

MEETING NOTICE AND AGENDA
TECHNICAL ADVISORY COMMITTEE
OF THE
SEASIDE BASIN WATER MASTER

DATE: Wednesday, November 18, 2015

MEETING TIME: 1:30 p.m.

**Monterey Regional Water Pollution Control Agency Offices
5 Harris Court, Building D (Ryan Ranch)
Monterey, CA 93940**

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

OFFICERS

Chairperson: Roger Hulbert, California American Water Company

Vice-Chairperson: Joe Oliver, 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:	November 18, 2015
AGENDA ITEM:	2.A
AGENDA TITLE:	Approve Minutes from the September 9, 2015 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
September 9, 2015**

Attendees: TAC Members

City of Seaside – No Representative
California American Water – No Representative
City of Monterey – No Representative
Laguna Seca Property Owners – Bob Costa
MPWMD – Joe Oliver
MCWRA – Howard Franklin
City of Del Rey Oaks – No Representative
City of Sand City – Leon Gomez (via telephone)
Coastal Subarea Landowners – Paul Bruno (via telephone)

Watermaster

Technical Program Manager - Robert Jaques
Executive Officer and Assistant – Dewey Evans and Laura Dadiw

Consultants

None

Others

None

The meeting was convened at 1:43 p.m. after a quorum had arrived. Mr. Oliver Chaired the meeting as Mr. Hulbert was called away at the last minute.

1. Public Comments

There were no public comments.

2. Administrative Matters:

A. Approve Minutes from the August 12, 2015 Meeting

With Mr. Franklin abstaining because he did not attend that meeting, the Minutes were unanimously approved as presented.

3. Approve Work Plan for FY 2016 Management and Monitoring Program (M&MP) and FY 2016 and 2017 M&MP Operations and Capital Budgets

Mr. Jaques summarized the Agenda packet materials for this item. He highlighted the addition of Task M.1.g with a budget amount of \$1,900 which had come up after the agenda packet for today's meeting had been sent out, and handed out the attached documents detailing this addition. He explained that some of the documentation that needs to be submitted under the Sustainable Groundwater Management Act as an adjudicated basin may require consultant assistance, and that this task would cover doing that work if needed. He also reported that the FY 2016 Budget for the M&MP is projected to be \$35,040 less than the FY 2015 Budget.

Mr. Oliver reported that he had received a quote from a supplier to replace the sample pump used at the Laguna Seca Driving Range well (under Task I.2.b.3) and that the quote was for approximately \$2,800 which was higher than the \$2,000 budget figure he had provided to Mr. Jaques for inclusion in the M&MP Budget. However, Mr. Oliver went on to say that he felt that a suitable pump could

probably be obtained from another supplier for the \$2,000 figure. Mr. Franklin asked if the \$2,000 figure turned out to be too low could funds be moved from other tasks to cover a modest increase and he was told that this could be done.

The TAC gave its unanimous approval of the Work Plan and Budgets for the M&MP as presented in the agenda packet with the addition of Task M.1.g.

4. Continued Discussion of Work Plan to Address Findings of Laguna Seca Modeling Work

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

Mr. Franklin reported that the model being developed for the Salinas River Groundwater Basin (SRGB) significantly overlaps the Seaside Basin. Hence, their modeler will be asking for an executable version of the Watermaster's model for review. He also reported that Monterey County's legal counsel determined that the data contained in the SRGB model will be considered to be proprietary even though the model code itself will be publicly available. He was not sure what the implications of this were with regard to sharing of information.

Mr. Jaques asked Mr. Franklin to please send him a written request, via email, of what it is the SRGB modelers need and he will communicate with HydroMetrics to try to have that material provided to them. Mr. Franklin said he would like to get the Seaside Basin model as quickly as possible, because development of the SRGB model is on a tight time schedule, and agreed to send Mr. Jaques the request via email. He also said he felt it would be good if the HydroMetrics modeling expert(s) could participate in the next SRGB modeling TAC meeting scheduled for early October. Mr. Jaques pointed out that having a HydroMetrics staff member attend such a meeting would cost well over \$2,000 (the meetings are normally 4 hours long so a full day or more of billable time would be involved in having HydroMetrics attend in person). Mr. Jaques asked if HydroMetrics could participate via teleconference line and Mr. Franklin said he would look into that.

In response to Mr. Franklin's request, Mr. Oliver suggested adding the following wording to the 3rd bulleted item on page 19 of the Agenda packet "It is currently intended that the SRGB modelers will be requesting a copy of the Watermaster's Seaside Basin model with the intent of hopefully incorporating it into the model being developed for the SRGB." Mr. Jaques will add that wording to this item.

All TAC members expressed their approval of having the Watermaster's model provided to the SRGB modelers for their review.

5. Set Next Meeting Date

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

There was TAC agreement to set the next TAC meeting date for November 18, 2015 and for there to be no TAC meeting in October.

6. Schedule

Mr. Jaques highlighted the three items listed on page 22 of the Agenda packet. There was no other discussion on this item.

7. Other Business

There was no Other Business to discuss.

The meeting adjourned at 2:17 p.m.

Attachment

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.

Management and Monitoring Plan Operations Budget For Tasks to be Undertaken in 2016							Comparative Costs from 2015 Budget	
Task	Subtask	Sub-Subtask	Cost Description	CONSULTANTS & CONTRACTORS ⁽³⁾				Total
				MPWMD	Private Consultants	Contractors		
Labor								
			Technical Project Manager	\$0	\$60,000	\$0	\$60,000	\$60,000
M.1 Program Administration								
	M.1.a		Project Budget and Controls	\$0	\$0	\$0	\$0	\$0
	M.1.b		Assist with Board and TAC Agendas	\$0	\$0	\$0	\$0	\$0
	M.1.c & M.1.d		Preparation for and Attendance at Meetings ⁽⁸⁾	\$0	\$7,000	\$0	\$7,000	\$7,000
	M.1.e		Peer Review of Documents and Reports ⁽⁸⁾	\$0	\$2,500	\$0	\$2,500	\$3,100
	M.1.f		QA/QC	\$0	\$0	\$0	\$0	\$0
	M.1.g		SGMA Documentation Preparation	\$0	\$1,900	\$0	\$1,900	\$0
I.1 Initial Phase 1 Monitoring Well Construction (Task Completed in Phase 1)								
I.2 Production, Water Level and Quality Monitoring								
	I. 2. a.		Database Management					
		I. 2. a. 1.	Conduct Ongoing Data Entry/ Database Maintenance/Enhancement	\$11,052	\$0	\$0	\$11,052	\$13,452
		I. 2. a. 2.	Verify Accuracy of Production Well Meters	\$0	\$0	\$0	\$0	\$10,000
	I. 2. b.		Data Collection Program					
		I. 2. b. 1.	Site Representation and Selection ⁽⁷⁾	\$0	\$0	\$0	\$0	\$0
		I. 2. b. 2.	Collect Monthly Water Levels ⁽⁶⁾	\$5,872	\$0	\$0	\$5,872	\$5,872
		I. 2. b. 3.	Collect Quarterly Water Quality Samples ⁽¹⁾⁽⁵⁾⁽⁶⁾	\$31,201	\$0	\$23,705	\$54,906	\$51,906
		I. 2. b. 4.	Update Program Schedule and Standard Operating Procedures.	\$0	\$0	\$0	\$0	\$0
		I. 2. b. 5.	Monitor Well Construction ⁽⁷⁾	\$0	\$0	\$0	\$0	\$0
		I. 2. b. 6.	Reports	\$4,704	\$0	\$0	\$4,704	\$6,204
I.3 Basin Management								
	I. 3. a.		Enhanced Seaside Basin Groundwater Model	(Costs Shown in Subtasks Below)				
		I. 3. a. 1	Update the Existing Model	\$0	\$0	\$0	\$0	\$20,000
		I. 3. a. 2	Develop Protective Water Levels	\$0	\$0	\$0	\$0	\$0
		I. 3. a. 3	Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions ⁽¹⁰⁾	\$0	\$40,000	\$0	\$40,000	\$40,000
	I. 3. b.		Complete Preparation of Basin Management Action Plan	\$0	\$0	\$0	\$0	\$0
	I. 3. c.		Refine and/or Update the Basin Management Action Plan ⁽¹¹⁾	\$0	\$27,300	\$0	\$27,300	\$25,000
	I. 3. d		Evaluate Coastal Wells for Cross-Aquifer Contamination Potential	\$0	\$0	\$0	\$0	\$0
I.4 Seawater Intrusion Contingency Plan								
	I. 4. a.		Oversight of Seawater Intrusion Detection and Tracking	\$0	\$0	\$0	\$0	\$0
	I. 4. b.		Provide focused area hydrogeologic investigation for Sand City Public Works	\$0	\$0	\$0	\$0	\$0
	I. 4. c.		Annual Report- Seawater Intrusion Analysis	\$2,928	\$25,750	\$0	\$28,678	\$28,678
	I. 4. d.		Complete Preparation of Seawater Intrusion Response Plan ⁽²⁾	\$0	\$0	\$0	\$0	\$0
	I. 4. e.		Refine and/or Update the Seawater Intrusion Response Plan ^{(2) (9)}	\$0	\$0	\$0	\$0	\$0
	I. 4. f.		If Seawater Intrusion is Determined to be Occurring, Implement Contingency Response Plan ⁽²⁾	(No Costs are Included for This Task, as This Task Will Likely Not be Necessary During 2016. If it Does Become Necessary, Use of Contingency Funds or a Budget Modification Will Likely be Necessary)				\$0
TOTALS CONSULTANTS & CONTRACTORS				\$55,757	\$164,450	\$23,705		
SUBTOTAL not including Technical Program Manager =							\$183,912	\$211,212
Contingency (not including Technical Program Manager) @ 20% ⁽⁴⁾ =							\$36,782	\$42,242
Technical Program Manager =							\$60,000	\$60,000
TOTAL=							\$280,694	\$313,454

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	August 12, 2015
AGENDA ITEM:	2.B
AGENDA TITLE:	Notes From October 13, 2015 Meeting of the Model Development TAC for the County's Salinas River Groundwater Basin Investigation
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

At the October 13, 2015 meeting of the County's Model Development TAC for its Salinas River Groundwater Basin Investigation, the following topics of interest to the Watermaster were discussed:

1. The principal investigators for the County's consultants on this project, Brown and Caldwell, have left the firm for other employ. The County decided to have the work taken over by the U.S. Geological Survey, with the principal investigator being Mr. Randy Hanson. The County and USGS are currently negotiating an agreement for this purpose. The original outline of tasks to be performed will still be followed, and TAC and stakeholder meetings as originally planned will still be held. The County is in the process of selecting a facilitator firm to assist it in setting up and conducting the stakeholder meetings.
2. Monterey County received a \$100K grant to work on climate change data for this area and will likely also have USGS do that work for them under contract.
3. The calibrated model is still expected to be completed in the first quarter of 2016, but may lag to June 2016.
4. The completed model with all inputs is still expected to be completed in 2019.
5. The model will be open-source using MODFLOW which is a public domain software.
6. Some of the data that will be input into the model is proprietary, since the County has agreements with some well-owners to obtain data from them on the condition that the data (production quantities, well locations, water levels, etc.) will not be made available to the public. That data will be "screened" in the model so it cannot be extracted from it.
7. An RFP will likely be sent out soon by the County for consultant assistance on some of the tasks.
8. The next TAC meeting will be in November 2015.
9. Mr. Jaques asked Mr. Franklin (of Monterey County) if the model could be expanded to include the El Toro and Corral de Tierra areas. Mr. Franklin responded that the County previously had Geosyntec consultants study those areas in 2007 at a conceptual level, but that they did not do modeling of those areas due to a lack of available data in those areas. Mr. Franklin went on to say that the scope of the current modeling project is to fulfill the Court-ordered settlement of litigation filed against the County with regard to the most recent General Plan Update, and is limited to the County's Zone 2C which does not fully include those areas. He said performing further work in those areas under a separate project would be a decision to be made by the County Board of Supervisors
10. From discussions with Mr. Franklin and Mr. Hanson it appears that the full model will be made publicly available once it is developed, but that the proprietary data will be included in a manner that will protect it to comply with the County's agreement with certain of the well-owners.
11. Mr. Franklin reported that recently enacted legislation now makes well log data publicly available, whereas in the past it was privileged data.
12. A decision on how best to use the Watermaster's Seaside Basin Model needs to be made by the modeling team. The objective is for the Salinas River Basin Model and the Watermaster's Seaside Basin Model to not be in conflict with each other. One thought is to run the Watermaster's Model separately to represent

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

AGENDA ITEM:	2.B (Continued)
this part of the larger Salinas River Basin. Mr. Hanson commented that he probably will not simulate the Seaside Basin in the Salinas River Basin Model, but instead will use the Watermaster's Seaside Basin Model as-is and make the boundary between the two models fit together to avoid conflicts. In doing this he will examine how closely the model interfaces match and decide if anything needs to be done to make them match.	
ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	2.C
AGENDA TITLE:	
PREPARED BY:	Robert Jaques, Technical Program Manager
SUMMARY: On October 8, 2015 the MRWPCA Board of Directors certified the Final EIR for the Groundwater Replenishment Project. Attached is a summary of the Comments the Watermaster submitted on the Draft EIR for that Project, and the Responses to those comments as contained in the Final EIR. It appears that the Watermaster's comments were adequately responded to, and that the Project will take into account those comments as it is further developed and implemented.	
ATTACHMENTS:	Summary of Comments Submitted by the Watermaster and Responses to those Comments in the Final EIR
RECOMMENDED ACTION:	None – information only

Summary of Comments Submitted by the Watermaster
And
Responses to those Comments in the Final EIR

COMMENT: When deciding whether a project could have an impact, the GWRP should be considered to have the potential to have a Significant impact on the Seaside Basin because injecting 3,500 AFY into the Basin constitutes adding a large new source of water at a new location and will thus impact flow patterns in the aquifer and also groundwater elevations. Currently the total amount of water pumped out of the Basin is on the order of 4,000 AFY, so a 3,500 AFY new source would be a large one. Therefore, its impacts should be evaluated before making a determination of its significance in terms of impacts. The Project would have the potential to significantly impact recharge to the Seaside Groundwater Basin, contrary to the statement in the DEIR, so this wording should be revised accordingly.

However, based on the description of the quality of the Project's recharge water, the manner in which it would be injected into the Basin, and the findings of the studies you performed, much of which is contained in the Appendices by Margie Nellor and the company that performed the groundwater analyses, it does not appear that these impacts would be harmful to the Basin. Consequently, the determination that it would not have a significant impact is reasonable.

RESPONSE: The Draft EIR conclusions related to the cumulative impact for topical Section 4.10 "Hydrology/Water Quality: Groundwater" in Table S-2, Summary of Cumulative Impacts and Mitigation Measures, are supported by the information provided on pages 4.10-77 through 4.10-78 of the Draft EIR. The cumulative impact of the Proposed Project is "LS" because the modeling conducted for the cumulative project scenarios show that Seaside Basin groundwater conditions (water levels, protective elevations at the coast, storage capacity, and recharge) with implementation of the cumulative projects would be the same or better than conditions without implementation of the cumulative projects. Groundwater elevations generally would be higher under the cumulative conditions than under the conditions without the cumulative projects. These higher groundwater levels would tend to slow or stop seawater intrusion. For these reasons, there would not be a significant cumulative impact on groundwater levels, recharge, or storage with the Proposed Project injections of 3,500 AFY of water into the Seaside Basin. Per Section 4.10.4 of the Draft EIR, pursuant to Appendix G of the CEQA Guidelines a project would have a significant impact on hydrology if it would substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. The Project operations would significantly impact groundwater resources if operations were to result in groundwater mounding, changes in groundwater gradients, or lowering of groundwater levels such that nearby municipal or private groundwater production wells experience a substantial reduction in well yield or physical damage due to exposure of well screens. Substantial reduction would occur if wells were to become incapable of supporting existing land uses or planned uses for which permits have been granted. More specifically, one of the following two conditions may occur that would trigger this condition:

- A decline in average groundwater level is significant if it would lower the water level to a depth below the median depth to the top of the well screen in nearby wells.
- A decline in average groundwater level is significant if it would decrease pump output (in gallons per minute) by more than 10%.

The Proposed Project's impact assessment related to groundwater depletion, levels, and recharge in the Seaside Basin is provided in Draft EIR Appendix L "Recharge Impacts Assessment Report" and is summarized on pages 4.10-64 through 4.10-65 of the Draft EIR. The modeling incorporated estimates of the delivery of the purified recycled water in various year types and was conducted using the Seaside Basin Watermaster predictive model for analyzing future conditions in the basin, reasonable assumptions of operation of the production wells in the basin, and reasonable assumptions of the future operation of the Aquifer Storage and Recovery project. The assessment concludes that there would be no significant operational impact to groundwater levels, recharge or storage in the Seaside Groundwater Basin. Similarly, the cumulative impacts of the Proposed Project combined with cumulative projects would

have a less-than-significant impact on groundwater levels, protective elevations at the coast, storage capacity, and recharge.

The comment acknowledges and agrees with the impact conclusions of the Draft EIR related to the impacts of the Proposed Project on the Seaside Groundwater Basin; no further response is necessary.

COMMENT: In numerous places the acronym “MPWSP” is incorrectly spelled “MPSWP.” Suggest a “Find and Replace” be done to the document to correct these typos.

RESPONSE: The incorrect spelling of the MPWSP (Monterey Peninsula Water Supply Project) has been corrected. See Chapter 5, Changes to the Draft EIR regarding pages S-35 and 4.11-101 of the Draft EIR.

COMMENT: The statement is made on this page that “Based on the experience of the Water Management District in the operation of its nearby Aquifer Storage and Recovery wells, back-flushing of each deep injection well would occur about weekly and would require discharge of the back-flush water to a percolation basin (basin), with a storage capacity of about 240,000 gallons. Water percolated through the basin would recharge the Paso Robles aquifer.” On an annual basis the volume of water that will be extracted from the Santa Margarita aquifer by back flushing will be substantial. If that water is percolated into the Paso Robles aquifer it would likely not reach the Santa Margarita aquifer for a long time, if ever, depending on the properties of the geologic layer that separates these two aquifers. It would therefore seem that the volume extracted from the Santa Margarita aquifer for back-flushing should be subtracted from the volume that is recharged via the deep injection wells when determining the volume of water that Cal Am would be entitled to pump from that aquifer. Another approach to address this concern would be to send the back-flush water back to the MRWPCA’s Regional Plant by disposing of it into the sanitary sewer. That volume could then be sent through the AWT and come back to the Seaside Basin as an additional offsetting flow that could be injected back into the Santa Margarita aquifer to ensure that this aquifer does not experience any net depletion due to development activities.

These issues should be addressed in the design of the Project and should also be addressed in the Watermaster’s Storage Agreement with Cal Am for the recharged water from the Project.

RESPONSE: Operation of the Proposed Project will involve maintenance of the deep injection wells through a process referred to as backflushing. Backflushing consists of periodic pumping of deep injection wells for the purpose of maintaining injection capacity (see pages 35 to 38 in Appendix L of the Draft EIR). As described in the Draft EIR, injection rates typically decrease because of numerous factors such as air entrainment, filtration of suspended or organic material, bacterial growth, precipitates due to geochemical reactions, swelling of clay colloids, dispersal of clay particles due to ion exchange, and/or mechanical compaction of aquifer materials. Pumping the injection well (backflushing) reverses the flow in the well, alters the geochemical environment, and dislodges clogging particles. In this manner, backflushing repairs some of the wellbore damage that occurs over time and restores injection rates. Optimal backflushing rates and schedules are best determined once the project is in operation and actual injection rates can be monitored. Backflushing would be conducted only as needed, based on injection rate monitoring. The project proponent would not backflush unnecessarily as it would result in additional costs that could be avoided. Backflushing operations at the nearby Monterey Peninsula Water Management District ASR wellfield include weekly pumping of each well for several hours at twice the original injection rate. For planning purposes, these operations have been assumed to be applicable to the Proposed Project injection wells. Assuming a maximum injection design of 1,000 gallons per minute (gpm) for the deep injection wells, a maximum backflushing design of 2,000 gpm has been assumed. This is considered a maximum amount of backflushing because the highly treated (purified recycled) water injected by the Proposed Project will likely result in lower clogging rates than the water injected into the ASR wells and may require less frequent backflushing. In addition, only two to three wells will operate at any given time to accommodate the monthly injection schedule envisioned for the Proposed Project, with at a minimum one back-up well (see Draft EIR Appendix L page 30; see also Draft EIR Table 2-9). Only active wells will be subject to periodic backflushing. Further, if the Proposed Project

wells are injecting at rates lower than the design rate of 1,000 gpm (which will occur during most months), the extraction for backflushing would be conducted at a rate lower than the design rate of 2,000 gpm. To estimate the maximum weekly amount for purposes of designing the backwash discharge facilities (i.e., percolation basins), the Proposed Project assumes up to four hours of weekly backflushing at up to 2,000 gpm, producing approximately 480,000 gallons (1.47 AF) per well per week (page 36, Appendix L, Draft EIR). For three active wells, backflushing would produce a maximum of about 229 AFY, which is less than but close to the amount of Proposed Project water allocated for the Paso Robles Aquifer for some years (Table 2-9, Draft EIR). Water pumped for backflushing would be discharged into a small surface basin constructed near the injection wellfield as part of the Proposed Project. The basin would be located on the Aromas Sand, which comprises the upper 300- to 400-feet of vadose zone beneath the Proposed Project Injection Well Facilities area. This geologic unit was determined to be highly permeable in a recent nearby field investigation (see page 16 in Appendix L). Water will be conveyed from the well to the basin and allowed to infiltrate into the permeable site sediments and percolate to the water table. By allowing the water to recharge, pumped water would be conserved in the groundwater basin. This approach for infiltration of back-flushed water was conceptually approved by the SWRCB Division of Drinking Water (DDW) (June 2014). Discharge of groundwater backflushed from the deeper aquifer will be recharged into and primarily replenish the shallow aquifer. Although this removes a small amount of groundwater from the deeper aquifer, replenishment of the shallow aquifer is beneficial to the basin. As discussed in the Draft EIR (pages 4.10-18 to 4.10-19), both aquifer systems have been over-drafted historically. The replenishment of the shallow aquifer will increase water levels locally, which may increase local rates of vertical leakage into the deeper aquifer. Water remaining in the shallow Paso Robles Aquifer will be available for extraction by downgradient production wells that are at least partially screened in the Paso Robles Aquifer, including the nearby Paralta well. A recent study (Yates, et al., 2005) estimated that approximately 15% of the production in the Paralta well is from the shallow Paso Robles Aquifer. Although the percolating water will require a lag time (up to about 200 days) prior to reaching the water table, the transport time will be shortened with continued recharge and a steady state condition of replenishment will occur at the water table. Importantly, all of the percolating water will be conserved in the basin. This transfer of water pumped from the deeper Santa Margarita Aquifer into the shallow Paso Robles Aquifer is too small to have a significant impact on deeper water levels according to the groundwater significance criteria (see page 4.10-45 in the Draft EIR). Except for the short amount of time when wells are pumped, water will be continually injected into Proposed Project wells, which will more than compensate for any short-term lowering of water levels. Further, because the Proposed Project has injection capacity for both aquifers, an equivalent amount of injection water previously targeted for the shallow aquifer could be re-allocated to the deeper aquifer, if warranted. Ongoing monitoring of water levels by the Monterey Peninsula Water Management District will allow for real-time adjustments to be made to the amounts injected into either of the two Seaside Basin aquifers as needed. The option of discharging the backflush water into the Seaside Golf Course reservoir was raised in a comment on the Draft EIR. Although technically feasible, the transport/conveyance associated with this concept would add unnecessary costs to the Proposed Project, as well as increase energy use, potentially increasing the impact of greenhouse gas emissions. Further, if the water is not recharged back into the basin, the well maintenance may complicate the amount of downgradient extraction planned as part of Proposed Project operations and result in a reduced ability for the Proposed Project to meet its objectives. An additional comment suggested re-routing the backflushed water through the sanitary sewer to the RTP and AWT Facility then, after treatment, returning it to the Seaside Basin via injection as an offsetting flow. This would amount to treating the same water twice, would require a substantial use of energy to convey the water to and from the treatment plant (increasing impacts related to greenhouse gas emissions and energy demand), and is not warranted given the planned operation of the Proposed Project. Because these potential alternative components (discharge of well backflush water to the Seaside golf course reservoir or back to the RTP) would result in increased environmental impacts and would not better meet the project objective to produce reasonably-priced water, they are not considered further in this EIR. Finally, a comment suggested that the backflush water be considered for mitigation and treatment relating to H₂S gas. As previously discussed in Master Response #7: Well Development/Construction Water Use and Discharge, naturally-occurring H₂S gas

has been detected in low concentrations – up to about 0.75 mg/L – in groundwater samples from local Santa Margarita wells (Fugro, 1997). These concentrations could potentially result in a short-term odor when H₂S volatilizes from groundwater in the back-flush basin, but would result in a less-than-significant odor nuisance impact and would not create or increase human health or ecological risks for the following reasons:

- The injection well sites are located a minimum of 500 feet from any sensitive receptors (i.e., City of Seaside residences). Most wells are more than 1,000 feet from potential receptors.
- The backflush water will be composed mostly of the highly-treated purified recycled water that does not contain H₂S.
- Nearby ASR wells are operated in the same manner related to routine well backflushing and discharge of backflush water to a similar surface basin. These facilities are located in closer proximity to residences in the City of Seaside with no complaints from nearby residents. Given the initial low H₂S concentrations, the distance to sensitive receptors (closest residences located more than about 500 to 600 feet away), and the dilution of H₂S with Proposed Project water, there is no need to mitigate or treat development water at the Proposed Project site. Nonetheless, monitoring for H₂S gas will be part of the health and safety program during the well construction field program and will be considered for the groundwater monitoring program to be developed for the Proposed Project Engineering Report.

