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

DATE: Wednesday, March 13, 2024 MEETING TIME: 1:30 p.m.

THE TECHNICAL ADVISORY COMMITTEE MEETING WILL BE CONDUCTED BY TELECONFERENCE AND WILL NOT BE HELD IN THE MONTEREY ONE WATER OFFICES. YOU MAY ATTEND AND PARTICIPATE IN THE MEETING AS FOLLOWS: JOIN FROM A PC, MAC, IPAD, IPHONE OR ANDROID DEVICE (NOTE: ZOOM APP MAY NEED TO BE DOWNLOADED FOR SAFARI OR OTHER BROWSERS PRIOR TO LINKING) BY GOING TO THIS WEB ADDRESS:

https://us02web.zoom.us/j/89032212772?pwd=RGxTcUJkRUdTKzIxNmxtQWExTIA2dz09

If joining the meeting by phone, dial this number: +1 669 900 9128 US (San Jose)

If you encounter problems joining the meeting using the link above, you may join from your Zoom screen using the following information:

Meeting ID: 890 3221 2772

Passcode: 724119

TAC Member Teleconferencing Information is on the Next Page

OFFICERS

Chairperson: Jon Lear, MPWMD

Vice-Chairperson: Tamara Voss, MCWRA

MEMBERS

California American Water Comp	any City of I	Del Rey Oaks	City of Monterey
City of Sand City	City of Seaside	(Coastal Subarea Landowners
Laguna Seca Property Owners		Monterey Cou	nty Water Resources Agency
Monterey Peninsula Water Management District			

Agenda Item	Page
1. Public Comments	<u>No.</u>
2. Administrative Matters:	
A. Approve Minutes from the December 13, 2023 Meeting	3
B. Sustainable Groundwater Management Act (SGMA) Update	17
3. Discuss Follow-up Actions Regarding Induction Logging Findings on Sentinel Well No. 4	22
4. Discuss Proposed Change in TAC Presentation of 2024 Seawater Intrusion Analysis Report	38
5. Schedule	39
6. Other Business	42
The next regular meeting is tentatively planned for Wednesday April 10, 2024 at 1:30 p.m.	

TAC MEMBER TELECONFERENCING INFORMATION

NAME	ENTITY	LOCATION
Tamara Voss	Monterey County Water	1441 Schilling Place, Salinas, CA
	Resources Agency	
Kim Shirley	City of Del Rey Oaks	4 Baxter Place, Del Rey Oaks, CA
Nisha Patel	City of Seaside	Engineering Trailer,
		440 Harcourt Avenue
		Seaside, CA
Tim O'Halloran	California American Water	511 Forest Lodge Rd. Suite 100
		Pacific Grove, CA
Cody Hennings	City of Monterey	City of Monterey Administrative Service
		Center, Orca Room, 735 Pacific Street,
		Monterey, CA
Jon Lear	Monterey Peninsula Water	5 Harris Court, Bldg. G, Monterey, CA
	Management District	
Leon Gomez	City of Sand City	City Hall in Sand City, 1 Pendergrass
		Way, Sand City, CA 93955
Paul Bruno	Coastal Subarea Landowners	192 Healy Ave, Marina, CA

* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	March 13, 2024
AGENDA ITEM:	2.A
AGENDA TITLE:	Approve Minutes from the December 13, 2023 Meeting
PREPARED BY:	Robert Jaques, Technical Program Manager
CUDALADY	

SUMMARY:

Draft Minutes from this meeting were 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 December 13, 2023

Attendees: TAC Members

City of Seaside – Nisha Patel California American Water – Tim O'Halloran City of Monterey – Cody Hennings Laguna Seca Property Owners – No Representative MPWMD – No Representative MCWRA – Tamara Voss City of Del Rey Oaks – Kim Shirley City of Sand City –Leon Gomez Coastal Subarea Landowners – No Representative

Watermaster

Administrative Officer – Laura Paxton

Consultants

Montgomery & Associates – Pascual Benito Montgomery & Associates – Georgina King

Others

MCWD – Tobias Osbourn SNG – Ed Ghandour

The meeting was convened at 1:30 p.m.

