M E E T I N G N O T I C E AND A G E N D A

TECHNICAL ADVISORY COMMITTEE
OF THE
SEASIDE BASIN WATER MASTER

DATE: Wednesday, June 14, 2017
MEETING TIME: 1:30 p.m.
Monterey Regional Water Pollution Control Agency Offices
5 Harris Court, Building D (Ryan Ranch)
Monterey, CA 93940

If you wish to participate in the meeting from a remote location, please call in on the Watermaster Conference Line by dialing (712) 432-1212. Use the Meeting ID 355890617. Please note that if no telephone attendees have joined the meeting by 10 minutes after its start, the conference call will be ended.

OFFICERS
Chairperson: Nina Miller, California American Water Company
Vice-Chairperson: Jon Lear, MPWMD

MEMBERS
California American Water Company **City of Del Rey Oaks** **City of Monterey**
City of Sand City **City of Seaside** **Coastal Subarea Landowners**
Laguna Seca Property Owners **Monterey County Water Resources Agency**
Monterey Peninsula Water Management District

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The next regular meeting will be held on Wednesday July 12, 2017 at 1:30 p.m. at the MRWPCA Board Room.	

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	June 14, 2017
AGENDA ITEM:	2.A
AGENDA TITLE:	Approve Minutes from the April 12, 2017 Meeting
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Draft Minutes from this meeting was emailed to all TAC members. Any changes requested by TAC members have been included in the attached version.

ATTACHMENTS:	Minutes from this meeting
RECOMMENDED ACTION:	Approve the minutes

D-R-A-F-T
MINUTES

Seaside Groundwater Basin Watermaster
Technical Advisory Committee Meeting
April 12, 2017

Attendees: TAC Members

City of Seaside – Scott Ottmar
California American Water – No Representative
City of Monterey – Laurie Williamson (via telephone)
Laguna Seca Property Owners –Bob Costa
MPWMD – Jon Lear
MCWRA – Tamara Voss
City of Del Rey Oaks – No Representative
City of Sand City – No Representative
Coastal Subarea Landowners – No Representative

Watermaster
Technical Program Manager - Robert Jaques

Consultants
None

Others
None

The meeting was convened at 1:35 p.m. after a quorum had been established.

1. Public Comments

There were no public comments.

2. Administrative Matters:

A. Approve Minutes from the February 8, 2017 Meeting

On a motion by Mr. Ottmar, seconded by Mr. Costa, the minutes from this meeting were unanimously approved.

B. Sustainable Groundwater Management Act (SGMA) Update

Mr. Jaques summarized the agenda packet materials for this item. Mr. Costa asked if Mr. Jaques could provide any update on Marina Coast Water District's Notice filed with DWR to become a Groundwater Sustainability Agency. Mr. Jaques responded that it was his understanding that the County and Marina Coast Water District were in discussions on this matter but he did not know what progress had been made. Ms. Voss said she had the same understanding. She added that Clark Colony (located within Monterey County) was a potential Notification conflict area as well.

C. Progress Update on Salinas River Groundwater Basin Investigation Model TAC

Mr. Jaques summarized the agenda packet materials for this item. There was no other discussion.

D. Draft EIR/EIS for the Monterey Peninsula Water Supply Project

Mr. Jaques summarized the agenda packet materials for this item. There was no other discussion.

E. RWQCB Issuance of Waste Discharge Requirements for the Pure Water Monterey Project

Mr. Jaques summarized the agenda packet materials for this item. There was no other discussion.

3. Discussion of Response to Board Questions or Comments about HydroMetrics' Technical Memorandum - *Seaside Groundwater Basin Analysis of Wells Sampled in December 2016*

Mr. Jaques summarized the agenda packet materials for this item.

Ms. Voss asked if Mr. Riedl's concern about possible leakage of surface runoff water into the Sentinel Well had been addressed. Mr. Jaques responded that Mr. Feeney reported there was very little possibility of surface water runoff entering the monitoring well, because there is a screwed-down lid the box within which the wellhead is located, and the wellhead itself has a PVC cap over the top of it. Mr. Feeney reported that he had never seen accumulated water within the box at a level high enough for it to have been able to flow into the monitoring well. Mr. Jaques and Mr. Lear reported, however, that in response to this concern Mr. Feeney would be installing lockable expansion plugs on top of the wellheads prior to the next sampling event. Mr. Lear went on to explain that the locking mechanisms will be similar to the ones that are used by MPWMD on their other monitoring wells and will be keyed to MPWMD's keying system.

Mr. Lear raised the question of whether the sampling schedule for the production wells should also be changed to March and September, as has been recommended for the Sentinel Wells. Ms. Voss asked Mr. Lear what the purpose of sampling the production wells was. Mr. Lear responded that it is to provide general water quality and water level data for basin management purposes. He went on to say he did not think it was essential that the sampling schedule for the production wells be changed unless there was a desire to do so. Mr. Jaques said he would contact HydroMetrics and obtain their recommendation regarding whether it would be desirable to change the sampling schedule for the production wells and the other monitoring wells and report back to the TAC on this matter.

In response to a question about why it had taken so long for the laboratory to provide analytical data from the July 2016 samples, Mr. Lear responded that the production and monitoring well samples had coincidentally been collected and submitted at the same time that storm water first flush samples had been submitted. This caused the laboratory to be temporarily overloaded, so it took an extended time for the analytical data to be received. He said that normally there is a 3 to 4-week turnaround time between submitting samples to the laboratory and getting the analytical results. Mr. Lear said that in the future expedited turnaround times would be requested to avoid this problem.

A motion was made by Mr. Ottmar, seconded by Ms. Voss, to approve the Technical Program Manager's proposed responses to the Board on their questions and comments about HydroMetrics' Technical Memorandum titled *Seaside Groundwater Basin Analysis of Wells Sampled December 2016*, with these additions:

- Add the word "sealed" prior to the words "lockable caps," in the proposed response to the first numbered item on page 24 of the agenda packet.
- Add the information provided by Mr. Lear confirming that the recent spikes in water levels at Sentinel Well SBWM-4 were directly associated with the injection of large quantities of water at the ASR Wells, in the response to Mr. Sabolsice's comment on that issue.

The motion passed unanimously.

4. Continued Discussion of Work Plan to Investigate Cause(s) of Changing Water Quality in Sentinel Wells and Approvals for HydroMetrics and Martin Feeney to Perform the Initial Portions of the Work Plan

Mr. Jaques summarized the agenda packet materials for this item.

Ms. Voss expressed the opinion that there had been a laboratory analytical or labeling error in the data from the July 2016 Sentinel well sampling event, and that the data should be discarded.

Mr. Ottmar recommended that improved quality control procedures be used beginning with the next sampling event for the summer of 2017. This would include field and laboratory blanks. Ms. Voss said that having improved quality control procedures in place would make the data more defensible if any question about its validity arose.

It was also recommended that the issue of pumping three casing volumes of water out for taking samples be further investigated to determine whether that would be feasible, or if not, why it would not be feasible. Ms. Voss and Mr. Lear concurred that pumping out three casing volumes before taking samples was typically what was done. Mr. Lear explained that because of the configuration of the Sentinel Wells, taking three well volumes would lead to getting an average value of water quality over the screen areas. Ms. Voss pointed out that getting a representative sample is the objective, and asked that a description of how that is being achieved be provided. There was some discussion about using the low-flow sampling technique, but Mr. Lear commented that this would create a problem with performing induction logging at the same time the water quality samples were being collected.

Mr. Jaques said he would have Mr. Feeney provide a description of the quality assurance/quality control procedures and a Standard Operating Procedure (SOP)for the Sentinel Well sampling work for review and discussion by the TAC at its next meeting.

A motion was made by Mr. Ottmar, seconded by Mr. Costa, to approve The Technical Program Manager’s recommendations as presented, with the addition of wording explaining to the Board that the TAC was reviewing, and might be making recommendations for improvements to, the quality assurance/quality control procedures and standard operating procedures. The motion passed unanimously.

5. Discuss HydroMetrics’ Scope and Cost Proposal for Updating the Basin Management Action Plan

Mr. Jaques summarized the agenda packet materials for this item.

Mr. Lear said he felt it would be good to update the Model and the Basin Management Action Plan, but that the timing of when to perform that work should be discussed. He noted that groundwater models are often updated in haste when a question has to be answered, and that that was not a desirable approach to take.

Mr. Ottmar said he felt that updating the Model and the Basin Management Action Plan could be deferred and considered in conjunction with developing the Fiscal Year 2018 budget.

Ms. Voss said she felt that the Basin Management Action Plan needed to be updated, but also felt that it could be considered in conjunction with developing the Fiscal Year 2018 budget. She also asked whether the model needed to be recalibrated on a regular basis. Mr. Jaques explained that the model had been updated with more recent data several years ago, but at that time it had not been recalibrated because it was felt that the groundwater levels predicted by the model satisfactorily corresponded to field measured groundwater levels. However, in some parts of the basin it was found that he model results were beginning to diverge from the field measured results, and therefore recalibration would be desirable at some time in the near future.

Mr. Costa asked if it would be desirable to defer updating the Model and Basin Management Action Plan until new Corral de Tierra data was available. Mr. Jaques said he did not expect the new Groundwater Sustainability Agency for the Corral de Tierra portion of the Salinas Valley Basin to be generating new data for the Corral de Tierra area in the near future, because that Agency was still in the very early formative process.

A motion was made by Mr. Ottmar, seconded by Ms. Voss, to defer action on updating the Model and the Basin Management Action Plan until development of the Fiscal Year 2018 budget.

6. Schedule
Mr. Jaques highlighted a few items in the schedule, and there was no other discussion.

7. Other Business
Mr. Lear reported that over 1,700 acre-feet of water was injected through the ASR wells this year. He went on to request that an item be placed on a near-future TAC meeting agenda to consider the different types of water quality that will result from the implementation of the Monterey Peninsula Water Supply Project’s desalination plant, the Pure Water Monterey Recycling Project, and the ASR project. He said he and Mr. Stoldt of MPWMD would like to meet with Mr. Jaques in preparation of that agenda item.

8. Set Next Meeting Date
Following a brief discussion there was agreement to cancel the May TAC meeting and hold the next TAC meeting on the normal meeting date of Wednesday, June 14, 2017.

The meeting adjourned at 2:40 p.m.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	June 14, 2017
AGENDA ITEM:	2.B
AGENDA TITLE:	Change in Conference Line Telephone Number
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
I received the notice below regarding the Conference Line used for TAC meetings. As soon as I receive the information about the new dial-in number I will include that on the front page of future TAC meeting agenda packets.

Valued Customer,

Next month, your FreeConferenceCall.com dial-in number and playback number are changing due to our efforts to provide the highest quality service possible.

Please note: Your **access code will remain the same** and all of your recordings will be transferred to your new playback number.

More information will be provided to you in the coming weeks. We apologize in advance for any inconvenience this may cause.

If you have any questions or concerns, please contact our award-winning Customer Care team at (844) 844-1322 or email services@freeconferencecall.com.

Best Regards,

Nella Marov-Perez

Customer Care Manager

ATTACHMENTS:	None
RECOMMENDED ACTION:	Watch for the new Conference Line telephone number on the front of the agenda for the next TAC meeting

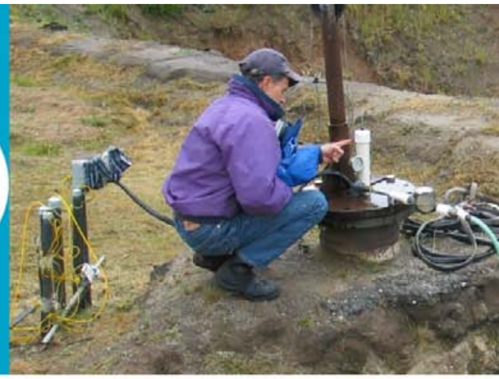
SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	June 14, 2017
AGENDA ITEM:	3
AGENDA TITLE:	Presentation on Pure Water Monterey Project
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
Representatives from MPWMD and MRWPCA will be present to provide a progress report on the Pure Water Monterey Project. Attached are copies of the PowerPoint slides that will be used in the presentation, so those who attend the meeting via the conference call-in line will be able to follow along during the presentation.

