MEETING NOTICE AND AGENDA

TECHNICAL ADVISORY COMMITTEE OF THE SEASIDE BASIN WATER MASTER

DATE: Wednesday, August 9, 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's new Conference Line by dialing (515) 739-1015. 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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SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	2.A
AGENDA TITLE:	Approve Minutes from the July 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
July 12, 2017

Attendees: TAC Members

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

Watermaster
Technical Program Manager - Robert Jaques

Consultants
HydroMetrics – Georgina King (via telephone)

Others
None

Due to the change-over in the conference call-in number, there was a delay in getting people connected. The meeting was convened at 1:46 p.m. after a quorum had been established.

1. Public Comments

There were no public comments.

2. Administrative Matters:

A. Approve Minutes from the June 14, 2017 Meeting

On a motion by Ms. Voss, seconded by Mr. Riedl, the minutes from this meeting were unanimously approved as presented.

B. Sustainable Groundwater Management Act (SGMA) Update

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

3. Discussion of Potential Changes in Groundwater Quality Resulting from Introducing New Sources of Water into the Aquifers

Mr. Jaques introduced this agenda item and Mr. Lear made a presentation using the attached PowerPoint slides. Some of the items discussed in Mr. Lear's presentation included:

- MPWMD wanted to raise this topic for discussion by the TAC because new water sources will be coming into the Seaside Groundwater Basin aquifers when the Monterey Peninsula Water Supply Project and Pure Water Monterey projects come on-line.
- In Orange County Water District's groundwater recharge project the low TDS of the reverse osmosis water caused the release of arsenic from the clays in the aquifer. In other situations other types of constituents such as uranium, chromium, or selenium could be released.

- MPWMD feels water quality changes could lead to Material Damage, as defined in the Adjudication Decision.
- The four types of water that will be in the basin (native Seaside Groundwater Basin water, ASR water from the Carmel River Basin, Pure Water Monterey water, and desalinated water) have considerably different water qualities. Some minerals may be added at the end of the treatment processes for the Pure Water Monterey and Monterey Peninsula Water Supply Projects, for example there may be lime addition for pH adjustment.
- We need to see what changes in groundwater flow paths, water levels, and water chemistry will result from the new projects coming on-line.
- Mixing ratios of the various water sources will vary throughout the year.
- MPWMD has been collecting data on the effects of ASR water going into the Seaside Groundwater Basin. Similar work should be done as these other additional water sources come on-line.
- Models are available off-the-shelf that can predict these types of chemical effects. MPWMD's consultants have used these to see the effects of the injection of Carmel River water into the Seaside Groundwater Basin.
- A listing of tasks that would need to be done to assess the groundwater quality impacts from the new water sources was presented.
- A geochemical model could be of help to those agencies that need to get permits for their projects.

Mr. Jaques asked Mr. Lear if MPWMD's consultants or others could develop such a model for the Seaside Basin. Mr. Lear responded yes. He went on to say that Mr. Stoldt felt that the Watermaster having a single model, rather than each proponent having their own model, would be a better approach. Steve Short is a geochemist who does this type of work for MPWMD.

Mr. Jaques asked Ms. King if HydroMetrics does this type of work. She responded that they normally use outside consultants for this type of work.

Mr. Riedl asked if there would be any impact from disinfection byproducts. Mr. Lear said yes, and that some study on this has already been done by MPWMD. He added that the Division of Drinking Water requires some monitoring to be done for this.

Mr. Lear reported that MPWMD feels that this type of work is an important due-diligence action that needs to be taken.

Mr. Gomez and Ms. Voss voiced their support for undertaking this work.

Mr. Jaques said he would pursue this and provide further information for TAC consideration at a future meeting.

4. Follow-up from Board Discussion and Direction Regarding Updating the Basin Management Action Plan (BMAP) and the Seaside Basin Groundwater Model

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

Mr. Riedl asked if Task 4 was really necessary. Ms. King explained that it is important for this work to be done in order to see if the various projects will improve water levels sufficiently to protect the basin. Ms. Voss said she concurred that this work was important to do.

Mr. Jaques said he would contact Mr. Yates to solicit his comments and recommendations regarding updating and recalibrating the model, and would share that information with Ms. King.

5. Discussion of Possible Revisions to Seawater Intrusion Response Plan (SIRP)
Mr. Jaques summarized the agenda packet materials for this item.

Mr. Lear reported that the PCA-East Multiple well is screened in both the Paso Robles and Santa Margarita aquifers, and water quality samples from this well are therefore not representative of the water quality from either of these individual aquifers. He went on to say that the Ord Terrace Shallow and Deep wells are both perforated in the Santa Margarita aquifer (upper-level and lower-level), and water quality results were similar from early samples taken from those two levels, so only the Ord Terrace Deep well was considered necessary to obtain representative Santa Margarita water quality information at that location.

Ms. Voss commented that the Sentinel Wells were originally designed for induction logging and not for water quality sampling. Therefore, she felt using them only as an indicator and following Approach Number 1, as outlined on page 24 in the agenda packet, was satisfactory.

Ms. Voss asked Ms. King how the chloride threshold values listed on page 26 of the agenda packet compared to the "native" water quality, and noted that these values are very low. Ms. King responded that information describing the development of the chloride threshold values is contained in the appendices of the SIRP.

Mr. Lear commented that the intent of the Sentinel Wells was to perform induction logging, and that it would be better, in his opinion, to stay with the current water quality sampling and induction logging approach and to follow Approach Number 1.

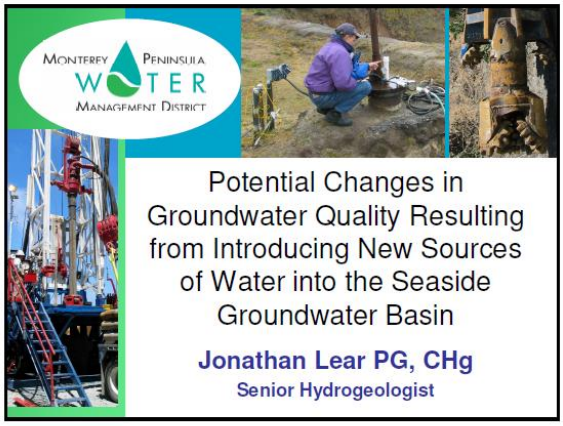
There was consensus to pursue Approach Number 1 as described in the agenda packet.

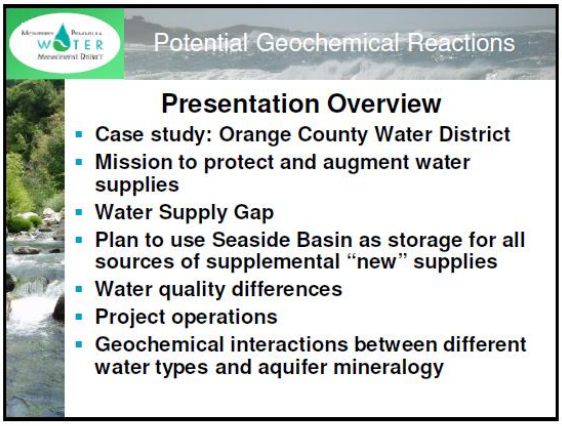
6. Schedule
Mr. Jaques highlighted the anticipated TAC meeting schedule changes for the months of October and November, as noted in this agenda item.

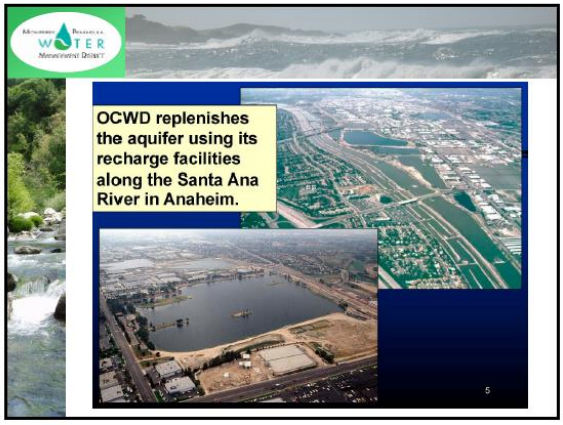
7. Other Business
Mr. Riedl commented that since the PCA-East Multiple well is screened across two aquifers and is no longer used for monitoring purposes, it should be considered for abandonment and destruction to prevent aquifer cross-contamination. Mr. Lear said he agreed with that, and noted that it is an MPWMD-owned well. Mr. Lear recommended that the Watermaster formally ask MPWMD to abandon and destroy that well. There was agreement to agendize this for action at the next TAC meeting.

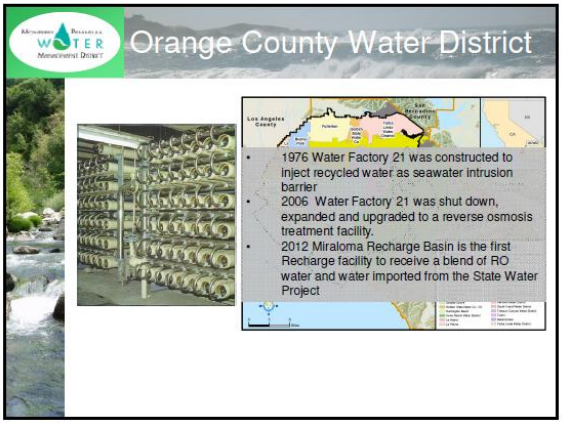
8. Set Next Meeting Date
The next regular meeting will be held on Wednesday August 9, 2017 at 1:30 p.m. at the MRWPCA Board Room.