In response to this comment, the text of the air quality impact analysis on pages 4.3-30 through 4.3-31 for odors during construction has been revised to further clarify the less than significant impacts of odors during construction. See Chapter 5, Changes to the Draft EIR.

COMMENT: In the last paragraph on this page the word “of” should be replaced with the word “or.”

RESPONSE: The identified typographical error (last paragraph, last sentence on page 2-77 of the Draft EIR changing the word “of” to “or”) has been corrected. See Chapter 5, Changes to the Draft EIR.

COMMENT: The Legend of this Figure is titled “Adjudicated Seaside Groundwater Basin Boundary.” The boundary that is shown does not accurately match the Adjudication Decision boundary, as noted in the comment above on Figure 4.10-5. The Legend title should be revised or the boundary shown should match the Adjudication Decision boundary.

RESPONSE: The Legend Title of Figure 2-3 on page 2-95 of the Draft EIR has been revised to indicate the correct contents of the legend as requested in this comment. See Chapter 5, Changes to the Draft EIR.

COMMENT: In the Legends for the two maps on this page please add a footnote clarifying what is meant by “Deep Zone.”

RESPONSE: The terms “deep zone” and “shallow zone” in the Seaside Basin generally correlate to the Santa Margarita Aquifer and Paso Robles Aquifer, respectively. Because contours extend into areas where these formations do not exist, this generalized nomenclature developed by Yates (et al., 2005) has been adopted by HydroMetrics, the Seaside Watermaster’s hydrogeologic consultants that created the basin groundwater model and the source of the contours (HydroMetrics’ Memorandum to Bob Holden; Subject: Groundwater Replenishment Project Development Modeling, October 2, 2013; see Appendix C within the Draft EIR’s Appendix L, Figures 8 and 9 citing the original source). Although the two maps on Figure 2-4 in the Draft EIR have been appropriately labeled as Paso Robles Water Levels and Santa Margarita Water Levels, the legend on the top map has been incorrectly labeled as “Deep Zone Water Elevation contour” in the legend (and should be labeled “Shallow Zone” water elevation). Both legends on Figure 2-4 on page 2-96 of the Draft EIR have been revised to indicate the name of each aquifer for the Final EIR in response to this comment. See Chapter 5, Changes to the Draft EIR.

COMMENT: In the Table of Contents at the top of this page the Section number for “Hydrogeology/Water Quality-Groundwater” should be 4.10, not 4.1.

RESPONSE: Page 4.1-1 of the Draft EIR has been modified to correct the typographic error as requested in this comment. See Chapter 5, Changes to the Draft EIR.

COMMENT: Please add that the southeasterly boundary of the Seaside Basin is also a groundwater divide that is subject to movement.

RESPONSE: The text in Section 4.10.2.4, page 4.10-16 (top paragraph) in the Draft EIR has been revised to clarify that the southeasterly boundary of the Seaside Basin is also a groundwater divide that is subject to movement. See Chapter 5, Changes to the Draft EIR.

COMMENT: The boundary for the Seaside Basin in this Figure appears to be approximately the same as the Court Adjudication boundary, except in the eastern portion of the Basin. Since the Adjudication Decision imposes management and other requirements on the area within the Adjudication boundary it would be good to also show the exact Adjudication boundary on this Figure.

RESPONSE: Figure 4.10-5 has been replaced with a revised version (Figure 4.10-5rev) in response to this comment. See Chapter 5, Changes to the Draft EIR.

COMMENT: Please add that since the activities described in the M&MP completed in September 2006 have been accomplished, the Watermaster has prepared an updated M&MP each year to address changing conditions and issues of concern. These are submitted to the Court each year as part of the Watermaster's Annual Report.

RESPONSE: Page 4.10-40 of the Draft EIR has been amended as requested in this comment to add the following text: "The activities described in the 2006 M&MP have been accomplished, and the Watermaster has prepared an updated M&MP each year to address changing conditions and issues of concern. These are submitted to the Court each year as part of the Watermaster's Annual Report." See Chapter 5, Changes to the Draft EIR.

COMMENT: These pages include the statements that:

- (1) "The volume of water pumped for development of each well would be about 3,600,000 gallons, based on four 10-hour days of development pumping at 1,500 gpm as estimated by Todd Groundwater. If the water used for development were drawn from groundwater and not returned as recharge, aquifer volumes or groundwater levels could be decreased; however, well development water at the Injection Well Facilities would be allowed to percolate back to the groundwater basin through on-site disposal resulting in a less-than-significant impact to aquifer volumes and groundwater levels."
- (2) "The Injection Well Facilities construction would not use substantial amounts of groundwater that would not be returned to the groundwater system and would not impact groundwater volume or levels due to loss of recharge."
- (3) "Impacts associated with groundwater depletion, levels and recharge during the construction of the Proposed Project would be less than significant."
- (4) "Therefore, for the project as a whole, the potential construction impacts would be less than significant relative to groundwater recharge, volume, or levels, and no mitigation measures would be required."

The Project proposes to develop four wells using this volume of water so collectively the amount that would be pumped from the Seaside Basin for well development would total approximately 45 acre-feet. The Adjudication Decision does not appear to make any provision for this pumping, and makes no allocation of groundwater pumping for this purpose.

In addition surface recharge at the proposed development water percolation sites will take a long period of time before the recharged water reaches the Santa Margarita (and even the Paso Robles) aquifers. Also, some of it may remain in the overlying Aromas Sands and not reach either of the two other aquifers. Therefore, it is not reasonable to assume that allowing the development water to percolate through on-site disposal will have a less than significant impact on groundwater levels or aquifer volumes. This is particularly true since the wells will be in close proximity to each other and the development water pumping might produce a localized groundwater depression.

One approach that would address this concern would be to return the development water to MRWPCA's Regional Plant by disposing of it into the sanitary sewer. That volume could then be sent through the AWT and come back to the Seaside Basin as an additional offsetting flow that could be injected back into the Santa Margarita aquifer to ensure that this aquifer does not experience any net depletion due to development activities.

These issues should be addressed in the design of the Project and will need to be resolved to the satisfaction of the Watermaster before well development can occur.

RESPONSE: The use and discharge of groundwater during well construction (drilling) and well development represent a one-time use of a relatively small amount of water, most of which will be recharged to the Seaside Groundwater Basin. Water use and discharge methods relating to the injection well construction are discussed in the Draft EIR (see pages 2-75 through 2-76 and 4.10-53 and 4.10-54; also, see Appendix L, pages 41 through 47) and are summarized below. During well drilling, water is circulated in the borehole and combined with inert substances such as bentonite or gels to control density and viscosity (referred to as drilling fluids or mud). The purpose of the drilling fluids is to lubricate the drilling bit and transport cuttings of the natural geologic sediments to the surface. The amount of water required for each well will vary with the volume of the borehole and the amount of fluid loss (recharge) to the formation during the drilling process. Well drilling for four deep injection wells and four deep monitoring wells is expected to take approximately 5 days to complete for each well and is expected to require about 2,500 gallons of water per day for a total of 12,500 gallons (0.04 AF) of water per well for the deep injection wells. Water use will likely be less than one-half of that amount for the four shallow vadose zone wells. Total construction water is estimated at less than 1 AF for all project wells. The source of the construction water for well drilling has not yet been identified, but it would likely be pumped from local groundwater, conveyed from a local fire hydrant, or hauled in from an out-of-basin source. After the well has been drilled, the drilling fluids will be flushed from the well and either disposed offsite or partially applied to the local land surface in compliance with Regional Water Quality Control Board (RWQCB) regulatory requirements. Water quality impact analyses of construction related discharges are provided on pages 4.10-55 through 4.10-56 and 4.11-56 through 4.11-62 of the Draft EIR. After the wells have been drilled and installed, each well will be developed in order to maximize well yield. Well development consists of applying energy to the well-aquifer interface via both mechanical methods such as swabbing and pumping methods. Well development activities are conducted typically on all production and injection wells and have been performed on most, if not all, production wells in the Seaside Groundwater Basin. Pumping for well development serves two purposes: (1) it repairs clogging that may have occurred during drilling to restore the natural hydraulic properties, and (2) it alters the physical characteristics of the aquifer near the wellbore so that water flows more freely into the well. This process does not rely on an external water source and is accomplished by pumping local groundwater. Almost all of the water pumped for well development can be conserved through land application, allowing the water to infiltrate into the local permeable soils at the drill sites and to percolate back into the groundwater system. This discharge method is considered to be a best management practice by the RWQCB and has been used by most of the nearby production wells and nearby Monterey Peninsula Water Management District Aquifer Storage and Recovery (ASR) wells drilled in the Seaside Groundwater Basin. For the Proposed Project, such discharge will be conducted in compliance with a RWQCB General Waste Discharge Requirement (WDR) order (General Order 2003-003) for Discharges to Land with a Low Threat to Water Quality (including well development water). The Order requires identification of any potential pollutants associated with the discharge and a monitoring program. For the Proposed Project, well development will only apply to the four deep injection wells; vadose zone wells are not subject to the same type of well development requirements as the deep injection wells. Based on a reasonable assumption of the amount of time required to develop the four deep injection wells, approximately 3,600,000 gallons (11 AF) will be pumped from each well during development (Draft EIR, page 4.10-54). The Seaside Basin Adjudication defines the de minimus amount for production as 5 AFY. While the estimated amount for well production for the Proposed Project is 11 AF per well, unlike production, the groundwater pumped for development is not removed permanently from the groundwater

basin. Through land discharge, the development water would be returned to the basin through local infiltration and percolation. In addition, any extra water pumped for aquifer testing and/or groundwater sampling would also be percolated back into the groundwater basin. Given the permeable soils at the Proposed Project site, only very small amounts of water would be lost to evaporation and actual consumption would be well below the estimated de minimus amount (see pages 16 and 37 in Appendix L, Draft EIR). The option of discharging the development water into the Seaside Golf Course reservoir was raised as part of the public comments. Although technically feasible, that transport/conveyance would add unnecessary energy use and associated greenhouse gas emissions, potentially contributing to climate change impacts of the Proposed Project. It would also add to the Proposed Project cost. Because this potential alternative component (discharge of well construction and development water to the Seaside golf course reservoir) could result in increased environmental impacts and would not better meet the project objective to produce reasonably-priced water, it is not considered further in this EIR. Other production wells drilled in the Seaside Basin to date have used similar amounts of water during construction and development and have successfully discharged development water to the land surface for infiltration. Specifically, all of the ASR wells have employed this method (Joe Oliver, personal communication, ongoing). Naturally-occurring hydrogen sulfide (H₂S) gas has been detected in low concentrations – up to about 0.75 mg/L – in several local Santa Margarita wells (Fugro, 1997). During construction of a nearby ASR well (ASR 3) drilled near the Seaside Middle School, development water was conveyed offsite to another discharge location due to the short-term odor problems associated with naturally-occurring H₂S. The Monterey Peninsula Water Management District monitors H₂S in the ASR wellfields; detections to date have been similar or lower than published values (Pueblo Water Resources, 2014). These concentrations are not a health concern for drinking water or as an air pollutant, but can affect the taste and odor of the water¹⁰. The dissolved H₂S can volatilize when development water is exposed at the surface. This volatilization created a localized short-term nuisance for odor during discharge of development water at the ASR 3 wellsite. The remote location of the Proposed Project injection well sites would eliminate this public concern. Specifically, as shown and described in the Draft EIR on pages 4.3-26 through 4.3-28 and pages 4.14-29 through 4.14-41, the nearest sensitive receptors to this site are residences located west of General Jim Moore Boulevard at distances of 500 to 700 feet from the nearest proposed well sites and about 1,200 feet from the proposed back-flush facility. The Seaside Middle School is located approximately 700 feet northwest of the Injection Well Facilities site. Given the low H₂S concentrations, the distance to receptors, and the fact that nearby ASR 1 and ASR 2 wells (located within 300 feet of residences in the City) did not experience problems with H₂S odor nuisances during development water discharge, there is no need to mitigate or treat development water at the Proposed Project site. Nonetheless, monitoring for H₂S gas will be part of the health and safety program during the well construction field program and will be considered for the groundwater monitoring program to be developed for the Proposed Project Engineering Report. In response to this comment regarding H₂S emissions, the text of the air quality impact analysis on page 4.3-28 for odors during construction has been revised to further explain the conclusion that odor impacts during construction would be less than significant. See Chapter 5, Changes to the Draft EIR. Development discharge composed of groundwater from the deeper aquifer will be recharged into and primarily replenish the shallow aquifer. This would, in effect, transfer a small amount of groundwater from the deeper aquifer to the shallow aquifer, which are hydraulically connected. As stated on page 4.10-19 of the Draft EIR, most of the recharge to the Santa Margarita Aquifer is assumed to occur by leakage from the overlying Paso Robles Aquifer, especially in areas where the lower part of the Paso Robles Aquifer is relatively permeable. As discussed in the Draft EIR (pages 4.10-18 through 4.10-19), both aquifer systems have been over-drafted historically. The replenishment of the shallow aquifer will increase water levels locally, which may increase local rates of vertical leakage into the deeper aquifer. Water remaining in the shallow aquifer would be available for extraction by downgradient production wells, many of which are at least partially screened in the Paso Robles Aquifer, including the nearby Paralta well. A recent study (Yates, et al., 2005) estimated that approximately 15% of the production in the Paralta well is from the shallow Paso Robles Aquifer. Although the percolating water will require a lag time (up to about 200 days) prior to reaching the water table, the transport time will be shortened with additional recharge and a steady state condition of replenishment will occur at the water table. A recent

field program documented highly permeable sands throughout the vadose zone. Importantly, all of the percolating water will be conserved in the basin. This one-time movement of water pumped from the deeper Santa Margarita Aquifer into the shallow Paso Robles Aquifer is too small to have a significant impact on deeper water levels according to the significance criteria for groundwater impacts (see page 4.10-45 in the Draft EIR). Nonetheless, because the Proposed Project has injection capacity for both aquifers, an equivalent amount of injection water previously targeted for the shallow aquifer could be re-allocated to the deeper aquifer, if warranted. Ongoing monitoring of water levels by the Monterey Peninsula Water Management District – including before, during, and after construction of the Proposed Project – will allow for real-time adjustments to be made to the amounts injected into either of the two Seaside Basin aquifers as needed.

COMMENT: The statement is made on this page that “...all other cumulative projects are approved or mandated by the Seaside Basin Watermaster.” One of the listed projects is the MPWSP. While the Watermaster supports the MPWSP, it did not approve or mandate this project.

RESPONSE: The comment references the following sentence (emphasis added): “The cumulative conditions considered for the Overall Cumulative Projects would be the same as the combined analysis of implementation of the Proposed Project and the MPWSP with a 6.4 mgd desalination plant because all other cumulative projects are approved or mandated by the Seaside Basin Watermaster so would occur both with the combined scenario and under conditions expected with all other cumulative projects implemented.” The sentence use of the words “all other” is intended to exclude the MPWSP as being one that is approved or mandated by the Watermaster; so the Draft EIR is consistent with this comment.

COMMENT: At several places in this Appendix it is stated that one of the requirements for the Project will for the proponents to submit, and receive approval from the SWRCB’s Division of Drinking Water (DDW), a Response Retention Time (RRT) Plan. The purpose of this Plan is to provide measures to ensure that no water from the Project is allowed to reach any drinking water supply well if the recharged water quality does not comply with the required standards. Due to the critical nature of water quality and the likelihood of public concern about possible contamination of drinking water supplies due to recharging the Basin with treated wastewater, the Watermaster would like to have the opportunity to review and comment on the Project’s Response Retention Time Plan when it is submitted to the DDW for its review.

Also in Appendix D, Attachment A (letter from California Department of Public Health dated June 5, 2014 mention is made of the requirement for MRWPCA to submit both a “Contingency Plan” (along with the Engineering Report) and a “Response Plan.” These appear to be separate from the RRT Plan. The Contingency Plan, according to that letter is to “...ensure that no untreated or inadequately treated wastewater will be delivered to the use area.” The on-line sensors included in the design will presumably identify some types of chemical-physical water quality deviations from the State’s requirements, but the water will have already left the AWT and gone into the delivery pipeline once it passes through those sensors. An even more difficult issue is that the wet-lab analytical work that will be necessary to confirm that the water produced by the AWT meets State quality requirements (e.g. pathogens, primary and secondary MCLs, lead, copper, total nitrogen, and TOC) will take some time to process and the water that is tested will long since have left the AWT and be in the pipeline leading to the use area. As there appears to be no storage facility included in the AWT design to contain the treated water until its quality has been confirmed as meeting the State’s requirements, what is the plan for complying with the requirement that no inadequately treated water is delivered to the use area?

With regard to the State’s requirement that MRWPCA have an approved Response Plan, the table in Appendix D on page 66 includes a statement that “Prior to start-up of the GWR Project, MRWPCA will develop and submit a plan to DDW to provide an alternative source of water or a DDW-approved treatment system should the GWR Project impact a drinking water well so that it cannot be used as a water supply or the GWR Project fails to meet the pathogen control requirements.” For the same reasons

stated above, the Watermaster would like to have the opportunity to review and comment on the Project's Contingency and Response Plans when they are submitted to the DDW for its approval.

RESPONSE: Pursuant to the Final Groundwater Replenishment Regulations as discussed in Appendix D, the project proponents must develop a proposed Response Retention Time (RRT) for inclusion in the draft Engineering Report for the Project that will be submitted to the State Water Resources Control Board – Division of Drinking Water for approval and review by the Regional Water Quality Control Board. A copy of the draft Engineering Report will be provided to the Watermaster for review and comment.

Pursuant to the Final Groundwater Replenishment Regulations as discussed in Appendix D, the project proponents must develop a contingency plan for inclusion in the draft Engineering Report for the Project that will be submitted to DDW for approval and review by the RWQCB. The regulations do not specify what must be included in the Contingency Plan. Based on other groundwater replenishment projects, typical elements of a Contingency Plan include the following: • treatment system controls, reliability and redundancy, • critical control point monitoring, • operations during source control and treatment process upsets at the Regional Treatment Plant and AWT Facility, and • an emergency response plan. The regulations require the development of a response retention time (RRT), which is not a plan, but as discussed in Appendix D, an estimate of the time needed to retain recycled water underground to identify any treatment failure so that inadequately treated recycled water does not enter a potable water system. Sufficient time must elapse to allow for a response that will protect the public from exposure to inadequately treated water, and provide an alternative source of water or remedial treatment at the wellhead if necessary. The RRT is the aggregate period of time that includes: (1) time between treatment verification samples or measurements; (2) time to make the measurement or analyze the sample; (3) time to evaluate the results; (4) time to make a decision regarding the appropriate response; (5) time to activate the response; and (6) time for the response to work. A copy of the draft Engineering Report will be provided to the Watermaster for review and comment. The regulations, as discussed in Appendix D, also include provisions for monitoring and reporting to ensure that the quality of recycled water used for injection is safe – the regulations do not require storage and testing prior to injection. All of these requirements and contingency provisions will be incorporated into the permit issued by the RWQCB for the project.

Pursuant to the Final Groundwater Replenishment Regulations as discussed in Appendix D, prior to startup of operations, the project proponents must develop a plan to provide an alternative source of water or treatment system should a groundwater replenishment project impact a drinking water well so that it can no longer be used as a source of water supply. A description of the plan will be included in the draft Engineering Report for the Project that will be submitted to DDW for approval and review by the RWQCB. A copy of the draft Engineering Report will be provided to the Watermaster for review and comment.

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	2.D
AGENDA TITLE:	Sustainable Groundwater Management Act (SGMA) Update
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Change in Groundwater Storage Reporting Requirement: A webcast presented jointly by the SWRCB and the DWR was held on October 27 and I participated in it via their webcast site. In this webcast State staff presented a general overview of the SGMA requirements and responded to questions from the live audience and the webcast audience. I submitted a question regarding whether we would be required to develop data regarding the change of groundwater storage during the reporting period when we submit our Annual Reports to DWR, as required by SGMA as an Adjudicated Basin. As you may recall we included a task in this year's M&MP to have HydroMetrics develop that data if in fact we have to submit it. However, the language in that Section of the SGMA qualifies that the data Adjudicated Basins must submit is "...to the extent available..." Since we do not currently determine the annual change in storage in our basin, this data is not available, so my interpretation was that we would not need to develop it.

I wanted to get confirmation that my interpretation was correct, so I submitted my question during the webcast. Unfortunately, they choose not to answer the question during the webcast but promised to provide email responses to all questions that they did not answer. The first email response that I received from DWR on November 5 indicated that they would have to get a legal interpretation of the Water Code, and that they were working with their legal staff to prepare a response. I received a second response from DWR on November 6 in which they stated that after consulting with their legal staff and the program team they agreed that if the Watermaster does not already have groundwater storage information, we would not be required by the law to collect it. However, if that information could be estimated based on existing data, it would be appropriate to provide that estimate with a description of the methods and assumptions used.

In my question to DWR I described two methods that I felt could be used, as follows:

1. A simple approach would be to estimate the amount of recharge to the basin that occurred from rainfall and other sources during the reporting period, and subtract from that the amount of pumping that was done during that same reporting period. The difference between these two amounts would be an estimate of the change, either positive or negative, in groundwater stored in the basin. This approach could likely be done in-house using available rainfall and production data and would likely not require consultant assistance.
2. A more complex approach would be to develop groundwater elevation contours at the start and end of the reporting period, and to then determine the change in volume of stored water between those two sets of groundwater contours. This would require assistance from HydroMetrics, who estimated it would cost approximately \$1,900 to perform this analysis.

TAC direction on the preferred approach is requested.

Incorrect Location of Adjudication Boundary: In reviewing certain of the many documents posted on

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

AGENDA ITEM:	2.D (Continued)
DWR's website regarding the SGMA I found that they have incorrectly shown the entire Seaside Subbasin (of the larger Salinas Valley Basin) as being adjudicated. I sent them a map Joe Oliver had prepared that showed the Seaside Subbasin boundary, as contained in DWR Bulletin 118, and the Adjudication Decision boundary and asked DWR to correct their map to show that the Seaside Basin Adjudication Decision only applies to a portion of the Seaside Subbasin. Attached is a copy of the DWR website's map and also the one prepared by Mr. Oliver. DWR responded saying that they will correct their mapping to properly show the Adjudication boundary location. <u>Regulations for Requesting Boundary Changes:</u> DWR has recently adopted its regulations to revise basin boundaries from those currently shown in their Bulletin 118 and will initially accept requests for boundary revisions for a 90 day period beginning on January 1, 2016. They indicate that they will have additional submittal periods which they will provide notice of, but do not indicate how long into the future it may be after the initial submittal period before they open up another submittal period. Attached are DWR's regulations which require considerable supporting documentation, coordination with other potentially affected agencies, public review, and CEQA compliance, among other things. Thus, if any entity wished to request a boundary revision this complex process would need to be carried out rapidly. According to Russ McGlothlin the Watermaster would not qualify to submit a boundary revision request, even if it wished to, as it is not a "local agency" as defined by Water Code Section 10721(m) (which is SGMA Section 10721(m)). He reports that DWR is taking a strict line on this. However, he said that any of the cities or the MPWMD could do so. At this point it is not known whether the Watermaster would want to seek a boundary revision, which according to Mr. McGlothlin would have to be submitted by another entity. If the Watermaster did wish to seek a boundary revision it would probably be best to try to coordinate that with MCWRA or MPWMD.	
ATTACHMENTS:	1. Descriptive brochure of the SGMA 2. Maps of basin boundaries pertaining to the Seaside Basin 3. DWR's regulations for requesting boundary changes
RECOMMENDED ACTION:	Provide direction on approach to be used to estimate change in storage volume



What is sustainable groundwater management?

Sustainable groundwater management balances groundwater resources in a manner that ensures basin resiliency and benefits present and future generations. The SGMA defines **sustainable groundwater management** as the management of groundwater supplies in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.

The **planning and implementation horizon** is a 50-year time period over which plans and measures will be implemented in a basin to ensure that the basin is operated within its sustainable yield. **Sustainable yield** is the maximum quantity of water that can be withdrawn annually from a groundwater supply without causing undesirable results (as calculated over a base period that represents long-term conditions including any temporary surplus). **Undesirable results** include significant and unreasonable chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface waters.

The SGMA directs DWR to publish best management practices for sustainable groundwater management by January 1, 2017.

Resources

Financial

Proposition 1 provides \$100 million for sustainable groundwater management planning and related projects. The proposition also provides substantial funding for groundwater cleanup, storage projects, and other actions that will help local agencies sustainably manage groundwater. Information on how local agencies can apply for Proposition 1 funding will become available as soon as July 2015.

Technical

The SGMA calls on the state to provide technical assistance to groundwater sustainability agencies and to entities that extract or use groundwater to promote water conservation and protect groundwater resources. Both state and local agencies will provide assistance. For updates on state efforts, please visit the agency websites listed below.

CalEPA

California Groundwater
www.groundwater.ca.gov

Department of Water Resources

Groundwater Information Center
www.water.ca.gov/groundwater/

State Water Resources Control Board

Groundwater Management Program
http://www.waterboards.ca.gov/water_issues/programs/gmp/

All photographs in this brochure are credited to the
California Department of Water Resources

January 2015



Sustainable Groundwater Management Act

“Local agencies will now have the power to assess the conditions of their local groundwater basins and take the necessary steps to bring those basins in a state of chronic long-term overdraft into balance.”