ATTACHMENTS:	Copies of PowerPoint slides
RECOMMENDED ACTION:	None required – information only



MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Pure Water Monterey Injection Wells

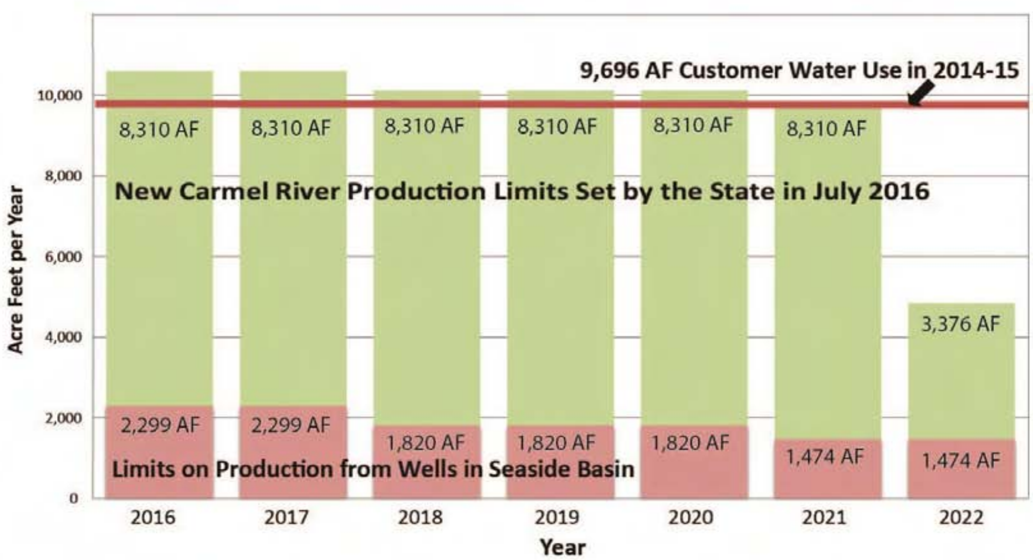
Maureen Hamilton

14 June, 2017

Presentation Overview

- Need
- PWM Overview
- Injection Wells Overview

The Supply Gap



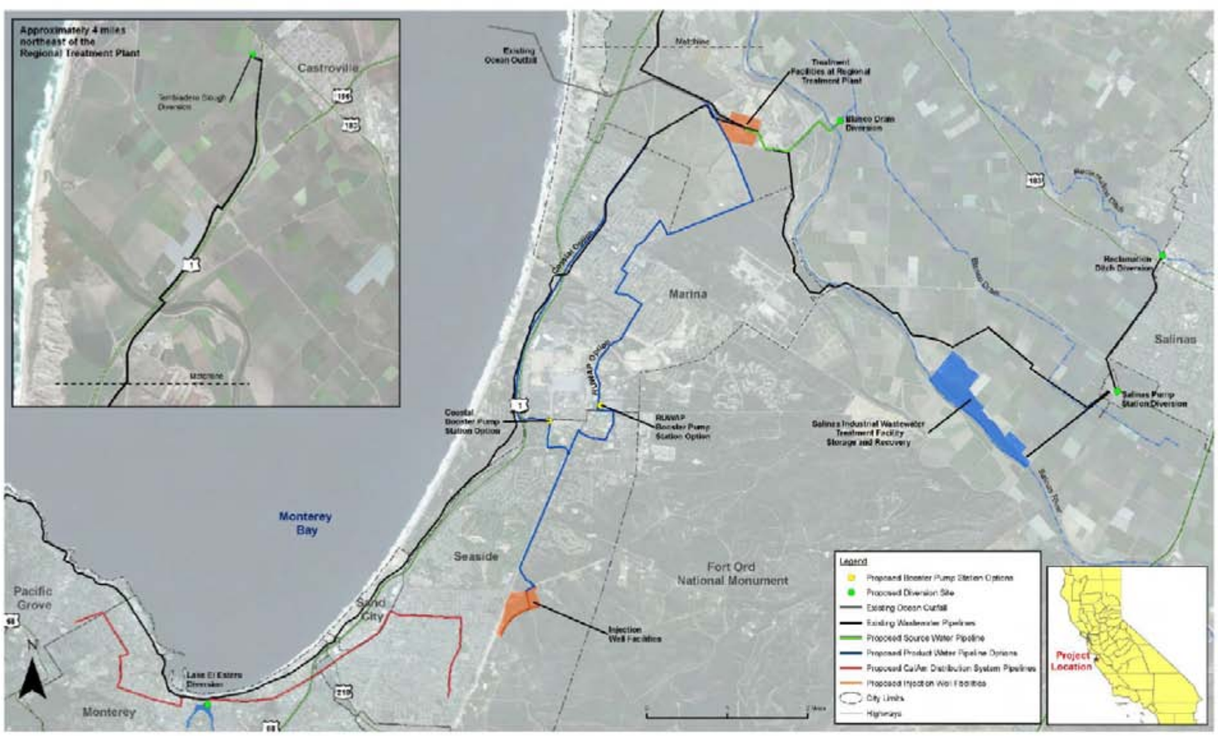
MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

PWM - Components

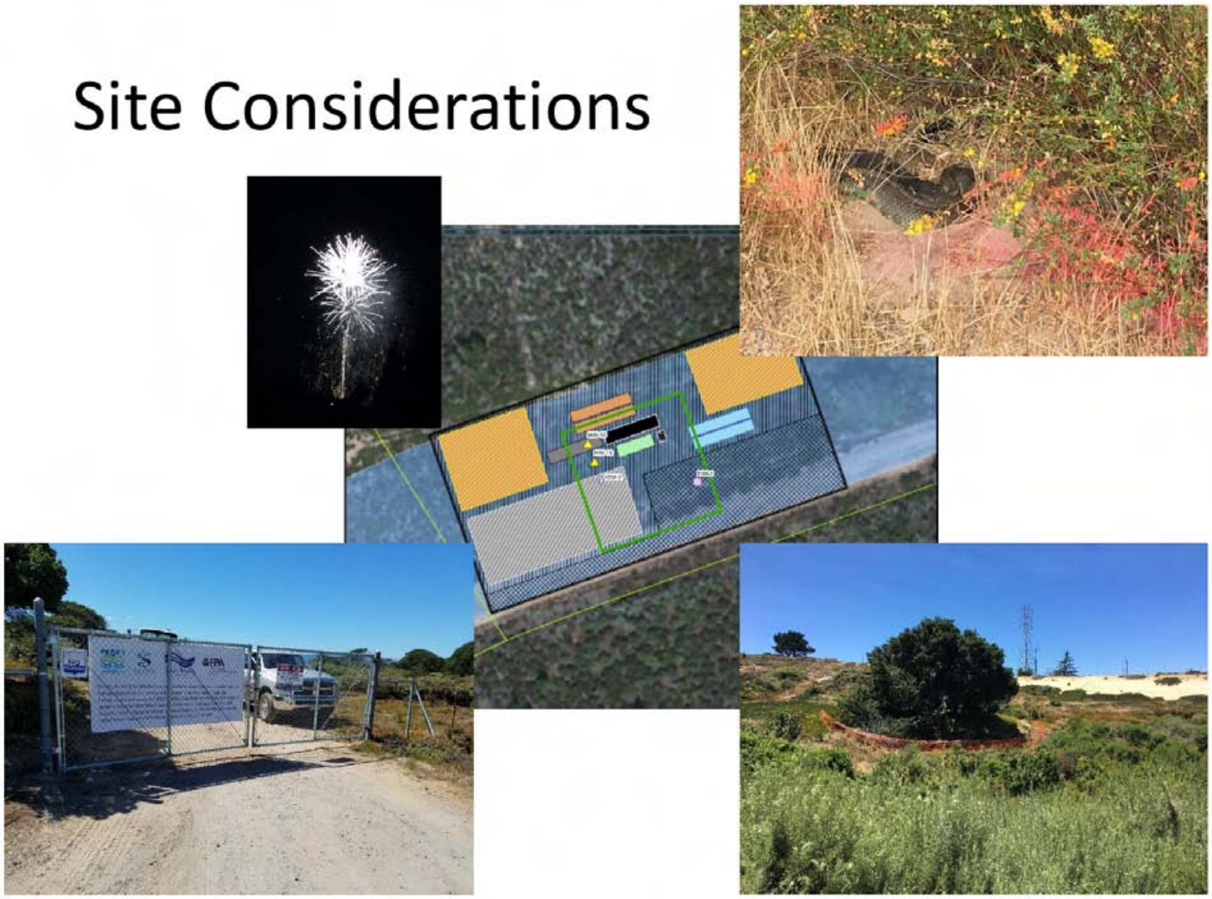
"New" Water

- Source Water
  - Available water rights
  - Water that needs treatment
- Advanced Water Purification Facility
- Conveyance (RUWAP)
- Storage (Injection Wells)

PWM - Map



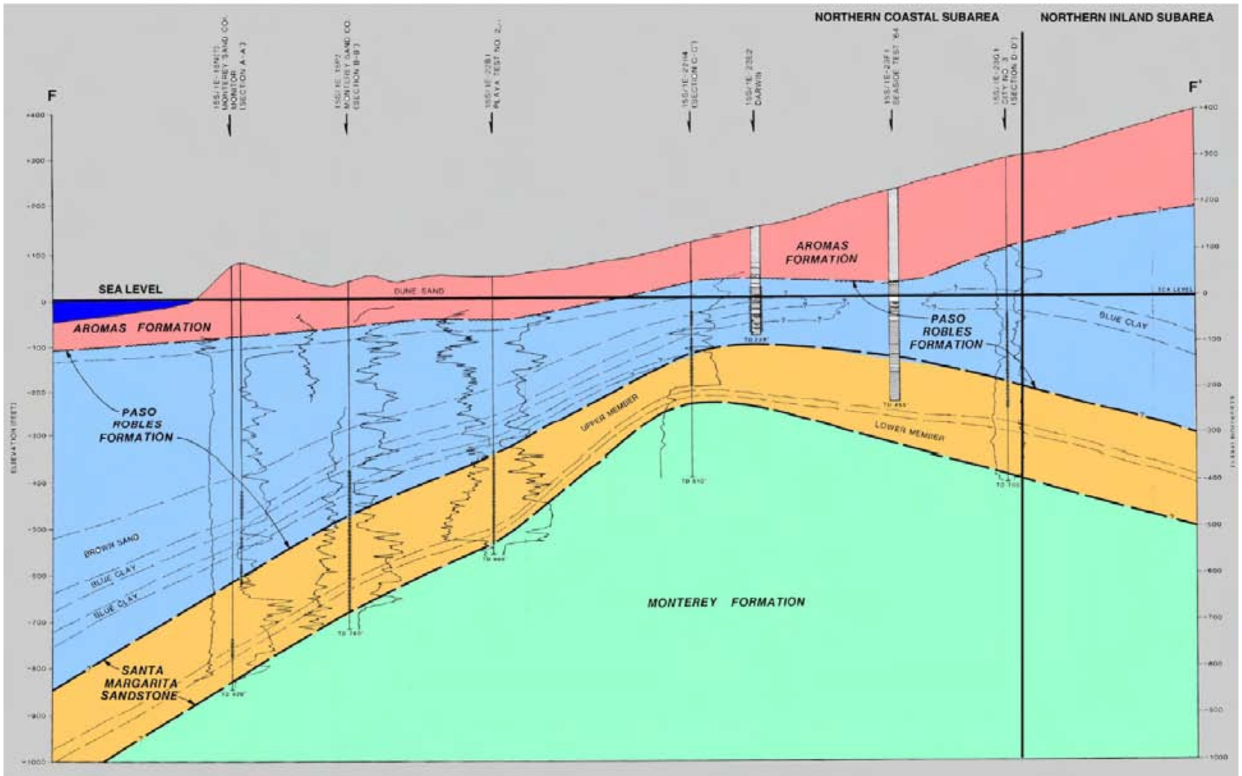
Site Considerations



Injection Wells - Components

- 4 Deep Injection Wells (DIW)
- 4 Vadose Zone Wells (VZW)
- Up to 6 Monitoring Well Clusters
- Backflush Basin
- Pipes & Appurtenances
- Electrical Building

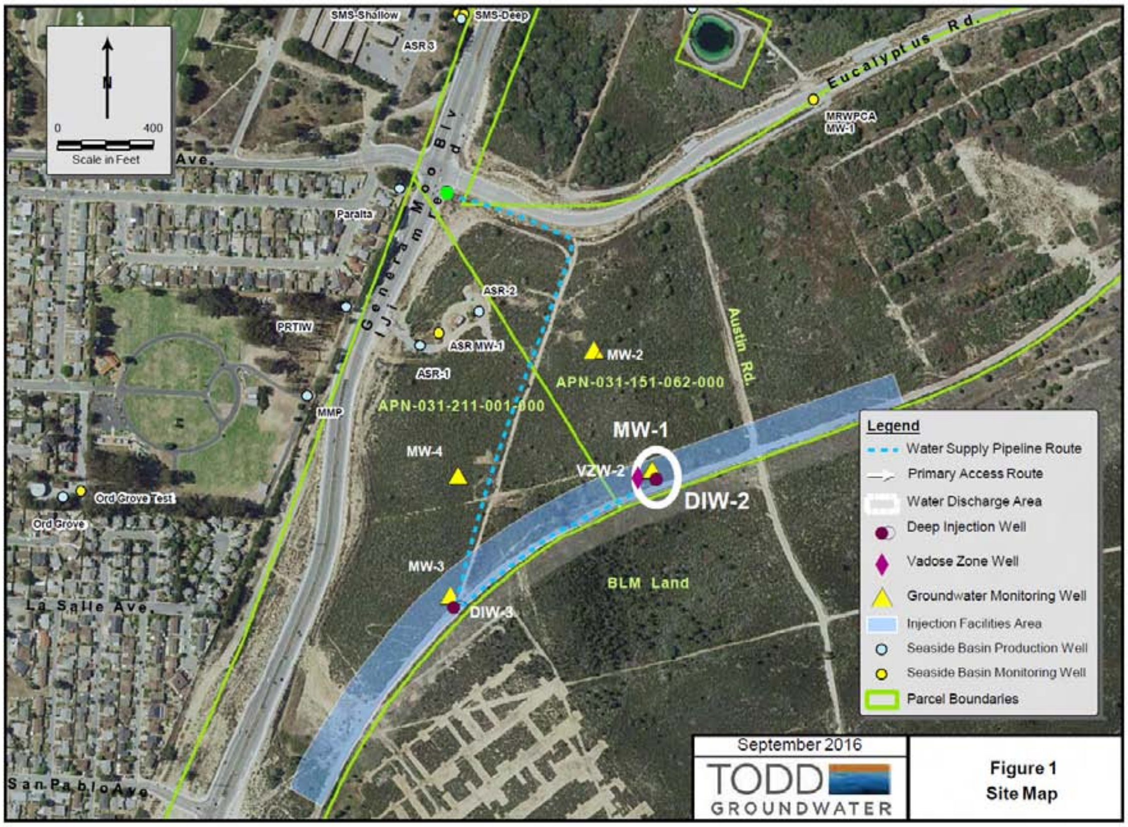
WEST-EAST SECTION THROUGH COASTAL PART OF SEASIDE GROUNDWATER BASIN



Monterey Peninsula Water Management District

Injection Wells - Funded Components

- 2 DIW
- 1 VZW
- 2+ Monitoring Well Clusters
- Backflush Basin
- Pipes & Appurtenances
- Electrical
- Building & Landscaping