The meeting adjourned at 3:10 p.m.

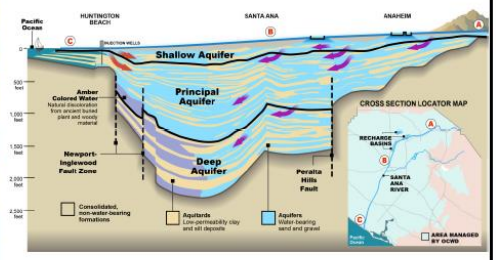

Monterey Peninsula
Water
Management District
Potential Changes in Groundwater Quality Resulting from Introducing New Sources of Water into the Seaside Groundwater Basin
Jonathan Lear PG, CHg
Senior Hydrogeologist


Potential Geochemical Reactions
Presentation Overview
Case study: Orange County Water District
Mission to protect and augment water supplies
Water Supply Gap
Plan to use Seaside Basin as storage for all sources of supplemental "new" supplies
Water quality differences
Project operations
Geochemical interactions between different water types and aquifer mineralogy


OCWD replenishes the aquifer using its recharge facilities along the Santa Ana River in Anaheim.


Orange County Water District
1976 Water Factory 21 was constructed to inject recycled water as seawater intrusion barrier
2006 Water Factory 21 was shut down, expanded and upgraded to a reverse osmosis treatment facility.
2012 Miraloma Recharge Basin is the first Recharge facility to receive a blend of RO water and water imported from the State Water Project

Cross Section of OCWD



Arsenic Occurrences in Groundwater

- Following mixing of water delivered from the State Water Project with Reverse Osmosis water produced at the upgraded Factory 21 plant, the Water District began to detect spikes of Arsenic in the groundwater.
- Arsenic spikes were transient and were later linked to the recharge of higher blend ratios of Reverse Osmosis water at the recharge facilities.
- Recharged water from Factory 21 had a resonance time in the ground from 6 months to 2 years, but the Arsenic spikes were not related to residence time.
- Stanford Professor, Scott Fendorf, discovered that is was not the residence time creating the Arsenic spikes, but rather the initial geochemical interactions between the clays in the aquifer and the low TDS RO water.
- Naturally occurring Arsenic was locked in the clays by Calcium and Magnesium ions. Naturally recharging water was not able to unlock the Arsenic, but RO water low in Calcium dissolved the ions from the clays and released the Arsenic.

Take Home Message

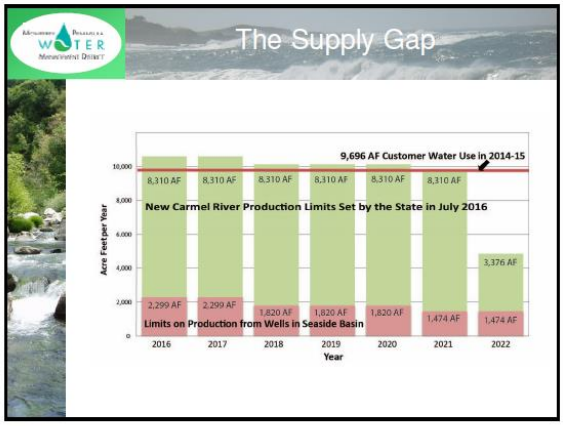
"It only takes a little Arsenic or other elements to contaminate a big aquifer. In Orange County the contaminant was Arsenic, but in other areas it may be Uranium, Chromium, Selenium, or Boron, as other examples" – Scott Fendorf

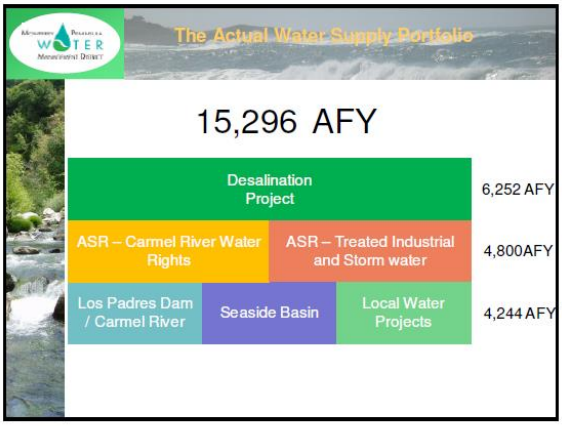
Take Home Message:

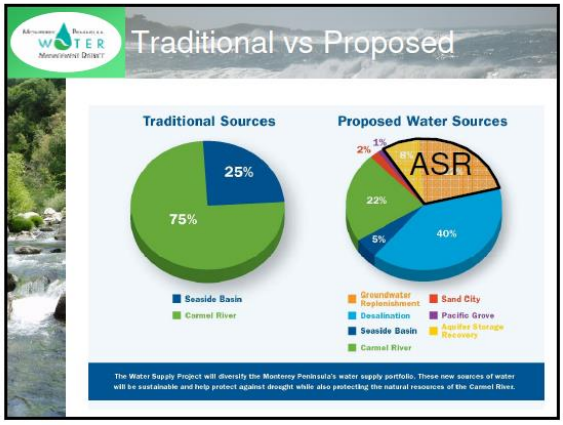
Mixing different water types can cause unexpected changes in geochemistry when reacting with aquifer matrix minerals.

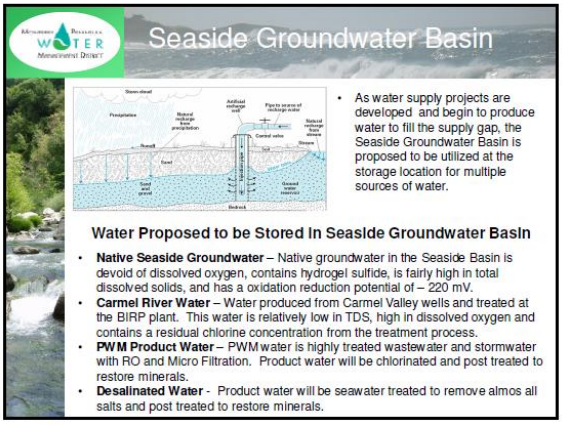
District Mission Statement

- The Monterey Peninsula Water Management District's mission is to promote or provide for a long-term sustainable water supply, and to manage and protect water resources for the benefit of the community and the environment.
- Seaside Adjudication – Water quality implications and Material Damage


The Supply Gap
9,696 AF Customer Water Use in 2014-15
New Carmel River Production Limits Set by the State in July 2016
Limits on Production from Wells in Seaside Basin
8,310 AF
2,299 AF
1,820 AF
1,474 AF
3,376 AF
Acre Feet per Year
Year
2016
2017
2018
2019
2020
2021
2022


The Actual Water Supply Portfolio
15,296 AFY
Desalination Project
6,252 AFY
ASR – Carmel River Water Rights
ASR – Treated Industrial and Storm water
4,800AFY
Los Padres Dam / Carmel River
Seaside Basin
Local Water Projects
4,244 AFY


Traditional vs Proposed
Traditional Sources
25%
75%
Seaside Basin
Carmel River
Proposed Water Sources
ASR
40%
22%
5%
2%
1%
8%
Groundwater Replenishment
Sand City
Desalination
Pacific Grove
Seaside Basin
Aquifer Storage Recovery
Carmel River
The Water Supply Project will diversify the Monterey Peninsula's water supply portfolio. These new sources of water will be sustainable and help protect against drought while also protecting the natural resources of the Carmel River.


Seaside Groundwater Basin
As water supply projects are developed and begin to produce water to fill the supply gap, the Seaside Groundwater Basin is proposed to be utilized at the storage location for multiple sources of water.
Water Proposed to be Stored In Seaside Groundwater Basin
Native Seaside Groundwater – Native groundwater in the Seaside Basin is devoid of dissolved oxygen, contains hydrogel sulfide, is fairly high in total dissolved solids, and has a oxidation reduction potential of – 220 mV.
Carmel River Water – Water produced from Carmel Valley wells and treated at the BIRP plant. This water is relatively low in TDS, high in dissolved oxygen and contains a residual chlorine concentration from the treatment process.
PWM Product Water – PWM water is highly treated wastewater and stormwater with RO and Micro Filtration. Product water will be chlorinated and post treated to restore minerals.
Desalinated Water - Product water will be seawater treated to remove almos all salts and post treated to restore minerals.

Locations of Storage

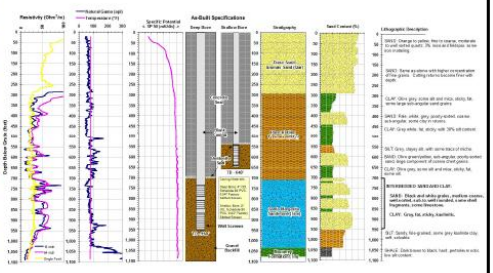
Project Operations

Climate drives the Carmel River ASR Injection Program and lower winter demand is proposed to drive the injection of desalinated water, but the PWM injection operations are proposed for 365 days a year. Due to the seasonality and climatic variability of the project operations, water mixing ratios in the Seaside basin will be transient.

Changes in Composition of Water

- **Wet Cycles** –System demand is low and Carmel River Water is available for injection which will result is a blend of PWM, Carmel River, and to a lesser extent, Desalinated water.
- **Drought** - Carmel River Water is unavailable so the blend of stored water will be more PWM and desalinated water banked in the winter.
- **Drought Reserve and Storage Payback** – PWM is proposing to establish a 1,000 AF drought reserve and CalAm has proposed to replenish the Seaside Groundwater Basin 700 AFY over 25 years.