Ms. Voss Chaired the meeting as Mr. Lear was out of town and unable to attend. Ms. Paxton assisted Ms. Voss by conducting the roll call votes.

1. Public Comments

Mr. Ghandour said he was present for the item concerning the SNG well. There were no other public comments.

2. Administrative Matters:

A. Approve Minutes from the August 9, 2023 Meeting

On a motion by Ms. Shirley, seconded by Mr. O'Halloran, the minutes were unanimously approved as presented, with Ms. Voss, Ms. Patel, and Mr. Hennings abstaining as they were not present at that meeting.

B. Sustainable Groundwater Management Act (SGMA) Update

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item. Ms. Voss and Mr. O'Halloran said they appreciated having these summaries in the agenda packet.

C. Update on Damage to Sentinel Well No. 4

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item and there was no other discussion.

D. Results from Fall 2023 Induction Logging of the Sentinel Wells

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item. The hydrogeologic consultants felt that no action is required at this time, due to the small conductivity increases that have been observed.

There was a brief discussion regarding the Sentinel Wells in general. Mr. Voss commented that small conductivity increases have also been noted in some of the other Sentinel Wells as well as in Sentinel Well No. 4.

A motion was made by Mr. O'Halloran, seconded by Ms. Shirley, that the TAC concur with the consultants' finding that no action at this time is required. The motion passed unanimously.

E. Interpretation of Airborne Electromagnetic (AEM) Surveys Conducted by the Department of Water Resources as They Pertain to the Seaside Basin

Ms. Voss introduced this item. Mr. Benito of Montgomery & Associates provided a PowerPoint presentation describing the work that had been done and what information it provided regarding the Seaside Basin. A copy of those presentation slides is attached.

Limited data regarding seawater intrusion within the Seaside Basin was obtained from this work. However, it was shown that the top 150 feet all along the immediate shoreline of the Basin is intruded, as was previously assumed. New stratigraphy information within the Basin was provided by the surveys.

There was some discussion regarding possibly performing additional surveys within the Basin. Ms. King commented that such work is costly and there are limitations on where it can be performed. Ms. Voss noted that ground-truthing using data from existing wells is important to verify the results of the AEM surveys.

F. Update on SNG Well

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item. Mr. Ghandour provided historical information regarding this well and there was discussion about it. His recollection was that the well was perforated at a depth of approximately 160 feet. Ms. King noted that the other wells slightly further inland in this area are perforated at deeper depths and are not showing the higher chloride levels that the SNG well is.

Ms. Voss was in favor of seeing if legal efforts could be made to have the SNG well repaired or destroyed without having to await the resolution of the litigation that is currently in progress.

Mr. Ghandour reported that litigation among the partnership partners is currently in Court and under appeal. Recently an embezzlement litigation in Orange County has been initiated regarding the property. Some damage to the casing has been observed earlier via video inspection, but nothing has been done due to the limitations imposed by the Court. He asked if there was any data indicating the presence of seawater intrusion when no pumping is occurring, commenting that it was his understanding that no intrusion was being detected in nearby wells that are closer to the coastline. He was hopeful that some resolution to the litigation by the Orange County Court will occur in the next few months. Ms. Voss commented that downward migration of seawater intruded water in wells having leaking casings has been observed in the Salinas Valley. Ms. Shirley felt it would be good to pursue legal efforts to have the well repaired or destroyed.

A motion was made by Ms. Shirley, seconded by Mr. Hennings, that the Board be asked to see if it is feasible to initiate legal action to have the Court direct that repairs be made to this well now, rather than waiting until the litigation between the well owners is resolved. The motion passed unanimously with Mr. Gomez abstaining.

3. Progress Report on FO-9 Replacement Well

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item and there was no other discussion.