Monterey Peninsula Water Management District

Phase 1 - Components

- One deep injection well (900' x 24")
- Two monitoring wells

1. Site prep (grading)
2. Deep monitoring to inform Deep Injection
3. Shallow monitoring
4. Deep injection

Phase 1 – Under Construction

Phase 1 - Timing

- Bid Opening – April 10, 2017
- Notice of Award – April 25, 2017
- Notice to Proceed – May 12, 2017
- Construction Start – May, 2017
- Construction End – September, 2017

Phase 2 - Components

- Design dependent on Phase 1
  - 1 DIW, 1 VZW, Monitoring Wells.
  - Electrical, architecture, piping
  - Backflush facilities
  - Operation/interaction/interlocks

Phase 2 - Timing

- Design completion estimated 4Q, 2017
- Construct start estimated 1Q, 2018
- Construction completion estimated 4Q, 2018
  - WDR to inject R3-2017-0003
  - Watermaster Storage Agreement
  - Operating Reserve 1,000/1,750 af minimum
  - Drought Reserve up to 1,000 af
  - MPWMD Water Distribution System Permit

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Sustainable Water Supply

- Up to 3500 af/year
  - Counts against CDO
  - ~365
  - Rain or shine
- 200 af/year drought reserve
  - up to 1000 af
- 90% into DIW
- VZW from injection and infiltration

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Water Quality

- Northern Coastal Subarea water level rise, reduction in potential for seawater intrusion.
  - Predicted 8-22' after 5 mos
  - VZW predicted 5-40' after 5 mos
- Pilot Plant Water Samples
  - TDS 74 mg/L (Basin Plan 480)
  - Total N 1.3 mg/L (Basin Plan < 5)
- Vadose Zone sediments
  - Chemical analysis of sands
  - Geochemical modeling PHREEQC and PHAST
  - ➢ Leaching within regulatory standards
- Santa Margarita Aquifer analysis inferred from ASR studies.
  - New core sample for bench testing and model updates
- Groundwater Monitoring, Title 22 criteria
  - Travel time estimated to be 10.8 mos

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	June 14, 2017
AGENDA ITEM:	4
AGENDA TITLE:	Modifications to the Sentinel Wells Induction Logging and Water Quality Sampling Work
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Background

At its April 12, 2017 meeting the TAC discussed various aspects of the Sentinel Wells induction logging and water quality sampling work. Some questions were raised and some recommendations were made for changes in the quality control and quality assurance aspects of that work. Specifically, these were to:

1. Improve quality control procedures by including field duplicates, and field and laboratory blanks, to make the analytical data more defensible if any question about its validity arose.
2. Further investigate the issue of pumping out three casing volumes of water before taking samples to determine whether that would be feasible, or if not, why it would not be feasible.
3. Provide a description of the quality assurance/quality control procedures and a Standard Operating Procedure (SOP) for the Sentinel Well sampling work for review and discussion by the TAC at its next meeting.

Discussion

The quality control procedures and the Standard Operating Procedures that have historically been used to conduct the Sentinel Wells sampling events, along with information about the physical construction of the wells, are described in the attachment to this Agenda item. These were reviewed with the Watermaster's consultants, and proposed modifications to them to address the concerns raised by the TAC at its April 12 meeting have been included. These modifications are highlighted in ***boldface italics*** in the attachment.

It is not feasible to pump out three casing volumes of water before taking the water quality samples. The reasons for this are discussed in the section titled "Well Purging Prior to Sample Collection" in the attachment.

Recommendation

Approve the use of the modified quality control procedures and Standard Operating Procedures contained in the attachment.

ATTACHMENTS:	The Watermaster's Sentinel Wells Construction Information and Sampling Program
RECOMMENDED ACTION:	Approve the Technical Program Manager's recommendation as presented, or modify it

THE WATERMASTER'S SENTINEL WELLS CONSTRUCTION INFORMATION AND SAMPLING PROGRAM

DESIGN AND CONSTRUCTION OF THE SENTINEL WELLS

Description and Purpose of the Sentinel Wells

In 2007 the Watermaster constructed four deep monitoring wells in the northwestern portion of the Seaside Groundwater Basin. These are referred to as the Watermaster's Sentinel Wells and they are numbered SBWM-1, SBWM-2, SBWM-3, and SBWM-4. The wells are located along the ocean in the coastal portion of the former Fort Ord Military Reservation, as shown in Figure 1. The wells were constructed by the Watermaster as part of a Court-ordered monitoring program for the Seaside Basin.

The Sentinel Wells are designed to allow detection of seawater intrusion at any depth throughout the entire saturated sediment column. This is accomplished by performing induction logging which can measure, from within the casing, the conductivity of the fluids within the adjacent formation. The use of induction logging as a method to detect seawater relies on the fact that the addition of seawater to ground water changes the native groundwater's physical properties. With the exception of distilled water, all water contains some level of dissolved minerals or salts. Typical drinking water contains less than 1,000 parts per million of dissolved salts whereas seawater contains approximately 35,000 parts per million of salts. Unlike organic contaminants which degrade water with concentrations measured in parts per billion; degradation of water by seawater is the result of contamination on the parts per million or even parts per thousand basis. The addition of more salts to the water, as the result of mixing with seawater, changes the physical properties of the water such as the density and the electrical properties of the water. As the water within the aquifer becomes more saline due to the intrusion of seawater, the electrical conductivity of the formation containing the water increases relative to the value measured when the aquifer was filled with native groundwater. This change in conductivity can be easily detected by induction logging with down-hole geophysical tools and, as such, is a cost-effective method of detecting seawater intrusion in locations where the aquifer units are thick and the potential pathways for seawater intrusion are unclear.

Well Design

It is important to note that the initial concept of designing the Sentinel Wells was for them to consist of monitoring well clusters. Each cluster would have had four separate monitoring wells completed to various depths. One would have been drilled to the Monterey Formation and completed toward the lower portion of the aquifer system, one would have been completed in the upper Santa Margarita Sandstone, and two would have been completed in the overlying Paso Robles Formation. It was assumed that the deeper boring would extend as deep as 1,500 to 2,500 feet. The cost to design and construct these clustered wells was estimated at approximately $4.35 million.

Figure 1. Sentinel Wells Location Map

Orthophoto base from HJW (1999), 1:36,000 scale imagery

Because of the very high cost of using the cluster-well concept, a revised concept was developed utilizing single-well monitoring sites, as opposed to having multiple wells at each site. These single wells would extend into and perforate the Santa Margarita Sandstone. The wells would be constructed of 3-inch diameter casing to allow the periodic downhole conductivity/resistivity (induction) profiling of the aquifer system. This would allow detection of seawater (as measured as an increase in formation conductivity) at any depth from the top of saturation (i.e. the water table) to bottom of the well.

Data collection from the Sentinel Wells was to include periodic induction logging of the cased boreholes for calibration purposes, and collection of physical water samples from the Santa Margarita Sandstone. Successive induction logs would be overlaid on previous logs for comparison. In addition to the indirect measurement of water quality within all portions of the Paso Robles Formation and Santa Margarita Sandstone, the wells would allow monitoring of water level conditions in the Santa Margarita Sandstone.

In summary, the revised approach was intended to allow collection of the following data:

- Conductivity/Resistivity (Induction) surveys of the entire sediment column providing indirect measurement of water quality and water quality changes
- Water levels in the Santa Margarita Sandstone
- Collection of water quality samples from the Santa Margarita Sandstone using a “bomb” type of downhole sample collection device

Well Drilling

A fourteen-inch diameter, one-quarter inch thick, steel conductor casing was set to a depth of 50 feet at each of the four sites. The purpose of the conductor casings was to provide stability to the near surface sand deposits. The casings were installed and centered in twenty-inch diameter boring and set with cement grout.

8.75-inch diameter pilot borings were advanced either to the planned maximum depth of 1,500 feet, or to a depth at which the Monterey Formation was positively identified. The pilot boring for SBWM-1 was the only drill hole where the Monterey Formation was not encountered.

Well Construction and Completion

After completion of the pilot bore and geophysical logging the data were reviewed to develop a completion plan for each well. Completion plans (total depth, placement of well screens, and annular seal depth) were developed for each well through consultation between project geologists (Martin Feeney PG, CHg and Mike Burke PG, CHg) and Mr. Joe Oliver PG CHg of the Monterey Peninsula Water Management District. The details of the completion plan are summarized below:

SBWM-1 – This was the first well drilled. The geologic and geophysical data from this well revealed the absence of Santa Margarita Sandstone and the presence of Purisima Formation to total depth of 1,500 feet. The workplan assumed that the well completions would be in the Santa Margarita Sandstone. The absence of this unit required development of a differing well design that met the goals and intent of the project. Whereas the Santa Margarita Formation is approximately 200 feet thick the Purisima Formation can be over 1,000 feet thick. This complicated the design of the wells as the project budget and materials were based on the assumption of a thinner aquifer section. Project geologists and Mr. Oliver met and discussed the data and developed a revised well design. The revised design was to perforate the most permeable zones in the lower Purisima Formation – the formation that is hydrostratigraphically adjacent to the Santa Margarita Sandstone to the south. The seal was placed to the top of the lower Purisima Formation.

SBWM-2 – The geologic and geophysical data at this well revealed the conditions to be similar to those found at SBWM-1. The significant difference at this location was that the Monterey Formation was encountered by the pilot boring. The approach to completing this well was based on the approach developed for SBWM-1. SBWM-2 was perforated in the permeable zones between the top of the lower Purisima and the top of the Monterey Formation. The seal was placed to the top of the lower Purisima Formation.

SBWM-3 – Data from this well revealed a shallower sequence of Purisima Formation, and a substantially shallower depth to the top of the Monterey Formation. This well was completed consistent with the approach utilized for SBWM-1 and SBWM-2.

SBWM-4 – Geologic and geophysical data from SBWM-4 was interpreted as Purisima Formation overlying Santa Margarita Formation overlying Monterey Formation. The total thickness of the materials between the top of the lower Purisima Formation and the top of the Monterey Formation was less than 230 feet. Given the geologic complexity, perforations were placed from the top of the lower Purisima Formation to the top of the Monterey Formation. Seal was placed to the top of the lower Purisima Formation.

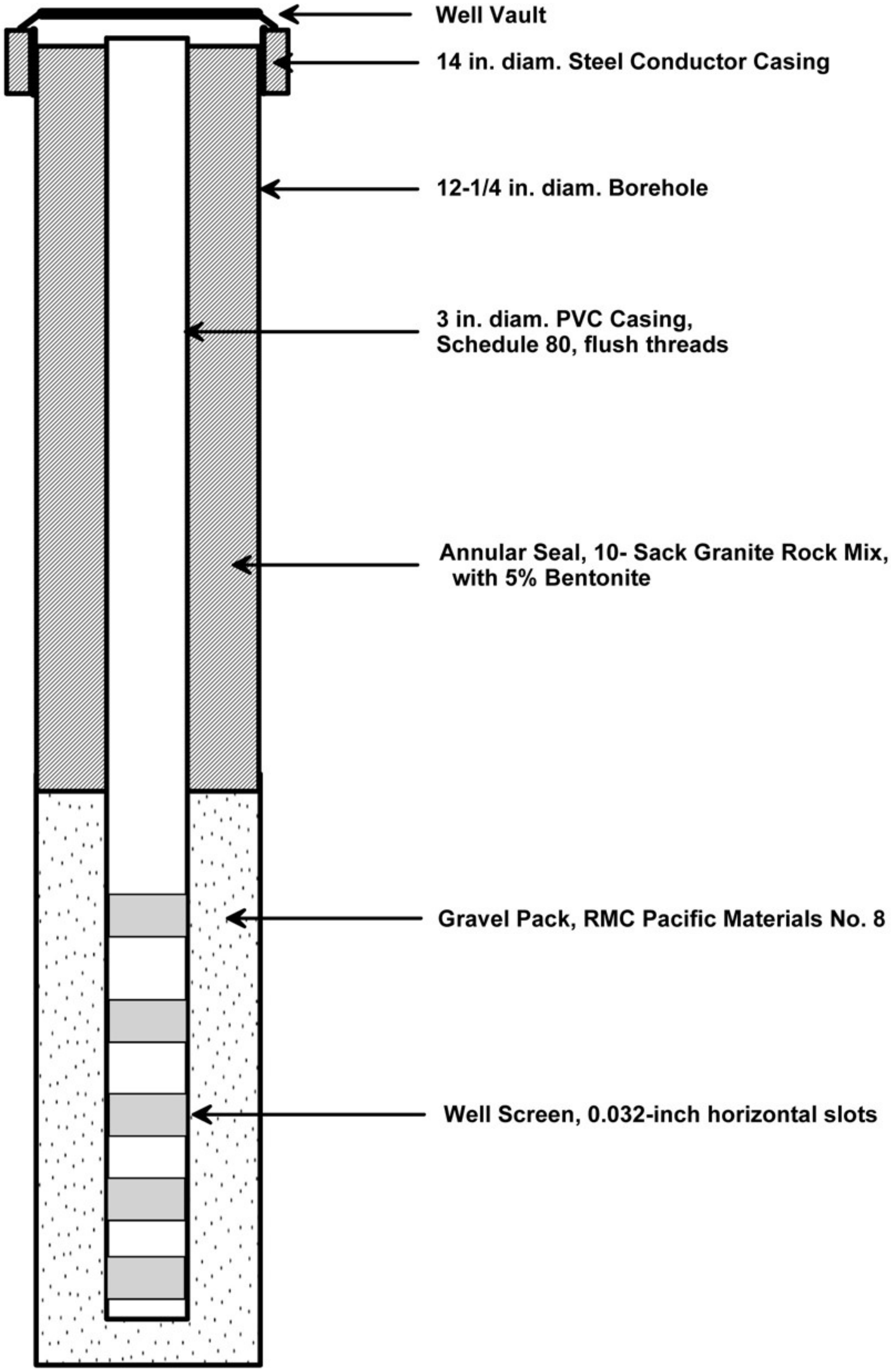
A summary of the construction details for each of the wells is presented in Table 1, and a depiction of the typical well construction features is provided in Figure 2.