Stratigraphy of Seaside Basin



Santa Margarita Sandstone

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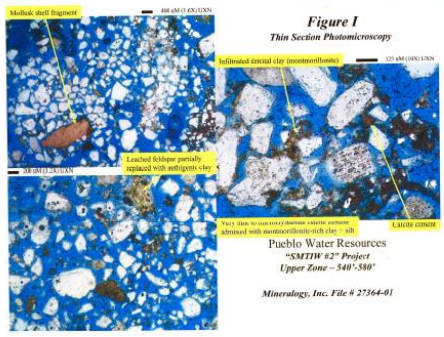
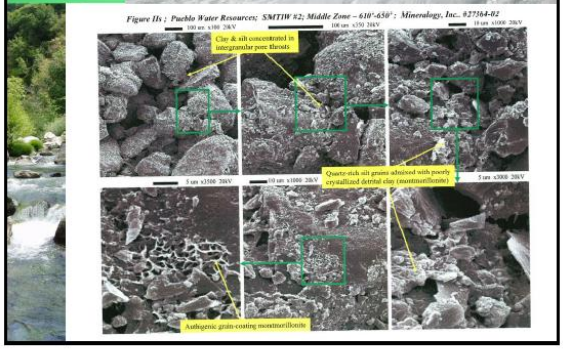
Santa Margarita Sandstone



Santa Margarita Sandstone



Geochemical Modeling

Defining Some Terms that Drive Geochemical Reactions

- **Aqueous speciation** – the distribution of individual ions and ion pairs in water
- **Saturation** – the state of an aqueous solution in chemical equilibrium with a particular solid phase
- **Undersaturation** – phase is thermodynamically favored to dissolve

Geochemical Modeling

- **Supersaturation** – phase is thermodynamically favored to form
- **Kinetics** – the rates of geochemical reactions
- **Mass Transfer** – moving mass between phases (solid, aqueous, gas)
- **Reactive Transport** – coupling flow and chemical reactions

Geochemical Modeling

- Input Data – Good quality required!
- Water Chemistry - Use proper methods of filtration, preservation, and dilution
  - Measure field parameters (pH, Eh, D.O., temperature, alkalinity, specific conductance) at time of sample collection
  - Charge balance must be within acceptable limits
- Aquifer Material and Minerology
  - Thin section analysis
  - Electron scanning microscopy
  - Bench leaching tests

Modeling Process

- Reaction paths - solution composition as a function of reaction progress, quantities of secondary minerals formed, and composition of solid-solutions formed
- Time of reaction - kinetic rate laws and relative reaction rates based on temperatures and pressures

Output from Model

- Transport Processes – Advection, Hydrodynamic Dispersion and Diffusion
- Reactions on Mineral Surfaces, Adsorption, Ion exchange
- Mineral Dissolution and Precipitation, Thermodynamic model, Kinetic rate expressions
- Biochemical Processes

Tasks

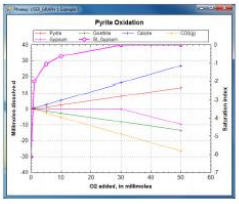
- Identify the different water qualities, quantities, flow paths, and residence times
- Characterize minerology of Santa Margarita Sandstone
- Collect water quality data to populate geochemical model
- Construct geochemical model and evaluate the effects of mixing differing water types in the Seaside Groundwater Basin.

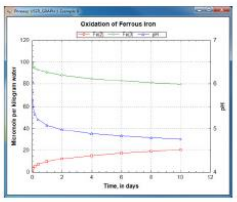
Goals

- Create a model to evaluate geochemical reactions between differing water types and aquifer mineralogy to forecast best post-treatment conditioning for RO water
- Create a tool to evaluate and model water quality issues and forecast solutions if they arise after project operations begin
- Create a tool to test options and assist with permitting water projects

ASR Water Quality Modeling

Questions?





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SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	2.B
AGENDA TITLE:	Sustainable Groundwater Management Act (SGMA) Update
PREPARED BY:	Robert Jaques, Technical Program Manager

At the State level:
Since my last update, I have not received any new materials from the State that would impact the Watermaster.

At the Monterey County level:
The Advisory Committee which will provide advice and recommendations to the SVBGSA on technical issues met on July 20 and was to consider the Watermaster's application for membership on this committee. I informed Gary Peterson, who is the interim General Manager of the SVBGSA, that I was unavailable to attend that meeting and requested that he reschedule the item to a future meeting when I could attend. He agreed to do that. The next meeting date is tentatively scheduled for September 21 and I will plan to attend that meeting.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	2.C
AGENDA TITLE:	Request Destruction of Abandoned Monitoring Well
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

At the TAC's July 12, 2017 meeting there was discussion regarding monitoring well "PCA-East Multiple" which is an MPWMD-owned monitoring well. Mr. Lear of MPWMD reported that the well is no longer used for monitoring and is perforated in both the Paso Robles and Santa Margarita aquifers.

Since a well perforated in multiple aquifers poses a potential risk for aquifer cross-contamination, it was requested that an item be placed on today's meeting agenda to consider requesting MPWMD to destroy the well, so that the potential for aquifer cross-contamination will no longer exist.

If the TAC approves, the attached letter making this formal request will be sent to MPWMD.

ATTACHMENTS:	Proposed letter to be sent to MPWMD requesting destruction of this well
RECOMMENDED ACTION:	Approve sending the attached letter to MPWMD

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

August 10, 2017

Monterey Peninsula Water Management District
Attention: Mr. David Stoldt, General Manager
5 Harris Court, Building G
Monterey, CA 93940

Subject: **Request for Destruction of Abandoned Monitoring Well**

Dear Mr. Stoldt:

At a recent Watermaster TAC meeting Mr. Lear of your staff reported that the well named "PCA-East Multiple" is no longer in use as a monitoring well, and is perforated in both the Paso Robles and Santa Margarita aquifers. In Mr. Lear's Memorandum dated August 8, 2012 titled *"Summary of Seaside Groundwater Basin Cross-Aquifer Contamination Wells Investigation Process and Conclusions"* this well was identified as one that has the potential to allow cross-aquifer contamination to occur because it has perforations in more than one aquifer.

In view of the potential risk this well poses, and the fact that it is no longer needed for monitoring purposes, the Watermaster requests that MPWMD have the well destroyed using proper procedures so that this risk will be eliminated.

If you have any questions regarding this request, please contact me at (831) 375-0517 or by email at bobj83@comcast.net.

Sincerely,

Robert S. Jaques
Technical Program Manager

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	3
AGENDA TITLE:	Continued 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 July 12, 2017 meeting a presentation was made on the potential for changes in groundwater quality to occur in the Seaside Basin as a result of introducing new water sources for injection into the Basin. These new sources include desalinated water and additional Carmel River ASR water from the Monterey Peninsula Water Supply Project, and advance-treated wastewater from the Pure Water Monterey Project.

Following discussion of this topic at that meeting there was TAC consensus to investigate developing a model that could be used to predict these types of chemical effects. It was reported that MPWMD's consultants are already using these types of models to predict the geochemical effects of the injection of Carmel River water into the Seaside Groundwater Basin. It was also noted that such a model could be of help to those agencies that need to get permits for projects that would introduce new water sources into the Basin.

I held a conference call with Georgina King of HydroMetrics and Jon Lear of MPWMD to discuss development of a geochemical model for use in the areas of the Basin where injection of these new water sources will occur. As a result of that discussion it appears that the most cost-efficient approach would be the following:

- HydroMetrics would use the Watermaster's existing groundwater model, and information about injection locations and quantities, injection scheduling, etc. provided by MPWMD for each of these projects, to develop a model scenario that will provide flow path and groundwater level information needed as input for geochemical modeling.
- MPWMD's consultants would use the data provided by HydroMetrics, and the necessary water quality data from these water supply projects, to develop and run the geochemical model.

At today's meeting the TAC is asked to approve taking this approach to address this issue and protect the quality of groundwater in the Seaside Basin in anticipation of these new water sources being introduced into the Basin. If the TAC approves this approach, then detailed scopes of work and cost estimates from these consultants will be developed so they can be included in the Management and Monitoring (M&MP) Work Plan and Budget for 2018. Those documents are scheduled for TAC approval at the September TAC meeting.

ATTACHMENTS:	None
RECOMMENDED ACTION:	Approve taking the approach described above, or provide other direction to the Technical Program Manager

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	4
AGENDA TITLE:	Continued Discussion Regarding Updating the Basin Management Action Plan (BMAP) and the Seaside Basin Groundwater Model
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

At the TAC's July 12, 2017 meeting the TAC (for the second time) reviewed the scope-of-work and costs in the attached Proposal from HydroMetrics for updating the BMAP and the Model. Input was solicited regarding any of the proposed work TAC members felt did not need to be performed, as well as work that TAC members felt should be added to the proposed scope-of-work. The only item raised was a question about whether Task 4 (updating the Section on Groundwater Management Actions) was really necessary. Ms. King explained that it is important for this work to be done in order to see if the various supplemental water supply projects will improve water levels sufficiently to protect the basin.

I asked Gus Yates to review HydroMetrics' proposed scope-of-work and to provide his comments and recommendations on that. Attached are Mr. Yate's Memo discussing his recommendations and HydroMetrics response to his Memo. In response to the Board's request I also contacted MPWMD/MRWPCA regarding sharing in the costs to update the Model (see attached letter sent to these entities). Attached is the joint response letter from MPWMD and MRWPCA indicating their willingness to share in these costs. I believe that the matter of how costs should be shared for this work is a Board policy decision, not a TAC decision, and I will be providing this letter to the Board for its consideration at its next meeting.