-Governor Edmund G. Brown Jr.
From the letter accompanying the signing
of AB 1739, SB 1168 and SB 1319



Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) is a package of three bills (AB 1739, SB 1168, and SB 1319) that provides local agencies with a framework for managing groundwater basins in a sustainable manner. Recognizing that groundwater is most effectively managed at the local level, the SGMA empowers local agencies to achieve sustainability within 20 years.

The SGMA:

- Respects regional differences and provides for a tailored approach to planning
- Establishes minimum standards for sustainable groundwater management
- Improves coordination between land use and groundwater planning
- Provides state technical assistance
- Creates a mechanism for state intervention if, and only if, a local agency is not managing its groundwater sustainably
- Protects water rights

Groundwater Basins (Basins)

Department of Water Resources (DWR) Bulletin 118 identifies 515 alluvial groundwater basins in California. The SGMA recognizes these basins as the initial boundaries for groundwater management and directs DWR to develop a process for revising basin boundaries by January 1, 2016.

Groundwater Sustainability Agency (GSA)

A local agency, combination of local agencies, or county may establish a GSA. It is the GSA's responsibility to develop and implement a groundwater sustainability plan that considers all beneficial uses and users of groundwater in the basin. GSAs must be formed by June 30, 2017.

Groundwater Sustainability Plan (GSP)

GSAs must develop GSPs with measureable objectives and interim milestones that ensure basin sustainability. A basin may be managed by a single GSP or multiple coordinated GSPs. DWR will develop regulations for evaluating GSPs and alternatives to GSPs by June 1, 2016.

High and Medium Priority Basins:

DWR conducted an initial prioritization of all 515 basins. The SGMA requires high and medium priority basins to develop GSPs. Low and very low priority basins are encouraged, but not required, to develop GSPs.

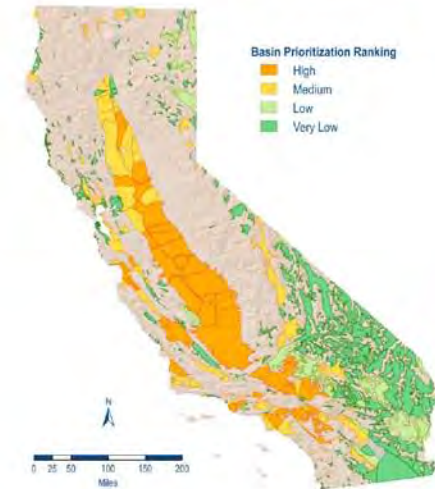
Basins in Critical Overdraft:

DWR will identify basins subject to critical conditions of overdraft by January 1, 2017. High and medium priority basins in critical overdraft must develop GSPs by January 31, 2020.

Alternatives to Groundwater Sustainability Plans:

A basin can be managed by an alternative to a GSP if approved by DWR. Alternatives to GSPs are due to DWR for evaluation and assessment by January 1, 2017.

Final Basin Prioritization



State Backstop

If a local agency is not managing its groundwater sustainably, the SGMA directs the State Water Resources Control Board (State Water Board) to protect the resource until a local agency can sustainably manage the basin. The State Water Board may initiate the State Backstop process in the following circumstances:

- A basin has no GSA after June 30, 2017.
- A high or medium priority basin in critical overdraft has no GSP or the GSP is inadequate after January 31, 2020.
- A high or medium priority basin not in critical overdraft has no GSP or the GSP is inadequate after January 31, 2022.
- A high or medium priority basin has no GSP, or the GSP is inadequate, and there are significant depletions of interconnected surface waters after January 31, 2025.

Steps to Sustainability

June 1, 2016

DWR adopts regulations for evaluating groundwater sustainability plans

June 30, 2017

Groundwater sustainability agencies formed

January 31, 2020

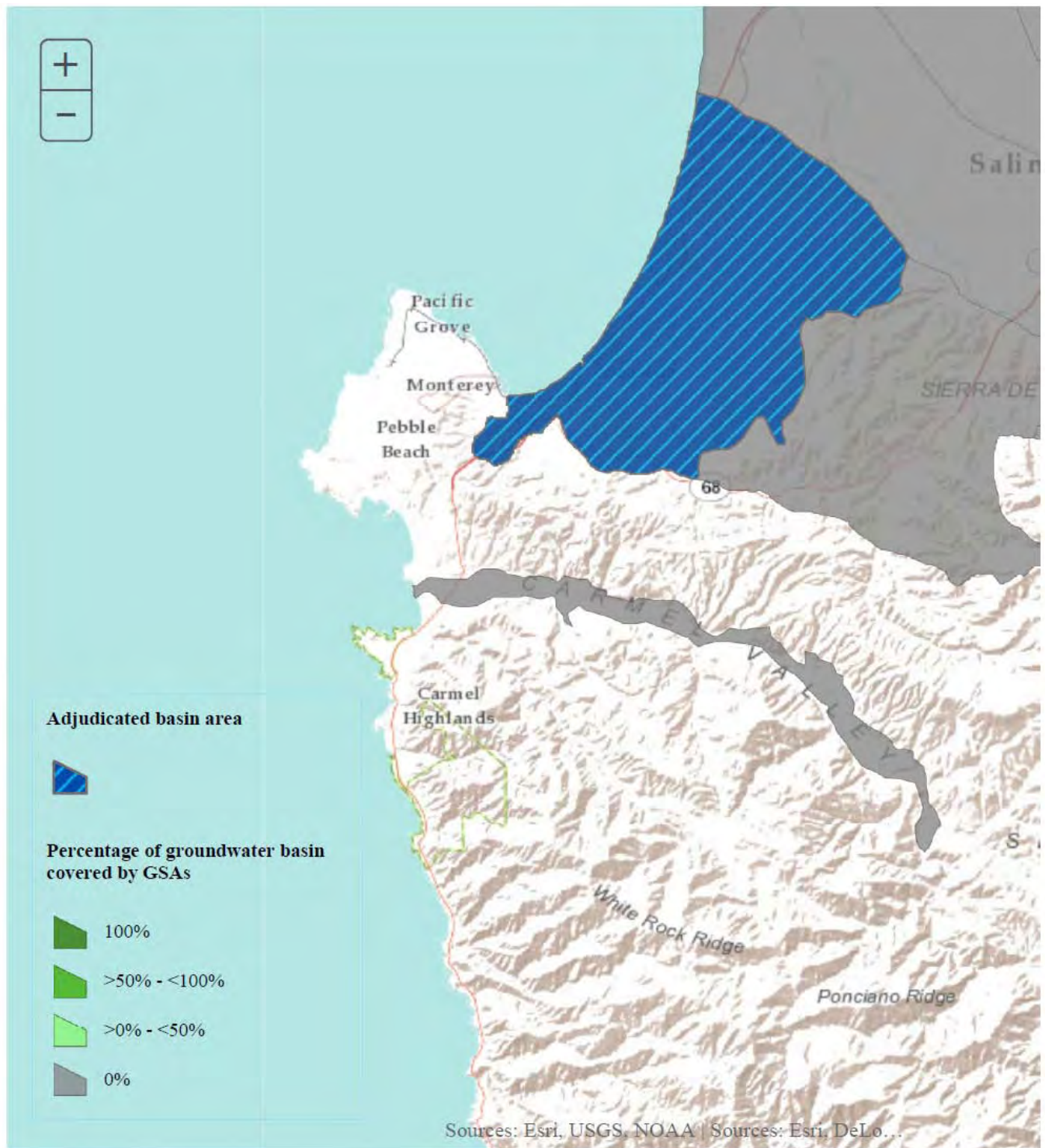
High and medium priority basins in critical overdraft managed by groundwater sustainability plans

January 31, 2022

All high and medium priority basins managed by groundwater sustainability plans

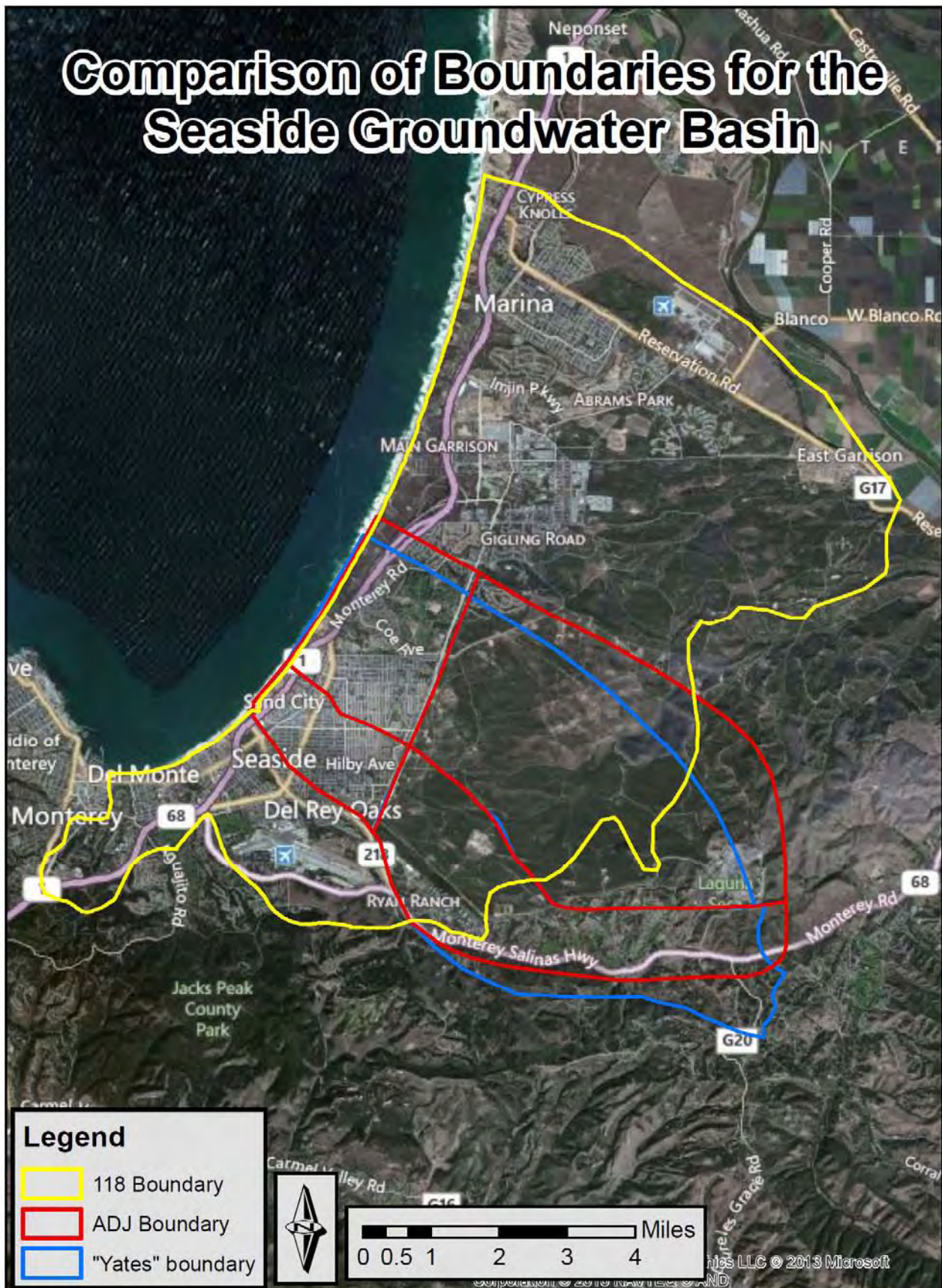
January 31, 2040/2042

All high and medium priority basins achieve groundwater sustainability (twenty years after plan is adopted)



DWR website's map of the Adjudicated Seaside Basin

Comparison of Boundaries for the Seaside Groundwater Basin



Map Prepared by Joe Oliver

CALIFORNIA CODE OF REGULATIONS
 TITLE 23. WATERS
 DIVISION 2. DEPARTMENT OF WATER RESOURCES
 CHAPTER 1.5. GROUNDWATER MANAGEMENT
 SUBCHAPTER 1. GROUNDWATER BASIN BOUNDARIES
 ARTICLE 1. Introductory Provisions

§ 340. Authority and Purpose

These regulations specify the information a local agency is required to provide when requesting that the Department revise the boundaries of a basin or subbasin, including the establishment of new subbasins, and the methodology and criteria used by the Department to evaluate a modification to existing basin or subbasin boundaries.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 12924, Water Code.

§ 340.2. Intent

The revision of the boundaries of any basin or subbasin or creation of new subbasins that are adopted by the Department shall be consistent with the State's interest in the sustainable management of groundwater basins as expressed in the Sustainable Groundwater Management Act (Part 2.74 of Division 6 of the Water Code, beginning with Section 10720).

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10720.1, Water Code.

§ 340.4. Basin Boundaries

Unless other basin or subbasin boundaries are established pursuant to these regulations, a basin or subbasin's boundaries shall be as identified in Bulletin 118. A clear and unambiguous written description of a basin or subbasin boundary in Bulletin 118 shall prevail over any inconsistent basin or subbasin boundary as depicted on a map, in an electronic data file, or otherwise, except when modified pursuant to these regulations. Any discrepancy or uncertainty shall be resolved by the Department based upon the best available technical information.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10721(b), 10722, 10722.2, and 12924, Water Code.

ARTICLE 2. DEFINITIONS

§ 341. Definitions

In addition to terms defined in the Sustainable Groundwater Management Act and in Bulletin 118, which definitions apply to these regulations, the following terms used in this Chapter have the following meanings:

(a) "Act" means the Sustainable Groundwater Management Act (Part 2.74 of Division 6 of the Water Code, beginning with Section 10720).

(b) "Administrative adjustment" means a basin or subbasin boundary adjustment by the Department that either (1) amends existing basin or subbasin boundary data files to accurately reflect an unambiguous written basin or subbasin boundary description as defined in Bulletin 118 or amended pursuant to this Part, or (2) restates the description of a basin or subbasin boundary to more precisely reflect a mapped basin or subbasin boundary consistent with the original description.

(c) "Affected agency" means a local agency, as defined in Water Code Section 10721(m), whose jurisdictional area would, as a result of a boundary modification, include more,

fewer, or different basins or subbasins than without the modification.

(d) “Affected basin” means a basin or subbasin that is the subject of a boundary modification request and any basin or subbasin where the ability to achieve sustainable groundwater management could be significantly affected by groundwater use or management practices in another existing or proposed basin or subbasin. An adjacent basin or subbasin is presumed to be an affected basin for purposes of this Subchapter. The Department may determine a non-adjacent basin or subbasin is an affected basin if convincing evidence shows that the hydraulic connection to another basin or subbasin is likely to affect the ability of the non-adjacent basin or subbasin to achieve sustainable groundwater management over the planning and implementation horizon.

(e) “Affected system” means a public water system, as defined in Water Code Section 10721(r), whose service area would, as a result of a boundary modification, include more, fewer, or different basins or subbasins than without the modification.

(f) “Aquifer” refers to a three-dimensional body of porous and permeable sediment or sedimentary rock that contains sufficient saturated material to yield significant quantities of groundwater to wells and springs, as further defined or characterized in Bulletin 118.

(g) “Basin” is defined in the Sustainable Groundwater Management Act as a groundwater basin or subbasin identified and defined in Bulletin 118. For purposes of this Chapter, unless the context indicates otherwise, those terms are further defined as follows:

(1) The term “basin” shall refer to an area specifically defined as a basin or “groundwater basin” in Bulletin 118, and shall refer generally to an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom, as further defined or characterized in Bulletin 118.

(2) The term “subbasin” shall refer to an area specifically defined as a subbasin or “groundwater subbasin” in Bulletin 118, and shall refer generally to any subdivision of a basin based on geologic and hydrologic barriers or institutional boundaries, as further described or defined in Bulletin 118.

(h) “Basin consolidation” refers to any boundary modification that would reduce the number of subbasins within a basin or merge two or more adjacent basins but would change only shared boundaries and would not change the external boundary of any basin or subbasin.

(i) “Basin subdivision” refers to any boundary modification that would increase the number of subbasins within a basin or subbasin.

(j) “Boundary modification” means a change to the boundaries of an existing basin or subbasin or the establishment of a new subbasin.

(k) “Commission” means the California Water Commission.

(l) “County basin consolidation” means the consolidation of all contiguous basins or subbasins within a county into a single basin or subbasin whose boundaries do not extend beyond those of the county. If there are non-contiguous basins within a county, the consolidation applies separately to each basin or group of contiguous basins in the county. A county basin consolidation may redefine the shared boundaries of one or more adjacent basins or subbasins, but would not result in a net change in the amount of area included within a basin.

(m) “Department” means the Department of Water Resources.

(n) “External boundary modification” refers to any proposal that would modify the boundary between the groundwater basin and the area outside any basin.

(o) “GIS” means a Geographic Information System that collects, stores, analyzes, and displays spatial or geographically referenced data.

(p) “Hydrogeologic barrier” refers to any subsurface feature that significantly impedes groundwater flow.

(q) “Hydrogeologic conceptual model” means a description of the geologic and hydrologic framework governing the occurrence of groundwater and its flow through and across the boundaries of a basin and the general groundwater conditions in a basin or subbasin.

(r) “Internal boundary modification” refers to any boundary modification that would modify the location of a boundary between subbasins within a basin or the shared boundary between adjacent basins.

(s) “Professional engineer” means a professional engineer licensed pursuant to Business and Professions Code, Division 3, Chapter 7, Section 6700 et seq.

(t) “Professional geologist” means a professional geologist licensed pursuant to Business and Professions Code, Division 3, Chapter 12.5, Section 7800 et seq.

(u) “Qualified map” means a geologic map of a scale no smaller than 1:250,000 that is published by the U. S. Geological Survey or the California Geological Survey, or is a map published as part of a geologic investigation conducted by a state or federal agency, or is a geologic map prepared and signed by a professional geologist that is acceptable to the Department.

(v) “Requesting agency” means the local agency that requests a boundary modification as authorized by Water Code Section 10722.2.

(w) “Request manager” is an employee or authorized representative of a requesting agency who has been delegated responsibility for submitting the boundary modification request and serving as the point of contact between the requesting agency and the Department.

(x) “State” means the State of California.

(y) “Technical study” means a geologic or hydrologic report prepared and published by a state or federal agency, or a study published in a peer-reviewed scientific journal, or a report prepared and signed by a professional geologist or by a professional engineer.

(z) “Written notice” means notification by electronic mail or U.S. Mail.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Division 3, Chapter 12.5, Section 7800 et seq., and Chapter 7, Section 6700 et seq., Business and Professions Code; Sections 25299.97 and 116275, Health & Safety Code, Sections 10721, 10722.2, and 12924, Water Code.

ARTICLE 3. BOUNDARY MODIFICATION CATEGORIES

§ 342. Introduction to Boundary Modifications

This Article describes different categories of boundary modifications. The identified categories are scientific modifications, based on geologic or hydrologic criteria, and jurisdictional modifications, which promote sustainable groundwater management. An administrative adjustment does not constitute a boundary modification subject to this Subchapter.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10720.1, 10722.2 and 12924, Water Code.

§ 342.2. Scientific Modification

A scientific modification to a basin or subbasin boundary consists of one of the following modifications and involves the addition, deletion, or relocation of a boundary based on the geologic or hydrologic conditions that define a groundwater basin or subbasin:

(a) An external boundary modification. Except in the case of some basin consolidations involving adjacent basins, external basin boundaries will only be modified as a result of scientific modifications.

(b) An internal boundary modification. A basin or subbasin boundary may be modified,

deleted, or added based on the presence or absence of a hydrogeologic barrier.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10720.1 and 12924, Water Code.

§ 342.4. Jurisdictional Modification

A jurisdictional modification involves the addition, deletion, or relocation of a basin or subbasin boundary that is not a scientific modification but promotes sustainable groundwater management and is one of the following:

(a) Internal boundary modification.

(b) Basin consolidation, including county basin consolidation.

(c) Basin subdivision.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10720.1 and 12924, Water Code.

§ 342.6. Other Boundary Modifications

Any boundary modification that does not conform to the categories specified in this article may be considered by the Department based on information the Department deems adequate to evaluate the modification in accordance with Section 10722.2 of the Water Code.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10720.1 and 12924, Water Code.

ARTICLE 4. PROCEDURES FOR MODIFICATION REQUEST AND PUBLIC INPUT

§ 343. Introduction to Procedures

This Article describes procedural requirements related to boundary modification requests and public input to those requests.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 343.2. Eligibility to Request Boundary Modification

A request for boundary modification may be initiated by a local agency whose jurisdictional area lies within or borders the existing or proposed basin or subbasin for which boundary modification is sought.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 343.4. Forms and Instructions

The Department shall make the forms and instructions for boundary modification requests available on its Internet Web site prior to basin boundary submission periods.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 343.6. Combination of Requests

Requesting agencies shall, to the greatest extent practicable, combine all boundary modification requests that affect the same basin or subbasin and coordinate with other affected agencies and affected systems, as necessary, to present the information as a single request. The Department may require the combination of boundary modification requests to avoid duplicative or conflicting requests, and may consider and adopt all or any proposals contained in a combined boundary modification request.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 343.8. Submission Periods

Prior to updating or revising Bulletin 118, and at other times, as needed, the Department shall establish submission periods during which boundary modification requests will be accepted. The initial submission period shall start January 1, 2016, and remain open at least 90 days. The Department shall announce the start of each subsequent submission period on its Internet Web site at least 60 days before the period begins, and the period will remain open at least 60 days. However, the submission periods described in this Section shall not apply to any request made pursuant to Section 841 of the Code of Civil Procedure.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 841, Code of Civil Procedure; Sections 10722.2 and 12924, Water Code.

§ 343.9. Initial Notification

(a) Within 15 days of a local agency's decision to explore boundary modification, the relevant local agency shall notify the Department by written notice of its interest in exploring a boundary modification and make general information about its process publicly available by posting relevant information to the local agency's Internet Web site or by other suitable means. The initial notification shall include a brief description and preliminary map of the proposed boundary modification.

(b) The Department shall post the initial notification required by this Section on the Department's Internet Web site within ten (10) working days of receipt.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 343.10. Status of Request

(a) The Department shall acknowledge the receipt of all boundary modification requests by written notice and shall post all materials received on the Department's Internet Web site within ten (10) working days of receipt.

(b) The Department shall determine whether the boundary modification request is complete and provide written notice to the requesting agency of its determination or of the need for additional information.

(1) A boundary modification request will be deemed complete if it substantially complies with the requirements of this Subchapter. Substantial compliance means that the requesting agency has attempted to comply with these regulations and the legislative intent of the Act in good faith, and the supporting information submitted and the form of submission are sufficiently detailed and necessary, as determined by the Department, to evaluate the boundary modification request.

(2) The Department will not evaluate a boundary modification request until the request has been deemed complete and the requesting agency has provided any other information specifically requested by the Department. However, the Department may begin its evaluation before evidence of support as described in Section 344.8(d) has been made available if the requesting agency affirms that the required support is likely forthcoming.

(c) When the Department determines that a request for boundary modification is complete, the Department shall update information posted to the Department's Internet Web site to reflect that the Department is prepared to evaluate the request on its merits and to receive public input to the request pursuant to Section 343.12.

(d) The requesting agency shall, upon receiving notice that the request is complete, within five (5) working days notify all local agencies and public water systems in the affected basins and any other person or entity who has made a written request for

notification of the proposed modification to the requesting agency. The notice from the requesting agency shall describe the procedural requirements to provide public input to a request pursuant to Section 343.12, including the deadlines to submit public input, the form in which public input must be submitted, and the address to which public input must be submitted.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 10723.4, Water Code.

§ 343.12. Public Input

(a) Any person may provide information to support or oppose a proposed boundary modification request as follows:

(1) Public input must be submitted by written notice to the Department within 30 days after the Department posts a notice that the request is complete pursuant to Section 343.10(c), and provide the requesting agency a duplicate copy of that information the same day.

(2) Public input must include the name, address, and electronic mail address of the person or entity providing that input.

(3) Public input must include a clear statement of the basis for the support of or opposition to the proposed boundary modification.

(4) The level of detail provided by public input need not be as comprehensive as that contained in the request, but must rely on similar scientific and technical information as the particular boundary modification request to which it is addressed, and will be evaluated by the Department using the same criteria.

(b) The Department shall post all public input on the Department's Internet Web site.

(c) The Department is not required to respond to comments received through public input, but will consider such comments as part of its evaluation of a boundary modification request.

(d) The Department shall give the requesting agency a reasonable opportunity to respond to public input, including the opportunity to modify the boundary modification request.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 343.14. Withdrawal of Request

The requesting agency may withdraw a boundary modification request at any time before the request is finalized by providing written notice to the Department.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

ARTICLE 5. SUPPORTING INFORMATION

§ 344. Introduction to Supporting Information

This Article describes the type of information provided by a requesting agency to support a boundary modification request.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 344.2. Requesting Agency Information

Each request for boundary modification shall include the following information:

(a) The name and mailing address of the requesting agency.

(b) A copy of the statutory or other legal authority under which the requesting agency was created with specific citations to the provisions setting forth the duties and responsibilities of the agency.

(c) A copy of the resolution adopted by the requesting agency formally initiating the boundary modification request.

(d) The name and contact information, including phone number, mailing address and electronic mail address, of the request manager.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 344.4. Notice and Consultation

Each request for boundary modification shall include information demonstrating that the requesting agency consulted with affected agencies and affected systems including, but not limited to, the following:

(a) A list of all local agencies and public water systems in the affected basins with the subset of affected agencies and affected systems specifically identified.

(b) An explanation of the methods used to identify affected agencies and affected systems.

(c) Information regarding the nature of consultation, including copies of correspondence with affected agencies and affected systems and any other persons or entities consulted, as appropriate.

