. The option to convert from an APA to SPA can be exercised by filing a declaration with the Court and serving said declaration on all other parties to the Decision. Once SNG Coastal Subarea APA is converted to SPA, the water can be used in any area of the Seaside Groundwater Basin.

No action by the Watermaster board is necessary to proceed with the conversion from APA to SPA water right. Accordingly, there is no need for this matter to be put on the January 2, 2019 Watermaster board meeting agenda.

Thank you for your inquiry into this matter.

Sincerely,

Laura Dadiw

Laura Dadiw
Administrative Officer

PROOF OF SERVICE

STATE OF CALIFORNIA)
)
COUNTY OF SANTA BARBARA)

I, Caitlin Malone, am employed by Brownstein Hyatt Farber Schreck in the County of Santa Barbara, State of California. I am over the age of 18 and not a party to the within action. My business address is: 1021 Anacapa Street, 2nd Floor, Santa Barbara, California 93101. On January 15, 2019, I served the within documents:

- **NOTICE OF FILING OF SEASIDE BASIN WATERMASTER ANNUAL REPORT (WATER YEAR 2018)**

☐ **BY OVERNIGHT DELIVERY.** By placing with an overnight mail company for delivery a true copy thereof, enclosed in a sealed package, delivery fees prepaid addressed as shown on the Service List below.

☐ **BY MAIL.** By placing each envelope (with postage affixed thereto) in the U.S. Mail addressed as shown below.

☐ By personally sending a true copy via e-mail to the parties at the e-mail addresses listed on the attached Service List, on the date below.

☒ By posting the document listed above to the Odyssey e-FileCA website for e-service on all parties listed on the Court's website for this matter.

SEE ATTACHED SERVICE LIST

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after the date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. Executed on January 15, 2019, at Santa Barbara, California.

Caitlin Malone
CAITLIN MALONE

California American Water v. City of Seaside
Monterey County Superior Court Case No. M66343

SERVICE LIST

Lori Girard, Esq.
Anthony Cerasuolo, Esq.
California-American Water Co.
511 Forest Lodge Road, Suite 100
Pacific Grove, CA 93950
Tel.: (831) 646-3240
Fax: (831) 375-4367
Lori.Girard@amwater.com
acerasuolo@amwater.com

Attorneys for California-American Water Company

Robert Donlan, Esq.
Ellison Schneider & Harris LLP
2600 Capitol Ave Ste 400
Sacramento, CA 95816-5905
Tel.: (916) 447-2166
Fax: (916) 447-3512
red@eslawfirm.com

Attorneys for California-American Water Company

Dino Pick
Del Rey Oaks City Manager
650 Canyon Del Rey Rd
Del Rey Oaks, CA 93940
Tel.: (831)394-8511
citymanager@delreyoaks.org

City of Del Rey Oaks

Christine Davi, Esq.
Monterey City Attorney's Office
512 Pierce Street
Monterey, CA 93940
Tel.: (831) 646-3915
Fax: (831) 373-1634
davi@monterey.org

Attorneys for City of Monterey

Vibeke Norgaard
City Attorney of Sand City
P.O.Box 183
Carmel, CA 93921
Tel.: (831) 624-1971
vibeke@vnorgaardlaw.com

Attorneys for City of Sand City

Donald G. Freeman, Esq.
Perry & Freeman
P.O. Box 805
Carmel, CA 93921-0805
Tel.: (831) 624-5339
Fax: (831) 624-5839
klglegal@hotmail.com

Attorneys for City of Seaside

Charles J. McKee, Esq.
Kelly L. Donlon
Office of County Counsel
168 W. Alisal Street, 3rd Floor
Salinas, CA 93901
Tel.: (831) 755-5045
Fax: (831) 755-5283
mckeecj@co.monterey.ca.us
granti@co.monterey.ca.us

Attorneys for County of Monterey

Kevin M. O'Brien, Esq.
Steven P. Saxton, Esq.
Downey Brand LLP
621 Capitol Mall, 18th Floor
Sacramento, CA 95814
Tel.: (916) 444-1000
Fax: (916) 444-2100
kobrien@downeybrand.com
ssaxton@downeybrand.com

Attorneys for County of Monterey

Charles J. McKee, Esq.
Kelly L. Donlon
Office of County Counsel
168 W. Alisal Street, 3rd Floor
Salinas, CA 93901
Tel.: (831) 755-5045
Fax: (831) 755-5283
mckeecj@co.monterey.ca.us;
avilajj@co.monterey.ca.us

Attorneys for Monterey County Water Resources Agency

Lisa A. Cole
Granite Rock Company
350 Technology Drive
Watsonville, CA 95076
Tel.: (831) 786-2107
Legal@graniterock.com

Attorneys for Granite Rock Company

Anthony Lombardo, Esq.
Anthony Lombardo & Associates
144 W. Gabilan Street
Salinas, CA 93901
Tel.: (831) 751-2330
Fax: (831) 751-2331
tony@alombardolaw.com

Attorneys for Laguna Seca Resort, Inc.

Frederick L. Kennifer
Johnson, Fantl & Kennifer, LLP
500 Camino El Estero
Monterey, CA 93940
rkennifer@johnsonfantl.com
Tel.: (831) 373-2800

Attorney for York School, Inc.

Paul Bruno, Member
Cypress Pacific Investors, LLC
P.O. Box 400
Marina, CA 93933
Tel.: (831) 384-4081
paul@mpe2000.com

For Cypress Pacific Investors, LLC, Successor in Interest to Muriel Calabrese 1987 Trust

David C. Sweigert, Esq.
Fenton & Keller
2801 Monterey Salinas Highway
P.O. Box 791
Monterey, CA 93942-0791
Tel.: (831) 373-1241
dsweigert@fentonkeller.com
esalameh@fentonkeller.com

Attorneys for D.B.O. Development Company No. 30

Eric Robinson, Esq.
Kronick, Moskovitz, Tiedemann & Girard
400 Capitol Mall, 27th Floor
Sacramento, CA 95814
Tel.: (916) 321-4500
Fax: (916) 321-4555
erobinson@kmtg.com

Attorneys for Bishop, McIntosh & McIntosh

David Carl Drummond
1600 Amphitheatre Pkwy
Mountain View, CA 94043
(650) 253-4350
daviddrummond@google.com

Attorneys for Mission Memorial Park

Sheri L. Damon, Esq.
Damon Law Offices
618 Swanton Road
Davenport, CA 95017
Tel.: (831) 345-3610
Fax: (831) 337-5212
sheri_damon@comcast.net

Of Counsel for Security National Guaranty, Inc.

Laura Dadiw
Watermaster Executive Officer
P.O. Box 51502
Pacific Grove, CA 93950
Tel.: (831) 641-0113
watermasterseaside@sbcglobal.net

Seaside Groundwater Basin Watermaster

David Laredo, Esq.
DeLay & Laredo
606 Forest Avenue
Pacific Grove, CA 93950
Tel.: (831) 646-1502
Fax: (831) 646-0377
dave@laredolaw.net

Attorneys for Monterey Peninsula Water Management District

Ed Ghandour
Security National Guaranty, Inc.
505 Montgomery Street, 11th Floor
San Francisco, CA 94111
Tel.: (415) 874-3121
Fax: (415) 874-3001
edg.sng@equus-capital.com

For Security National Guaranty, Inc.