I requested HydroMetrics to try to reduce its cost for Section 3 (Supplemental Water Supplies) of the BMAP, if Watermaster staff can provide much of the information in that section. I also requested that they revise their Scope of Work and Costs to reflect their response to Mr. Yate's Memo. Their attached revised Scope and Cost Proposal shows a $2,220 cost reduction in Task 3 to reflect having the Watermaster provide this assistance, and changes in costs for several other Tasks in accordance with their attached response letter to Mr. Yate's Memo. The net result of these revisions is an increase in cost of $9,590 over the amount contained in their original Proposal ($99,630-$90,040).

I am including updating the BMAP and the Model in the proposed 2018 Monitoring and Management Program (M&MP) which is the subject of item 5 on today's Agenda.

ATTACHMENTS:	1. Memo from Gus Yates Regarding Updating the Model 2. HydroMetrics Letter Responding to Mr. Yate's Memo 3. Revised Proposal from HydroMetrics for Updating the BMAP and the Groundwater Model 4. Letter Sent to MRWPCA and MPWMD Asking Them to Share in the Costs of Updating the Model 5. Joint MPWMD-MRWPCA Response Letter
RECOMMENDED ACTION:	Provide Further Input/Direction (if Any) to the Technical Program Manager Regarding the Scope and Cost for Updating the BMAP and the Groundwater Model

TODD GROUNDWATER

August 2, 2017

MEMORANDUM

To: Bob Jaques, Seaside Basin Watermaster Technical Program Manager

From: Gus Yates, Senior Hydrologist

Re: Recommendations Regarding Seaside Basin Groundwater Model Update and Recalibration

I have reviewed the proposed groundwater modeling tasks included in the "Scope and Cost to Update the Seaside Basin Management Action Plan" prepared by HydroMetrics Water Resources, Inc. (March 24, 2017). The proposed update and recalibration of the model are an opportunity to continue improving model performance, particularly with respect to some of the issues pointed out in my peer review of the current model (Todd Groundwater, 2015). Modeling is covered under Tasks 1 and 2 of the scope of work, and the subtasks listed for those two tasks are all reasonable to include in the work effort.

For the subtasks shown below, I offer a few suggestions and concerns related to how the analysis is carried out. I suspect HydroMetrics has already considered these issues, but perhaps some of the ideas are new.

Subtask 1.3 Model Recalibration

- Consider jointly calibrating recharge and aquifer parameters. Rainfall recharge, pipe leaks and irrigation efficiency are all poorly known yet generate most of the basin yield. If the simulated response to pumping ramp-downs in recent years has not been tracking measured water levels, the recharge estimate could be part of the problem.

- Emphasize long-term hydrograph trends in the calibration process. I find that residuals statistics are of little value. Also, trends are a key indicator of yield and sustainability; nonetheless they proved to be fairly unresponsive to model sensitivity tests we completed during my 2015 model peer review. It would be useful to identify which variables do control the trends in various parts of the basin.

- Consider not using PEST. Hydraulic conductivity (K) is undoubtedly highly variable, but the complex K patterns that typically result when PEST is used for calibration complicate the interpretation of results. For example, simpler K patterns might make it easier to identify which variables govern the development of the pumping trough in the Northern Coastal subarea.

- Seek consistency with the new Salinas Valley Integrated Hydraulic Model. Does the current Seaside Basin model boundary coincide with the SVIHM model boundary? Do both models treat that as a no-flow boundary because of a flow divide? Does either model predict water-level trends near the boundary that might alter the flow-divide location?

Subtask 2.1 Update Basin Conceptual Model

- Highlight data and understanding that have changed since 2009. The dynamic, flow-divide character of the northern and eastern basin boundaries has been recognized since at least 2005, but new areas of understanding might include:
    - Have data from the seawater intrusion sentry wells provided any new insight into how the Paso Robles and Santa Margarita aquifers are connected to the ocean?
    - The concept of the Laguna Seca Anticline as only a partial barrier to groundwater flow is relatively recent. It would be useful to present data and implications related to that reconceptualization.
    - The modeling work that HydroMetrics completed related to the locations of flow divides in the eastern part of the Laguna Seca subarea is a significant refinement of prior understanding of that boundary.
    - Has any information related to the injection wells or studies for the GWR project changed the conceptual understanding of the basin?
    - Do water levels during the past 8 years define the northeastern flow-divide basin boundary more precisely or indicate that its location is shifting?

Subtask 2.3 Update Estimates of Groundwater Storage

- Will the recently developed protective groundwater levels be used to define the bottom surface of a range of operable groundwater storage? How will protective groundwater levels be interpolated between wells and extrapolated inland for that purpose?
- How will areas where water levels are presently below protective elevations be balanced against areas where they are higher in the calculation of Useable Storage Space?
- How will temporary storage depletions (seasonal or multi-year drought) be handled in the calculation of Useable Storage Space?
- What assumptions regarding pumping location will be included in the calculation of Total Useable Storage Space? For example, there is a lot of storage space in the Northern Inland subarea, but is it useable if no wells are there to draw from it?

Subtask 2.4 Update Groundwater Budget

- A "current" groundwater budget might be tricky to define in light of pumping ramp-downs in recent years, plus the effects of a concurrent drought. As long as the pumping assumptions are stated clearly, pumping could be held at existing amounts[1] and simulated over a longer hydrologic period to obtain an average "current" water budget.

Subtask 2.5 Review Natural Safe Yield Estimates

- Appendix B of my 2015 peer review memo documented the shortcomings of the "natural safe yield" concept, and my low opinion of it remains unchanged. Even if "natural safe yield" calculations are required pursuant to the adjudication decision, the "operating yield" that HydroMetrics has calculated in previous reports should be emphasized.
- Applying the Zero Net Draft method for estimating yield could be difficult because 1) water levels in the Laguna Seca subarea have been continuously declining, and 2) water levels in the Northern Coastal subarea have been steady in some wells and declining in others. The Zero Net Draft method requires hydrographs that go up and down.

I look forward to learning what new insights about the basin emerge from the model update and recalibration process.

[1] Possibly including annual adjustments to irrigation pumping related to wet/dry year conditions.

HydroMetrics WRI

1814 Franklin St., Suite 501
Oakland, CA 94612

Mr. Bob Jaques
Seaside Watermaster Technical Program Manager
83 Via Encanto
Monterey, CA 93940

August 4, 2017

Subject: Response to Todd Groundwater's *Recommendations Regarding Seaside Basin Groundwater Model Update and Recalibration*

Mr. Jaques,

Thank you for forwarding the above referenced memorandum from Gus Yates of Todd Groundwater. As always, Mr. Yates's comments are well thought out and appreciated. We have reviewed each comment, and included our responses in this letter. Based on Mr. Yates's recommendations, we have revised our cost estimate for updating the groundwater model.

COMMENT REVIEW

SUBTASK 1.3 MODEL RECALIBRATION

- We agree that jointly calibrating recharge and aquifer parameters is a good idea. The recent dry years provide a good opportunity to test the sensitivity of the model to both aquifer parameters and recharge estimates. This will be a somewhat more complicated calibration, and therefore take additional effort.

- Mr. Yates's point of emphasizing long-term hydrograph trends is well taken. While we disagree that residuals statistics are of little value, we do agree that long term trends should be a primary focus, and appreciate Mr. Yates focusing our attention on this gauge of model applicability. Recalibrating the recharge parameters may improve simulated long-term hydrograph trends.

- We will continue to use Parameter Estimate (PEST) software during calibration. While we strive to use this software judiciously in calibration, it is an important tool in our modeling toolbox. We view this as more of a modeling style comment by Mr. Yates rather than a substantial comment.

- Consistency with the Salinas Valley Integrated Hydraulic Model (SVIHM), currently being developed by the USGS, is desirable but may be impractical for the BMAP/model update because of timing. The SVIHM has not been completed and its completion date is uncertain. Waiting for its completion will delay our model update for many months. We propose that when the SVIHM has been finalized that we assess how well it simulates historical conditions in the Seaside Basin. Based on that assessment, if we conclude that improvement is needed in the Seaside Basin model we can revise it using parts of the SVIHM that we feel improve model calibration. It is important to note is that although the SVIHM includes the Seaside Bain, the USGS will exclude any reporting of the simulation results for the Seaside Basin. We should, however, be able to get the model code from the USGS for our assessment of how well the SVIHM matches historic conditions in the Seaside Basin.

SUBTASK 2.1. UPDATE BASIN CONCEPTUAL MODEL

We agree with the items Mr. Yates's recommends to include in this update to the narrative description of the basin's conceptual model in the BMAP. Some of the items will require a little more time than previously budgeted.

Important to note is that this update of the conceptual model will not be used to update the groundwater model layers and boundary conditions. This type of update is very intensive and not warranted at this point. Perhaps when the Salinas Valley Integrated Hydraulic Model has been completed, a Seaside Basin model update can include integrating Salinas Valley model data as well as updating the model layers to reflect an improved conceptual understanding of the Seaside Basin.

SUBTASK 2.3 UPDATE ESTIMATE OF GROUNDWATER STORAGE

We do not plan on making significant changes to our previous methodology for calculating groundwater storage, but will update the storage figures in this subsection using data and other information obtained since the BMAP was originally prepared. Our decision to adhere to the previous methodology is based on the observation that the estimated amount of groundwater in storage has not been a factor in basin management. The

Adjudication Decision requires that the Total Usable Storage Space be periodically adjusted (based on new information).