(d) A summary of all public meetings at which the proposed boundary modification was discussed or considered by the requesting agency, including copies of any meeting agendas or minutes, if prepared, and any notices published.

(e) A copy of all comments regarding the proposed boundary modification received by the requesting agency and a summary of any responses made by the requesting agency.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 344.6. Description of Proposed Boundary Modification

(a) Each request for boundary modification shall include a concise description of the proposed modification, including an overview of the request and a description or explanation of the following:

(1) The category of boundary modification proposed.

(2) The identification of all affected basins or subbasins, including Bulletin 118 basin or subbasin names and numbers.

(3) A proposed name for each new subbasin or consolidated basin, if applicable.

(b) Each request for a jurisdictional boundary modification pursuant to Section 342.4 shall also include the following:

(1) An explanation of how the proposed boundary modification would promote sustainable groundwater management in the proposed basin or subbasin.

(2) An explanation of how the proposed boundary modification would affect the ability of adjacent basins or subbasins to sustainably manage groundwater in those basins or subbasins.

(3) A historical summary of groundwater management in the proposed basin or subbasin.

(4) An explanation of how the proposed boundary modification may affect state programs, including, but not limited to the California Statewide Groundwater Elevation Monitoring (Water Code Section 10920 et seq.), Groundwater Management Plans developed pursuant to AB 3030 (Water Code Section 10750 et seq.), Groundwater Sustainability Plans or alternatives developed pursuant to the Sustainable Groundwater Management Act (Water Code Section 10720 et seq.), any applicable state or regional board plans, and other water management and land use programs.

(c) Any other information deemed appropriate by the requesting agency, including but

not limited to, an explanation of opportunities that would arise from or obstacles that would be overcome by the boundary modification request.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 10733.6, Water Code.

§ 344.8. Local Agency Input

(a) Each request for boundary modification shall include the following:

(1) Evidence that the requesting agency provided information to affected agencies and affected systems regarding the proposed boundary modification as required by Section

344.4 and provided those affected agencies and affected systems an opportunity to comment in support or opposition.

(2) Copies of all comments and documents from affected agencies and affected systems in support of or opposition to the proposed modification.

(3) Any evidence the requesting agency believes will rebut any opposition to the proposed boundary modification or otherwise assist the Department in its evaluation.

(b) Any affected agency or affected system that elects to support or oppose the proposed boundary modification shall provide the requesting agency with one of the following:

(1) A copy of a resolution formally adopted by the decision-making body of the affected agency or affected system.

(2) A letter signed by an executive officer or other official with appropriate delegated authority who represents the affected agency or affected system.

(c) The level of detail provided by an affected agency or affected system in support or opposition to a proposed boundary modification need not be as comprehensive as that contained in the request, but the support or opposition must rely on similar scientific and technical information as the particular boundary modification request to which it is addressed, and will be evaluated by the Department using the same criteria.

(d) A request that involves basin subdivision pursuant to Section 342.4(c) shall provide information demonstrating that the proposed boundary modification is supported by at least three-fourths of the local agencies and public water systems in the affected basins.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 344.10. General Information

Each request for boundary modification shall include the following information:

(a) A description of the lateral boundaries and definable bottom of the proposed basin or subbasin that is in clear and definite terms, based on authoritative sources, and of sufficient detail to allow a map of the proposed lateral basin or subbasin boundaries to be plotted from that description.

(b) A graphical map of adequate scale and GIS files showing the proposed basin or subbasin boundary in relation to the existing Bulletin 118 basin or subbasin boundary and the affected agencies and affected systems that are within or bordering the existing and proposed basin or subbasin.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 12924, Water Code.

§ 344.12. Hydrogeologic Conceptual Model

(a) Each request for boundary modification shall include a clearly defined hydrogeologic conceptual model demonstrating the following for the proposed basin or subbasin:

(1) Principal aquifers.

(2) Lateral boundaries, including:

- (A) Geologic features that significantly impede or impact groundwater flow.
 - (B) Aquifer characteristics that significantly impede or impact groundwater flow.
 - (C) Significant geologic and hydrologic features and conditions of the principal aquifers, as appropriate, including information regarding the confined or unconfined nature of the aquifers, facies changes, truncation of units, the presence of faults or folds that impede groundwater flow, or other groundwater flow restricting features.
 - (D) Key surface water bodies, groundwater divides and significant recharge sources.
 - (3) Recharge and discharge areas within or adjacent to the basin or subbasin.
 - (4) Definable bottom of the basin or subbasin.
 - (b) The Department may waive the requirement of this section for an internal boundary modification pursuant to Section 342.4(a) if the requesting agency is able to demonstrate that the proposed boundary modification is unlikely to affect sustainable groundwater management.
- Note: Authority cited: Section 10722.2, Water Code.
- Reference: Sections 10722.2 and 12924, Water Code.

§ 344.14. Technical Information for Scientific Modifications

- (a) Each request for a scientific modification pursuant to Section 342.2 shall include information that demonstrates the extent of the aquifers, including the following:
 - (1) A qualified map that depicts the lateral boundaries of the aquifers that define the basin or subbasin.
 - (2) A technical study that provides subsurface data demonstrating the vertical thickness and relevant physical properties of the aquifers, such as hydrogeologic cross section(s), if available.
- (b) In addition to the information required in Section 344.14(a), each request for scientific modification involving a hydrogeologic barrier pursuant to Section 342.2(b) shall demonstrate the presence or absence of impediments to subsurface groundwater flow, such as impermeable material, a fault, or groundwater divide, based on the following information:
 - (1) A qualified map depicting geologic structures or features that could significantly impact or impede groundwater flow.
 - (2) A technical study that provides geologic and hydrologic evidence of groundwater conditions including, as appropriate:
 - (A) Historical and current potentiometric surface maps, groundwater levels, groundwater recharge and discharge areas of the aquifers within the vicinity of proposed boundary modification.
 - (B) Aquifer testing results demonstrating boundary condition response.
 - (C) Water quality information of the aquifers including but not limited to general water quality parameters and isotopic analysis.
 - (D) Geophysical investigations and supporting data.
 - (E) Other information that the requesting agency considers relevant to the boundary modification request.
- (c) Other technical information required by the Department that is necessary to evaluate a boundary modification request made pursuant to Section 342.2.
- (d) A request for a scientific modification to an external boundary pursuant to Section

342.2(a) may utilize any of the information in Section 344.14(b) if the requesting agency believes it may assist the Department in its evaluation.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 12924, Water Code.

§ 344.16. Technical Information for Jurisdictional Modifications

(a) Each request for a boundary modification that involves a jurisdictional modification pursuant to Section 342.4 shall include the following:

(1) A water management plan that covers all or a portion of the proposed basin or subbasin and contributes to meeting the requirements of Water Code Sections 10753.7(a) or 10727, including any of the following:

(A) An adopted groundwater management plan, a basin wide management plan, or other integrated regional water management program or plan that meets the requirements of Water Code Section 10753.7(a).

(B) Management pursuant to an adjudication action.

(C) One or more technical studies that cover the relevant portion of a basin or subbasin.

(D) A valid Groundwater Sustainability Plan adopted pursuant to the Act or an alternative approved by the Department in accordance with Water Code 10733.6.

(2) A Statement of the existing and planned coordination of sustainable groundwater management activities and responsibilities where required by the Act.

(b) Each request for a boundary modification that involves a basin subdivision pursuant to Section 342.4(c) shall provide, where applicable, a description and supporting documentation of historical and current conditions and coordination within the existing and proposed basin or subbasin related to the following:

(1) Groundwater level monitoring programs, historical and current groundwater level trends, and areas of significant groundwater level declines.

(2) Groundwater quality issues that may impact the supply and beneficial uses of groundwater, including a map of known impacted sites and areas, mitigation measures planned or in place, and a description of impact to water budget.

(3) Inelastic land surface subsidence including a map of known land subsidence areas, historical trends within known land subsidence areas, and a description of impacts to the water budget.

(4) Groundwater-surface water interactions, which may be demonstrated by a map identifying significant surface water bodies, and a groundwater elevation contour map or detailed written description of the direction of groundwater movement relative to the water bodies, the location and nature of seeps and springs, and known water quality issues within the basin or subbasin and in hydraulically connected adjacent basins or subbasins.

(5) A map identifying the recharge areas.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2, 10727, 10733.6, 10753.7, and 12924, Water Code.

§ 344.18. CEQA Compliance

The requesting agency shall satisfy requirements of the California Environmental Quality Act (Public Resources Code Sections 21000 et seq.), including, if necessary, information to enable the Department to satisfy the requirements of a responsible agency.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

ARTICLE 6. METHODOLOGY AND CRITERIA FOR EVALUATION

§ 345. Introduction to Methodology and Criteria for Evaluation

This Article establishes the methodology and criteria for the evaluation of proposed

boundary modifications.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 345.2. Basis for Denial of Request for Boundary Modification

The Department will evaluate boundary modification requests to determine whether the request has the overall effect of promoting sustainable groundwater management. A request may be denied if one or more factors that could limit substantial compliance with the Act are identified, including the following:

(a) The proposed boundary modification may limit the opportunity or likelihood of any of the following:

- (1) Sustainable groundwater management in the proposed basin or subbasin.
- (2) Sustainable groundwater management in other basins or subbasins.
- (3) Groundwater storage or recharge in the proposed or adjacent basins or subbasins.
- (4) Coordination of management activities and the sharing of data and information across basin or subbasin boundaries.

(b) The requesting agency is unable to provide information that would allow the Department to assess whether there is a history of sustainable management of groundwater levels in the existing or proposed basin or subbasin.

(c) For scientific modifications, if the Department does not consider that the available scientific evidence supports the addition, deletion, or relocation of a basin or subbasin boundary.

(d) The requesting agency has failed to provide all required information or information deemed necessary by the Department or has failed to substantially comply with the requirements of this Subchapter.

(e) The proposed boundary modification could result in the isolation of areas with known groundwater management problems, or of areas, including disadvantaged communities, that may lack the institutional infrastructure or economic resources to form an effective groundwater sustainability agency or develop an implementable groundwater sustainability plan or alternative, or any other groundwater management plan.

(f) The proposed boundary modification could result in the creation of unmanaged areas.

(g) An objection to a jurisdictional boundary modification has been raised by any of the following:

- (1) An agency created by statute to manage groundwater.
- (2) The Watermaster or other manager of an adjudicated groundwater basin or portion of a groundwater basin.
- (3) An exclusive local agency for compliance with the Act within their statutory boundaries.
- (4) A county in which the proposed boundary modification would occur.

(h) Where the Department finds that the requested boundary modification would be inconsistent with the objectives of the Act.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10720.8, 10722.2, 10723, 10727, 10733.6, and 10753.7, Water Code.

§ 345.4. Criteria for Evaluating Supporting Information

The Department shall apply the following criteria to assess whether the proposed basin or subbasin can be sustainably managed or would limit the sustainable management of adjacent basins or subbasins, and whether there is a history of sustainable management of groundwater levels in the proposed basin or subbasin.

(a) For scientific modifications pursuant to Section 342.2, the Department will consider the adequacy of hydrogeologic conceptual models and technical studies based on their

demonstration of scientific support for the boundary modification. The models and technical studies will be evaluated according to the following:

(1) Hydrogeologic conceptual models will be evaluated to determine the degree to which they apply technical information to describe the geologic framework, the direction and movement of groundwater flow, the water budget for the basin or subbasin, and any other feature as required by Section 344.12.

(2) Qualified maps of surficial geology, structural geology, or geophysical investigations, supporting subsurface interpretations, and any other feature as required by Section 344.14, will be evaluated to assess the presence or absence of a groundwater flow boundary.

(3) Potentiometric surface maps, groundwater levels, groundwater recharge and discharge areas, aquifer testing results, water quality data, and any other feature as required by Section 344.14 will be evaluated to assess the presence or absence of a groundwater flow boundary.

(b) For jurisdictional modifications pursuant to Section 342.4, the Department shall review evidence from existing water management plans that cover all or a portion of the proposed basin or subbasin. The Department shall evaluate the likelihood that the proposed basin or subbasin can be sustainably managed, the groundwater management practices in place within the basin or subbasin, and the historical and existing aquifer response to these management practices. The water management plan will also serve to provide additional information should it be necessary to clarify questions regarding management activities or supporting technical information.

(c) For jurisdictional modifications of basin consolidation or county basin consolidation or basin subdivision pursuant to Section 342.4(b) and (c), the Department will evaluate the adequacy of hydrogeologic conceptual models. The evaluation will assess the degree to which the models apply technical information to describe the geologic framework, the direction and movement of groundwater flow, the components of the water budget for the basin or subbasin, and any other feature as required by Section 344.12.

(d) For jurisdictional modifications of basin subdivision pursuant to Section 342.4(c), the Department will evaluate, where applicable, the adequacy of the description and supporting documentation of historical and current conditions and coordination in the existing and proposed basin or subbasin of the following:

(1) Current and historical groundwater levels from a groundwater monitoring well network that satisfies the following criteria:

(A) A sufficient density of monitoring wells to evaluate and implement sustainable groundwater management as determined by the Department.

(B) Wells with perforated intervals in all principal aquifers.

(C) The density and distribution of wells is adequate to characterize the potentiometric surface for each of the principal aquifers.

(D) The methods of data collection follow best management practices and data are collected at similar intervals and frequency.

(E) Groundwater level data demonstrate that the principal aquifers have not experienced long-term declines in groundwater levels.

(2) Water quality data, including data showing that areas with known water quality impacts would not be more isolated or concentrated.

(3) Current and historical land subsidence data demonstrating that no significant inelastic land subsidence is occurring.

(4) Technical information related to groundwater–surface water interactions showing that surface water is not adversely affected by groundwater extractions.

(5) Technical information related to recharge areas showing that recharge is not adversely affected by the proposed boundary modification.

(6) Evidence of coordination between local agencies and public water systems pertaining to water budgets, data collection, and other agreements designed to promote sustainable groundwater management, as appropriate.

(e) For any boundary modification request, the Department may consider any other scientific or technical information that relates to the ability of a proposed basin or subbasin to achieve sustainable groundwater management.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

ARTICLE 7. ADOPTION OF BOUNDARY MODIFICATION

§ 346. Introduction to Department Procedures

This Article describes the procedure for the adoption of boundary modifications by the Department.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 10723.4, Water Code.

§ 346.2. Presentation of Draft Boundary Modifications

(a) If the Department determines that a boundary modification is supported by adequate technical information and meets the requirements of this Subchapter, the Department shall post the draft revised basin and subbasin boundaries on the Department's Internet Web site and hold at least one public meeting to solicit comments on the draft boundaries prior to submitting them to the Commission.

(b) The Department shall present a copy of the draft revised basin and subbasin boundaries to the Commission to hear and comment on the draft revisions pursuant to Section 10722.2(e).

(c) The Department may finalize the revised basin and subbasin boundaries 60 days after the draft revisions have been presented to the Commission or 30 days after the Commission has met to hear and comment on the draft revisions, whichever comes earlier, if no substantial changes are required.

(d) If the Department makes substantial changes to a proposed boundary modification after presentation to the Commission, the Department shall notify the requesting agency and resubmit the proposed changes to the Commission for further review consistent with the Act.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

§ 346.4. Record of Boundary Modifications

After revising the boundaries of a basin or subbasin, or establishing a new subbasin, the Department shall record that information on the Department's Internet Web site and incorporate the revised basin and subbasin boundaries in subsequent updates to Bulletin 118.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Sections 10722.2 and 12924, Water Code.

§ 346.6. Subsequent Modifications by Department.

If, after revising the boundaries of a basin or subbasin, or establishing a new subbasin, the Department determines, based on substantial evidence, that assumptions regarding the sustainable management of the new basin or subbasins were incorrect, and that as a result the boundary modification should not have been adopted, the Department may, after consultation with the requesting agency, either restore the boundaries that existed before the boundary modification or revise the boundaries consistent with this

Subchapter.

Note: Authority cited: Section 10722.2, Water Code.

Reference: Section 10722.2, Water Code.

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE
* * * AGENDA TRANSMITTAL FORM * * ***

MEETING DATE:	November 18, 2015
AGENDA ITEM:	3
AGENDA TITLE:	Approve Initial RFSs for MPWMD and HydroMetrics for 2016
PREPARED BY:	Robert Jaques, Technical Program Manager
SUMMARY: Attached are the proposed initial contracts for each of the Watermaster's consultants that are expected to work on M&MP activities during 2016. Each of these firms is currently working under a master form of agreement with the Watermaster called a "Professional Services Agreement" (PSA). Actual work assignments are made through the issuance of Requests for Service (RFS) under the umbrella language of the PSA. The attached RFSs constitute the proposed initial 2016 work assignments for MPWMD and HydroMetrics as follows: • MPWMD RFS No. 2016-01 covering their normal M&MP tasks as in preceding years and also performing work recommended in their WY 2015 Water Quality and Water Level Report (which is contained in the Preliminary Draft 2015 Annual Report). As discussed when we were reviewing the 2016 M&MP Work Plan and Budget, the sampling pump on one of the Laguna Seca wells will need to be replaced in 2016 because the water level there has dropped so far that the existing pump is no longer able to provide the sample. One of the recommendations in the 2015 WQ/WL Report is to perform a comprehensive review of well construction details for all wells that are included in the M&MP in an effort to identify future monitoring complications that may arise due to falling water levels. This is new work this year which was not anticipated when the 2016 M&MP Budget and Work Plan were developed. I will revise those documents and include this work in RFS No. 2016-01. • MPWMD RFS No. 2016-02 covering their obtaining water quality and water level data from private producers who ask the Watermaster collect this data for them. The costs for this work are reimbursed by the private producers, and there is no net cost to the Watermaster for work performed under this RFS. • HydroMetrics RFS No. 2016-01 covering their providing general hydrogeologic consulting services and for providing assistance in preparing documents that the Watermaster will need to submit to fulfill its reporting requirements under the Sustainable Groundwater Management Act. • HydroMetrics RFS No. 2016-02 covering their preparing the 2016 SIAR. These consultants have reviewed the cost and scope details of these proposed contracts and their input has been included in the attached versions of the contracts. If requested by the TAC, I will develop additional RFSs for HydroMetrics during 2016 to perform further groundwater modeling or other work. These contracts are on today's TAC meeting agenda to provide the TAC with the opportunity to raise questions or make suggestions for changes to the scopes-of-work or costs, before they are presented to the Board for approval at the Board's December 2, 2015 meeting, to ensure the contacts can be in effect at the start of 2016.	
ATTACHMENTS:	4 - Proposed Consultant Contracts for FY 2016 (2 - HydroMetrics & 2 - MPWMD)
RECOMMENDED ACTION:	Discuss and either modify or approve the proposed contracts

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2016

RFS NO. 2016-01

(To be filled in by WATERMASTER)

TO: Derrick Williams
HydroMetrics WRI
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than December 31, 2016, and shall be performed in accordance with the Schedule contained in Attachment 2.

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

Total Price Authorized by this RFS: \$ 11,400.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 1 for Estimated Costs).

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

Requested by: _____ **Date:** _____
WATERMASTER Technical Program Manager

Authorized by: _____ **Date:** _____
WATERMASTER Chief Executive Officer

Agreed to by: _____ **Date:** _____
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

On an ongoing and as-requested basis, PROFESSIONAL will provide general hydrogeologic consulting services to WATERMASTER on a variety of topics. These may include, but not be limited to interpretation of water level and water quality data collected by WATERMASTER, BMAP and SIRP implementation issues, and preparation of documents for WATERMASTER's use in fulfilling its Sustainable Groundwater Management Act reporting requirements.

Providing these services will likely involve attending certain of WATERMASTER's Technical Advisory Committee (TAC) meetings, most of which will be attended telephonically. These TAC meetings do not include special TAC or other meetings which may be required as part of performing other work which may be authorized under other RFSs issued to PROFESSIONAL by WATERMASTER. Any such other scope and cost proposals will incorporate costs for those meetings.

The Tasks in WATERMASTER's 2016 Monitoring and Management Program (M&MP) to which this RFS No. 2016-01 pertains are:

- M. 1. c - Preparation and Attendance of Meetings
- M. 1. e - Peer Review of Documents and Reports
- M.1.g – Sustainable Groundwater Management Act Documentation Preparation

Work on Task M.1.g may or may not be necessary depending on direction yet-to-be-received from the Department of Water Resources as of the date of preparation of this RFS No. 2016-01. Therefore, no work is to be performed under Task M.1.g unless and until written direction to do so is provided by WATERMASTER to PROFESSIONAL.

ESTIMATED COSTS

General Consulting Services, including attending some TAC and other meetings either via telephone or in-person in Seaside, as requested by WATERMASTER will be billed at the following hourly rates, including all markups and other direct costs:

Derrik Williams = \$220.00/hour

Georgina King = \$195.00/hour

In addition to hourly labor costs, an allowance of \$1,000.00 is included in this RFS to cover travel and other incidental costs associated with the performance of this work.

The total cost authorized by this RFS No. 2016-01 is \$11,400.00.

HydroMetrics RFS No. 2016-01 Work Schedule

ID	Task Name	2016																Jan	Feb	Mar	A
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
1	M. 1. c - Preparation and Attendance of Meetings																				
2	M. 1. e - Peer Review of Documents and Reports																				
3	M.1.g - SGMA Document Preparation																				
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: 1/1/2016

RFS NO. 2016-02

(To be filled in by WATERMASTER)

TO: Derrik Williams
HydroMetrics WRI
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: Prepare the Seawater Intrusion Analysis Report for 2016. See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than December 31, 2016, and shall be performed in accordance with the Schedule contained in Attachment 2.

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

Total Price Authorized by this RFS: \$ 20,390.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 3 for Detailed Breakdown of Estimated Costs).

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

Requested by: _____ **Date:** _____
WATERMASTER Technical Program Manager

Authorized by: _____ **Date:** _____
WATERMASTER Chief Executive Officer

Agreed to by: _____ **Date:** _____
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

The scope consists of providing professional consulting services to WATERMASTER for preparation of the 2016 Seawater Intrusion Analysis Report (SIAR).

To promote efficiency, much of the text and graphics from the 2015 SIAR will be incorporated directly into the 2016 SIAR.

Preparing the 2016 SIAR will involve analyzing all water quality data at the end of Water Year 2016 (October 1, 2015 to September 30, 2016) and producing semi-annual (2nd and 4th quarters 2016) chloride concentration maps for each aquifer in the Basin. Time series graphs, trilinear graphs, and stiff diagram comparisons will be updated with new data. Second and fourth quarter groundwater elevation maps will also be produced. The annual EM logs will be analyzed to identify changes in seawater wedge locations. A determination of whether there is any evidence of seawater intrusion will be made, and recommendations will be included as warranted.

A Draft 2016 SIAR will be provided to WATERMASTER in electronic (not printed) form for review. WATERMASTER will provide its review comments and those of its TAC members through direct discussions with PROFESSIONAL at a TAC meeting. In addition to these oral comments, some TAC members may also provide recommended editorial changes electronically directly to PROFESSIONAL. These comments will be addressed in a Final 2016 SIAR. A CD containing an electronic version of the entire Final 2016 SIAR in MS Word and up to 15 printed and bound copies of the Final 2016 SIAR (quantity to be determined by WATERMASTER) will be provided to WATERMASTER.

ATTACHMENT 2

HydroMetrics RFS No. 2016-02 Work Schedule

ID	Task Name	2016																	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	I.4.c Annual Seawater Intrusion Analysis Report (SIAR)																		
2	HydroMetrics Provides Draft SIAR to Watermaster											◆ 11/9							
3	TAC Approves Annual Seawater Intrusion Analysis Report (SIAR)											◆ 11/16							
4	Board Approves Annual Seawater Intrusion Analysis Report (SIAR)											◆ 12/7							

ATTACHMENT 3

DETAILED BREAKDOWN OF ESTIMATED COSTS

Note: Regardless of the use of the term "Estimated Cost" in this RFS, if the work of this RFS is to be compensated for using Lump Sum Payment method, it is understood and agreed to by PROFESSIONAL that the Total Price listed on page 1 of this RFS is binding and limiting as defined in Section V of the Agreement.

Task	Hours		Costs			
	Georgina King (\$195 per hr)	Nick Byler (\$110 per hr)	Georgina King	Nick Byler	Expenses	Total Costs
2016 Seawater Intrusion Analysis Report						
Produce 2016 SIAR	32	100	\$ 6,240	\$ 11,000	\$ 1,000	\$ 18,240
Attend One TAC Meeting in Monterey	10	0	\$ 1,950	\$ -	\$ 200	\$ 2,150
TOTALS	42	100	\$ 8,190	\$ 11,000	\$ 1,200	\$ 20,390

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2016

RFS NO. 2016-01.

(To be filled in by WATERMASTER)

TO: Joe Oliver

FROM: Robert Jaques.

Monterey Peninsula Water Management District
PROFESSIONAL

WATERMASTER

Services Needed and Purpose:

Perform certain Tasks contained within the Watermaster's Monitoring and Management Plan for 2015 (See detailed Scope of Work in Attachment 1).

Completion Date: The work of this RFS No. 2016-01 shall be completed in accordance with the schedule contained in Attachment 2.

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

Total Price Authorized by this RFS: \$ 82,150.00 (See Attachment 3 for a Breakdown of this Total Price. Cost is authorized only when evidenced by signature below.)

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

Requested by: _____ **Date:** _____.

WATERMASTER Technical Program Manager

Authorized by: _____ **Date:** _____.

WATERMASTER Chief Executive Officer

Agreed to by: _____ **Date:** _____.