Additional information about the construction and initial data collection from the Sentinel Wells is contained in Attachment A.

Table 1. Well Completion Summary

	SBWM-1	SBWM-2	SBWM-3	SBWM-4
Description of Location	Range 8	Bunker 11	Bunker 1	MCWD Lift Station
GPS Coordinates	N 36 39' 07.9" W 121 49' 24.4"	N 36 38' 46.1" W 121 49' 45.3"	N 36 38' 32.0" W 121 49' 55.4"	N 36 37' 47.0" W 121 49' 50.19"
Ground Surface Elev. (ft., msl)	96	73.7	59.5	62.4
Pilot Bore Depth, ft.	1500	1500	1370	980
Casing Depth, ft.	1500	1500	1310	930
Screen Depths, ft.	1130 - 1150 1210 - 1230 1290 - 1310 1380 - 1400 1470 - 1490	990 - 1010 1070 - 1090 1140 - 1160 1230 - 1250 1370 - 1390 1460 - 1480	860 - 880 970 - 990 1060 - 1080 1200 - 1220 1270 - 1290	705 - 800 820 - 920
Annular Seal Depth, ft.	1100	950	820	690

Figure 2. Typical Sentinel Well Construction



SENTINEL WELLS WATER QUALITY SAMPLING PROGRAM

Sampling and Induction Logging Program

The Sentinel Wells have historically been sampled for water quality either once or twice per year ever since they were constructed in 2007. In recent years the sampling schedule has been as shown in Table 2.

Table 2. Water Quality Sampling

Well Number	Sample Depths, Feet	Sampling Dates
SBWM-1	1,140 & 1,390	January & July
SBWM-2	1,000 & 1,470	July
SBWM-3	870 & 1,275	July
SBWM-4	715 & 900	January & July

In its Technical Memorandum titled *"Seaside Groundwater Basin Analysis of Wells Sampled in December 2016"* dated February 2, 2017, HydroMetrics recommended that in the future the sampling dates be changed from January and July to March and September, so that samples would be collected at what have historically been the lowest and highest groundwater levels in these wells. That recommendation was approved by the Watermaster in early 2017 and the change in sampling dates will begin with the summer 2017 sample which will be collected in September 2017.

All four of the Sentinel Wells have also historically been induction-logged twice per year, in January and July. The induction logging dates will also change to March and September, beginning with the September 2017 sampling event.

Water Quality Sampling Procedure

Sample Collection

Attachment B contains an excerpt from the USGS document titled "*Techniques of Water-Resources Investigations Book 9, Handbooks for Water-Resources Investigations National Field Manual for the Collection of Water-Quality Data.*" The following is a description of the Standard Operating Procedure (SOP) that has been historically used for water quality sampling of the Sentinel Wells. This SOP generally follows the procedure described in Attachment B with the exception described below regarding the purging of the well casing prior to collecting the water quality sample.

In this SOP the “Sample Person” is typically Martin Feeney and the “contractor” is typically Pacific Surveys. Proposed changes to the SOP to improve quality control are shown in ***boldface italics***.

Field blanks are used to evaluate the collection process (from field sampling through sample analysis) for contamination from exposure to ambient conditions, from sample containers, or from improper sampling and handling techniques. If target analytes are found in field blanks, sampling and handling procedures will be reevaluated and corrective actions taken.

Field duplicates are analyzed for the same analytical parameters as the original samples. The duplicate sample is collected immediately after collection of the original sample, following the same sampling protocols.

Field duplicates are used to evaluate the precision of the sampling process, from sample collection through laboratory analysis. The combined variability from sampling and analysis technique, in addition to sample heterogeneity, will be assessed using field duplicates. If acceptance criteria (Relative Percent Difference less than or equal to 25%) are exceeded, field sampling and handling protocols will be reviewed and problems corrected.

STANDARD OPERATING PROCEDURES FOR SAMPLE COLLECTION

1. The Sample Person obtains sample collection bottles, ice chest, ice or freezer packs, deionized water (DIW), and Chain of Custody/Analysis Request forms from Monterey Bay Analytical Services (MBAS). A copy of the Chain of Custody/Analysis Request form is contained in Attachment C. The sample collection bottles come with labels already affixed to them, and are filled-in by the Sample Person at the well sites.
2. At the well site, the Sample Person meets with the contractor that will be operating the equipment to collect the down-hole water quality samples. Sample collection depths are confirmed with the contractor before inserting the sample collection device into the well casing. The device is referred to as a "bomb" type sampler and is shown in Figure 3.
3. Sample Person flushes the sample collection device using DIW provided by MBAS.
4. Contractor prepares the sample collection device by drawing a vacuum on it.
5. Contractor then lowers the sample collection device into the well casing to the specified sample collection depth, and collects the sample.
6. Contractor retrieves the sample collection device to the surface and lays it out on a support table.
7. Sample Person fills out the labels on the sample collection bottles with the necessary identifying information for this sampling event.
8. Sample person holds the opened sample collection bottle underneath the discharge orifice on the sample collection device, and Contractor opens the orifice so the water sample flows into the collection bottle. This step is repeated as necessary until all of the original and duplicate sample collection bottles have been filled.
9. The sample collection device is drained empty and flushed with DIW to prepare it for the next sampling event.
10. Steps 3 through 9 are repeated for each depth at which a sample is to be collected.
11. Immediately after each sampling event the sample collection bottles are placed into the ice chest to keep them at the desired holding temperature.
12. ***During the course of the day's sampling events one or more field blanks is collected, and the sample bottle is appropriately labeled as a field blank. The field blank is collected by first rinsing out the sample collection device with DIW, and then filling the sample collection device with DIW, and then collecting a sample of the DIW after it has passed through the sample collection device in order to see if any contamination is occurring through the process of collecting samples in that device. Also during the course of the day's sampling events one or more duplicate samples is collected at the same time the original samples are collected, and the bottles are appropriately labeled as field duplicates. The frequency of collecting field blanks and field duplicates is 5%, meaning that for every 20 original samples collected, one field blank and one field duplicate is collected.***
13. At the end of the day's sampling events, the ice chest containing the sample collection bottles, along with the completed Chain of Custody/Analysis Request forms, are delivered by the Sample Person to MBAS to start the analytical process.

Well Purging Prior to Sample Collection

The objectives of the sampling procedure are to minimize changes in ground water chemistry during sample collection and transport to the laboratory, and to maximize the probability of obtaining a representative, reproducible ground water sample. In many instances where samples are collected from production wells (rather than monitoring wells) well-volume purging is performed prior to collecting the sample in order to meet the objective that the samples obtained will represent water quality from the screened interval of the well.

In production wells purging is generally performed when the sample to be analyzed is taken from the discharge of the well pump. This is because standing water in the well casing can be of a different chemical composition than that contained in the aquifer to be sampled. Solutes may be adsorbed onto or desorbed from the well casing material, oxidation may occur, and biological activity is possible. Therefore, the stagnant water within the well is typically purged by running the well pump for at least 15 to 20 minutes prior to collecting the water quality sample, so that the sample will be representative of the water quality in the aquifer.

Section 4.2.3 in the USGS document titled "*Techniques of Water-Resources Investigations Book 9, Handbooks for Water-Resources Investigations National Field Manual for the Collection of Water-Quality Data*" provides a recommended procedure for well purging prior to sample collection. The following is an excerpt from this Section of that document: "*Well purging removes standing water from the borehole. The purpose of purging is to reduce chemical and biochemical artifacts caused by the materials and practices used for well installation, well construction, and well development, and by reactions occurring within an open borehole or annular space between a well casing and borehole wall. Purging also serves to condition the sampling equipment with well water. The purging process forms a continuum with that of sample withdrawal. Sample withdrawal is the process by which sample water is transported for collection and processing, after the well has been purged. As a rule of thumb, the standard USGS purge procedure removes three or more well volumes of standing water while monitoring the water level and the stabilization of routine field measurements as a function of time, pumping rate, and the volume of water being removed. Inherent in the purge procedure is an assumption that stabilization of field properties indicates that the discharge water represents ambient formation water. Field personnel should examine this assumption for each well, using their knowledge of the well and aquifer hydraulics. Review of the purging history, including physical* *and chemical data monitored, can save time and help determine how the well should be purged."*

Figure 3. Sentinel Wells Sample Collection Device

Purging of the Sentinel Wells prior to sample collection is not desirable, or feasible, for a number of reasons:

1. As reported above under the section titled "*Description and Purpose of the Sentinel Wells*" the Sentinel Wells were designed primarily as induction logging conduits, with water quality sampling being a secondary function. All of these wells are all perforated in more than one aquifer. Consequently, purging water by pumping it out of the well casing would draw in water from each of these aquifers (most likely the greatest amount would come from the shallowest aquifer), and the water coming out through the purging process would be a blend of those waters. This would make it impossible to obtain a representative discrete sample of either of the aquifers within which the perforations are located (the "ambient formation water" which the USGS process cites as an objective of performing the purging process).

2. The Sentinel Wells are not production wells, they are monitoring wells. Consequently, they have small casings (3-inch diameter) and do not have well pumps. Purging would require lowering a well pump downhole, and collecting the purged water in a tank truck for off-site disposal. Off-site disposal would be necessary since the wells are located in the Fort Ord Dunes State Park, and the permit from State Parks that authorized the installation and sampling of the wells does not include on-site disposal of purge water. Because of the small casing diameter, only a low capacity pump could be installed with an estimated maximum pumping rate of approximately 10 gpm. Due to the very long length of the casings, it would take approximately 1,500 gallons to equal a three-casing-volume purge, and this would take approximately 2.5 hours per well to perform. Assuming that a standard 3,000-gallon water truck would be used to haul away the purge water for disposal, two trips to the disposal location would be necessary in order to dispose of purge water from the four Sentinel Wells. Performing purging would add considerable time and cost to each sampling event.

3. In the low-flow/low-volume sample collection method, which is the method MPWMD uses to collect samples from their monitoring wells (see description of this method in <u>Attachment D</u>), the low-flow/low-volume pumps are permanently installed within the casing. If this method was used on the Sentinel Wells, those pumps would have to be removed after each sampling event, so the casing would be cleared for induction logging. The pumps would then have to be reinstalled in order to be in place for the next sample sampling event. Using this process would result in considerable additional cost and multiple mobilizations of equipment and personnel. It would also increase the probability of having materials accidently dropped into the casing, or of hoses and/or lines becoming twisted and stuck in the casing. The

current water quality sampling device, known as a “bomb sampler”, should continue to be used if induction logging of the Sentinel Wells is to continue. If a change is made to the low-flow/low-volume sample collection method, then induction logging should be discontinued because it is too costly to perform both induction logging and low-flow/low-volume sampling.

Another method of sample collection involves the use of osmotic samplers, which employ passive diffusion bags. These could be deployed at the two depths in each well where water quality samples are collected, and left in place for six months and then retrieved before performing induction logging. New bags would then need to be installed after each induction logging event was completed. The normal types of osmotic samplers employ “passive diffusion bags” which would collect composite samples representing the average water quality over the six-month periods. These would not represent the water quality at the time of the two annual sampling events (March and September of each year). A special type of osmotic sampler could be used that could collect discrete samples of any volume of water necessary for any constituent. Each sampler would have to be custom-built for the environment in which they are deployed for the appropriate draw rate. These special samplers are expensive and are mainly used for time series data, not discrete sampling like the Sentinel Wells require. For these reasons using the osmotic sampling method would not be desirable, and would also add considerable cost to each sampling event.

<u>**Laboratory Analyses**</u>

Samples are delivered for analysis to Monterey Bay Analytical Services (MBAS), an ELAP certified laboratory, and the samples are analyzed for a complete mineral panel. A complete mineral panel includes calcium, cation-anion balance, chloride, conductivity, magnesium, nitrate, pH, potassium, sodium, sulfate, and total alkalinity. In addition a separate laboratory subcontracted to MBAS analyzes for iodide. MBAS is responsible for reviewing, validating, and/or qualifying results on the data reports. Any deviations from sample preparation, analysis, and/or QA/QC procedures are documented. Departure from QC acceptance limits are highlighted. Once the data reports are finalized, a hard copy is sent to the Sample Person who reviews them and determines if there were any analytical issues of concern.