SUBTASK 2.4 UPDATE GROUNDWATER BUDGET

We agree that defining current groundwater budgets for any basin is difficult because basin management conditions vary with time. However, we disagree that the most effective way to deal with this is to hold pumping steady while simulating long-term hydrologic cycles. Pumping variability in response to wet and dry years is part of the hydrologic fluctuation of the basin, and cannot be discounted. We believe the best approach is to address the long-term water budget and acknowledge that recent years have been relatively dry. This approach will lead to a slight increase in budget, but less increase in budget than would be required to adopt the proposed approach of simulating constant pumping and fluctuating hydrology.

SUBTASK 2.5 REVIEW NATURAL SAFE YIELD

- We completely agree that the natural safe yield concept is badly flawed. It is, unfortunately, a construct that has burrowed its nose into too many groundwater basin adjudications. We will attempt to emphasize the operating yield concept more strongly.

- Mr. Yates' observation about our inability to apply a Zero Net Draft method for estimating yield is well taken. We will remove this approach from the BMAP update.

BUDGET IMPLICATIONS

There are four items that change our estimated budget for the BMAP update.

1. Jointly calibrating recharge and aquifer parameters will be a somewhat more complicated calibration, and therefore take additional effort. Add $8,210 to Subtask 1.2.
2. Update the BMAP's conceptual understanding of the basin will require an additional effort. Add $2,040 to Subtask 2.1.
3. Include analysis of long-term water budget that acknowledges recent drought. Add $1,300 to Subtask 2.4.
4. Zero Net Draft method for estimating basin yield will be removed from the budget. Subtract $1,130 from Subtask 2.5.

HydroMetrics WRI

1814 Franklin St., Suite 501
Oakland, CA 94612

Mr. Robert S. Jaques
Seaside Groundwater Basin Watermaster
83 Via Encanto
Monterey, CA 93940

August 4, 2017

Subject: Revised Scope and Cost to Update the Seaside Basin Management Action Plan

Mr. Jaques:

Thank you for the opportunity to provide you with this scope and cost to update the Seaside Groundwater Basin's Basin Management Action Plan (BMAP). The scope we have put together addresses the BMAP items that were presented at the February 2017 Technical Advisory Committee meeting, and includes some of the recommendations made by Gus Yates of Todd Groundwater.

The Watermaster's first 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 Watermaster a logical set of actions that can be undertaken to manage the basin to its Safe Yield. Over the eight 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. This improved understanding should be incorporated into an updated BMAP to facilitate ongoing responsible management of the groundwater resource.

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. If simulated groundwater levels are not accurate this reduces the accuracy of all output from the model such as groundwater storage and water budget.

The scope of work provided below assumes the model will be used to develop estimates of groundwater storage, water budget, and safe yield; and to test impacts of potential management actions. The groundwater model was developed to assist in making basin management decisions, and for providing the simulated results that are required for analysis in the BMAP. As the model currently only includes input data through September 2013, groundwater storage, water budget, and safe yield estimates can only reliably be obtained from the model up through Water Year 2013. The model needs to be updated through Water Year 2016 to be used for current estimates. It is likely recalibration of the model will be required so that it more accurately simulates the historic low groundwater levels currently occurring in the basin.

The scope outlined below starts with an update and recalibration of the groundwater model, and then generally updates each of the main sections of the BMAP.

Task 1: Update Seaside Basin Groundwater Flow Model.

Subtask 1.1. Update Model Input Data.

Groundwater production, groundwater levels, injected water, and precipitation data will be sourced and compiled for input into the groundwater model. In addition to precipitation, estimates of storm water percolation, septic tank leakage, and system losses are also needed as they all contribute to the recharge of the basin. Most data are already available from MPWMD or Watermaster, but some other pumpers such as Cal Water Service and Marina Coast Water District, which do not fall under the Watermaster will be contacted for their data.

The updated model input data will be incorporated into the groundwater model. Once the model has been updated and is successfully running, hydrographs comparing measured and simulated groundwater levels will be prepared. The hydrographs produced will be the same ones used in the 2009 model report.

Subtask 1.3. Model Recalibration.
Model calibration is a process that involves varying relatively uncertain and sensitive parameters such as horizontal and vertical hydraulic conductivities, over a reasonable range of values. Per Mr. Yates's recommendation, we will jointly calibrate recharge and aquifer parameters. This is a change from our previous calibration approach of only calibrating aquifer parameters. Calibration will be completed when simulated results match the measured data within an acceptable measure of accuracy, and when successive calibration attempts do not notably improve the calibration statistics. Parameter Estimation (PEST) software will be used as a tool to improve calibration.

Estimating the effort involved in model calibration is difficult because there is no defined set of steps that can be followed. The costs provided with this scope reflect our best estimate, but additional costs may be necessary to complete calibration successfully.

Subtask 1.4. Model Update Technical Memorandum.
A Draft Technical Memorandum will be prepared documenting the model update and calibration results. After presenting the Tech Memo to the TAC and receiving comments, a Final Tech Memo will be prepared for submission to the Board. For purposes of the cost estimate, we have assumed HydroMetrics WRI will present the findings to the TAC and to the Board. One presentation will be in-person and one will be by telephone.

Task 2: Update BMAP Section 2 - State of the Seaside Groundwater Basin.

Subtask 2.1. Update Basin Conceptual Model. Since the 2009 BMAP was completed, a significant amount of modeling has been undertaken that has assisted in improving our hydrogeologic understanding of the basin. Additionally, a few new wells have been drilled that may improve our understanding of basin geometry. Below is a list of recent developments that will be used to update our conceptual understanding of the basin:

- Modeling work we completed related to the locations of flow divides in the eastern part of the Laguna Seca subarea and how pumping outside of the basin affects groundwater within the basin.
- The concept of the Laguna Seca Anticline as only a partial barrier to groundwater flow is relatively recent. We will present data and implications related to that reconceptualization.
- New wells, such as the Pure Water Monterey ASR wells and the MPWMD ASR wells, may provide new data related to aquifer depths and bottom of the basin that could improve the conceptual understanding of the basin.
- Groundwater levels collected over the past eight years may provide an undated definition of the basin's northeastern flow-divide boundary.

Subtask 2.2. Analyze Groundwater Levels Trends. Since 2009, eight years of groundwater level data have been collected, some of it using data loggers that record groundwater levels multiple times a day. This has allowed us to vastly improve our understanding of both seasonal and long-term trends. The basin has also experienced a recent drought and Court-mandated pumping reductions. How groundwater levels have responded to these changes has also improved our understanding of the basin. Furthermore, protective groundwater elevations developed after the 2009 BMAP should be included and discussed in an updated BMAP.

Subtask 2.3. Update Estimates of Groundwater Storage. The updated BMAP will include updates of estimated total stored groundwater, usable storage space, and total useable storage space. The Watermaster is required under the Decision to recalculate Total Usable Storage Space and adjust the allocation as needed.

The groundwater model and protective groundwater elevations should be used to quantify these storage estimates for the Seaside Basin. The 2009 BMAP did not have the benefit of site specific protective elevations and thus used Ghyben-Herzberg generated elevations. This updated BMAP will instead use protective elevations developed using groundwater models that estimate onshore groundwater elevations that keeps the productive onshore aquifers fresh (HydroMetrics LLC, 2009b).

Subtask 2.4. Update Groundwater Budget. A long-term and current groundwater budget will be developed to enhance our understanding of the groundwater system, and how the basin has responded during the recent drought. Similar to Subtask 2.3, the groundwater budget can be readily generated from groundwater model output. However, the groundwater model needs to be updated through September 2016 and recalibrated for it be used reliably to evaluate the current and historical water budget.

Subtask 2.5. Review Natural Safe Yield Estimates. The State of California has experienced a recent drought which has impacted natural aquifer recharge more than was anticipated in the 2009 BMAP. Also, even though pumping in recent years has been below the amounts required under the Decision, groundwater levels have continued to fall. This suggests that the Natural Safe Yield of 3,000 AFY in the Decision may be too high.

The reevaluated Safe Yield will be compared against other Safe Yield estimates that were included in the 2009 BMAP. If appropriate, a revised Safe Yield to replace the Decision-established Natural Safe Yield of 3,000 AFY will be provided for basin management purposes.

Task 3: Update Section 3 – Supplemental Water Supplies.
This section will be primarily completed by Watermaster staff, and will be edited and integrated into the BMAP update by HydroMetrics WRI. Watermaster staff will update the old BMAP Section 3 with current information on projects being considered to meet the long-term water needs in the Seaside Basin. Included will be MRWPCA's Pure Water Monterey groundwater replenishment project and Cal Am's Monterey Peninsula Water Supply Project (MPWSP). Recent Environmental Impact Reports will be used to update the information. If any other projects are in early planning stage, they will also be included in the update.

In the revised cost estimate (Table 1), the number of hours has been reduced from our previous cost estimate in March to reflect that Watermaster staff will be responsible for the majority of this task.

Task 4: Update Section 4 – Groundwater Management Actions.
This section will be updated to reflect actions and interim water supplies that have already been implemented, eliminate actions that are no longer viable, and add potential future actions and interim water supplies that could be implemented to address basin imbalances in the short-term before the long-term supply projects in Section 3 of the BMAP can be permitted, built and operated.

An example of a local management action would be to identify optimal extraction well locations such that those wells can make more efficient use of useable stored groundwater. The groundwater model is the most appropriate tool for this as it is able to simulate cumulative impacts by taking into account long-term projects and any other short-term projects while optimizing well locations.

It is beyond the scope of the BMAP update to prepare preliminary costs for potential future actions and interim water supplies. However, as cost is an important factor in deciding which actions to pursue, the Watermaster may need to engage a financial expert to provide preliminary cost estimates for those actions that do not already have cost estimates associated with them.