PROFESSIONAL

ATTACHMENT 1

Detailed Scope of Work for RFS No. 2016-01

Background:

The Watermaster Board approved the Budget for the 2016 Management and Monitoring Program Work Plan (hereinafter referred to as the “2016 M&MP Work Plan”) at its meetings of October 21 and December 2, 2015.

This RFS No. 2016-01 authorizes PROFESSIONAL to perform certain work on certain of the Tasks described in the 2016 M&MP Work Plan. The Task numbers listed in Table 1 of this Detailed Scope of Work for RFS No. 2016-01 correspond to the Task numbers in the 2016 M&MP Work Plan.

Table 1

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. a.1	Conduct ongoing data entry/ database maintenance	PROFESSIONAL will perform water production, water level, and water quality data entry into WATERMASTER’s database, and data editing as necessary, and will provide appropriate quality control and quality assurance for this data. Upon request from WATERMASTER, PROFESSIONAL will also enter other data into the database, such as updated information pertaining to well records. WATERMASTER will provide PROFESSIONAL with water production data. PROFESSIONAL will review the water production data provided by WATERMASTER for quality assurance and quality control purposes, and will notify WATERMASTER of any discrepancies PROFESSIONAL observes in this data. WATERMASTER will followup as appropriate with the water producers to resolve any such discrepancies. PROFESSIONAL will also host and maintain the Watermaster’s Database. Any changes to WATERMASTER’s database will be authorized under a separate agreement for performing such work for WATERMASTER. That agreement will either be with PROFESSIONAL or with another consultant. PROFESSIONAL will prepare quarterly water production, water level, and water quality tabulations in Excel format and will provide those tabulations to another WATERMASTER Consultant who will post them to the WATERMASTER’s website, so it will be accessible to the public and other interested parties.

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. b. 2	Collect Monthly Water Levels	The monitoring wells from which water level data is to be collected by PROFESSIONAL are listed under the heading “MONITORING TO BE PERFORMED BY PROFESSIONAL” in the column titled “Level” in Table 2. PROFESSIONAL will visit each of the indicated wells at the frequencies shown in Table 2 in order to obtain the water level data. At these visits PROFESSIONAL will measure and record water levels by either taking manual water levels using an electric sounder, or by dataloggers. Dataloggers which have been installed on the four Coastal Sentinel, the four ASR monitoring, and the inland (BLM site) monitoring wells will be used to measure the levels at those wells. This Task budget amount includes the possible replacement of up to 2 dataloggers at a unit price of \$750, plus \$100 for installation parts. All of the other wells will be manually measured.

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. b. 3	Collect Quarterly Water Quality Samples	The monitoring wells from which water quality data is to be collected by PROFESSIONAL are listed under the heading “MONITORING TO BE PERFORMED BY PROFESSIONAL” in the column titled “Quality” in Table 2. PROFESSIONAL will visit each of the indicated wells at the frequencies shown in Table 2 in order to obtain the water quality samples, and will perform water quality analyses on these samples. The water quality constituents that will be measured in these analyses are: Specific Conductance (micromhos/cm), Total Alkalinity (as CaCO₃), Bicarbonate (as HCO₃⁻), pH, Chloride, Sulfate, Ammonia Nitrogen (as NH₃), Nitrate Nitrogen (as NO₃), Total Organic Carbon, Calcium, Sodium, Magnesium, Potassium, Iron, Manganese, Orthophosphate, Total Dissolved Solids, Hardness (as CaCO₃), Boron, Bromide, and Fluoride. For the following wells listed in Table 2, Barium and Iodide (Ba + I) will also be measured annually: SBWM MW-1 Deep (from two discrete depth zones), SBWM MW-2 Deep (from two discrete depth zones), SBWM MW-3 Deep (from two discrete depth zones), and SBWM MW-4 Deep (from two discrete depth zones)– For the following wells listed in Table 2, Barium and Iodide will also be measured quarterly: MSC Shallow, MSC Deep, PCA-W Shallow, PCA-W Deep, MPWMD #FO-09 Shallow, and MPWMD #FO-09 Deep. The data may either come from water quality samples that are collected by the airlift method, by the positive displacement method during induction logging of these wells and/or other data gathering techniques, or combinations of these methods, at the discretion of PROFESSIONAL, and will be submitted to a State-certified analytical laboratory for analysis. 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, the Laguna Seca Driving Range sampling pump is no longer adequate due to declining groundwater levels, so \$2,000 to purchase a replacement sampling pump has been included in this Task. \$1,000 has been included in this Task to perform additional semi-annual water quality sampling at Sentinel Well SBMW-1 as recommended in the 2014 SIAR.

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. b. 6	Reports	PROFESSIONAL will prepare and submit reports to WATERMASTER summarizing and analyzing the data that is collected, according to the following schedule: 1. One combined report summarizing and analyzing the water quality and water level data from the 1st & 2nd Quarters of the Water Year. 2. One annual report summarizing and analyzing the water quality and water level data from the 3rd & 4th Quarters of the Water Year, and containing tables consolidating the data for the complete Water Year and a narrative summarization of the findings, conclusions, and recommendations for the complete Water Year. This annual report may include, as attachments, additional documentation as needed to support the findings, conclusions and recommendations. 3. One report containing a compilation of the available water level records for monitor wells that are part of the Seaside Basin Monitoring & Management Plan (M&MP) in a format to allow assessment of the long-term trends in water levels in each of the wells. This report will contain a table showing pertinent well construction data, existing average annual water level changes, and projected future water level changes. This will be accompanied by a brief description and recommendations regarding those monitor wells for which future monitoring complications may arise due to falling water levels.
I.4.c	Review Seawater Intrusion Analyses	WATERMASTER will have another consultant perform analyses and prepare mapping and other documents pertaining to seawater intrusion detection. PROFESSIONAL will participate in meetings with that consultant during the course of its work, and will provide review comments and recommendations to WATERMASTER regarding this work as it is being carried out by that consultant.

Table 2

WELL NAME AND SUBAREA LOCATION ⁽⁶⁾	MONITORING NETWORK ⁽¹⁾		MONITORING REQUIRED BY DECISION ⁽²⁾		MONITORING CURRENTLY BEING PERFORMED BY PROFESSIONAL NOT SUBJECT TO THIS RFS ⁽³⁾		MONITORING TO BE PERFORMED BY PROFESSIONAL UNDER THIS RFS ⁽⁴⁾			
	Professional's	Watermaster's	Level (Monthly)	Quality (Annually)	Level		Level		Quality	
					Frequency		Frequency		Frequency	
					Monthly	Quarterly	Monthly	Quarterly	Annually	Quarterly
Northern Coastal Subarea (and vicinity)										
MSC-Shallow		X					X			X
MSC-Deep		X					X			X
PCA-W Shallow		X						X		X
PCA-W Deep		X						X		X
PCA-E (Multiple) Shallow	X				X				X	
PCA-E (Multiple) Deep	X				X				X	
Ord Grove Test-Shallow/Deep	X				X					
Paraita Test-Shallow/Deep	X				X					
Ord Terrace-Shallow	X				X				X	
Ord Terrace-Deep	X				X				X	
MPWMD #FO-09-Shallow	X				X					X
MPWMD #FO-09-Deep	X				X					X
MPWMD #FO-10-Shallow		X					X		X	
MPWMD #FO-10-Deep		X					X		X	
Fort Ord Monitor MW-B-23-180-Dune/Aromas		X					X		X	
CDM MW-1-Dune/Aromas		X					X			
CDM MW-2-Dune/Aromas		X					X			
CAW Del Monte Observation-Shallow		X							X	
SBWM MW-1-Deep (Purisima) ⁽⁶⁾		X						X	X	
SBWM MW-2-Deep (Purisima) ⁽⁶⁾		X						X	X	
SBWM MW-3-Deep (Purisima) ⁽⁶⁾		X						X	X	
SBWM MW-4-Deep (Purisima/Santa Margarita) ⁽⁶⁾		X						X	X	
Northern Inland Subarea (and vicinity)										
MPWMD #FO-01-Shallow	X					X				
MPWMD #FO-01-Deep	X					X				
MPWMD #FO-07-Shallow	X					X				
MPWMD #FO-07-Deep	X					X				
MPWMD #FO-08-Shallow	X					X				
MPWMD #FO-08-Deep	X					X				
MPWMD #FO-11-Shallow	X					X				
MPWMD #FO-11-Deep	X					X				
SBWM MW-5-Shallow (Paso Robles) ⁽⁶⁾		X						X	X	
SBWM MW-5-Deep (Santa Margarita) ⁽⁶⁾		X						X	X	

Table 2 (Continued)

WELL NAME AND SUBAREA LOCATION ⁽⁸⁾	MONITORING NETWORK ⁽¹⁾		MONITORING REQUIRED BY DECISION ⁽²⁾		MONITORING CURRENTLY BEING PERFORMED BY PROFESSIONAL NOT SUBJECT TO THIS RFS ⁽³⁾		MONITORING TO BE PERFORMED BY PROFESSIONAL UNDER THIS RFS ⁽⁴⁾			
	Professional's	Watermaster's	Level (Monthly)	Quality (Annually)	Level		Level		Quality	
					Frequency		Frequency		Frequency	
					Monthly	Quarterly	Monthly	Quarterly	Annually	Quarterly
Southern Coastal Subarea (and vicinity)										
Plumas '90 Test-Deep		X					X			
K-Mari-Dune/Aromas		X					X			
CDM MW-3-Dune/Aromas		X					X			
CDM MW-4-Dune/Aromas		X					X			
MW-BW-08A-Dune/Aromas		X					X			
MW-BW-09-180-Shallow		X					X			
Laguna Seca Subarea (and vicinity)										
MPWMD #FO-03-Shallow	X					X				
MPWMD #FO-03-Deep	X					X				
MPWMD #FO-04-Shallow (E)	X					X				
MPWMD #FO-04-Deep (W)	X					X				
MPWMD #FO-05-Shallow	X					X				
MPWMD #FO-05-Deep	X					X				
MPWMD #FO-06-Shallow	X					X				
MPWMD #FO-06-Deep	X					X				
Justin Court (RR M2S)-Shallow	X					X				
LS Pistol Range (Mo Co TH-1)-Deep	X					X				
York Rd-West (Mo Co MW-1 D)-Deep	X					X				
Seca Place (Mo Co MW-2)-Deep	X					X				
Robley Shallow (North) (Mo Co MW-3S)-Shallow	X					X				
Robley Deep (South) (Mo Co MW-3D)-Deep	X					X				
LS No. 1 Subdivision-Deep	X					X				
Blue Larkspur-East End-Believed to be Deep	X					X				
York School-Shallow		X	X						X	
Laguna Seca Driving Range (SCS-Deep)-Shallow		X						X	X	
Laguna Seca County Park #2-Shallow		X	X						X	
CAW Granite Construction-Deep		X					X			
CAW Ryan Ranch (RR) #7-Deep		X	X						X	
Laguna Seca Golf New #12-Deep ⁽⁹⁾		X							X	
Pasadera Main Gate-Deep		X	X						X	
No. of Wells in Each Network⁽⁵⁾	32	29	4	0	8	24	14	9	20	6

Notes:

- (1) The wells within the Professional's Monitoring Well Network are the wells that PROFESSIONAL monitors as part of PROFESSIONAL's own monitoring program. The wells within the Watermaster's Monitoring Well Network are the wells to be monitored under this RFS.
- (2) Monitoring required by the Decision is the monitoring described in the Monitoring and Management Program which was incorporated by reference in the Decision of the Court dated February 9, 2007.
- (3) Monitoring currently being performed by PROFESSIONAL not subject to this RFS is monitoring work PROFESSIONAL is performing under other monitoring programs. This monitoring is not a part of this RFS.
- (4) Monitoring to be performed by PROFESSIONAL is the monitoring to be performed under this RFS.
- (5) The Watermaster's Monitoring Well Network includes the wells recommended in the Enhanced Monitoring Well Network report prepared by PROFESSIONAL, dated October 23, 2007, plus the 4 new Sentinel Wells installed in 2007 and the BLM well installed in 2011.
- (6) The Seaside Basin Watermaster (SBWM) wells are all equipped with dataloggers that obtain measurements at least daily, but will be manually sounded for water level on a quarterly basis for calibration purposes. SBWM MW-4 Deep is to be sampled for water quality semi-annually.
- (7) Not used.
- (8) Shallow=Paso Robles; Deep=Santa Margarita or Purisima.
- (9) This well is so close to the Laguna Seca Old No. 12 well that no water level monitoring is necessary.
- (10) CAW East Fence Shallow well can no longer be sampled and was therefore dropped from this list.

ATTACHMENT 2 SCHEDULE

MPWMD RFS No. 2016-01 Work Schedule																										
ID	Task Name	2016												2017												
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
1	I.2.a DATABASE MANAGEMENT																									
2	I.2.a.1 Conduct Ongoing Data Entry/Database Maintenance																									
3	I.2.b DATA COLLECTION PROGRAM																									
4	I.2.b.2 Collect Monthly Water Levels (MPWMD)																									
5	I.2.b.3 Collect Quarterly Water Quality Samples (MPWMD)																									
6	I.2.b.6 Reports (from MPWMD)																									
7	Watermaster Prepares Combined Quarterly Water Production, Water Level, and Water Quality Reports for 1st & 2nd Quarters												6/6													
8	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2016																10/31									
9	Watermaster Prepares Report Regarding Long-Term Trends in Water Levels in Monitoring Wells												8/1													
10	I.4.c MPWMD Provides Assistance in Seawater Intrusion Detection																									

Work Schedule for MPWMD RFS No 2016-01 11-18-15

Page 1

ATTACHMENT 3 SUMMARY OF ESTIMATED COSTS						
M&MP TASK NO.	LABOR HOURS		HOURLY RATE	SUPPLIES AND MATERIALS		TOTAL
	BREAKDOWN	TOTAL		BREAKDOWN	TOTAL	
I. 2. a. 1	12 mo. @ 8 hrs/mo.	96	\$112	Other services needed to host and maintain Watermaster's Database, estimate \$300 for the year.	\$300	\$11,052
I. 2. b. 2.	12 mo. @ 4 hrs/mo.	48	\$89	2 replacement dataloggers @ \$750, plus \$100 for installation parts	\$1,600	\$5,872
I. 2. b. 3.	Quarterly WQ wells (Table 2): MPWMD Coastal wells (6 wells - shallow and deep aquifers @ 3 sites: MSC, PCA-W, FO-09), plus one additional quarterly WQ well sample. Labor: 4 events @ 16 hrs/event	64	\$89	Fuel: 4 events @ \$10/site x 3 sites = \$120; Lab costs: 4 events @ \$225/well x 7 wells = \$6,300	\$6,420	\$12,116
	Annual WQ wells (Table 2): 1 event @ 28 hrs/event = 28 hrs	28	\$89	BLM site (no sampling required in 2016): Eductor setup (use MPWMD portable unit): \$0 x 1 site = \$0; Airlift equip.: \$100 x 1 site x 0 event = \$0; Fuel: \$20 x 1 site x 0 event = \$0. Lab cost (annual WQ wells): \$175 x 15 wells x 1 event = \$2,625; maintenance on previously installed sample collection equipment = \$1,000. One-time cost for replacing LS Driving Range well pump = \$2,000.	\$5,625	\$8,117
	WM Sentinel and Northern Inland wells: download/store dataloggers, 4 events @ 2 hrs/event	8	\$89	N/A	\$0	\$712
	WM Sentinel wells: Semi-annual induction logging -- all 4 sites; annual WQ (Jul) from each aquifer at each site (2 per well site) -- 4 sites; semi-annual WQ (Jan) -- SBWM MW-1 and MW-4 only. Total labor = 2 events @ 4 hr/event.	8	\$89	Induction logging: 2 events = \$23,705 Cost includes semi-annual induction log collection, water sample collection, WQ analyses, misc site maintenance costs; WQ samples are collected annually at all 4 sites; additional semi-annual WQ at MW-4 (& MW-1 per 2014 SIAR for add'l \$1,000).	\$24,705	\$25,417
	Compile data: 4 events @ 24 hours/event	96	\$89	N/A	\$0	\$8,544
I. 2. b. 6	1 - combined Q1 and Q2 quarterly report @ 18 hrs	18	\$112	N/A	\$0	\$2,016
	1- annual report @ 24 hrs	24	\$112	N/A	\$0	\$2,688
	1-well records report	24	\$112	N/A	\$0	\$2,688
I. 4. c	Provide SWI supplemental data and review	24	\$122	N/A	\$0	\$2,928
TOTAL ESTIMATED COST =						\$82,150

Notes:

1. Vehicle mileage is included in the labor costs above.
2. Regardless of the use of the term "Estimated Cost" in this RFS, if the work of this RFS is to be compensated for using Lump Sum Payment method, it is understood and agreed to by PROFESSIONAL that the Total Price listed on page A-1 of this RFS is binding and limiting as defined in Section V of the Agreement.

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2016

RFS NO. 2016-02

(To be filled in by WATERMASTER)

TO: Joe Oliver

FROM: Robert Jaques

Monterey Peninsula Water Management District
PROFESSIONAL

WATERMASTER

Services Needed and Purpose:

Perform water level and water quality data collection for specified wells within the Seaside Basin in accordance with the Scope of Work contained in Attachment I.

Completion Date: The work of this RFS No. 2016-02 shall be completed on an as-directed basis from the Watermaster during 2016. All work under this RFS will be completed not later than December 31, 2016.

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

Total Price Authorized by this RFS: \$4,788.00 (See Attachment I for details regarding this Total Price, and how costs will be authorized on an as-directed basis. Cost is authorized only when evidenced by signature below.)

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

Requested by: _____ **Date:** _____
WATERMASTER Technical Program Manager

Authorized by: _____ **Date:** _____
WATERMASTER Chief Executive Officer

Agreed to by: _____ **Date:** _____
PROFESSIONAL

ATTACHMENT 1
Scope of Work for RFS No. 2016-02

Background:

The WATERMASTER Board authorized its staff to contract with the PROFESSIONAL to collect water level and water quality data from certain wells located within the Seaside Basin, if the owners/operators of those wells expressed this desire to the WATERMASTER. The procedures for this data collection are described in the January 17, 2008 "Notice to Well Owners" that was sent out by the Watermaster to well owners in the Seaside Groundwater Basin.

This RFS No. 2016-02 authorizes PROFESSIONAL to perform this data collection work on an as-directed basis, with formal authorization from the WATERMASTER to the PROFESSIONAL being required prior to the PROFESSIONAL performing such work on any specified well. This will provide the WATERMASTER with full control over which wells are provided this service, as well as over the costs for having this work performed.

The wells to which these services may be provided are listed in Table 1.

The estimated costs, per well, to perform these services are as follows:

Monthly Water Levels - It is estimated that it will take approximately 0.5 hour/well to perform a water level measurement. This time estimate is based on the assumption that the water level measurements will be performed at the time that a field person is already out and about collecting data from other wells, and the fact that the distance between wells located within the Basin is not that great. This labor would be billed at the field rate of \$89/hr, so the estimated cost per water level measurement would be \$44.50.

The total estimated cost would be \$534 per year per well for 12 monthly measurements.

Annual Water Quality Sampling - Assuming that annual water sample collection would coincide with water level collection at a well, it is estimated that it will take approximately 0.5 hr to collect the water quality sample, including sampling time, bottle labeling, custody forms, delivery to laboratory, etc. There will also be an estimated 0.5 hr for receipt, review and computer entry of laboratory data, and an estimated \$175 per sample for the laboratory analysis. The sampling work would be billed at the field rate of \$89/hr, so the estimated cost per annual water quality sample would be \$89 for labor, and \$175 for laboratory services, for a total cost per sample of \$264. Only one sample per well per year will need to be collected and analyzed. This sample will be collected in the fall.

The total estimated cost for collecting and analyzing the sample per well is \$264.

Combined Water Level Measurements and Water Quality Sampling: For combined water level and water quality monitoring, the total estimated cost, per well, for the 12-month period is \$798.

Of the wells listed in Table 1 it is assumed that not more than 6 will ask to have data collected for them by the WATERMASTER, the total estimated cost would be:

Potential No. of Wells Needing Water Level Data Collected	= 6 @ \$534 =	\$3,204
Potential No. of Wells Needing Water Quality Data Collected	= 6 @ \$264 =	\$1,584
	TOTAL =	<u>\$4,788</u>

Table 1

APN	DETAILS	COMPANY	Watermaster "Producer" Well?	MPWMD Assigned Well #	Monthly Water Levels Required	Monthly Water Levels Being Collected?	Annual Water Quality Analyses Required?	Annual Water Quality Data Being Collected?
Within MPWMD Boundaries								
012-432-004	CAW - Plumas #4	California American Water Co.	Y	T15S/R1E-27Jg	Y	Y	Y	N
012-843-013	CAW - Darwin	California American Water Co.	Y	T15S/R1E-23Ea	Y	Y	Y	N
011-041-018	CAW - Military	California American Water Co.	Y	T15S/R1E-14Nd	Y	Y	Y	N
011-061-004	CAW - Ord Grove #2	California American Water Co.	Y	T15S/R1E-23Bc	Y	Y	Y	N
011-071-018	CAW - New Luzern	California American Water Co.	Y	T15S/R1E-23De	Y	Y	Y	N
011-091-017	CAW - Playa #3	California American Water Co.	Y	T15S/R1E-22Bc	Y	Y	Y	N
011-091-017	CAW - Playa #4	California American Water Co.	Y	T15S/R1E-22Bf	Y	Y	N	
011-493-028	CAW - Paralta	California American Water Co.	Y	T15S/R1E-14Ra	Y	Y	Y	N
031-151-010	Reservoir Well	City of Seaside	Y	T15S/R1E-13Na	Y	?	Y	N
031-231-062	Coe Avenue Well	City of Seaside	Y	T15S/R1E-14Ma	Y	?	Y	N
011-181-014	Public Works Corp. Yard	City of Sand City	Y	T15S/R1E-22Ed	Y	?	Y	N
011-011-020	Cypress Pacific	Monterey Peninsula Engineering	Y	T15S/R1E-22Dd	Y	N	Y	N
011-236-010	Robinette -Design Ctr.	City of Sand City	Y	T15S/R1E-22Mc	Y	?	Y	N
011-041-043	(in front of Target)	DBO Development	Y	T15S/R1E-22Ce	Y	N	N	
011-061-022	MMP prod well	Mission Memorial Park	Y	T15S/R1E-23Ab	Y	Y	N	
011-061-022	PRTIW -operated by MMP	Mission Memorial Park	Y	T15S/R1E-23Ac	Y	N	Y	N
011-501-014-500		Security National Guaranty, Inc.	Y	T15S/R1E-15K1	Y	N	Y	N
011-532-005		Granite Rock Company	Y	T15S/R1E-22Eb	Y	?	N	
012-511-005	Shea Well	City of Del Rey Oaks	Y	T15S/R1E-26Mc	Y	N	N	
012-115-017	City #4	Seaside Municipal Water System	Y	T15S/R1E-23Gc	Y	?	Y	?
012-653-003	City #2	Seaside Municipal Water System	Y	T15S/R1E-23Pb	Y	?	N	
012-664-017	City #1	Seaside Municipal Water System	Y	T15S/R1E-23Lb	Y	?	N	
012-115-017	City #3	Seaside Municipal Water System	Y	T15S/R1E-23Ga	Y	?	Y	?
173-071-052	East Well (Lot #9)	CAW - Bishop Unit	Y	T16S/R2E-05Fa	Y	N	N	
173-072-034	well lot Bishop #1 (west)	CAW - Bishop Unit	Y	T16S/R2E-05Ea	Y	Y	N	
173-072-041	well lot Bishop #2 (east)	CAW - Bishop Unit	Y	T16S/R2E-05Fb	Y	Y	N	
416-111-002	Mutual	CAW - Hidden Hills Unit	Y	T16S/R2E-09Cb	Y	N	N	
416-111-004	Standex	CAW - Hidden Hills Unit	Y	T16S/R2E-09Cc	Y	N	N	
416-111-004	Bay Ridge	CAW - Hidden Hills Unit	Y	T16S/R2E-09Cd	Y	Y	N	
259-031-011	RR#7	CAW - Ryan Ranch #7	Y	T15S/R1E-36Nb	Y	Y	N	
259-031-012	RR#8	CAW - Ryan Ranch #8	Y	T16S/R1E-01Cb	Y	Y	N	
259-031-012	RR#11	CAW - Ryan Ranch #11	Y	T16S/R1E-01Cd	Y	Y	N	
173-071-056	Old Main Gate (Lot #12)	Pasadera - New Cities Developme	Y	T16S/R2E-05Mg	Y	Y	N	
173-071-051	Paddock #1(Lot #11)	Pasadera - New Cities Developme	Y	T16S/R2E-05Mf	Y	N	N	
203-031-034	01-349	York School	Y	T15S/R1E-36Qa	Y	?	N	
173-071-048	(new #12)	Laguna Seca Golf Resort	Y	T16S/R2E-06Hb	Y	Y	N	
173-071-048	(racetrack)	Laguna Seca Golf Resort	Y	T16S/R2E-06Ga	Y	Y	N	
Outside MPWMD Boundaries								
173-011-025, -026	LS Cnty Park #3	MPRPD	Y	T16S/R2E-05Gd	Y	?	N	
173-011-025, -026	LS Cnty Park #4	MPRPD	Y	T16S/R2E-05Ge	Y	?	N	
					Y = 38	N or ? = 21	Y = 16	N or ? = 16

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	4
AGENDA TITLE:	Discuss and Provide Input on the 2015 Seawater Intrusion Analysis Report (SIAR)
PREPARED BY:	Robert Jaques, Technical Program Manager
SUMMARY:	HydroMetrics has completed preparing the Draft Seawater Intrusion Analysis Report (SIAR) for Water Year 2014-2015, and the Executive Summary, Conclusions, and Recommendations from the Draft SIAR are attached. The complete Draft SIAR is lengthy, so rather than including it in this agenda packet it has been posted on the Watermaster's website so TAC members wishing to review the entire document can do so. The SIAR examines the "health" of the Basin with regard to whether or not there are any indications that seawater intrusion is either occurring or is imminent. Previous SIARs have stated that depressed groundwater levels, continued pumping in excess of recharge and fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion <u>could</u> occur in the Seaside Groundwater Basin. In spite of these factors, the previous SIARs stated that neither the Piper nor the Stiff Diagrams nor any of the other parameters indicated the presence of seawater intrusion in the existing monitoring wells. HydroMetrics has reported essentially these same findings and conclusions in the Draft 2015 SIAR. The Draft 2015 SIAR, however, does recommend continued close monitoring of the declining water levels in the Laguna Seca Subarea, although not for seawater intrusion detection purposes but for general basin management purposes. A representative from HydroMetrics will participate in today's TAC meeting via telephone to provide an oral summary of the report and to respond to questions by TAC members.
ATTACHMENTS:	Executive Summary, Conclusions, and Recommendations from the Draft 2015 SIAR
RECOMMENDED ACTION:	Discuss and either modify the Draft SIAR findings and recommendations or recommend that the Board approve the Draft SIAR

EXECUTIVE SUMMARY

No seawater intrusion has historically been or is currently observed in existing monitoring and production wells in the Seaside Groundwater Basin, as demonstrated by the different tools and analyses that are used to investigate for evidence of seawater intrusion.