In order to ensure that the Watermaster and its consultants become promptly aware of any analytical results that could be indicative of possible seawater intrusion, HydroMetrics reviewed the historical levels of chloride in each of the Sentinel Wells and developed the “Alert Levels” shown in Table 3. MBAS will provide an immediate notification if any of these levels are reached or exceeded whenever it performs analyses of water quality samples from the Sentinel Wells.

Quality Control and Quality Assurance Procedures

The Sample Person described in the SOP above is responsible for carrying out the field quality control and quality assurance (QA/QC) procedures described in the SOP. MBAS is responsible for carrying out the laboratory QA/QC procedures. Tables 4 and 5 show the QA/QC procedures used by MBAS for the analysis of Sentinel Well water quality samples.

Table 3. Alert Levels

Well Number & Sample Depth	Alert Level Chloride Concentration (mg/L)
SBWM-1: 1,140 feet	90
SBWM-1: 1,390 feet	100
SBWM-2: 1,000 feet	80
SBWM-2: 1,470 feet	80
SBWM-3: 870 feet	80
SBWM-3: 1,275 feet	80
SBWM-4: 715 feet	150
SBWM-4: 900 feet	290

Table 4. Quality Assurance Procedures

QA PROCEDURE	QA PARAMETER	FREQUENCY	CRITERION	CORRECTIVE ACTION
Method Blank	Analytical Contamination	3 per analytical batch	< RL	Reanalyze analytical batch
LCS (CRM)	Accuracy	1 per analytical batch	80-120% REC	Reanalyze analytical batch
Analytical Duplicate	Analytical Precision	1 per analytical batch	RPD < 25%	Reanalyze analytical batch
Matrix Spike	Matrix Interference and Accuracy	1 per analytical batch; at 3-10x the native conc.	75-125% REC	Reanalyze analytical batch

Matrix Spike Duplicate	Precision and Accuracy	1 per analytical batch; at 3-10x the native conc.	RPD <25%	Reanalyze analytical batch
Continuing Calibration	Analytical Control	1 per 10 sample runs	80-120% of initial slope	Reanalyze analytical batch

Notes:
LCS=Laboratory Control Sample
RL=Reporting Limit
REC=Recovery
RPD=Relative Percent Difference

Table 5. Quality Control Procedures

ANALYTE	*METHOD BLANK*	*QCS*	*ANALYTICAL DUPLICATE*	*MATRIX SPIKE*	*MATRIX SPIKE DUPLICATE*	*CONTINUING CALIBRATION*
Calcium (Ca)	yes	yes	no	yes	yes	yes
Chloride (Cl)	yes	yes	no	yes	yes	yes
Conductivity (SEC)	yes	yes	yes	no	no	yes
Magnesium (Mg)	yes	yes	no	yes	yes	yes
Nitrate (NO3)	yes	yes	no	yes	yes	yes
pH (Laboratory)	no	yes	yes	no	no	yes
Potassium (K)	yes	yes	no	yes	yes	yes
Sodium (Na)	yes	yes	no	yes	yes	yes
Sulfate (SO4)	yes	yes	no	yes	yes	yes
Total Alkalinity (as CaCO3)	yes	yes	yes	no	no	yes

Accuracy. Accuracy, or bias, is a measure of how close a result is to the expected value of the target analyte in a sample. Accuracy will be determined by the analysis of certified reference materials and matrix spikes, where the results can be compared with an expected value and expressed as %recovery. This is an assessment of laboratory analytical methods. For Quality Control Standards (QCS), it will be expressed as %recovery by the following equation:

$$\%Recovery = \frac{X}{T} \times 100$$

where,

X = Measured concentration

T = True spiked concentration

or, for Matrix Spike (MS) samples, by the following equation:

$$\%Recovery = \frac{(B - A)}{T} \times 100$$

where,

B = Measured concentration of spiked sample

A = Measured concentration of unspiked sample

T = True spiked concentration

Accuracy/bias as related to contamination involves both field and laboratory components. ***Field blanks will be collected at a frequency of 5%, i.e. one field blank will be collected and analyzed for every 20 water quality samples that are collected.*** Laboratory blanks will be prepared and analyzed at a frequency of 10%, i.e. one laboratory blank will be prepared and analyzed for every batch of 10 samples.

Precision. Precision is concerned with the ability to quantitatively repeat results. To demonstrate the precision of a method or instrument, field duplicates will be collected, analyzed, and their results compared. Precision is expressed as relative percent difference (RPD) by the following equation:

$$RPD\ (\%) = \frac{|X_1 - X_2|}{(X_1 + X_2)/2} \times 100$$

where,

X_1 = Original sample concentration

X_2 = Duplicate sample concentration

$|X_1 - X_2|$ = Absolute value of $X_1 - X_2$

Field duplicates will be collected at a frequency of 5%, i.e. one field duplicate will be collected and analyzed for every 20 water quality samples that are collected. Laboratory duplicates will be prepared and analyzed at a frequency of 10%, i.e. one laboratory duplicate will be prepared and analyzed for every batch of 10 samples.

ATTACHMENT A

Additional Information About the Construction and Initial Data Collection from the Sentinel Wells

Well Drilling

The diameter of each of the pilot borings was 8.75 inches. Drill pipe lengths were twenty feet, and following advancement of each joint of pipe the fluid was circulated and cleaned to provide representative cutting samples and a balanced column of fluid. Cutting samples were collected throughout the pilot drilling and a lithologic log of the borehole was prepared. Representative cutting samples for each ten-foot depth interval were placed in labeled, compartmentalized sample trays which were then photographed.

Geophysical logging was performed after pilot bore drilling was completed at each site. The geophysical logs include measurements of natural gamma radiation, spontaneous potential, short-and long-normal resistivities, and single point resistance.

Lithologic logs, photographic documentation of the cutting samples, and geophysical logs for each of the borings were prepared.

Well Construction

The first step in the well construction process was the reaming of the pilot to a diameter of 12-1/4 inches. Once the ream was complete, a temporary construction tremie was installed in the boring. The casing was then installed, and centered in the boring using plastic centralizers. Centralizers were placed immediately above and below each screen zone, and at intervals of 80 feet within the upper blank section.

Gravel pack and cement grout were placed using the construction tremie. Gravel pack was placed in lifts of approximately 60 feet. After gravel pack was determined to be properly placed to the desired depth, a cement grout annular seal was placed from the top of the gravel pack to ground surface.

Descriptions of the monitoring well construction materials are presented below:

Well Casing: PVC, 3-inch diameter, schedule 80, flush threaded.
Well Screen Perforations: Machine cut slots, 0.032-inch openings.
Gravel Pack: RMC Pacific Materials No. 8 Blend.
Annular Seal: Cement grout, 10-sack mix, with 5 percent bentonite.

Once the annular seal was complete and cured, each monitoring well was provided with a water-tight, flush-mounted, traffic-rated circular well vault set in place with concrete. Reference point elevations were established for each of the wells based on survey data provided by RBF Consulting.

Well Development

Well development was performed immediately following the construction of each well. Initial development was performed by airlifting, with the well casing serving as the eductor pipe. Final development was accomplished by airlifting through a 1-1/2 inch eductor pipe that was lowered to the total completed depth of each well. The purpose of the final development and the use of the eductor pipe was to develop the lower portions of the wells to ensure that the casings were clean and open through total depth in order to provide access to total casing depth for future geophysical monitoring, and to clear and clean all portions of the well screen for water quality sampling.

Initial Data Collection

Baseline Data Collection

The successful construction of the monitoring wells allowed for the completion of baseline data collection. Lithologic and geophysical data were acquired through the drilling of the pilot borings. The completed monitoring wells provided for the collection of supplemental geophysical data (induction logs), water quality data, and water level data.

Water Level Data

Static water levels were measured at each of the monitoring wells on September 13, 2007, at the time of induction logging. Reference point elevations established by RBF Consulting were used to determine the water surface elevation at each site. Water level data are summarized in the Table 6.

Table 6. Water Level Data Summary

	SBWM-1	SBWM-2	SBWM-3	SBWM-4

Approx. Ground Surface Elevation, ft, (msl)	96	73.7	59.5	62.4
Depth to Water, ft.	115.9	93.0	78.4	82.4
Water Surface Elevation, ft. from MSL	-19.9	-19.3	-18.9	-20

Water surface elevations were significantly below sea level at each well and did not suggest a clear gradient and flow direction.

Water Quality Data

Composite Sampling

Once airlift development was believed to be sufficiently complete, and water produced by airlifting was clear, water quality samples were collected. The samples likely represented a composite of groundwater produced from all sections of the well screen. Samples were delivered to Monterey Bay Analytical Services laboratory in Monterey, where general mineral analyses were performed. Laboratory data for the composite samples is summarized in Table 7, and the data is depicted graphically in Figures 4 and 5.

Depth-Specific Sampling

For purposes of determining the appropriateness of utilizing down-hole sampling techniques, depth specific water samples were collected concurrently with induction logging. Discreet depth specific water quality samples were collected from two depths in each monitoring well. Samples were collected from the middle of the top and bottom screens on SBWM-1, SBWM-2 and SBWM-3. Samples were collected 10 feet below the top of the screen and 20 feet above the bottom of the screen in SBWM-4. The purpose of the discreet, depth specific, sampling was to provide additional baseline data, evaluate variations in water quality from different depths within each completed well, and allow for comparison of water quality characteristics between the discreet samples and the composite airlift samples. Analytical results for the discreet samples are provided in Table 8, and the data is depicted graphically in Figures 5 and 6.

Water Quality Interpretation

Water quality data from the Sentinel Wells supplemented and complemented the geologic and geophysical data from the boreholes. The water quality findings were as follows:

- Generally, the water quality of the wells, based on the composite samples, decreased with increasing distance south. SBWM-1 displayed a total dissolved solids concentration of 305 milligrams per liter (mg/l) whereas SBWM-4 had a concentration of 671 mg/l. These values were consistent with water quality data for wells completed in the Purisima Formation and the Santa Margarita Formation, respectively.

- Based on the composite samples, the water from the three northern wells (SBWM-1, SBWM-2, and SBWM-3) was of a sodium-chloride-bicarbonate chemical character while, the water from SBWM-4 was of a stronger sodium-chloride chemical character.
- Depth specific samples from all wells are presented in the bottom panel of Figure 5. As can be seen, the signatures fell into two groups; the lower groups being both samples from SBWM-1 and SBWM-2 and the uppermost sample from SBWM-3. The other group contains the lower sample from SBWM-3 and both samples from SBWM-4. However, careful analysis of the signatures suggested that the lower sample in SBWM-3 was grouped with the SBWM-4 samples primarily due to increased concentration not necessarily due to similar chemical character.

Table 7. Summary of Water Quality Data, Composite Samples

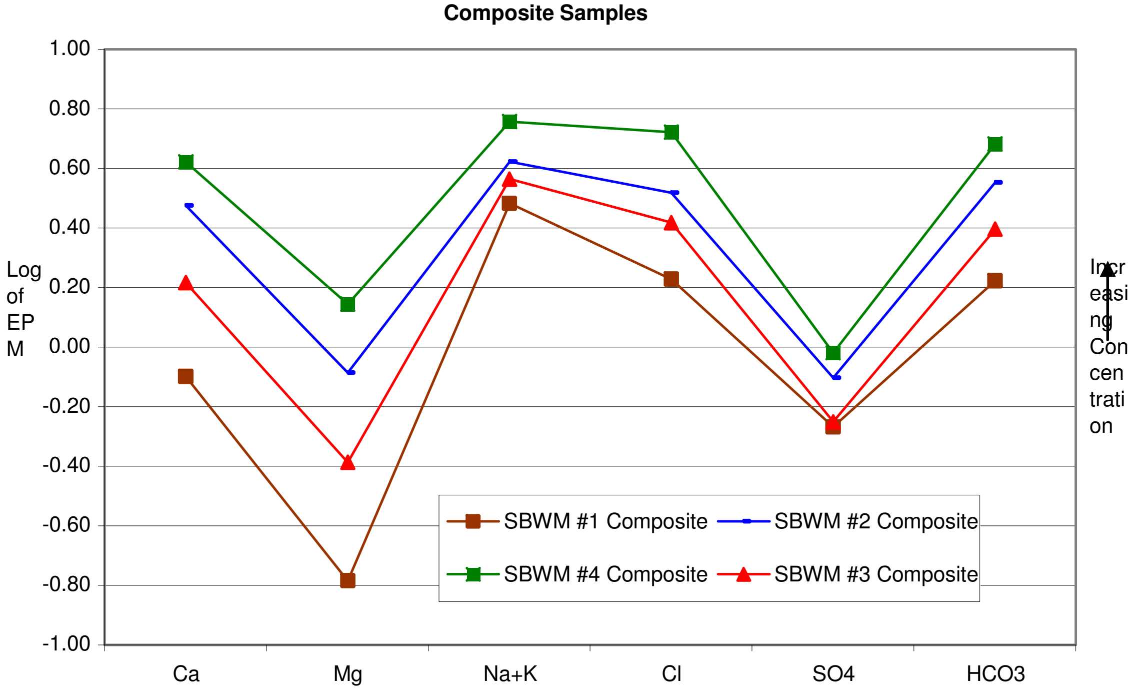
	SBWM-1	SBWM-2	SBWM-3	SBWM-4
Sample Date	8/14/07	9/4/07	9/6/07	9/5/07
Specific Conductance, μmhos/cm	435	815	620	1150
Total Dissolved Solids, mg/l	305	486	365	671
Calcium, mg/l	16	60	33	84
Magnesium, mg/l	2	10	5	17
Sodium, mg/l	68	94	82	128
Potassium, mg/l	3.2	4.5	4.2	5.9
Bicarbonate, mg/l (as HCO3)	102	218	152	294
Sulfate, mg/l	26	38	27	46
Chloride, mg/l	60	117	93	187