Task 5: Update Section 5 – Recommended Management Strategies.
After developing the groundwater management actions, we will present the results to the TAC with the purpose of soliciting input that will allow each action to be ranked in order of preference. The top actions will become recommended management strategies that the Watermaster should consider going forward.

Task 6: Prepare Draft, Final Draft and Final Updated BMAP.
A Draft Updated BMAP will be prepared that follows the format of the 2009 BMAP. After the TAC has reviewed the Draft Updated BMAP, comments received will be incorporated into a Final Draft Updated BMAP that will be presented to the Board. If comments are received from the Board, these will be included in a Final Updated BMAP. Up to 15 bound hardcopies will be provided to the Watermaster. We assume that HydroMetrics WRI will attend one TAC and one Board meeting in person to present the Updated BMAP.

Estimated Budget
The total cost to update and recalibrate the groundwater model through September 2016, and to update the BMAP is provided in Table 1.

Schedule
We expect it will take two months to update and recalibrate the groundwater model. An updated BMAP draft can be completed in approximately six weeks after the model update.

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

Please call if you have any questions.

Sincerely,

Georgina King
Principal Hydrogeologist
HydroMetrics Water Resources Inc.

Table 1: Cost Estimate for Basin Management Action Plan Update

Tasks	HydroMetrics WRI Labor			Labor Total		Other Direct Costs	TOTALS
	Derrik Williams	Georgina King	Hanieh Haeri				
	President	Principal Hydrogeologist	Hydrologist				
Rates	$220	$195	$130	Hours	($)	($)	($)
Task 1: Update Groundwater Model & Recalibrate							
Subtask 1.1. Update Model Input Data	8	24	40	72	$ 11,640	$ -	$ 11,640
Subtask 1.2. Model Recalibration	46	10	140	196	$ 30,270	$ -	$ 30,270
Subtask 1.3. Model Update and Recalibration Technical Memorandum	12	28	32	72	$ 12,260	$ 200	$ 12,460
Subtotal Task 1	*66*	*62*	*212*	*340*	*$ 54,170*	*$ 200*	*$ 54,370*
Task 2: Update BMAP Section 2 - State of the Seaside Groundwater Basin							
Subtask 2.1. Update Basin Conceptual Model	2	16	4	22	$ 4,080	$ -	$ 4,080
Subtask 2.2. Analyze Groundwater Levels Trends	1	16	4	21	$ 3,860	$ -	$ 3,860
Subtask 2.3. Update Estimates of Groundwater Storage	5	10	16	31	$ 5,130	$ -	$ 5,130
Subtask 2.4. Update Groundwater Budget	4	8	20	32	$ 5,040	$ -	$ 5,040
Subtask 2.5. Review of Natural Safe Yield Estimates	3	8	12	23	$ 3,780	$ -	$ 3,780
Subtotal Task 2	*15*	*58*	*56*	*129*	*$ 21,890*	*$ -*	*$ 21,890*
Task 3: Update BMAP Section 3 – Supplemental Water Supplies	*1*	*4*	*0*	*5*	*$ 1,000*	*$ -*	*$ 1,000*
Task 4: Update BMAP Section 4 – Groundwater Management Actions	*8*	*20*	*12*	*40*	*$ 7,220*	*$ -*	*$ 7,220*
Task 5: Update BMAP Section 5 – Recommended Management Strategies	*4*	*10*	*0*	*14*	*$ 2,830*	*$ -*	*$ 2,830*
Task 6: Prepare Draft, Final Draft and Final BMAP	*6*	*40*	*20*	*66*	*$ 11,720*	*$ 600*	*$ 12,320*
TOTAL for GROUNDWATER MODEL UPDATE	66	62	212	340	$ 54,170	$ 200	$ 54,370
TOTAL for BMAP UPDATE	34	132	88	254	$ 44,660	$ 600	$ 45,260
TOTAL	*100*	*194*	*300*	*594*	*$ 98,830*	*$ 800*	*$ 99,630*

Notes

Other direct costs include travel expenses, office supplies, photocopies, postage, and equipment rental

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

July 12, 2017

Monterey Regional Water Pollution Control Agency
Attention: Mr. Paul Sciuto, General Manager
5 Harris Court, Building D
Monterey, CA 93940

Monterey Peninsula Water Management District
Attention: Mr. David Stoldt, General Manager
5 Harris Court, Building G
Monterey, CA 93940

Subject: **Recalibration and Updating of Seaside Groundwater Basin Model**

Dear Mr. Sciuto and Mr. Stoldt:

The Seaside Basin Watermaster is considering recalibrating and updating its Seaside Groundwater Basin Model in 2018. The Model was developed for the Watermaster by our consultant, HydroMetrics WRI, and was provided to you free-of-charge for your use in performing modeling studies for your Pure Water Monterey groundwater replenishment project.

Attached is a preliminary proposal from HydroMetrics to perform this work. The proposal provides an explanation of why this work needs to be performed, and includes a preliminary estimate of approximately $46,000 to do this work (Task 1 of their proposal).

Because the Pure Water Monterey project will need to use the Model for further studies and reporting purposes, the Watermaster's Board of Directors believes it would be appropriate for your entities to share in the cost of recalibrating and updating the Model.

This letter is a request that you provide the Watermaster with an indication of your willingness to share in these costs. Over the next two months we will be developing a firm scope-of-work and cost to have HydroMetrics perform this work, and will be presenting it our Board for approval at their October 2017 meeting.

If you have any questions regarding this request, please contact me at (831) 375-0517 or by email at bobj83@comcast.net.

Sincerely,

Robert S. Jaques
Technical Program Manager
[Note: Attachment not included in TAC agenda packet version of this letter]

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

July 31, 2017

Robert S. Jaques
Technical Program Manager
Seaside Basin Watermaster
PO Box 51502
Pacific Grove, CA 93950

Subject: Cost Sharing for Recalibration and Updating of Seaside Groundwater Basin Model

Dear Bob:

Thank you for your July 12th letter discussing the recalibration and updating of the Seaside Groundwater Basin Model. In that letter, you inquired about the willingness of our District and Monterey One Water to share in the cost of HydroMetrics to perform the work.

Both of our agencies stand ready to share in the cost of recalibration and updating of the Seaside Groundwater Basin Model.

One possible paradigm for cost sharing might be based on average annual production rights from the basin. For example:

Cal-Am	2021 Safe Yield	1,474 AF	
	Middle School average ASR	650 AF	
	Fitch Park average ASR	590 AF	
	Total Cal-Am	2,714 AF	32%
Non-Cal-Am Pumpers	2021 Safe Yield	1,526 AF	18%
MPWMD	Santa Margarita average ASR	650 AF	8%
Monterey One Water	Pure Water Monterey	3,500 AF	42%

That would result in our two public agencies supporting 50% of the cost. Please let me know your thoughts on this.

Sincerely yours,

David J. Stoldt
General Manager

5 Harris Court, Building G, Monterey, CA 93940 • P.O. Box 85, Monterey, CA 93942-0085
831-658-5600 • Fax 831-644-9560 • http://www.mpwmd.net

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	5
AGENDA TITLE:	Initial Discussion Regarding Scope of Work for Monitoring and Management Program (M&MP) for FY 2018
PREPARED BY:	Robert Jaques

The Schedule calls for the TAC to approve an FY 2018 Work Plan and Budget for the 2018 Management and Monitoring Program (M&MP) at its September 2017 meeting. This will then go on to the Board for approval at its October 2017 meeting.

In order to obtain TAC input and direction regarding these items, I have reviewed the FY 2017 M&MP and have edited it to reflect those work items that I anticipate being performed in FY 2018. A copy of this Proposed Work Plan is attached.

Items highlighted in yellow are costs and/or descriptions for the various tasks that I will evaluate and update as necessary, based on the TAC's input at today's meeting and discussions with our consultants.

Other than the obvious need to change the dates in the M&MP from 2017 to 2018 (which I have done), all other proposed changes from the 2017 M&MP are shown in Track-Change format (deletions in ~~red~~ strikeout and additions in blue underlines) for the TAC to consider in preparing the 2018 M&MP. Most of the proposed revisions are relatively minor, but there are two that are significant:

Task I.3.a.1 - Update the Existing Model. This has been the subject of discussion at several TAC and Board meetings. The Board requested that Gus Yates of Todd Groundwater, who performed a peer review involving the Model last year, be been asked to review HydroMetrics' proposed scope-of-work for updating the Model and to provide his comments and recommendations. The preliminary dollar amount shown was taken from HydroMetrics' July 2017 Revised Proposal, but that amount may change before it is presented to the TAC for approval at its September 2017 meeting, depending on the comments and recommendations received from Mr. Yates.

Task I. 3. c. - Refine and/or Update the Basin Management Action Plan. This has also been the subject of discussion at several TAC and Board meetings. As reported under Agenda Item No. 4, HydroMetrics reduced its cost for Section 3 (Supplemental Water Supplies) of the BMAP to reflect having the Watermaster staff provide much of the information in that section. The preliminary dollar amount shown was taken from HydroMetrics' July 2017 Revised Proposal.

Task I. 3. e. – Development of a Geochemical Model. This is the topic discussed under Item No. 3 of today's Agenda. At this point in time no cost estimates have been developed for this work. If the TAC approves including this Task in the M&MP, a cost estimate will be presented in the M&MP when it comes to the TAC for approval for approval at its September 2017 meeting.