This annual report addresses the potential for, and extent of, seawater intrusion in the Seaside Groundwater Basin. Continued pumping in excess of recharge and fresh water inflows, pumping depressions near the coast, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin.

- Piper diagrams for groundwater samples collected from depth-discreet monitoring wells during Water Year 2015 show no changes in water chemistry towards seawater.
- No groundwater samples collected in Water Year 2015 and plotted on Stiff diagrams, show chemistry indicative of incipient seawater intrusion.
- Overall, chloride concentration trends have been stable for most monitoring wells.
- Maps of chloride concentrations for the shallow aquifer do not show chlorides increasing towards the coast. The deep aquifer maps show that the highest chloride concentrations are limited to coastal monitoring wells PCA-West Deep and sentinel well SBWM-4. The chloride concentrations in these wells appears to be stable.
- Although production wells have a different water quality than the monitoring wells, this is probably as a result of them being screened across both shallow and deep zones. The production well water qualities are not indicative of seawater intrusion.
- Induction logging data at the coastal sentinel wells do not indicate changes indicative of seawater intrusion.
- Groundwater levels continue to be below protective elevations in the deep coastal target monitoring wells for which protective elevations were

developed (MSC deep, PCA-West, and sentinel well SBWM-3). Two of the three shallow wells' groundwater levels are above protective elevations: PCA-W shallow and CDM-MW4. MSC shallow remains below protective elevations.

- The 2nd quarter deep aquifer groundwater levels along the coast are more than 20 feet below sea level. These depressed levels were last observed in Water Year 2013. Overall declines in groundwater levels are due to the effects of the continuing drought.
- Groundwater levels in the Laguna Seca subarea are continuing to decline at the same rate since 2001 despite triennial reductions in allowable pumping. In the eastern portion of the subarea, shallow groundwater levels are declining at a rate of approximately 0.6 feet per year, while the deep groundwater levels are declining at a much faster rate of between two and three feet per year. The rate of decline in groundwater levels in the western portion of the subarea is between one and two feet per year.
- Groundwater production in the Seaside Groundwater Basin for Water Year 2015 was 3,762.0 acre-feet, which is 278.1 acre-feet less than Water Year 2014. This amount is less than the Court-mandated operating yield of 3,920 acre-feet per year that is required between October 1, 2014 and September 30, 2017.

Based on the findings of this report, the following recommendations should be implemented to continue to monitor and track potential seawater intrusion.

1. Continue to Analyze and Report on Water Quality Annually

Seawater intrusion is a threat, and data must be analyzed regularly to identify incipient intrusion. Maps, graphs, and analyses similar to what are found in this report should continue to be developed every year.

2. Document Declining Groundwater Levels in the Laguna Seca Subarea

Although this recommendation is not one that is related to seawater intrusion because of the inland location of the wells, it is important for the sustainability of the groundwater basin. The state of groundwater levels in monitoring wells in the Laguna Seca subarea needs to be reported at least annually to the Watermaster. For the sustainability of the subarea, the Watermaster should consider options in the next water year to address the situation.

SECTION 4

CONCLUSIONS

Depressed groundwater levels below sea level, continued pumping in excess of recharge and fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin. In spite of these factors, no seawater intrusion has historically been or is currently observed in existing monitoring or production wells in the Seaside Groundwater Basin. Analyses which indicate that seawater intrusion is not occurring include:

- All water samples for Water Year 2015 from depth-discreet monitoring wells plot generally in a single cluster on Piper diagrams, with no water chemistry changes towards seawater.
- Water quality in some of the production wells is different than the water quality in the monitoring wells. This may be a result of mixed water quality from both shallow and deep zones in which these wells are perforated. The production wells' water qualities are not indicative of seawater intrusion.
- Stiff diagrams of production wells were not indicative of incipient seawater intrusion.
- Overall, chloride concentration trends were stable for most monitoring wells.
- Maps of chloride concentrations for the shallow aquifer do not show chlorides increasing towards the coast. The deep aquifer maps show that higher chloride concentrations are limited to coastal monitoring wells PCA-West Deep and sentinel well SBWM-4.
- Induction logging data at the coastal sentinel wells do not indicate changes indicative of seawater intrusion.
- The 2nd quarter deep aquifer groundwater levels along the coast are more than 20 feet below sea level. These depressed levels were last observed in Water Year 2013. Overall declines in groundwater levels are due to the effects of the continuing drought.

- Groundwater levels in the Laguna Seca subarea are continuing to decline at the same rate since 2001 despite triennial reductions in allowable pumping. The shallow groundwater levels are declining at a rate of approximately 0.6 feet per year, while the deep groundwater levels in the eastern portion of the subarea are declining at a much faster rate of between two and three feet per year. The cause of this decline is due in part to the safe yield of the subarea being incorrect and in part due to the influence of wells to the east of the groundwater basin. The rate of decline in groundwater levels in the western portion of the subarea is between one and two feet per year.
- Groundwater production in the Seaside Groundwater Basin for Water Year 2015 was 3,762.0 acre-feet, which is 278.1 acre-feet less than Water Year 2014. This amount is less than the Court-mandated operating yield of 3,920 acre-feet per year that is required between October 1, 2014 and September 30, 2017.
- Groundwater levels remain below protective elevations in all deep target monitoring wells (MSC deep, PCA-W, and sentinel well SBWM-3). Two of the three shallow wells' groundwater levels are above protective elevations: PCA-W shallow and CDM-MW4. MSC shallow remains below protective elevations.

In spite of the definitive geochemical data, groundwater level and pumping data suggest that a potential for seawater intrusion exists. Northern Coastal subarea groundwater levels in the deep zone remain below sea level (Figure 28 and Figure 30). Two potential processes may explain why no seawater intrusion has not yet been observed in the deep coastal wells:

- The location of seawater/fresh water interface is currently unknown. It is, however, sufficiently far offshore in the deep zone that it has not reached the coastal monitoring wells. A seawater interface may be moving towards the coast, but may take some years to arrive. Before the interface arrives, pumping will mine much of the fresh water stored beneath the ocean in the lower aquifer.
- Overlying aquifers and aquitards limit or prevent seawater from percolating into the lower aquifer. Groundwater level data and results from groundwater modeling suggest that this condition is occurring. Coastal groundwater levels in aquifers that are in close hydraulic communication with the ocean remain near sea level because the ocean acts

as a constant-pressure reservoir. Northern Coastal subarea groundwater levels in the deep aquifer are more than 20 feet below sea level (Figure 28 and Figure 30), suggesting that this aquifer is not in close communication with the ocean. This is further evidence that groundwater in the deep aquifer is currently being mined rather than replaced by seawater.

These two processes are displayed on Figure 37. The two processes are not independent, and it is likely that some combination of both factors is occurring.

SECTION 5

RECOMMENDATIONS

The analyses presented previously in this report are based on existing data. While informative, the data are spatially incomplete and temporally sporadic. The following recommendations should be implemented to monitor and track seawater intrusion. They are the same recommendations as were made last year.

CONTINUE TO ANALYZE AND REPORT ON WATER QUALITY ANNUALLY

Seawater intrusion is a threat, and data must be analyzed regularly to identify incipient intrusion. Maps, graphs, and analyses similar to what are found in this report should continue to be developed every year.

DOCUMENT DECLINING GROUNDWATER LEVELS IN THE LAGUNA SECA SUBAREA

Although this recommendation is not one that is related to seawater intrusion because of the inland location of the wells, it is important for the sustainability of the groundwater basin. The state of groundwater levels in monitoring wells in the Laguna Seca subarea needs to be reported at least annually to the Watermaster. The current rate of decline, particularly in the eastern portion of the subarea, is not acceptable. For the sustainability of the subarea, the Watermaster should consider options in the next water year to address the situation.

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	5
AGENDA TITLE:	Discuss and Provide Input on the Preliminary Draft Watermaster 2015 Annual Report
PREPARED BY:	Robert Jaques, Technical Program Manager
SUMMARY: The Watermaster submits an Annual Report to the Court after the end of each Water Year to fulfill one of its obligations under the Court Decision that created the Watermaster. A Preliminary Draft Annual Report for 2015 is being presented to the TAC for its review and input, in as complete a form as it can be as of today's TAC meeting. Due to its large file size, a complete copy of the Preliminary Draft 2015 Annual Report cannot be included with the agenda packet. However, a copy of the <u>body</u> of the Preliminary Draft is attached. A few of the attachments to the Annual Report, were still being prepared, and are therefore not included. A copy of the complete Preliminary Draft Annual Report, with those attachments that have been completed, is posted on the Watermaster's website for anyone that would like to examine the entire document. At today's meeting I will review with the TAC the principle components of the Preliminary Draft and provide an opportunity for TAC raise questions, provide input, and provide suggested edits to the Preliminary Draft Annual Report. A few items highlighted in yellow remain to be completed after the Board's December 2 meeting.	
ATTACHMENTS:	Preliminary Draft 2015 Annual Report (Body only)
RECOMMENDED ACTION:	Provide input to the Technical Program Manager regarding any edits to the Preliminary Draft Annual Report that the TAC wishes to propose

SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2015

December XX, 2015

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SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2015

Integral to the Superior Court Decision (Decision) rendered by Judge Roger D. Randall on March 27, 2006 is the requirement to file an Annual Report. This 2015 Annual Report is being filed on or before December 15, 2015, consistent with the provisions of the Decision, as amended by the Annual Report Review and Order dated January 7, 2011. This Annual Report addresses the specific Watermaster functions set forth in Section III. L. 3. x. of the Decision. In addition this Annual Report includes a section pertaining to Water Quality Monitoring and Basin Management.

A. Groundwater Extractions

The schedule summarizing the Water Year 2015 (WY 2015) groundwater production from all the producers allocated a Production Allocation in the Seaside Groundwater Basin is provided in Attachment 1, “Seaside Groundwater Basin Watermaster, Reported Quarterly and Annual Water Production from the Seaside Groundwater Basin for all Producers Included in the Seaside Basin Adjudication During Water Year 2015.” For the purposes of this Annual Report Water Year 2015 is defined as beginning October 1, 2014 and ending on September 30, 2015.

B. Groundwater Storage

Monterey Peninsula Water Management District (MPWMD), in cooperation with California American Water (CAW) operates the Seaside Basin Aquifer Storage and Recovery (ASR) program. Under the ASR program, CAW diverts water from its Carmel River sources during periods of flow in excess of NOAA-Fisheries’ bypass flow requirements, and transports the water through the existing CAW distribution system for injection and storage in the Seaside Basin at the MPWMD’s Santa Margarita ASR site and CAW’s Seaside Middle School ASR site. During WY 2015, 215 AF were diverted and stored in the Seaside Basin under the ASR program. Rainfall in the area was about 76% of normal, but due to the rainfall distribution pattern throughout the season, Carmel River flow was only 33% of normal. WY 2015 was the fourth consecutive hydrologic “drought” year on the Monterey Peninsula and was classified as “Dry” by MPWMD.

Based upon production reported for WY 2015, the following Standard Producers are entitled to Free and Not-Free Carryover Credits to 2016 in accordance with the Decision, Section III. H. 5:

<u>Producer</u>	<u>Free Carryover Credit</u> <u>(Acre-feet)</u>	<u>Not-Free Carryover Credit</u>
Granite Rock	136.59	81.28
DBO Development	266.14	156.92
Cypress (Calabrese)	3.65	0.59
CAW	00.00	00.00
City of Seaside Muni	00.00	00.00

C. Amount of Artificial Replenishment, If Any, Performed by Watermaster

Per the Decision, “Artificial Replenishment” means the act of the Watermaster, directly or indirectly, engaging in contracting for Non-Native Water to be added to the Groundwater supply of the Seaside Basin through Spreading or Direct Injection to offset the cumulative Over-Production from the Seaside Basin in any particular Water Year pursuant to Section III.L.3.j.iii. It also includes programs in which Producers agree to refrain, in whole or in part, from exercising their right to produce their full Production

Allocation where the intent is to cause the replenishment of the Seaside Basin through forbearance in lieu of the injection or spreading of Non-Native Water (referred to herein as “In-lieu Replenishment”).

During Water Year 2015 the Watermaster indirectly engaged in In-lieu Replenishment of the Basin. Non-native water was made available to the Basin during Water Year 2015 and is foreseeable for Water Year 2016 under a Memorandum of Understanding and Agreement entered into by Watermaster with the City of Seaside for its golf course irrigation program creating in-lieu replenishment water. In Water Year 2015 a total of 195.03 acre-feet was delivered to the City of Seaside by the Marina Coast Water District for irrigation of its golf courses. Of this amount 195.03 acre-feet was credited to the City of Seaside by the Watermaster under the terms of the Memorandum of Understanding and Agreement referred to above.

As reported in the 2014 Annual Report, this in-lieu replenishment program was extended by the Board in 2013 and made retroactive to January 1, 2013. The City of Seaside estimated that its remaining Marina Coast Water District entitlement would provide sufficient irrigation water to satisfy the irrigation demands of the golf courses through WY 2018. The extended MOU will continue until all of the City’s remaining MCWD entitlement has been used within the Program, and all of the City’s Replenishment Assessment Credit has either been used by the City, or by another party if the City transfers its Replenishment Assessment Credit. A copy of the extended MOU was contained in Attachment 13 of the 2013 Annual Report.

D. Leases or Sales of Production Allocation and Administrative Actions

No sale of Production Allocation and no actions pertaining to real property and/or water rights occurred during WY 2015. Cypress Pacific LLC (known as Calabrese in the Adjudication Decision) converted 8.0 acre-feet of Alternative Production Allocation to Standard Production Allocation by a declaration to the Monterey County Superior Court filed on January 21, 2015. A copy of this Court declaration is contained in Attachment 12.

During WY 2015 the Watermaster Board did not make any revisions to its *Rules and Regulations*.

During WY 2015 the Watermaster Board was comprised of the following Members and Alternates:

<u>MEMBER</u>	<u>ALTERNATE</u>	<u>REPRESENTING</u>
Director Paul Bruno	N/A	Coastal Subarea Landowner
Director Eric Sabolsice	Roger Hulbert	California American Water
Director Bob Costa	N/A	Laguna Seca Subarea Landowner
Director Bob Brower	Jeanne Byrne	MPWMD
Mayor Dave Pendergrass	Todd Bodem	City of Sand City
Supervisor Dave Potter	Supervisor Jane Parker	Monterey County (MCWRA)
Mayor Jerry Edelen	Kristin Clark	City of Del Rey Oaks
Councilmember Libby Downey	Mayor Clyde Roberson	City of Monterey
Mayor Ralph Rubio	Councilmember Dennis Alexander	City of Seaside

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

The CAW/MPWMD ASR Program operated during intermittent periods when excess Carmel River flows were available in WY 2015 and accordingly, 215 acre-feet of water were injected into the Basin as Stored Water Credits and 0 (zero) acre-feet was extracted during this water year.

Even though no water was imported from the Carmel Basin for the ASR program as described in **Section B** above, during WY 2015 195.03 acre-feet of imported water was used to irrigate golf courses owned by the City of Seaside overlying the Seaside Basin, as discussed above in **Section C**. The terms and conditions under which this in-lieu replenishment water was used to generate a credit to be applied against the City of Seaside's overproduction replenishment assessments is described in the "Memorandum of Understanding Between the Seaside Basin Watermaster and the City of Seaside" which was contained in Attachment 3 to the Watermaster's 2010 Annual Report. This is the only imported, reclaimed or desalinated water used either directly or for storage in the groundwater basin that has been reported to the Watermaster during WY 2015.

F. Violations of the Decision and Any Corrective Actions Taken

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

The Watermaster made a declaration regarding the availability of Artificial Replenishment for WY 2016 at its Board meeting of December 2, 2015. A copy of this declaration is contained in [Attachment 2](#). In WY 2015 the Watermaster continued the 10% water production reduction that was implemented in WY 2013, as required under Section III.B.2 of the Decision. [Also at its Board meeting of December 2, 2015 the Watermaster implemented an additional 10% water production reduction to become effective for WY 2016, also as required under Section III.B.2 of the Decision.](#)

Total pumping for WY 2015 did not exceed the Operating Yield (OY) for the Seaside Basin, but it did exceed the Natural Safe Yield (NSY) of the Basin.

CAW and the City of Seaside reported annual pumping quantities that exceeded their Standard Production NSY allocations by 782.17 and 25.77 acre-feet, respectively, and reported annual pumping quantities that exceeded their Operating Yield allocations by 462.03 and 0.06 acre-feet, respectively. The City of Seaside did not exceed its Alternative Production NSY. The Watermaster will assess CAW and the City of Seaside a Replenishment Assessment for these over productions, as further described in Section H, below.

G. Watermaster Administrative Costs

The total estimated Administrative costs through the end of October of Fiscal Year 2015 amounted to \$107,000 including a \$12,000 dedicated reserve. Costs include maintaining an office and paying a part time administrator and some part time staff to take and transcribe minutes of the Watermaster Board meetings during 2015. The "Fiscal Year 2015 Administrative Fund Report" is provided as [Attachment 3](#).

H. Replenishment Assessments

At its meeting of October 21, 2015 the Watermaster Board determined that the same Replenishment Assessment unit cost of \$2,702 per acre-foot that had been used in the two preceding Water Years should be used against WY 2016 pumping. The Agenda transmittal from that meeting discussing this determination is contained in Attachment 4.

Alternative and Standard Producers report their production amounts from the Basin to the Watermaster on a quarterly basis. Based upon the reported production for WY 2015, CAW's Replenishment Assessment for Overproduction in excess of its share of the Natural Safe Yield is \$2,113,413.61 and for Overproduction in excess of its share of the Operating Yield is \$312,102.70. The City of Seaside's Replenishment Assessment for its Municipal System for Overproduction in excess of its share of the Natural Safe Yield is \$69,629.57, and for overproduction in excess of its share of the Operating Yield is \$37.60. The City of Seaside did not exceed its Alternative Production Allocation for its Golf Course System production. A summary of the calculations for Replenishment Assessment for WY 2015 is contained in Attachment 5.

I. All Components of the Watermaster Budget

The Watermaster budget has four separate funds: Administrative Fund; Monitoring & Management–Operations; Monitoring and Management–Capital Fund and; Replenishment Fund. Copies of the budgets adopted for both Fiscal Year 2015 and Fiscal Year 2016 are contained in Attachment 6. The Chief Executive Officer provides monthly financial status reports to the Watermaster Board on all financial activities for each month with year-to-date totals.

J. Water Quality Monitoring and Basin Management

Water Quality Analytical Results

Groundwater quality data continued to be collected and analyzed on a quarterly basis during WY 2015 from the enhanced network of monitoring wells. The low-flow sampling method implemented in 2009 continued to be used in 2015 and is expected to continue to be used in the future to improve the efficiency of sample collection. As discussed in the 2013 Annual Report, the Watermaster reduced the frequency of water quality sampling at SBWM-MW5 to once every 3 years.

No modifications to the quarterly data collection frequency from the enhanced network of monitoring wells were made during WY 2015 and none are being proposed for WY 2016.

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

The expanded water quality analyses begun in WY 2012 were continued in WY 2015, and will be continued in WY 2016, for the four coastal 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).

Copies of the sampling results are contained in the report in Attachment 7, and all of the recommendations contained in the report are being actively pursued by the Watermaster. Funds to pursue these recommendations have been included in the adopted FY 2016 budgets contained in Attachment 6.

Management and Monitoring Program Work Plan

The Management and Monitoring Program (M&MP) 2016 Work Plan contained in Attachment 9 includes the types of basin management activities conducted in prior years as well as revisions approved by the Board at its October 21, 2015. The major changes from the 2015 M&MP Work Plan are:

Task M.1.e: This Task has not been used in recent years. Its budget amount was reduced, but not eliminated, in case some work of this type is necessary in 2016.

Task M.1.g: This Task is new this year and is a result of the implementation by the State of the Sustainable Groundwater Management Act.

Tasks I.2.a.1 and I.2.b.6: Private Consultant services have not been needed for these Tasks in the past, so no Private Consultant services for these Tasks are included in the 2016 budget.

Task I.2.a.2: This task that was completed in 2015 and no further work on this Task is expected to be required in 2016.

Task I.2.b.2: Costs to replace two dataloggers @ \$750 each, plus \$100 for installation parts, have been included in this task.

Task I.2.b.3: The cost of \$2,000 to replace the sampling pump used at the Laguna Seca Driving Range well, and \$1,000 to perform additional water quality testing at one of the Watermaster's sentinel wells, have been included in this task.

Task I.3.a.1: This Task consists of three subtasks as follows:

- Step 1: Update the Watermaster's Seaside Basin groundwater model and check its accuracy
- Step 2: Recalibrate the model (if necessary)
- Step 3: Prepare report describing the work that was done (if recalibration is necessary)

Step 1 was completed in 2014, and the Peer Review of the model performed in 2015 indicated that the model did not need to be recalibrated. Therefore, Steps 2 and 3 are not necessary, and no budget amount for this Task is required in 2016.

Task I.3.c: The budget for this Task was increased at the suggestion of HydroMetrics to reflect increases in hourly rates for their staff members who would work on this assignment, if the Watermaster determines that this Task should be performed in 2016.

The 2016 Budget is \$32,760 lower than the 2015 Budget, for the reasons described above.

No new monitoring wells are planned for installation in 2016. Consequently no monies are budgeted in the M&MP Capital Budget for 2015.

Calibration of Well Meters

The FY 2015 Management and Monitoring Program (M&MP) included Task I.2.a.2 - Verify Accuracy of Production Well Meters in order to ensure that water production data is accurate. The well meters of the major producers had been verified for accuracy during 2009, but it was felt that a periodic reevaluation of the larger producers would be desirable to determine if any pump testing or meter calibration work needed to be performed. With the assistance of personnel from MPWMD and Cal Am, site inspections of production wells were conducted to see if anything appeared not to be working properly such that it would affect the accuracy of metered production data on any of these wells, and to determine if any follow-up action should be taken. Attachment 10 contains a summary spreadsheet of the inspection data from these well meter inspections. The data indicates that most meters passed the minimum installation standards. Of those that did not, there was one meter that had a non-conventional vertical installation but passed the field flow test (Sand City Public Works), and two meters had installations that did not technically conform to the recommended five-pipe-diameters upstream straight distance (Tioga and Paddock). These are highlighted with shading in Attachment 10. When metering accuracy was evaluated by the Watermaster in 2009 it was concluded that there would be little benefit to requiring that pumping tests be performed on wells that have historically produced very small quantities of water, since even large errors in meter readings from these pumps would have little or no impact on Basin management decisions. Because of the very small amount of flow that has historically been pumped from the Tioga well the Watermaster concluded that it would not be worthwhile to conduct a pumping test on this well. The Paddock well installation is only marginally less than the recommended

installation configuration, and therefore it is unlikely that the meter would be appreciably inaccurate. The Watermaster concluded that no further action needs to be taken at this time with regard to meter calibration issues. Should future well production or other data indicate that metering accuracy is in question, this matter could be revisited.

Basin Management Database

Pertinent groundwater resource data obtained from a number of sources has been consolidated into the Watermaster's database to allow more efficient organization and data retrieval. No modifications or enhancements to the database are planned in FY 2016.

Enhanced Monitoring Well Network

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

Basin Management Action Plan (BMAP)

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

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

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

Updating of the BMAP may be performed in FY 2016, but only if new data or other information warrants doing so. It is Task I.3.c in the M&MP Work Plan contained in Attachment 9.

Seawater Intrusion Response Plan

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

The Final SIRP was approved by the Watermaster Board in 2009 and a summary of the Seawater Intrusion Contingency Actions from the SIRP were contained in Attachment 10 of the 2009 Annual Report. The complete document may be viewed and downloaded from the Watermaster's website at: <http://www.seasidebasinwatermaster.org/>. No modifications to the SIRP are planned in 2016.

Seawater Intrusion Analysis Report

The Watermaster retained HydroMetrics LLC to prepare the WY 2015 Seawater Intrusion Analysis Report (SIAR) required by the M&MP. The WY 2015 SIAR provides an analysis of data collected during this Water Year.