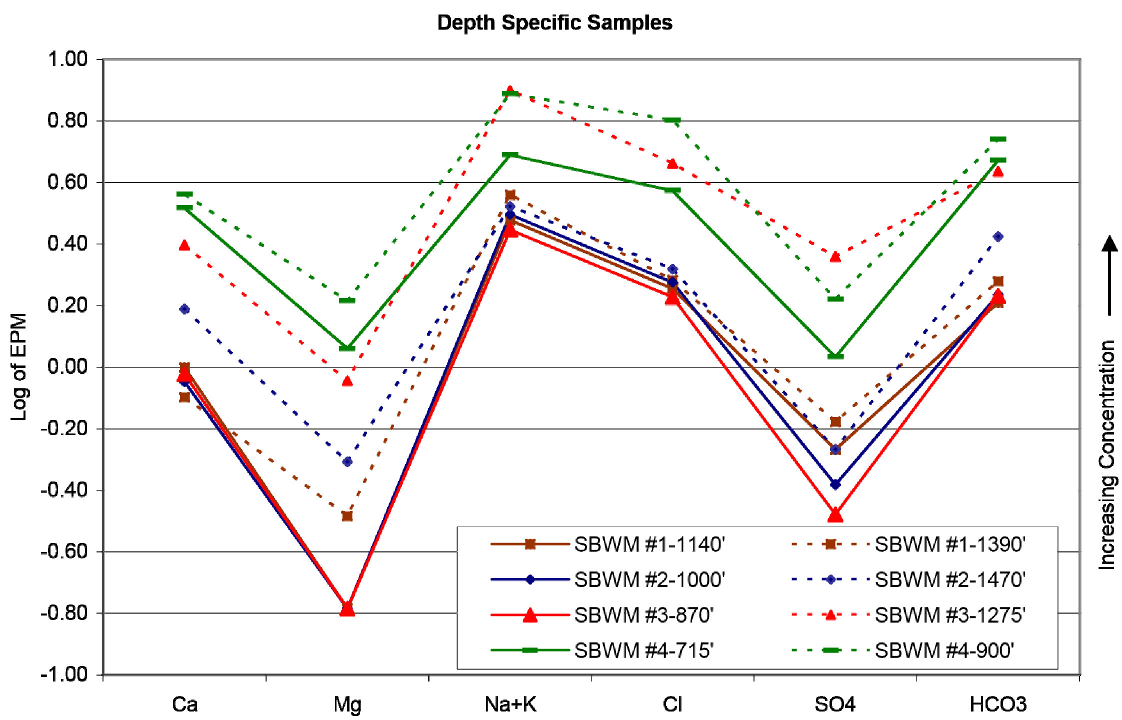
Table 8. Summary of Water Quality Data, Discreet Depth Specific Samples

	SBWM-1		SBWM-2		SBWM-3		SBWM-4	
Sample Date	9/13/07		9/24/07		9/13/07		9/24/07	
Sample Depth, ft.	1140	1390	1000	1470	870	1275	715	900
Specific Conductance, μmhos/cm	409	471	451	526	410	1130	977	1375
Total Dissolved Solids, mg/l	256	317	*	*	270	686	*	*
Calcium, mg/l	20	16	18	31	19	50	66	73
Magnesium, mg/l	2	4	2	6	2	11	14	20
Sodium, mg/l	67	81	70	74	62	178	109	172
Potassium, mg/l	3.6	4.5	3.4	4.4	3.9	7.9	6.3	9.7
Bicarbonate, mg/l (as HCO3)	99	116	105	162	104	264	287	336
Sulfate, mg/l	26	32	20	26	16	110	52	80
Chloride, mg/l	64	68	67	74	60	163	133	226

* Analysis not completed

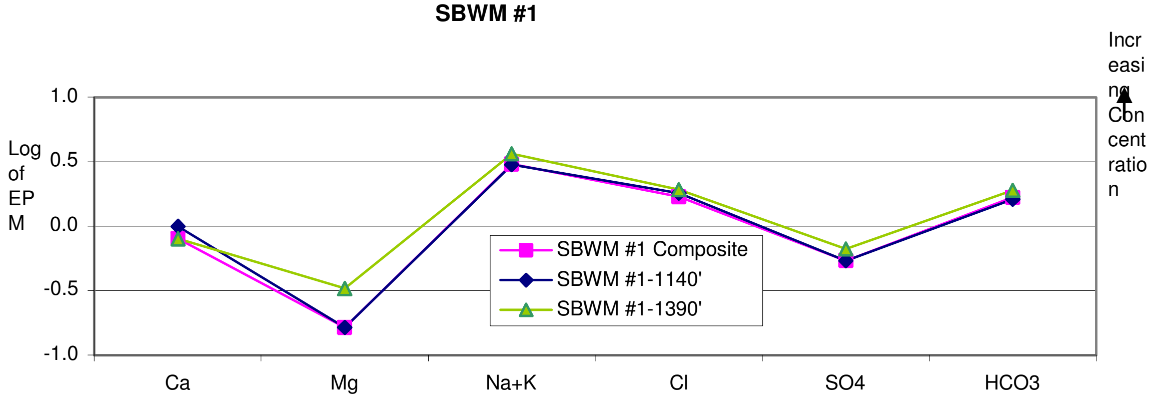
Figure 5. Graphs of Water Quality Samples

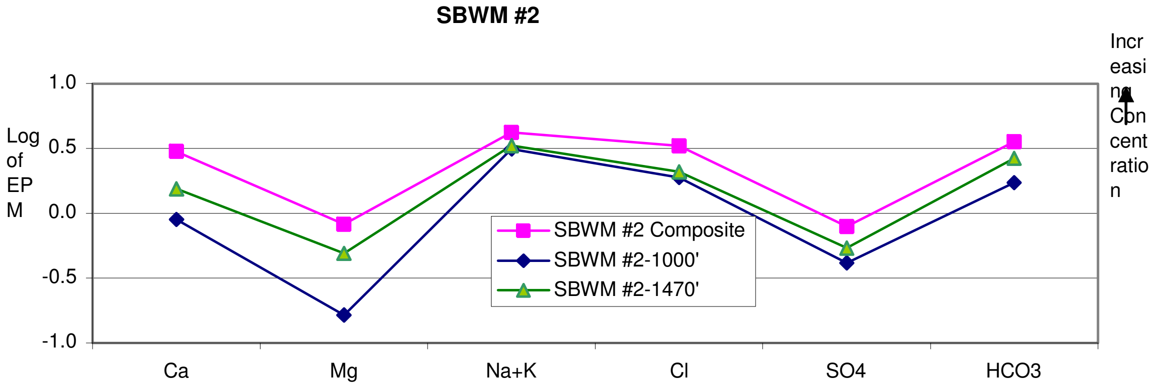


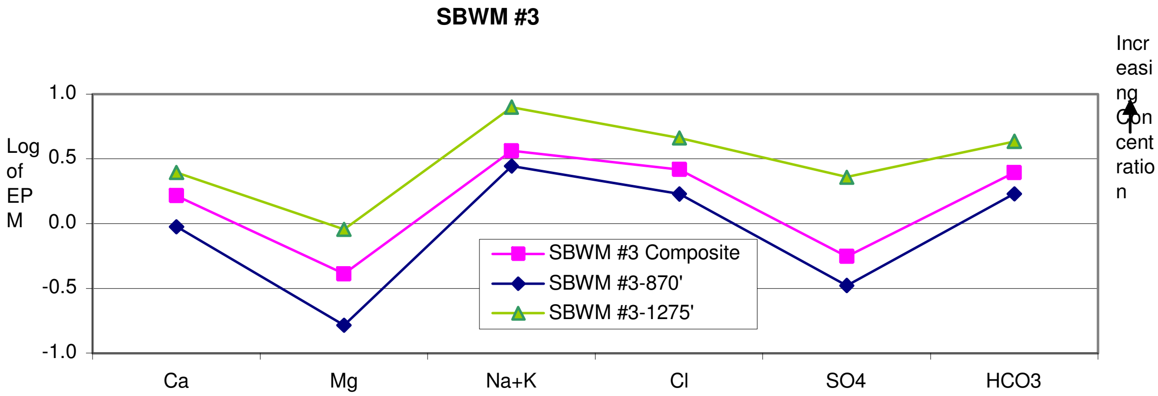


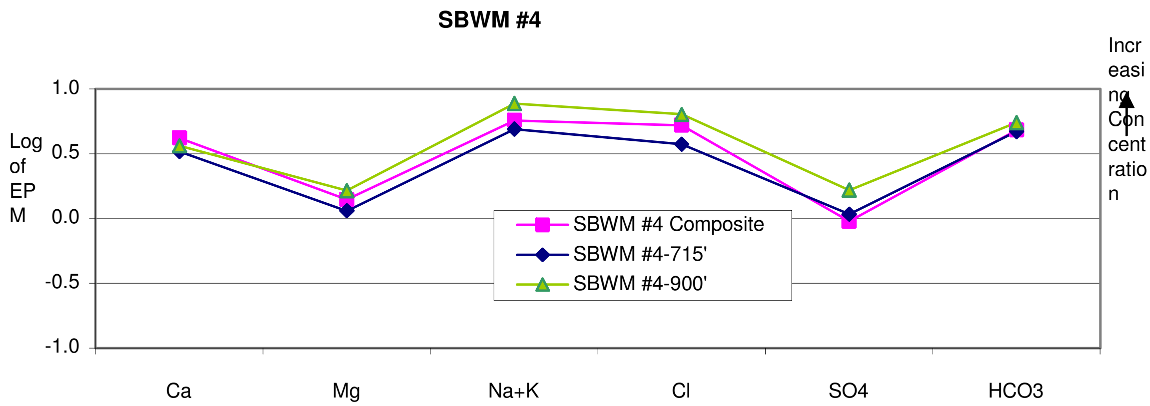
EPM = Equivalents per million = concentration (PPM) x valence/molecular weight

Figure 6. Graphs of Individual Well Quality Data









EPM = Equivalents per million = concentration (PPM) x valence/molecular weight

- As can be seen on Figure 6, depth specific sampling provided significant additional insight into the water quality conditions within the aquifer system. The sampling data revealed significant water quality difference with varying depths in the wells.
- With the exception of SBWM-2, all of the wells showed increased salinity with depth. The higher salinity in the composite sample compared to either of the specific-depth zones suggested that poorer quality water was coming from a zone not specifically sampled.

Induction Logging
The first set of induction logs did not reach the bottom of the wells, so additional development was performed to clean the wells to the bottom. A second set of induction logs were subsequently performed and the probe successfully reached bottom. Induction logs provide a vertical profile of the conductance of the formation fluids throughout the entire saturated section at each well. These logs will serve as a baseline for the monitoring program through which any future changes in the salinity of groundwater within any zone may be easily identified and tracked during subsequent induction logging. The induction log for each well is discussed and interpreted below.

Induction Log Interpretation
Induction logs measure the conductivity of the formation at a radial distance of approximate three feet from the casing. The measured conductivity is an aggregate measurement of the electrical conductivity of the formation fluid and the formation solids, and for this reason will not directly correspond with a water sample from the same depth. In clean sand, which has no inherent conductivity, the conductivity measurement more closely approximates the conductivity of the fluid, whereas in clay, which is inherently conductive, the measurement is a composite of the fluid conductivity and the clay conductivity. In materials that are mixtures of materials the conductivity increases with increased clay content. Given this relationship, if high conductivities are measured in sediments known to be sand, the water is saline, and in a coastal environment, is strong evidence of seawater intrusion. In clay formations, the formation fluids are commonly naturally saline. Detection of seawater intrusion in clay materials can be most easily be detected by increases in conductivity over time.

SBWM-1—The upper 50 feet of the this well showed very high conductivities. This signature was present in all of the wells and was the result of the 50-foot steel conductor casing. However, because the water table was below the conductor casing at all locations, the steel casing did not interfere with data collection within the saturated sediments below. Below the conductor casing in SBWM-1, the materials were dry to a depth of approximately 115 feet. Below this depth, there was approximately 10 feet of sand containing fresh water. Below 125 feet and extending to approximately 350 – 400 feet there was sand containing saline water with conductivities measuring as high as 10,000 µmhos/cm. This saline water was contained within the Dune /Beach Sand Deposits and within the Aromas Sand. Below this depth conductivities were relatively low with the exception of the thick marine clay between approximately 600 -700 feet. The other conductive zones also correlated with clay zones.

SBWM-2— As in SBWM-1 there was a thin layer of fresh water overlying a zone of saline water to approximately 130 feet within the Beach/Dune Sands and Aromas Sands. Below this depth, the materials became increasingly clayey, complicating the interpretation. Below this depth, there were no obvious zones of anomalous conductivity; that is, the zones that were more conductive correlated with clay zones.

SBWM-3— In SBWM-3 saline water extended to approximately 100 feet within the Dune/Beach Sand and Aromas Deposits. Below 100 feet, the materials became clay and conductivities rapidly declined. Again, below the shallow saline water, all zones of increased conductivity correlated with clay zones.