AGENDA ITEM:	5 (Continued)

If there are other revisions the TAC would like to make to prepare the M&MP for 2018 they can be brought up at today's meeting. The final M&MP for 2018, which will reflect any revisions or additions/deletions that come up at today's meeting, will be on the TAC's September 13, 2017 Agenda for approval.

ATTACHMENTS:	Seaside Groundwater Basin Monitoring and Management Program – Preliminary Proposed FY 2018 Work Plan
RECOMMENDED ACTION:	Approve the Proposed Work Plan or Recommend Edits to It

Seaside Groundwater Basin Management and Monitoring Program
FY 2018 Work Plan

The tasks outlined below are those that are anticipated to be performed during 2018. Some Tasks listed below are specific to 2018, while others Tasks recur throughout the program, such as data collection and 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** **($7,000)**	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** **($7,376)**	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 ($1,900)	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 ($13,452)	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 2018.
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 2018.

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 2018.
I. 2 b. 2 Collect Monthly Manual Water Levels ($7,192)	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. ~~Most~~ The wells where the use of dataloggers is feasible or appropriate have been equipped with dataloggers. ~~, but in accordance with the recommendation in the 2016 SIAR this Task budget amount includes the purchase and installation of one additional new datalogger at Monitoring Well PCA West Shallow at a price of $680, plus $50 for installation parts.~~ This Task ~~also~~ includes 2 replacement dataloggers @ $680, and the purchase of one datalogger @ $680 to keep in inventory as a spare if needed, plus $50 in parts for each datalogger. All of the other wells will be manually measured.

I. 2. b. 3 **Collect ~~Quarterly~~ Water Quality Samples.** **($55,520)**	Water quality data will be collected quarterly from certain of the monitoring wells, and annually or semi-annually from the Sentinel Wells. 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 in 2018. 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, an allowance of $2,000 to purchase a replacement sampling pump has been included in this Task. The additional water quality sampling at certain of the Sentinel Wells and the Ord Terrace Shallow Well, as recommended in the 2016 SIAR, is 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 2018.
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 2018.
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 2018.

I. 2. b.6 Reports ($2,688)	The groundwater level and water quality monitoring will be conducted on a monthly, quarterly, semi-annual or ~~and~~ 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. [IS THIS APPROACH SATISFACTORY AND IS IT BEING CARRIED OUT AS DESCRIBED?] 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 ($1,792)	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 ($54,370 – from Hydro-Metrics August 4, 2017 Revised Proposal)**	The existing 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 (Tasks I.3.a.2 and I.3.a.3). The scope and budget in 2014 for again updating the Model included the following: Step1: Update the model and check its accuracy - $10,000 Step 2: Recalibrate the model - $15,000 Step 3: Prepare report describing the work that was done - $5,000 Step 1 was completed in 2014 by incorporating recent pumping data, groundwater level data, and rainfall data, and then checking to see if the recently simulated groundwater levels match the recently measured groundwater levels. These are the principle findings and conclusions of this Step 1 work: • The model still provides reliable results in the Laguna Seca Subarea. • Although the performance of the model during the updated period is worsening, the calibration of the model remains within acceptable standards. • The northern boundary condition needs to be updated to reflect real groundwater elevation variations for the model period of 2005-2013. The behavior of the northern boundary will impact flows and the ability to calibrate the model for the area of the model that is adjacent to the northern boundary. An alternative method for defining this boundary condition will have to be developed that does not rely upon simulations from the Salinas Valley Integrated Groundwater Surface Water Model (SVIGSM). • 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. Modeling of the Laguna Seca Subarea was performed in 2014 and a peer review of that work was performed in 2015. The peer review concluded that the model is a reasonable representation of the Seaside Basin groundwater flow system. No major errors in assumptions, data or results were identified during this peer review, and the simulated water levels generally matched observed water levels for the historical calibration simulation. The peer review recommended some aspects of the model should be explored to try to determine some differences between field-measured conditions and model-predicted conditions in some parts of the Basin, but stated that the model should be used for estimating the operational safe yield of the basin and subareas, and for simulating the effects of possible management measures. It also recommended that some additional simulations should be completed for management measures likely to be implemented. ~~Therefore, Steps 2 and 3 will not be needed and no further work of this type is anticipated in 2018.~~ In 2018 Step 1 (updating the Model) will be performed again, along with Steps 2 (recalibrating) and 3 (reporting on this work).
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. ~~Therefore, no further work of this type is anticipated.~~ Protective water levels will be updated, if appropriate, as part of the work of Task I.3.c.

I. 3. a. 3 **Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions** **($40,000)**	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 2018 to further examine this situation.
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 The only work which may be performed on the BMAP in 2018 is discussed under Task I. 3. c.
I. 3. c. **Refine and/or Update the Basin Management Action Plan** **($45,260– from HydroMetrics' August 4, 2017 Revised Proposal)**	During 2018 ~~it may be beneficial to update~~ the BMAP will be updated based on new data~~,~~ and~~/or~~ knowledge that ~~is~~ has been gained since it was prepared in 2009.~~from the work described under Task I. 3. a. 3. Such work might involve issues pertaining to Operational and Natural Safe Yields or pumping redistribution strategies. Updating the BMAP has been scheduled and budgeted in several of the preceding years, but was not deemed to be necessary. This task is included primarily for budgeting purposes in the event such work is deemed necessary during 2018.~~
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). It is anticipated that MPWMD will perform that work in 2018.

I. 3. e. **Seaside Basin Geochemical Model** **($??? – Very Preliminary Order-of-Magnitude Estimate is $70,000)**	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 should be developed for use in the areas of the Basin where injection of these new water sources will occur. This can be most cost-efficiently accomplished in the following manner: • The Watermaster's consultant (HydroMetrics) will use the Watermaster's existing groundwater model, and information about injection locations and quantities, injection scheduling, etc. provided by MPWMD for each of these projects, to develop a model scenario that will provide flow path and groundwater level information needed as input for geochemical modeling. • MPWMD's consultants will use the data provided by HydroMetrics, and the necessary water quality data from these water supply projects, to develop and run the geochemical model. 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** **($21,786)**	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 2018.
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 2018.
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.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	August 9, 2017
AGENDA ITEM:	6
AGENDA TITLE:	Schedule
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

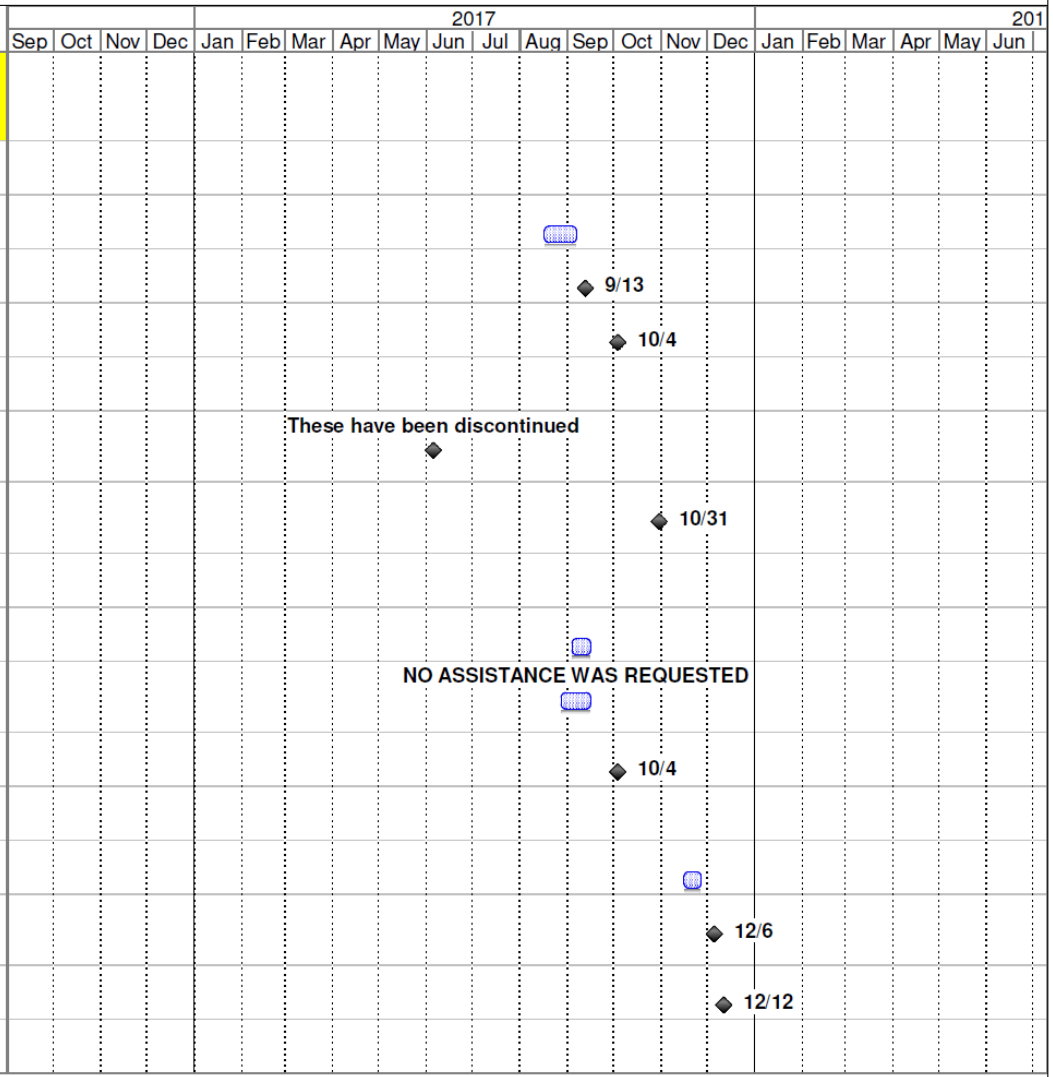
As a regular part of each monthly TAC meeting, I will provide the TAC with an updated Schedule of the activities being performed by the Watermaster, its consultants, and the public entity, MPWMD, which is performing certain portions of the work.