The SIAR examines the “health” of the Basin with regard to whether or not there are any indications that seawater intrusion is either occurring or is imminent. The WY 2015 SIAR states that depressed groundwater levels, continued pumping in excess of recharge and fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin. In spite of these factors, the SIAR reports that neither the Piper nor the Stiff Diagrams, chloride levels, or other water quality parameters indicate the presence of seawater intrusion in the existing monitoring wells.

The SIAR is lengthy, but the full *Executive Summary Section* from it is provided in Attachment 8. A complete copy of the document is posted for viewing and downloading from the Watermaster’s website at: <http://www.seasidebasinwatermaster.org/>. All recommendations contained in the SIAR are being carried out and are included in the budgeted activities contained in Attachment 6 and described in Attachment 9.

The Watermaster continues to analyze the data that is being gathered at the various monitoring sites in order to keep a close watch on the conditions within the Basin, as discussed under the “Enhanced Monitoring Well Network” heading above.

Groundwater Modeling

During FY 2009 the previous Groundwater Model of the Basin was updated and a separate Groundwater Model was developed to determine protective water levels within the Basin. The modeling work was performed by HydroMetrics LLC. This Model development work was described in the 2009 Annual Report.

Updating and Evaluating the Accuracy of the Groundwater Model

The Watermaster’s existing Seaside Basin Groundwater Model (the Model) was developed in 2007 and was updated in 2009. In 2014 the Model was again updated and was then checked to see if the simulated groundwater levels matched the measured groundwater levels. The plan for performing this work was as follows:

- Task 1: Update the Watermaster’s Seaside Basin groundwater model and check its accuracy.
- Task 2: Recalibrate the model. This Task would only be performed if recalibration was found to be necessary under Task 1.
- Task 3: Prepare a report describing the work that was done under Task 2. This Task would only be performed if recalibration is performed under Task 2.

Task 1 was performed in 2014 and this work led to the following four principle conclusions:

1. The model provides reliable simulations for the LSSA and these can be trusted for making management decisions.
2. The calibration of the model remains within acceptable standards.
3. The northern boundary condition of the model needs to be updated to reflect real groundwater elevation variations for the model period of 2005-2013. 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).
4. 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.

A copy of the Technical Memorandum describing the work was contained in Attachment 10 of the 2014 Annual Report.

As a result of these findings the Watermaster determined that it was not necessary to recalibrate the Model in 2014, but funds were included in the 2015 M&MP Budget to perform Tasks 2 and 3 if that work was deemed to be necessary in 2015.

Peer Review of Modeling of the Laguna Seca Subarea

In response to questions and concerns raised about the steady decline in water levels in the Laguna Seca Subarea (LSSA) in 2014 the Watermaster Board performed modeling of the LSSA relating to the natural safe yield and operating yield of the LSSA. Although there appeared to be no indication of any immediate substantial adverse physical impact to the Basin or the LSSA, the initial results of the modeling work indicated the natural safe yield and operating yield of the LSSA may be significantly less than that set forth in the Decision. A copy of the draft Technical Memorandum describing the modeling work and initial results was contained in Attachment 11 of the 2014 Annual Report. Because of the significance of these initial results, in December 2014 the Watermaster retained an independent hydrogeologist with suitable qualifications and experience to perform a technical peer review of the modeling work and the initial results in order to ensure that the modeling and final results are as accurate as possible.

Because of his extensive experience and his familiarity with the Laguna Seca Subarea and the Seaside Basin, Mr. Gus Yates of Todd Groundwater was selected to perform the peer review. The work included reviewing reports and memoranda, meetings with HydroMetrics personnel, sensitivity testing of the Groundwater Model, and preparing a Peer Review Memorandum. It was expected that the peer review would shed additional light on trans-boundary pumping effects in the LSSA and uncertainty in simulation results in the northern Coastal Subbasin, both of which are issues important to current water management decisions.

The Peer Review Technical Memorandum contained in [Attachment 11](#) describes in detail the work performed by Todd Groundwater to evaluate the Groundwater Model, and to examine the recent modeling work that had been done by HydroMetrics on the Laguna Seca Subarea of the Seaside Basin.

One of the significant things that was noted in the peer review is that the accuracy of any groundwater model will depend on the amount of hard field data, i.e. hydrogeologic data, well location and construction data, well water production data, etc. that is input into the model. When any of these types of data is limited, the modeler has to put in assumed values in order for the model to process the data and produce results. In portions of the Seaside Basin there are areas where little hydrogeologic data exists, for example in the Northern Inland Subarea, which is just to the north of the Laguna Seca Subarea and to the east of the Northern Inland Subarea. There is also limited data in the eastern portion of the Northern Inland Subarea. The peer review performed sensitivity analyses on certain of the hydrogeologic properties in these areas to see whether changing some of the assumed values there would appreciably affect the modeling results. In nearly every case while there were some differences in results in the early years of the model runs, the results under either the original or the revised values tended to converge, thus indicating that the original model assumptions were reasonable.

However, it was pointed out that a model can be “calibrated” in a variety of ways. In this context “calibration” refers to the process of adjusting assumed values such that a model’s calculated groundwater elevations match field-measured water levels in the various production and monitoring wells. Depending on how the calibration process is performed different models could produce different results in the areas between field-measured data points, and yet still appear to be properly calibrated. This is why the following statement was made in the Peer Review Technical Memorandum: *“The current model and the previous model (Yates and others, 2002) both simulated measured water levels reasonably well, but with substantially different aquifer parameters and water balances. Available data are insufficient to determine whether one model is more realistic or better than the other.”* For this reason one of the recommendations made in the Peer Review Technical Memorandum is that when the HydroMetrics model is run to assess future groundwater management measures that could be

undertaken, additional model runs should be performed using different assumed hydrogeologic values to determine the sensitivity of the model to these assumptions. The purpose of doing these sensitivity analyses would be to determine the level of confidence that could be placed in the modeling results of these potential groundwater management measures.

In summary, while the peer review identified some aspects of the Groundwater Model that warrant further examination, perhaps the most significant finding was that the HydroMetrics Model is deemed to be satisfactory for estimating the operational safe yield of the basin and its subareas, and for simulating the effects of groundwater management measures that might be considered in the future. As discussed above, when using the Model to simulate the effects of such measures, sensitivity tests should be performed to assess the level of confidence that can be placed in the findings of the modeling work.

After reviewing and discussing the Peer Review Technical Memorandum and receiving recommendations from its Technical Advisory Committee, the Watermaster Board made the following determinations:

1. It will probably not be possible to reach agreement among all parties on a specific number to use for the Natural Safe Yield of the LSSA, and that efforts should focus on addressing the problem of falling groundwater levels rather than seeking a universally acceptable NSY value for the LSSA.

2. The Watermaster should focus its efforts on protecting production wells, but should keep monitoring wells operational to provide data that can be used for future model runs.

3. It would not be desirable to perform further modeling work at this time, but it could be worth doing so in the future if climate change impacts were input into the model.

4. It would be desirable to more accurately determine the location of the southeastern boundary of the Seaside Groundwater Basin, and authorized having HydroMetrics use the Seaside Basin Model to try to establish where the flow divide between the LSSA and the El Toro Subarea is located. This information could then be used to determine if any of the LSSA wells are located east of that flow divide.

5. Pumping redistribution should not be pursued at this time.

6. Changing the Laguna Seca-El Toro boundary location should not be pursued at this time, and should only be reconsidered if future information provides overwhelming reasons to seek a change in the boundary location.

7. The Watermaster should monitor the development of the Salinas Valley Groundwater Basin Sustainability Agency and the State Department of Water Resources' development of regulations pertaining to requesting boundary revisions, with the intent to collaborate with these entities as appropriate.

In the early part of 2016 the Watermaster intends to file a noticed motion with the Court regarding several issues: (1) requesting a stay of the 2015 through 2018 Operating Yield reduction, (2) updating the Court concerning recent regional water supply developments pertinent to the Seaside Basin, and (3) updating the Court concerning the recent modeling results and findings concerning the LSSA and the Watermaster's intended work plan to address long-term water reliability for the subbasin. The filing may also include other requests related to direction on interpretation of the Decision.

Estimation of Flow Divide Locations Near the Easterly Adjudication Boundary of the Laguna Seca Subarea

Subsequent to receiving a presentation on the Laguna Seca modeling Peer Review, the Watermaster Board concluded it would be beneficial to perform modeling in order to determine the locations of the hydrogeologic flow divides between the Laguna Seca Subarea (LSSA) and the areas to the east of the Adjudication Decision boundary of the Seaside Basin.

This work was performed for the Watermaster by HydroMetrics in October 2015. The work included determining the recent (2010) locations as well as projected near-future (2018) locations, using the same assumed future pumping scenario of CAW cutting back its pumping from the LSSA as was used in the

earlier modeling work. It also included determining the flow divide locations under both winter and summer conditions (February and August), in order to provide an indication of whether the flow divides were moving or were remaining relatively stationary.

Attachment 13 contains the Technical Memorandum that explains the methodology that was used and outlines the results of this analysis. Conclusions contained in the Technical Memorandum are as follows:

1. The flow divides do not appear to move appreciably between the 2010 scenario and the 2018 scenario. This indicates that flow divides will remain relatively stable for the near future if no new production wells begin operating near the divides.

2. During both the 2010 scenarios and the 2018 scenarios, groundwater in the most northeasterly portion of the LSSA is on the same side of the flow divide as the Corral de Tierra subbasin of the Salinas Valley Basin (as defined in DWR Bulletin 118). This region of the LSSA was also shown by the safe yield analysis to be more influenced by pumping outside of the LSSA than by pumping within. The presence of a flow divide between this region and the rest of the LSSA further suggests that this region is in greater hydrogeological connection with the Corral de Tierra subbasin. As a result, it will not be possible for the Watermaster to implement effective groundwater management strategies that will prevent groundwater levels in that portion of the LSSA from continuing to fall due to pumping in the Corral de Tierra subbasin.

3. The Watermaster is likely to have greater success implementing strategies aimed at stabilizing groundwater levels within the portion of the LSSA that is westerly of the flow divide between the LSSA and the Corral de Tierra subbasin. These may, however, be temporary strategies as any new well near the eastern edge of the LSSA could influence groundwater levels west of the current flow divide.

4. There is little difference in the locations of the February and August flow divides that are external to the LSSA boundaries. However, flow divides within the subarea caused by local pumping depressions in August are seasonal and are not observed during the February scenario.

In summary, the Technical Memo confirmed that a flow divide exists in the eastern portion of the LSSA, and that the most northeasterly portion of the LSSA, as defined by the boundary map contained in the Adjudication Decision, is actually east of that flow divide. Consequently, water flows from that portion of the LSSA in a northeasterly direction into the Corral de Tierra subbasin. This means that the Watermaster will not be able to effectively manage groundwater resources in that portion of the LSSA, since water levels there are impacted by pumping from outside of the Adjudication Decision boundary of the LSSA.

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

In May 2015 the Monterey County Resource Management Agency convened a Technical Advisory Committee (TAC) to develop a new Salinas River Basin model, and asked the Watermaster to join their TAC for this work. The County asked for information regarding the Watermaster's model of the Seaside Basin to ensure that the Salinas River Basin model coordinates properly with the Watermaster's model.

The Watermaster agreed to provide to the County the modeling information it requested for several reasons:

1. The input data in the Watermaster's Model is already publicly available.
2. Some of the Seaside Basin management options the Board may wish to pursue would involve coordination with the agency(s) responsible for groundwater management in the basins adjacent to the Laguna Seca Subarea.
3. The County is beginning the process of forming a Groundwater Sustainability Agency (as required under the State's recently adopted Sustainable Groundwater Management Act) for the areas adjoining the Seaside Basin.
4. Coordinating with the County to seek mutually acceptable means of stabilizing groundwater levels in this area would be beneficial to the Watermaster as well as the County.

5. Having the Watermaster's Seaside Basin Model integrated into, or coordinated with, the County's Salinas River Basin Model will ensure that the two models produce compatible results, thus avoiding potential differences of opinion when modeling simulations are performed.

K. Conclusions and Recommendations

The Seaside Basin Watermaster Board has worked diligently to meet all of the Court's established deadline dates. All of the Phase 1 Scope of Work activities, which are described in the "Implementation Plan for the Seaside Basin Monitoring and Management Program" dated March 7, 2007, have been completed. At the Watermaster Board meeting held on October 21, 2015 the Board adopted the FY 2016 budgets contained in Attachment 6, which support carrying out all elements of the "Seaside Groundwater Basin Management and Monitoring Program Anticipated 2016 Work Plan." That Work Plan describes the M&MP activities that will be conducted during Fiscal Year 2016. A copy of this Work Plan is contained in Attachment 9.

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

In the early part of 2016 the Watermaster intends to file a noticed motion with the Court regarding several issues: (1) requesting a stay of the 2015 through 2018 Operating Yield reduction, (2) updating the Court concerning recent regional water supply developments pertinent to the Seaside Basin, and (3) updating the Court concerning the recent modeling results and findings concerning the LSSA and the Watermaster's intended work plan to address long-term water reliability for the subbasin. The filing may also include other requests related to direction on interpretation of the Decision.

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	6
AGENDA TITLE:	Set Next Meeting Date
PREPARED BY:	Robert Jaques, Technical Program Manager
SUMMARY: There is no TAC meeting business that needs to be conducted in December, so there will be no need for a December TAC meeting. I recommend that the next TAC meeting be held on January 13, 2016.	
ATTACHMENTS:	None
RECOMMENDED ACTION:	Approve skipping having a TAC meeting in December and holding the next TAC meeting on January 13, 2016

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	7
AGENDA TITLE:	Report on Analysis by HydroMetrics on Groundwater Flow Divides within and East of the Laguna Seca Subarea
PREPARED BY:	Robert Jaques, Technical Program Manager
SUMMARY: The Watermaster issued RFS No. 2015-04 to HydroMetrics in September 2015 to estimate the locations of flow divides within and to the east of the Laguna Seca Subarea. The purpose of this work was to help determine the location of the flow divide(s) that hydrogeologically separate(s) the LSSA from the Corral de Tierra subbasin of the Salinas Valley Basin, relative to the Adjudication Decision boundary of the LSSA. Previous modeling work by HydroMetrics indicated that water was flowing from the LSSA east into the Corral de Tierra subbasin in part due to pumping occurring in that subbasin, which is outside of the Seaside Basin Adjudication Decision boundary. Attached is the Technical Memo prepared by HydroMetrics describing their work and its findings and conclusions. The Technical Memo confirms that a flow divide exists in the eastern portion of the LSSA, and that the most northeasterly portion of the LSSA, as defined by the boundary map contained in the Adjudication Decision, is actually east of that flow divide. Consequently, water flows from that portion of the LSSA in a northeasterly direction into the Corral de Tierra subbasin. This means that the Watermaster is not able to effectively manage groundwater resources in that portion of the LSSA, since water levels there are impacted by pumping from outside of the Adjudication Decision boundary of the LSSA. The Technical Memorandum also found that the location of this flow divide is relatively stationary both between the winter and summer portions of the year, and from year to year out to 2018, which is as far into the future as the Technical Memorandum evaluated. A representative of HydroMetrics will participate by telephone conference line at today's TAC meeting to describe this work and respond to TAC questions about it.	
ATTACHMENTS:	Technical Memorandum from HydroMetrics
RECOMMENDED ACTION:	None required – information only

TECHNICAL MEMORANDUM

To: Bob Jaques, Technical Program Manager
Seaside Basin Watermaster

From: Stephen Hundt and Georgina King

Date: November 9, 2015

Subject: Groundwater Flow Divides within and East of the Laguna Seca Subarea

INTRODUCTION

The Seaside Groundwater Basin Watermaster (Watermaster) has raised a number of questions and initiated various studies in response to declining groundwater elevations in the Laguna Seca subarea (LSSA). Recent studies by HydroMetrics WRI indicated that declining groundwater elevations at least partially result from pumping outside the LSSA. Because the Watermaster has no control or influence over pumping outside the seaside basin boundaries, it is effectively unable to prevent declining groundwater elevations in a portion of the LSSA.

To obtain a better understanding of its future groundwater management options, the Watermaster asked HydroMetrics WRI to prepare a map of existing and potential future groundwater divides based on groundwater model results. Although these groundwater divides are not a strong barrier to flow, they do indicate regions where pumping may influence groundwater elevations. Based on the locations of these divides, the Watermaster may opt to move the boundary of the LSSA, or define different groundwater management options for different portions of the LSSA.

This technical memorandum presents the results of a study to identify model-estimated groundwater flow divides within and to the east of the LSSA. This study was requested by the Seaside Groundwater Basin Watermaster.

METHODS

The locations of flow divides in the LSSA were estimated from results of the existing groundwater flow model. Groundwater divide locations may move over time in response to changes in recharge and pumping. Therefore, the groundwater divide locations were mapped for a number of times. Four time periods were selected for analysis. Groundwater flow divides from February 2010 and August 2010 were selected from the historic model scenario, and the estimated future groundwater flow divide locations for February 2018 and August 2018 were selected from the baseline model scenario. The months of February and August were selected because they displayed the greatest difference in groundwater conditions for any six-month period. The year 2010 was chosen because it was near the end of the model calibration period, and had more strongly defined flow divides than the years 2011 or 2012. The year 2018 was chosen because it is when, under the baseline condition simulation, California-American Water Company's LSSA pumping will be eliminated in accordance with the Adjudication Decision (HydroMetrics LLC, 2009, Table 15).

Model-simulated groundwater elevations and groundwater flow directions in the Santa Margarita Aquifer were extracted for each chosen time period. Flow divides were delineated by identifying ridges in the groundwater elevation contour maps, and locations where flow directions diverge. The flow divides were termed either "well-defined" or "less-defined" based upon a qualitative inspection of the degree of divergence in the groundwater flow vectors. Several well-defined flow divides were apparent where flow vectors were oriented nearly 180 degrees apart. Other less-defined divides were identified where flow vectors were almost parallel, with only slightly divergent orientations. The flow divides were located based upon a one foot contour interval to improve our accuracy in defining the flow divide location, while the figures in this memorandum show a five foot contour interval.

RESULTS

Figures 1 through 4 show groundwater elevations and groundwater flow divides that were generated from simulated groundwater elevations from the Seaside Basin groundwater flow model. Groundwater elevations are displayed at five foot intervals with blue contour lines; model cells that have no groundwater flow due to the presence of the Laguna Seca anticline are shown as light grey rectangles. The Laguna Seca Anticline separates the northern and southern

subbasins of the Seaside Groundwater Basin. This feature – including the segment of the Old Terrace Fault that offsets the anticline – forms a subsurface hydraulic partial barrier to flow (Hydrometrics, 2009).

Flow divides are shown as purple dashed and solid lines on Figures 1 through 4, with arrows added to emphasize the direction of groundwater flow. The groundwater flow divides were classified as more-defined and less-defined, as indicated by the solid or dashed line, respectively.

The results show two flow divides that remain relatively stable for all four model periods. One of these flow divides begins east of the Laguna Seca anticline at the boundary of the LSSA and Northern Inland subareas. It runs east-southeast to just outside of the Seaside Basin where it connects with a second flow divide. The northern portion of this divide appears to be relatively well defined, but the southern portion of this divide is weakly defined. It is likely that the southern portion of this divide has less of an influence on flow directions. Groundwater on the southern side of the divide flows westerly into the LSSA and groundwater on the northern side of the divide flow northeasterly into the Northern Inland subarea. The second flow divide is located outside and southeast of the LSSA where a well-defined pumping depression has developed near the southern boundary of the groundwater model.

During the summer months when pumping is greatest, additional flow divides emerge within the LSSA around seasonal pumping depressions. Two such flow divides are present during August 2010 while only one remains in August 2018. These flow divides develop in a portion of the LSSA where groundwater flow takes place between, and generally parallel to, two structural features: the outcrop of the Monterey Formation which defines the southern edge of the groundwater model and the Laguna Seca anticline located along the boundary of the LSSA and Northern Inland subareas. This proximity of these boundaries exacerbates the pumping drawdowns that drive the development of the flow divides. These seasonal flow divides fade by the winter season.

It is important to recognize that these flow divides are neither static features nor hard physical barriers to flow. Instead, they are local high points or ridges that appear in groundwater elevations in response to the specific stresses that are placed on the groundwater system. A change in these stresses can cause flow divides to move, appear, or disappear. For example, increased pumping near one of the current flow divides could lower local groundwater levels and push the

divide away from where the increased pumping was occurring. The dynamic nature of these divides is highlighted by the seasonal flow divides within the LSSA that develop and dissipate with changes in pumping.

Furthermore, groundwater pumping on one side of a flow divide can influence groundwater levels on the other side of a flow divide. Groundwater pumping can move a flow divide, or lower the elevation of a flow divide. Either one of these actions can influence groundwater levels on the opposite side of the flow divide. This is consistent with a previous analysis of the safe yield of the LSSA (Hydrometrics, 2013), which suggested that pumping from wells located just outside of the eastern boundary were drawing groundwater elevations down within the LSSA and that their influence would hinder the Watermaster's efforts to stabilize groundwater elevation in the LSSA.

CONCLUSIONS

1. The flow divides do not appear to move appreciably between the 2010 scenario and the 2018 scenario. This indicates that flow divides will remain relatively stable for the near future if no new production wells begin operating near the divides.
2. During both the 2010 scenarios and the 2018 scenarios, groundwater in the most northeasterly portion of the LSSA is on the same side of the flow divide as the Corral de Tierra subbasin of the Salinas Valley Basin (as defined in DWR Bulletin 118). This region of the LSSA was also shown by the safe yield analysis to be more influenced by pumping outside of the LSSA than by pumping within. The presence of a flow divide between this region and the rest of the LSSA further suggests that this region is in greater hydrogeological connection with the Corral de Tierra subbasin. As a result, it will not be possible for the Watermaster to implement effective groundwater management strategies that will prevent groundwater levels in that portion of the LSSA from continuing to fall due to pumping in the Corral de Tierra subbasin. The Watermaster is likely to have greater success implementing strategies aimed at stabilizing groundwater levels within the portion of the LSSA that is westerly of the flow divide between the LSSA and the Corral de Tierra subbasin. These may, however, be temporary strategies as any new well near the eastern edge of the LSSA could influence groundwater levels west of the current flow divide.

3. There is little difference in the locations of the February and August flow divides that are external to the LSSA boundaries. However, flow divides within the subarea caused by local pumping depressions in August are seasonal and are not observed during the February scenario.

REFERENCES

HydroMetrics LLC. 2009. *Seaside groundwater basin modeling and protective groundwater elevations*, prepared for Seaside Basin Watermaster, 151 pp.

HydroMetrics LLC. 2013. *Technical memorandum: results of Laguna Seca safe yield analysis*, prepared for Seaside Basin Watermaster, December 24, 2013.