SBWM-4— As with the other wells, the induction log revealed a thin layer of fresh water overlying saline water with the Dune Sands/Beach Deposits to a depth of approximately 100 feet. Below this depth the materials became clay and there were no additional zones of increased conductivity uncorrelated with clay zones.

Conclusions

The geologic, geophysical, and hydrogeologic data from the Sentinel Wells provided significant additional understanding of the hydrogeology of the southern Fort Ord area of the Seaside Groundwater Basin.

- The most significant geologic finding was the absence of the Santa Margarita Sandstone at three of the four monitoring wells, and the extremely limited thickness of the Santa Margarita Sandstone at the most southerly site. The most northerly well encountered Pliocene-aged Purisima Formation to total depth (1,500 feet). Moving farther south, the monitoring wells encountered Purisima Formation overlying shales of the Monterey Formation. At the most southerly site, the lithologic and water quality data suggested that there is a 30- to 40-foot thick section of Santa Margarita Sandstone underlying the Purisima and overlying the Monterey Formation shales.

- The data revealed that the Purisima Formation extends much farther south into the Seaside Groundwater Basin than had previously been believed. Additionally, the data suggested that interpretation of geologic data from some of the previous monitoring wells in southern Fort Ord may have erroneously identified the Purisima Formation as the Santa Margarita Sandstone.
- The absence of the Santa Margarita Sandstone complicates the hydrogeologic understanding of the Seaside Basin, but it may have limited impacts on basin management. The Purisima Formation is water-bearing and is used for municipal supply by the Marina Coast Water District. The Purisima Formation is less permeable than the Santa Margarita Sandstone. However, the Purisima is substantially thicker and, as such, may have similar transmissivities. Additional analysis would be required to determine whether the occurrence of the Purisima Formation in place of the Santa Margarita Sandstone has relevance to basin storage volumes, susceptibility to seawater intrusion, opportunities for ASR, and basin management.
- Water level data from the Sentinel Wells revealed water levels in the lower aquifer system at the location of the wells to be approximately 20 feet below sea level.
- Water quality data from the Sentinel Wells revealed water quality to vary spatially and with depth. Down-hole sampling techniques revealed differences in salinity of more than two-fold within the same well that was masked when a composite sample was collected. This needs to be considered when designing a sampling program.
- Water from the wells completed in the Purisima Formation was significantly less saline than water from the Santa Margarita Sandstone in the Seaside Basin. This difference will complicate spatial analysis of water quality trends. Comparison of chloride concentrations between waters from Santa Margarita Sandstone and water from the Purisima Formation need to be considered carefully. Naturally occurring chloride concentrations in the Santa Margarita Sandstone were several times higher than the chloride concentrations in the Purisima Formation and therefore seawater intrusion detection “triggers” will need to be specific to the geologic unit.
- No evidence of seawater intrusion was detected in either of the primary aquifer systems of the Seaside Basin: the Paso Robles Formation or the Santa Margarita Sandstone/Purisima Formation.

- Geophysical data revealed significant seawater intrusion in the upper portions of SBWM #1 borehole to depths of approximately 350 feet. The existence of seawater intrusion in these shallow aquifer units in this area has been known for decades.
- Evidence for seawater intrusion at the other three well locations was limited to saline intrusion into the shallow Dune/Beach Sand Deposits.

ATTACHMENT B

Excerpts from the U.S. Geological Survey Techniques of Water-Resources Investigations Book 9, Handbooks for Water-Resources Investigations National Field Manual for the Collection of Water-Quality Data, Chapter A4. Collection of Water Samples Revised 2006

Collection of Non-Pumped Samples from Monitor Wells, Section 4.2.4.B

a. Field rinse the sampler (typically, a bailer) and sampler emptying device (and compositing device, if used) three times before collecting the sample. Deploy the sampler so as to minimize disturbance to the water column and aquifer materials.

i. Use a reel to keep sampler line clean and untangled.

ii. Lower sampler smoothly, entering water with as little disturbance as possible. iii. Allow sampler to fill, then withdraw sampler smoothly.

iv. Shake water in sampler vigorously to rinse all interior surfaces.

v. Attach sample-delivery tube or bottom-emptying device to sampler and drain the rinse water through the sampler.

vi. Repeat rinse procedure at least twice.

b. Repeat steps (a) i-iii to withdraw ground water for the sample.

Notes:

- Sampling equipment must be cleaned before leaving the field site.
- Wear gloves while cleaning and handling sampling equipment.
- Rinse sampling equipment with deionized water before the equipment dries.
- Clean equipment to be used at another well during the same field trip after rinsing it and before moving to the next site.
- Collect field blanks to assess equipment-cleaning procedures directly after the sampling equipment has been cleaned in the field or after moving to the next site and before sampling.
- When a sample collection device is lowered and raised through the water column, the disturbance to the water column can result in outgassing or degassing of ambient dissolved gases and an increase in concentrations of suspended particulates. Repeated movement of the device through the water column exacerbates these effects and can result in substantial modification of the ambient water composition and chemistry.

Excerpt from Appendix A4-C—Quality-control samples collected by field personnel for water-quality studies

Sample type	General description	Purpose
Field blank	Blank water that is passed through the entire sampling equipment system onsite and subjected to identical collection, processing, preservation, transportation, and storage procedures and laboratory handling as for environmental samples. • The field blank is processed onsite through clean equipment on the same day as, and along with, the environmental samples, either, (a) directly after the equipment has been field cleaned and before leaving for the next site (NFM 3), or, (b) at the next site, just before environmental samples for that site are processed. • A set of blanks can be processed and associated with the field blank.	Determine the concentrations of target analyte(s) present in the environmental sample that could be attributed to field procedures for equipment cleaning and sample handling. Results include effects from laboratory handling. Examples related to (a) and (b) (see "General description"): (a) Check the adequacy of field-cleaning procedures (demonstrate that equipment was adequately decontaminated after previous use); (b) Identify contamination of sampling equipment while in transport from office to field site or between field sites, and ambient field conditions at the field site.

ATTACHMENT C

Chain of Custody/Analysis Request Form

Monterey Bay Analytical Services Chain Of Custody / Analysis Request

4 Justin Ct. Suite D • Monterey, Ca 93940 • (831) 375-MBAS (6227) • (831) 641-0734 (Fax)

MBAS
Monterey Bay Analytical Services

Client/Company Name:	Attention:	Analysis Requested
Billing Address:		
E-Mail Address(es):	Contract/P.O. #:	
Turn Around Time: STD (7-14 Days) ☐ 48-Hour ☐ 5-Day ☐ 24-Hour ☐	Phone #	
	Fax #	

Project/System Information:

For Regulatory Complaince? YES ☐ NO ☐
For State or Local Health Department reporting:
Electronic Data Transfer (EDT)? YES ☐ NO ☐
System ID Number: ____________________

Drinking water ☐ Wastewater ☐ Monitoring Well ☐ Soil ☐ Sludge ☐ Other ☐

MBAS Lab #	Project ID or Source Code #	Sample Site / Description (Well Name, APN#, Address, Stormdrain #)	Sampling Date	Sampling Time	Receiving Temp.	CL2 Residual	Coliform Analysis Routine	Coliform Analysis Other	Coliform Analysis Repeat	Coliform Analysis Special	# Cont.	Container Type	Container Size						

	Printed Name	Signature	Date	Time	Comments or Special Instructions:
Sampled by:					
Relinquished by:					
Received by:					
Relinquished by:					
Received by:	Monterey Bay Analytical Services				

☐ Payment received	Check #	Amount:	Receipt #	Date:

Sample Condition Upon Receipt

COC Info

Was temp acceptable? Chemistry ≤6°C Micro ≤10°C	YES	NO	NA	<2 Hr	Is there evidence of chilling?	YES	NO	NA
Did bottles arrive intact?	YES	NO	NA					
Did bottle labels agree with COC?	YES	NO	NA					

Discrepency Documentation:

Person Contacted: ______________________ Method: In Person/Phone/Email ______________________

Problem ____

____

Resolution ____

____

Person Contacted: ______________________ Method: In Person/Phone/Email ______________________

Problem ____

____

Resolution ____

____

Sample Split/Filtration

Lab ID	Cont. Size	Pres	Date/Initials

Lab ID	Cont. Size	Pres	Date/Initials

Comments

ATTACHMENT D

Low-Flow/Low-Volume Sampling Method

Low-flow/low-volume purging method is sample collection using a pumping mechanism that produces low-flow rates [less than 1 liter per minute (L/min) or less than 0.26 gallon per minute (gpm)] that cause minimal drawdown of the static water table and usually employs a flow cell in which geochemical parameters are continuously monitored. These parameters may include dissolved oxygen content, oxidation-reduction potential (redox), conductivity, turbidity, and/or pH. The intent of this sampling protocol is to collect a representative sample from the monitored groundwater zone. A representative sample may be obtained when all the monitored chemical parameters have stabilized, thus quantitatively demonstrating that the sample being collected is in equilibrium with the groundwater system. The low-flow/low volume purging method (purging to parameter stability) tends to isolate the interval being sampled, which provides more accurate water-quality measurements and reduces the volume of purge water generated. This method has an advantage in that it can limit vertical mixing and volatilization of any volatile organic compounds (VOCs) in solution within the well casing or borehole, as compared to high-flow purging and sampling (e.g., air-lift sampling method). The figure below illustrates the QED Environmental Systems, Inc. low-flow sampling equipment. The bladder pump is placed in the monitor well and powered by a fuel source of compressed gas. The peristaltic action of the pump lifts water from the well and initiates flow through the well screen at the location where the drop tube and intake assembly have been placed. An electric wire sounder is used to measure drawdown to insure minimal drawdown is caused by pumping the well. Water quality parameters are monitored at the flow cell as the well is purged. The low-flow/low-volume purging method of sample collection has been described in groundwater monitoring literature since the mid-1980s with a defined methodology being accepted by the U.S. EPA in 1995. These protocols are summarized below as adopted by MPWMD staff:

1. **Flow rate**. The flow rate used during purging must be low enough to avoid increasing the water turbidity. The following measures should be taken to determine the appropriate flow rate: (a) The flow rate shall be determined for each well, based on the hydraulic performance of the well; (b) The flow must be adjusted to obtain stabilization of the water level in the well as quickly as possible; (c) The maximum flow rate used should not exceed 1 liter per minute (0.26 gpm); (d) Once established, this rate should be reproduced with each subsequent sampling event; (e) If a significant change in initial water level occurs between events, it may be necessary to re-establish the optimum flow rate at each sampling event.

2. **Measurement of water level and drawdown**. Measurement of the water level in the well during purging is important when establishing the optimum flow rate for purging. The goal is to achieve a stabilized pumping water level as quickly as possible with minimal drawdown, to avoid stressing the formation and mobilizing solids, and to obtain stabilized indicator parameters in the shortest time possible.

3. **Measurement of indicator parameters.** Continuous monitoring of water-quality indicator parameters is used to determine when purging is completed and sampling should begin. Measurement of indicator parameters (dissolved oxygen content, redox potential, specific conductance, temperature and pH) is required. This is most easily performed using an in-line flow cell (closed) system attached directly to the pump discharge tubing. For turbidity measurement, a separate field nephalometer should be used. If portable systems are used, they must be 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 may be necessary to achieve indicator parameter stabilization. In general, this may require that after installation, the portable pump should remain in place for a minimum of 1-2 hours to allow settling of solids and reestablishment of horizontal flow through the screen zone. If initial turbidity readings are excessive (>50 NTU), pumping should cease and the well should rest for another 1-2 hours before initiating pumping again. In wells set in very fine-grained formations, longer waiting periods may be required. Continuous water-level measurement devices are preferred, such as down-hole pressure transducers, but electronic water-level tapes can be used. The devices used should be capable of measuring to 0.01-foot precision.

4. **Sample Collection**. Water samples for laboratory analyses must be collected before water has passed through the flow-through cell (use a by-pass assembly or disconnect cell to obtain sample). VOC samples should be collected first and directly into pre-preserved sample containers. All sample containers are filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. During purging and sampling, the tubing should remain filled with water so as to minimize possible changes in water chemistry upon contact with the atmosphere.