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

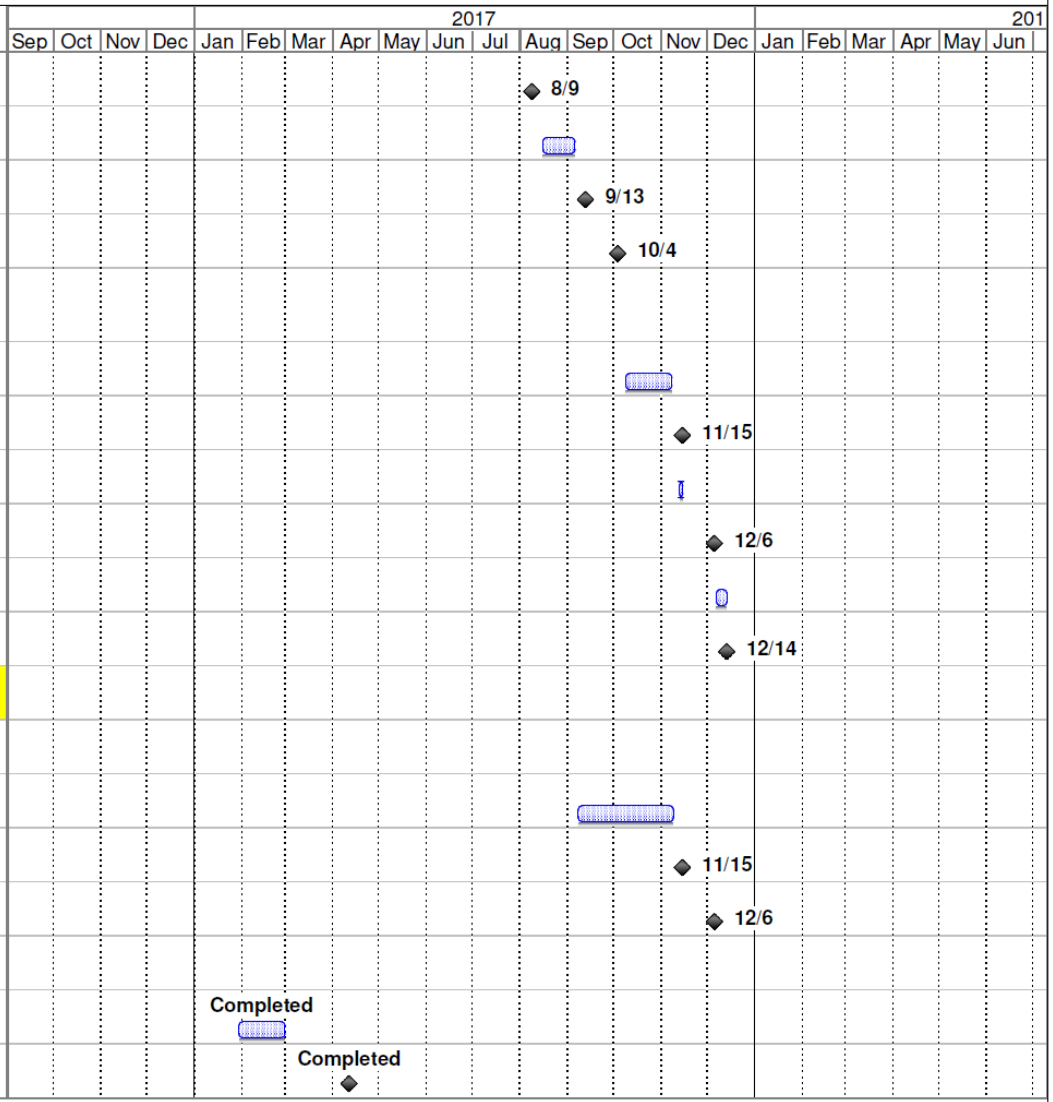
Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name
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)
5	Board Approves M&MP Budgets (Same as Task 21)
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)
8	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2016 (Same as Task 42)
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
12	Board Adopts and Declares 2018 Water Year Replenishment Assessment Unit Cost
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)
16	Watermaster Levies Replenishment Assessment for 2017
17	**Monitoring & Management Program (M&MP) Budgets for 2018 and 2019**

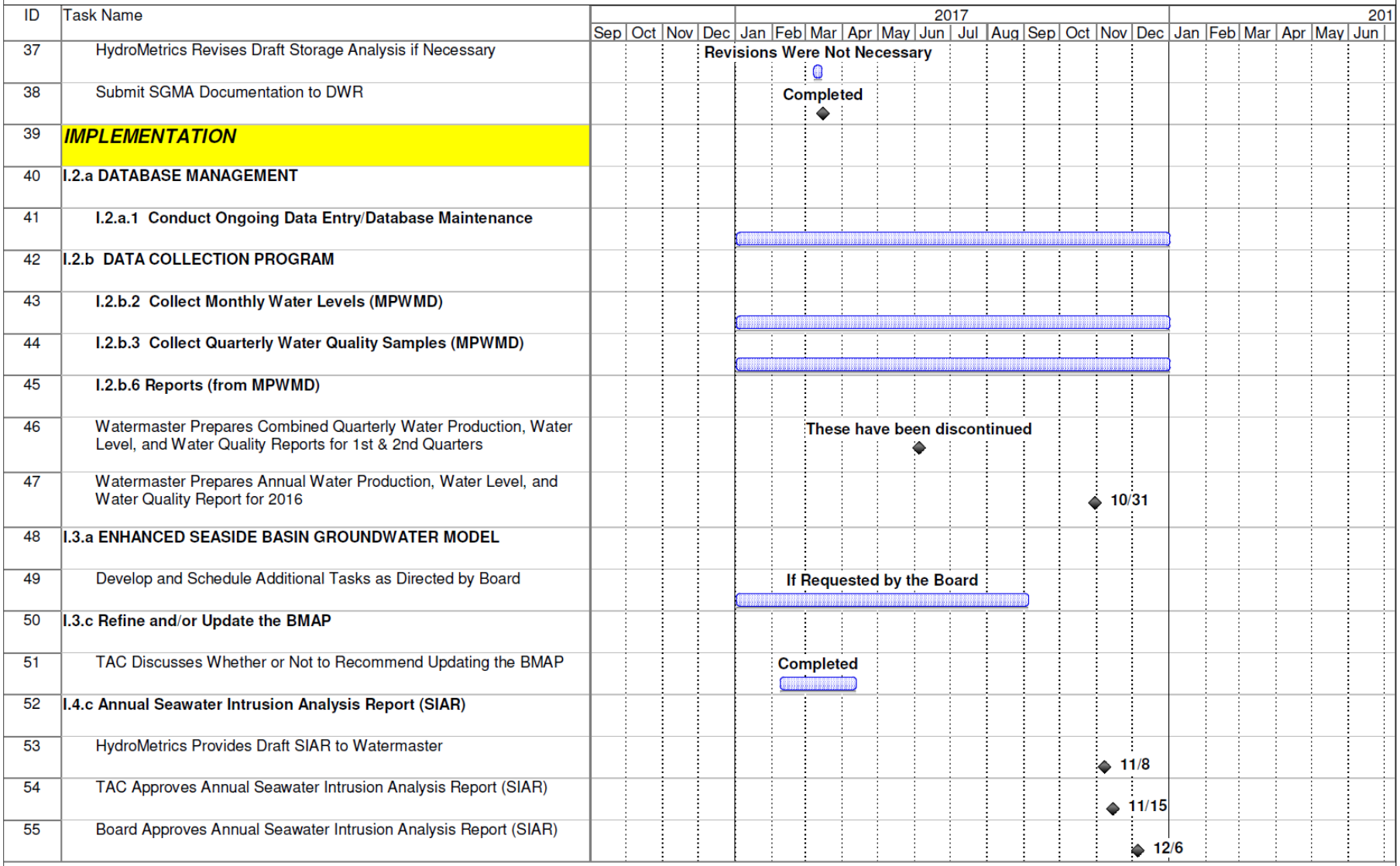


Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name
18	Preliminary Discussion of Potential Scope of Work for 2018 M&MP
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
21	Board approves 2018 M&MP Work Plan and 2018 and 2019 O&M and Capital Budgets
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
25	Prepare Draft 2017 Annual Report (Incorporating TAC Input)
26	Board Provides Input on Draft 2017 Annual Report (At December Board Meeting)
27	Prepare Final 2017 Annual Report (Incorporating Board Input)
28	Watermaster Submits Final 2017 Annual Report to Judge
29	***MANAGEMENT***
30	**M.1 PROGRAM ADMINISTRATION**
31	Prepare Initial Consultant Contracts for 2018
32	TAC Approval of Initial Consultant Contracts for 2018
33	Board Approval of Initial Consultant Contracts for 2018
34	**M.1.g – Sustainable Groundwater Management Act Reporting Requirements**
35	HydroMetrics Prepares Draft Groundwater Storage Analysis
36	TAC Reviews HydroMetrics Draft Storage Analysis



Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule



Seaside Basin Watermaster
Monitoring and Management Program
2017 Work Schedule

ID	Task Name	2017																201					
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	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:	August 9, 2017
AGENDA ITEM:	7
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