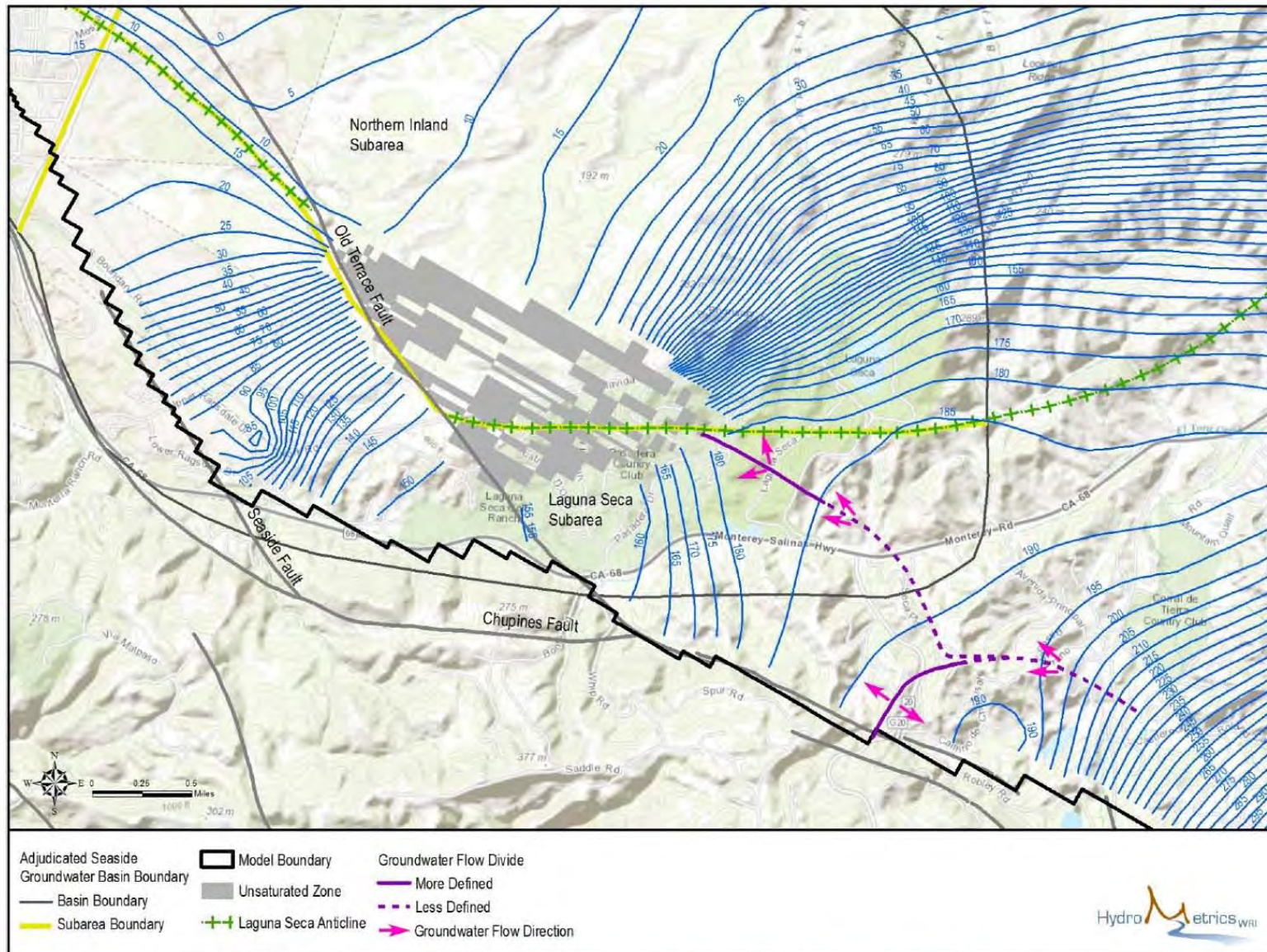


Figure 1: Groundwater Elevations and Flow Divides - February 2010
HydroMetrics Water Resources Inc. • 1814 Franklin Street, Suite 501 • Oakland, CA 94612
(510) 903-0458 • (510) 903-0468 (fax)

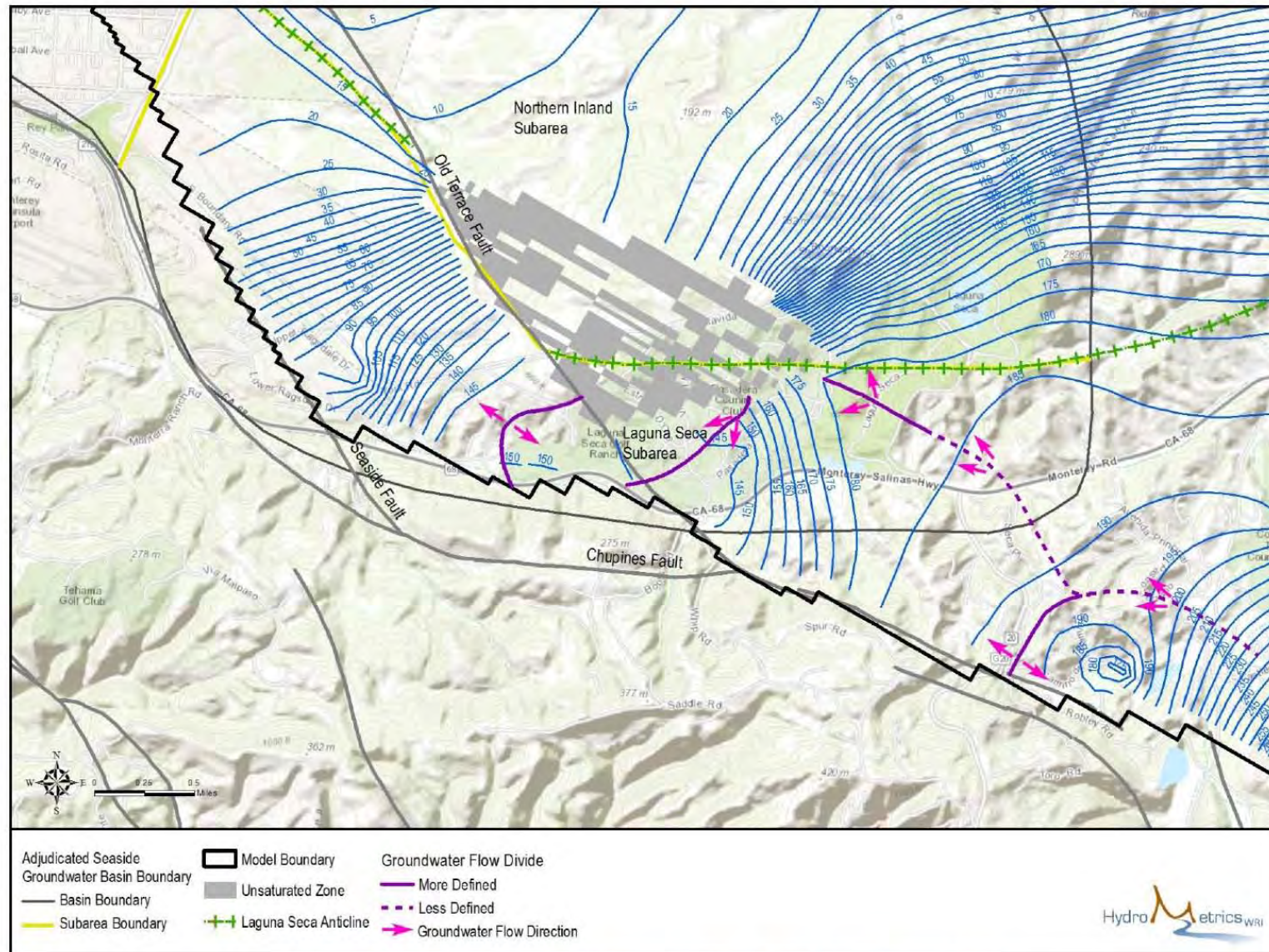


Figure 2: Groundwater Elevations and Flow Divides - August 2010

HydroMetrics Water Resources Inc. • 1814 Franklin Street, Suite 501 • Oakland, CA 94612
(510) 903-0458 • (510) 903-0468 (fax)

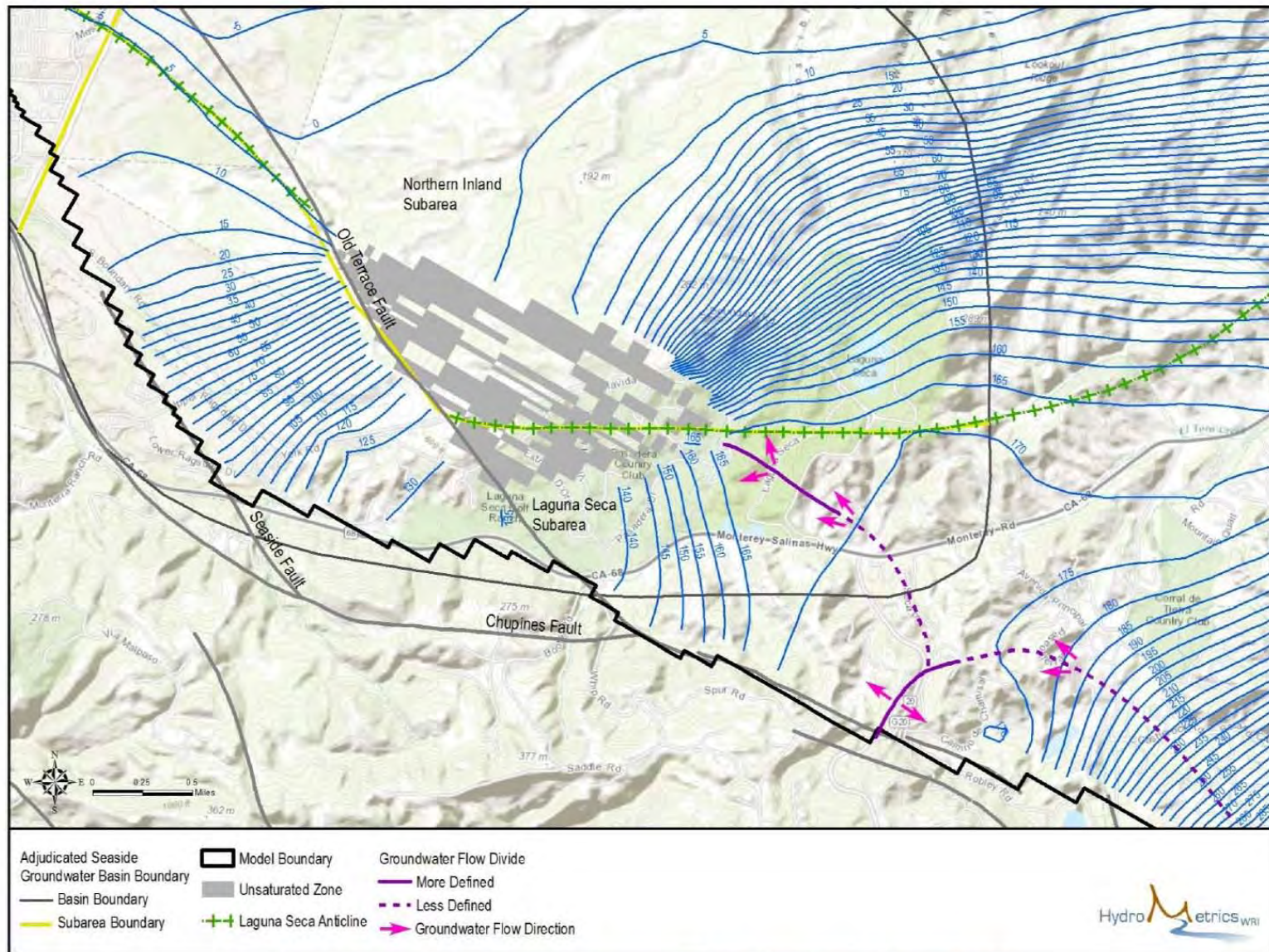


Figure 3: Groundwater Elevations and Flow Divides - February 2018

HydroMetrics Water Resources Inc. • 1814 Franklin Street, Suite 501 • Oakland, CA 94612
(510) 903-0458 • (510) 903-0468 (fax)

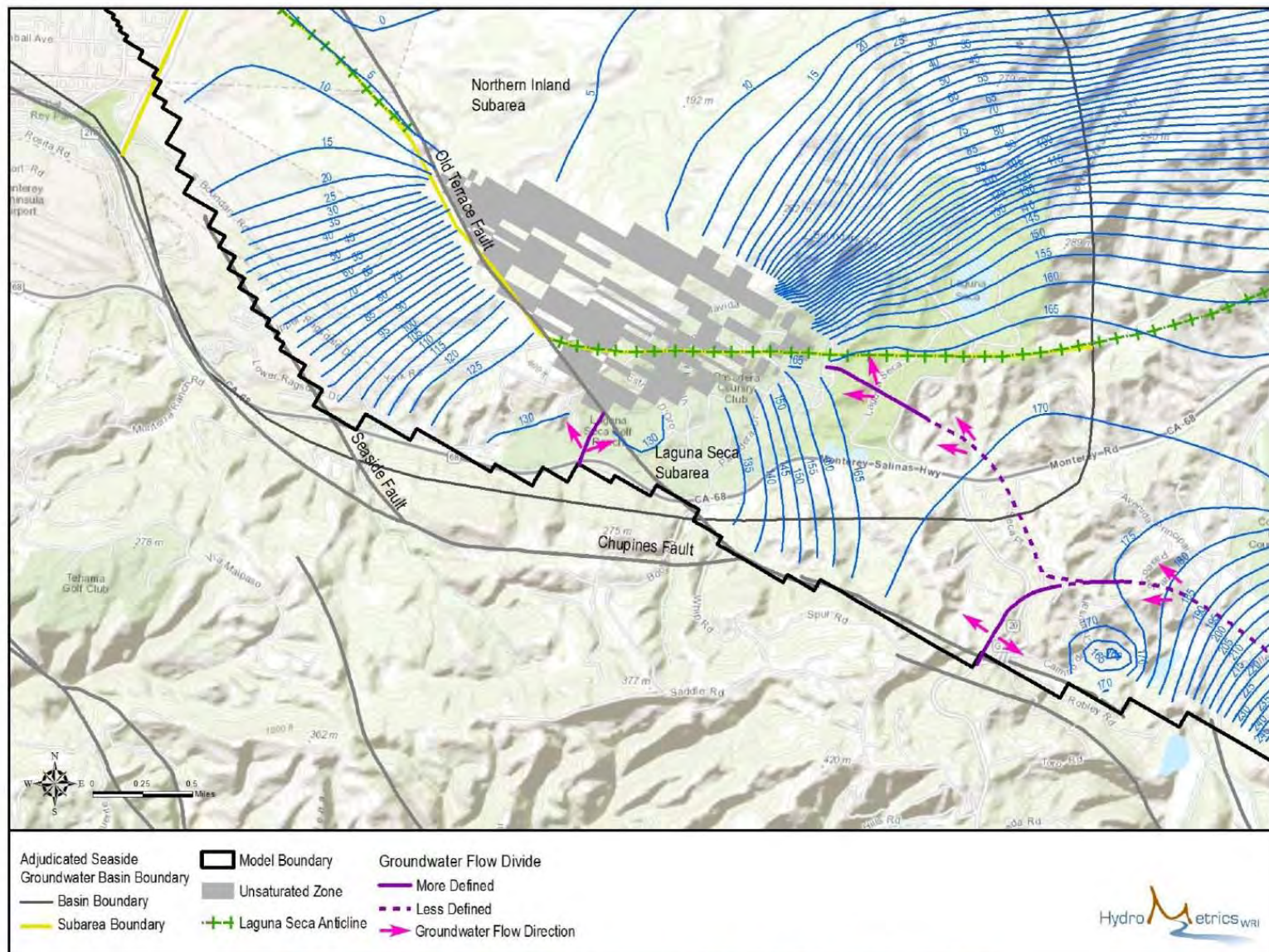


Figure 4: Groundwater Elevations and Flow Divides - August 2018
 HydroMetrics Water Resources Inc. • 1814 Franklin Street, Suite 501 • Oakland, CA 94612
 (510) 903-0458 • (510) 903-0468 (fax)

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	8
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 2015. There are a few things to note in this update: 1. There will be no December 2015 TAC meeting as there will be no TAC business that needs to be conducted at that time. The next TAC meeting will be the 2nd Wednesday in January, January 13, 2016. 2. The Board will meet on its normal meeting date of December 2 (1st Wednesday in December) to approve a number of things including the Annual Report and the Initial Consultant Contracts for 2016. Also attached is the proposed Work Schedule for FY 2016.	
ATTACHMENTS:	1. Schedule of Work Activities for FY 2015 2. Schedule of Work Activities for FY 2016
RECOMMENDED ACTION:	Provide Input to Technical Program Manager Regarding Any Corrections or Additions to the Schedule

Seaside Basin Watermaster Monitoring and Management Program 2015 Work Schedule

ID	Task Name	2015												2016					
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	CRITICAL PROJECT MILESTONES ASSOCIATED WITH TAC, BOARD, AND/OR CONSULTANT WORK																		
2	2016 Administration, Operations and Replenishment Budgets																		
3	Prepare M&MP Draft Budgets (Same as Task 19)												Completed						
4	TAC Approves M&MP Budgets (Same as Task 20)												Completed						
5	Board Approves M&MP Budgets (Same as Task 21)													Completed					
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 41)									Completed									
8	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2015 (Same as Task 42)													Completed					
9	Replenishment Assessment Unit Costs for Water Year 2016																		
10	B&F Committee Develops Replenishment Assessment Unit Cost for 2016 Water Year												Completed						
11	If Requested, TAC Provides Assistance to B&F Committee in Development of 2016 Water Year Replenishment Assessment Unit Cost												NO ASSISTANCE WAS REQUESTED						
12	Board Adopts and Declares 2016 Water Year Replenishment Assessment Unit Cost													Completed					
13	Replenishment Assessments for Water Year 2015																		
14	Watermaster Prepares Replenishment Assessments for Water Year 2015																		
15	Watermaster Board Approves Replenishment Assessments for Water Year 2015 (At December Meeting)																12/2		
16	Watermaster Levies Replenishment Assessment for 2015																		
17	Monitoring & Management Program (M&MP) Budgets for 2015 and 2016																		

Seaside Basin Watermaster Monitoring and Management Program 2015 Work Schedule

ID	Task Name	2015												2016											
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		
18	Preliminary Discussion of Potential Scope of Work for 2016 M&MP			Completed																					
19	Prepare Draft 2016 M&MP Work Plan and 2016 and 2017 O&M and Capital Budgets												Completed												
20	TAC approves Draft 2016 M&MP Work Plan and 2016 and 2017 O&M and Capital Budgets												Completed												
21	Board approves 2016 M&MP O&M and Capital Budgets													Completed											
22	2015 Annual Report (Note: Schedule Reflects Court Approval of Later Submittal Date for Annual Report)																								
23	Prepare Preliminary Draft 2015 Annual Report																								
24	TAC Provides Input on Preliminary Draft 2015 Annual Report																								
25	Prepare Draft 2015 Annual Report (Incorporating TAC Input)																								
26	Board Provides Input on Draft 2015 Annual Report (At December Board Meeting)																								
27	Prepare Final 2015 Annual Report (Incorporating Board Input)																								
28	Watermaster Submits Final 2015 Annual Report to Judge																								
29	MANAGEMENT																								
30	M.1 PROGRAM ADMINISTRATION (All Work Performed by Watermaster Staff)																								
31	Prepare Initial Consultant Contracts for 2016																								
32	TAC Approval of Initial Consultant Contracts for 2016																								
33	Board Approval of Initial Consultant Contracts for 2016																								
34	IMPLEMENTATION																								
35	I.2.a DATABASE MANAGEMENT																								
36	I.2.a.1 Conduct Ongoing Data Entry/Database Maintenance																								

Seaside Basin Watermaster Monitoring and Management Program 2015 Work Schedule

ID	Task Name	2015												201					
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
37	I.2.a.2 Verify Accuracy of Production Well Meters																		
38	Field Evaluations of Metering Facilities					Completed													
39	Report Findings and Recommendations to the TAC					Completed													
40	Carry Out Followup Actions if Necessary					None Required													
41	Report Findings and Recommendations to the Board							Completed											
42	I.2.b DATA COLLECTION PROGRAM																		
43	I.2.b.2 Collect Monthly Water Levels (MPWMD)																		
44	I.2.b.3 Collect Quarterly Water Quality Samples (MPWMD)																		
45	I.2.b.6 Reports (from MPWMD)																		
46	Watermaster Prepares Combined Quarterly Water Production, Water Level, and Water Quality Reports for 1st & 2nd Quarters								Completed										
47	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2015													Completed					
48	I.3.a ENHANCED SEASIDE BASIN GROUNDWATER MODEL																		
49	Perform Peer Review of Groundwater Model and Laguna Seca Modeling Results from 2014				Completed														
50	Initial Report to TAC on Findings and Recommendations from Peer Review					Completed													
51	Consultant Revises Preliminary Draft Peer Review Report					Completed													
52	Second Report to TAC on Findings and Recommendations from Peer Review						Completed												
53	Consultant Revises Draft Peer Review Report						Completed												
54	Report to Board on Findings and Recommendations from Peer Review							Completed											
55	Follow-up Actions on Peer Review Direction from Board (if needed)							None Required											

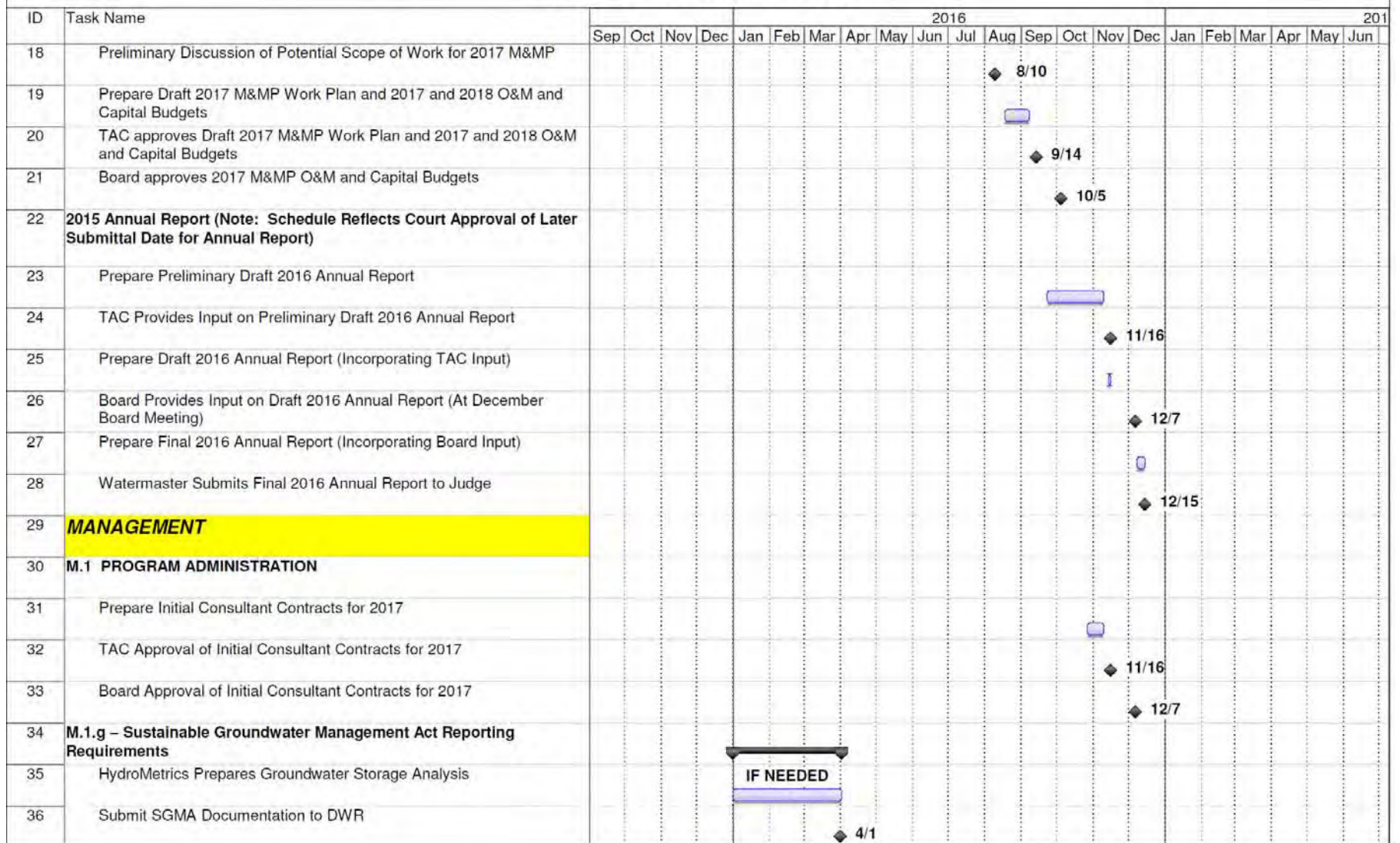
Seaside Basin Watermaster Monitoring and Management Program 2015 Work Schedule

ID	Task Name	2015												2016					
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
56	Develop Basin Management Actions for Board Consideration									Completed									
57	Present TAC's Recommended Basin Management Actions to Board											Completed							
58	I.3.a.1 Recalibrate Existing Groundwater Model (if necessary)									DETERMINED NOT TO BE NECESSARY									
65	I.3.c Refine and/or Update the BMAP									NO WORK SCHEDULED UNTIL TAC DIRECTION PROVIDED TO RESUME DISCUSSION									
66	I.4.c Annual Seawater Intrusion Analysis Report (SIAR)																		
67	HydroMetrics Provides Draft SIAR to Watermaster														Completed				
68	TAC Approves Annual Seawater Intrusion Analysis Report (SIAR)																		
69	Board Approves Annual Seawater Intrusion Analysis Report (SIAR)																		
70	I.4.d Complete Preparation of Seawater Intrusion Response Plan (SIRP)																		
71	I.4.e Refine and/or Update the SIRP																		

Seaside Basin Watermaster Monitoring and Management Program 2016 Work Schedule

ID	Task Name	2016																								201
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
1	CRITICAL PROJECT MILESTONES ASSOCIATED WITH TAC, BOARD, AND/OR CONSULTANT WORK																									
2	2016 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																									
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17	Monitoring & Management Program (M&MP) Budgets for 2017 and 2018																									

Seaside Basin Watermaster Monitoring and Management Program 2016 Work Schedule



Seaside Basin Watermaster Monitoring and Management Program 2016 Work Schedule

ID	Task Name	2016												2017					
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
37	IMPLEMENTATION																		
38	I.2.a DATABASE MANAGEMENT																		
39	I.2.a.1 Conduct Ongoing Data Entry/Database Maintenance																		
40	I.2.b DATA COLLECTION PROGRAM																		
41	I.2.b.2 Collect Monthly Water Levels (MPWMD)																		
42	I.2.b.3 Collect Quarterly Water Quality Samples (MPWMD)																		
43	I.2.b.6 Reports (from MPWMD)																		
44	Watermaster Prepares Combined Quarterly Water Production, Water Level, and Water Quality Reports for 1st & 2nd Quarters																		
45	Watermaster Prepares Annual Water Production, Water Level, and Water Quality Report for 2016																		
46	I.3.a ENHANCED SEASIDE BASIN GROUNDWATER MODEL																		
47	TAC Assists Board in Developing Work Plan to Address LSSA Modeling Results																		
48	Develop and Schedule Additional Tasks as Directed by Board																		
49	I.3.c Refine and/or Update the BMAP																		
50	I.4.c Annual Seawater Intrusion Analysis Report (SIAR)																		
51	HydroMetrics Provides Draft SIAR to Watermaster																		
52	TAC Approves Annual Seawater Intrusion Analysis Report (SIAR)																		
53	Board Approves Annual Seawater Intrusion Analysis Report (SIAR)																		
54	I.4.d Complete Preparation of Seawater Intrusion Response Plan (SIRP)																		
55	I.4.e Refine and/or Update the SIRP																		

NO WORK SCHEDULED UNTIL TAC DIRECTION PROVIDED TO RESUME DISCUSSION

WORK COMPLETED - NO FURTHER WORK PLANNED IN 2016

ONLY IF FOUND TO BE NECESSARY

**SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE**

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

MEETING DATE:	November 18, 2015
AGENDA ITEM:	9
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