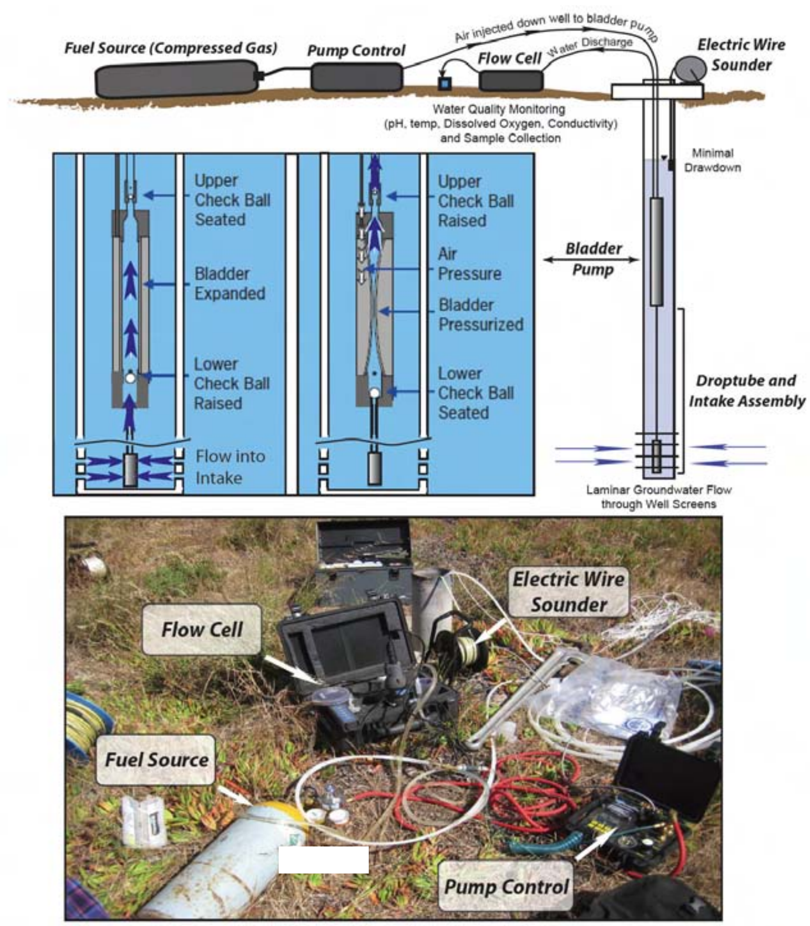


Figure 4. Low Flow Groundwater Sampling System Presented in Cartoon and Photograph

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	June 14, 2017
AGENDA ITEM:	5
AGENDA TITLE:	Approve Amendment No. 2 to RFS No. 2017-01 to Martin Feeney to Perform Conductivity and Temperature Profiling of the Sentinel Wells, and to Include Field Blank and Field Duplicate Samples in the Water Quality Sampling of these Wells
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

To implement the changes in the Sentinel Wells next sampling event (in September 2017) that were recommended in Agenda Item No. 3, it will be necessary to amend Martin Feeney's contract.

The attached Amendment No. 2 to RFS No. 2017-01 will accomplish this.

Funds in the already-approved 2017 M&MP Operations Budget, under Task I.3.a.3 titled "Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions ", can be used to perform this additional work. None of that Task's budget amount have been used in 2017, and the need to perform other work under that Task is unlikely in the remainder of 2017.

ATTACHMENTS:	Martin Feeney Amendment No. 2 to RFS No. 2017-01
RECOMMENDED ACTION:	Approve Amendment No. 2 to Martin Feeney RFS No. 2017-01, raising the Authorized Amount of RFS No. 2017-01 by $6,118.24 to $36,203.80.

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: July 6, 2017 **RFS NO.** 2017-01 Amendment No. 2
(To be filled in by WATERMASTER)

TO: Martin Feeney
Martin Blair Feeney
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: Perform conductivity and temperature profiling of Sentinel Wells, and make improvements to the quality control/quality assurance program for water quality sampling of these wells. See Amended Scope of Work in Attachment 1.

Completion Date: All work of this RFS as amended shall be completed not later than December 31, 2017.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price: The revised Total Price for RFS No. 2017-01, as authorized by this Amendment No. 2 thereto, is $36,203.80.

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: ______________________________ Date:__________.
WATERMASTER Technical Program Manager

Agreed to by: ______________________________ Date:__________.
PROFESSIONAL

<u>ATTACHMENT 1</u>

The original Scope of Work of RFS No. 2017-01 was to collect water quality samples, perform laboratory analyses of these samples, and to perform induction logging of certain of the WATERMASTER'S Sentinel Wells. The original cost of this RFS was $25,685.56.

After the issuance of RFS No. 2017-01 the WATERMASTER determined that it would also like the PROFESSIONAL to provide general hydrogeologic consulting services to the WATERMASTER on a variety of topics on an ongoing and as-requested basis. Amendment No. 1 to RFS No. 2017-01 was issued on December 26, 2016 to expand the original scope, and to increase the original authorization by $4,400, for providing these services.

After the issuance of Amendment No. 1 to RFS No. 2017-01, the WATERMASTER determined that it would like the PROFESSIONAL to also conduct continuous conductivity and temperature profiling of the Sentinel Wells, and to add the collection and analysis of a limited number of field blank and field duplicate samples as an improvement to the quality control/quality assurance program for the water quality sampling work. The scope of work to perform the conductivity and temperature profiling work is described below in PROFESSIONAL's letter dated February 6, 2017. As shown in that letter, the cost of that work is $5,668.24.

The cost to collect and analyze one field blank and one field duplicate water quality sample during the September 2017 water quality sampling event is $450.00.

$6,118.24 ($5,668.24+$450.00) is hereby added to the authorized cost of RFS No. 2017-01 to perform the additional work described above. Amendment No. 1 increased the authorized cost of RFS No. 2017-01 to $30,085.56. Therefore, the revised cost of RFS No. 2017-01 authorized by this Amendment No. 2 is $36,203.80.

February 6, 2017

Seaside Basin Watermaster
PO Box 51502
Pacific Grove CA.
93950

Attention: Bob Jaques, PE

Subject: Sentinel Well Data Collection Program 2017– Amendment No. 2 to RFS No. 2017-01

Dear Bob:

Following up on our discussions, I'm pleased to provide this amendment to the existing scope of work for assistance with the Seaside Basin Watermaster (Watermaster) data collection from the Sentinel Wells for the upcoming year. Presented in this proposal are an outline of the new tasks and an estimate of associated costs.

As you are aware, the on-going data collection program has detected fluctuating chloride levels in several of the Sentinel Wells. The cause of these fluctuations is still undermined, but HydroMetrics has developed a workplan to gather new data and further analyze previously collected, but not analyzed, data. Part of this workplan includes continuous electrical conductivity logging of each of the Sentinel Wells. This would be done as part of a separate mobilization of a local geophysical contractor (Newman Well Surveys) to reduce costs and assure that the water column in the wells is not disturbed for the on-going downhole sampling/induction logging effort.

The additional work would include coordination with State Parks and geophysical contractor, supervision of logging activities, review of collected data and transmittal of the data to HydroMetrics. Costs for the above described work is anticipated as follows:

Task Description	Cost
Hydrogeologic Services – Office – 4 hours	780.00
Hydrogeologic Services - Field Time – 12 hours	1,920.00
Newman Well Surveys (including 10% markup)	2,968.24
Total	**$5,668.24**

The opportunity to assist is appreciated. Please call if you have any questions.

Sincerely,

Martin Feeney

Newman Well Surveys
6080 Sherry Lee Ln.
Salinas, CA 93907

Fax Quote

Date	Quote #
1/13/2017	1263

831-809-5461

Martin Feeney
P.O.Box 23240
Ventura, CA 93002

Well Name				
Fort Ord State Park				
Item	**Qty**	**Cost**	**Description**	**Total**
Service Charge	1	550.00	Service Charge	550.00
Res Log	5,240	0.41	Fluid Conductivity Log	2,148.40

Prices good for 90 days

Total $2,698.40

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	June 14, 2017
AGENDA ITEM:	6
AGENDA TITLE:	Initial Discussion of Potential Changes in Groundwater Quality Resulting from Introducing New Sources of Water into the Aquifers
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
At the TAC's last meeting Jon Lear requested that the topic of potential changes in groundwater quality resulting from introducing new sources of water into the aquifers be agendized for discussion.

The reason for his asking that this topic be discussed is that introducing new sources of water into an aquifer, with each source having its own unique water quality, can result in chemical reactions that 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, for example in the Orange County Water District's groundwater injection program in southern California.

I met with Dave Stoldt and Jon Lear of MPWMD to learn more about this topic from them. As a result of that meeting Jon offered to make a presentation on this topic at the July TAC meeting to begin this discussion with the TAC.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	June 14, 2017
AGENDA ITEM:	7
AGENDA TITLE:	Schedule
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
As a regular part of each monthly TAC meeting, I will provide the TAC with an updated Schedule of the activities being performed by the Watermaster, its consultants, and the public entity, MPWMD, which is performing certain portions of the work.

Attached is the most recent update of the Work Schedule for FY 2017.

ATTACHMENTS:	Schedule of Work Activities for FY 2017
RECOMMENDED ACTION:	Provide Input to Technical Program Manager Regarding Any Corrections or Additions to the Schedule

Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name	Schedule (Sep 2016 – Jun 2018)
1	***CRITICAL PROJECT MILESTONES ASSOCIATED WITH TAC, BOARD, AND/OR CONSULTANT WORK***	
2	**2018 Administration, Operations and Replenishment Budgets**	
3	Prepare M&MP Draft Budgets (Same as Task 19)	
4	TAC Approves M&MP Budgets (Same as Task 20)	9/13
5	Board Approves M&MP Budgets (Same as Task 21)	10/4
6	**Watermaster Prepares Quarterly Water Production, Water Level, and Water Quality Reports**	
7	Watermaster Prepares Combined Quarterly Water Production, Water Level, and Water Quality Reports for 1st & 2nd Quarters (Same as Task 46)	**These have been discontinued**
8	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2016 (Same as Task 42)	10/31
9	**Replenishment Assessment Unit Costs for Water Year 2018**	
10	B&F Committee Develops Replenishment Assessment Unit Cost for Water Year 2018	
11	If Requested, TAC Provides Assistance to B&F Committee in Development of 2018 Water Year Replenishment Assessment Unit Cost	**ONLY IF ASSISTANCE IS REQUESTED**
12	Board Adopts and Declares 2018 Water Year Replenishment Assessment Unit Cost	10/4
13	**Replenishment Assessments for Water Year 2017**	
14	Watermaster Prepares Replenishment Assessments for Water Year 2017	
15	Watermaster Board Approves Replenishment Assessments for Water Year 2017 (At December Meeting)	12/6
16	Watermaster Levies Replenishment Assessment for 2017	12/12
17	**Monitoring & Management Program (M&MP) Budgets for 2018 and 2019**	

Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name	Schedule (Sep 2016 – Jun 2018)
18	Preliminary Discussion of Potential Scope of Work for 2018 M&MP	8/9
19	Prepare Draft 2018 M&MP Work Plan and 2018 and 2019 O&M and Capital Budgets	
20	TAC approves Draft 2018 M&MP Work Plan and 2018 and 2019 O&M and Capital Budgets	9/13
21	Board approves 2018 M&MP Work Plan and 2018 and 2019 O&M and Capital Budgets	10/4
22	**2017 Annual Report (Note: Schedule Reflects Court Approval of Later Submittal Date for Annual Report)**	
23	Prepare Preliminary Draft 2017 Annual Report	
24	TAC Provides Input on Preliminary Draft 2017 Annual Report	11/15
25	Prepare Draft 2017 Annual Report (Incorporating TAC Input)	
26	Board Provides Input on Draft 2017 Annual Report (At December Board Meeting)	12/6
27	Prepare Final 2017 Annual Report (Incorporating Board Input)	
28	Watermaster Submits Final 2017 Annual Report to Judge	12/14
29	***MANAGEMENT***	
30	**M.1 PROGRAM ADMINISTRATION**	
31	Prepare Initial Consultant Contracts for 2018	
32	TAC Approval of Initial Consultant Contracts for 2018	11/15
33	Board Approval of Initial Consultant Contracts for 2018	12/6
34	**M.1.g – Sustainable Groundwater Management Act Reporting Requirements**	
35	HydroMetrics Prepares Draft Groundwater Storage Analysis	Completed
36	TAC Reviews HydroMetrics Draft Storage Analysis	Completed

Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name	Schedule (Sep 2016 – Jun 2018)
37	HydroMetrics Revises Draft Storage Analysis if Necessary	Revisions Were Not Necessary
38	Submit SGMA Documentation to DWR	Completed
39	***IMPLEMENTATION***	
40	**I.2.a DATABASE MANAGEMENT**	
41	**I.2.a.1 Conduct Ongoing Data Entry/Database Maintenance**	Jan – Dec 2017
42	**I.2.b DATA COLLECTION PROGRAM**	
43	**I.2.b.2 Collect Monthly Water Levels (MPWMD)**	Jan – Dec 2017
44	**I.2.b.3 Collect Quarterly Water Quality Samples (MPWMD)**	Jan – Dec 2017
45	**I.2.b.6 Reports (from MPWMD)**	
46	Watermaster Prepares Combined Quarterly Water Production, Water Level, and Water Quality Reports for 1st & 2nd Quarters	These have been discontinued
47	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2016	10/31
48	**I.3.a ENHANCED SEASIDE BASIN GROUNDWATER MODEL**	
49	Develop and Schedule Additional Tasks as Directed by Board	If Requested by the Board
50	**I.3.c Refine and/or Update the BMAP**	
51	TAC Discusses Whether or Not to Recommend Updating the BMAP	Completed
52	**I.4.c Annual Seawater Intrusion Analysis Report (SIAR)**	
53	HydroMetrics Provides Draft SIAR to Watermaster	11/8
54	TAC Approves Annual Seawater Intrusion Analysis Report (SIAR)	11/15
55	Board Approves Annual Seawater Intrusion Analysis Report (SIAR)	12/6

Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name	Sep	Oct	Nov	Dec	Jan 2017	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan 201	Feb	Mar	Apr	May	Jun
56	**I.4.d Complete Preparation of Seawater Intrusion Response Plan (SIRP)**				WORK COMPLETED - NO FURTHER WORK PLANNED IN 2017																		
57	**I.4.e Refine and/or Update the SIRP**							ONLY IF FOUND TO BE NECESSARY															

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	June 14, 2017
AGENDA ITEM:	8
AGENDA TITLE:	Other Business
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
The "Other Business" agenda item is intended to provide an opportunity for TAC members or others present at the meeting to discuss items not on the agenda that may be of interest to the TAC.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only