4. Discuss and Provide Input on the 2023 Seawater Intrusion Analysis Report (SIAR)

Ms. Voss introduced this item and Ms. King of Montgomery & Associates provided a PowerPoint presentation describing the SIAR. A copy of those presentation slides is attached. The SIAR concluded that there was no evidence of seawater intrusion coming into the Seaside Basin. Groundwater levels in the Laguna Seca Subarea continue to decline as they have in prior years. It includes some discussion regarding the induction logging results from Sentinel Well No. 4. Native groundwater production from the Seaside Basin was considerably below the Decision-established Natural Safe Yield of 3,000 AFY, and considerably below the production level in 2022.

A motion was made by Mr. O'Halloran, seconded by Ms. Shirley, that the TAC approve the SIAR and that it be forwarded to the Board for its approval. The motion passed unanimously.

5. Discuss and Provide Input on the Preliminary Draft Watermaster 2023 Annual Report

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item. No edits to the Preliminary Draft 2023 Annual Report were requested or recommended by the TAC. A motion was made by Mr. Hennings, seconded by Ms. Patel, to approve the Preliminary Draft 2023 Annual Report as presented, and recommended that it be forwarded to the Board for its approval.

6. Approve Initial RFSs for Montgomery & Associates, MPWMD, Martin Feeney, and Todd Groundwater for 2024

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item. A motion was made by Mr. O'Halloran, seconded by Mr. Gomez, to approve the Initial RFSs for Montgomery & Associates, MPWMD, Martin Feeney, and Todd Groundwater for 2024, and that they be forwarded to the Board for its approval. The motion passed unanimously.

7. Schedule

Ms. Voss provided Mr. Jaques' summary of the agenda packet materials for this item. TAC members will be considering Mr. Jaques' proposed different approach to having the 2024 SIAR approved in order to avoid having to hold a December 2024 TAC meeting or a January 2025 Board meeting.

8. Other Business

There was no other business.

The meeting adjourned at 3:18 PM.





















Take Aways

Survey coverage was mainly limited to inland areas

- Survey coverage was mainly limited to initiand areas
 Provides a 3-D view into structure and stratigraphy of the initiand areas of the Monterey and Seaside Subbasins where data have previously been missing can be incorporated into future model updates
 Very clearly shows initiand seawater intrusion extent in coastal areas of Monterey Subbasin that were surveyed
 Additional survey transects at Sentinel Wells #2, #3, and #4, and possibly Golf Courses should be considered to fill data gaps in the Coastal Subarea (can use TOWTEM instead of SkyTEM)

3

References

 CA DWR's Statewide Airborne Electromagnetic Survey Project: Data Report for Survey Area 10 Monterey Bay Area, October 15, 2023 https://data.cnra.ca.gov/dataset/aem

Questions	Pascual Benito, Ph.D.
2	pbenito@elmontgomery.com
Ŏ	510-485-9054
	6 ASSOCIATES Montecimientes



				_
- Chioride L	istribution a	na Na/Cl	molar Rati	0
Cation/An	ions - Piper	and Stiff	Diagrams	
Electric In	duction Logs			
Groundwa	ter Elevation	S		
Protective	Groundwate	r Elevatio	ons	
Groundwa	ter Productio	on		





























Subarea	Well	Depth	EL Protective Elevation,	4th Quarter Elevation	Above or Below
			feetamsl	feetams	
	MSC	Deep	17	-24.6	Below
Northern		Shallow	11	0.9	Below
Coastal	PCA-W	Deep	17	-24.1	Below
		Shallow	2	0.8	Below
	Sentinel 3	Deep	4	-26.4	Below
Coastal	CDM-MW4	Shallow	2	3.1	Above
Shallov Deep =	v = Paso Rol Santa Marga	bles Aquif arita Aquif	er ler		CTM



CONCLUSIONSCONCIncreasing conductivity measured by induction logging
the Sentinel Wells indicates seawater intrusion
starting in the Paso Robles Formation (shallow
aquifer):Conditions in the basin t
potential for seawater in
subarea is below sea li
subarea is be

Conditions in the basin that continue to provide a potential for seawater intrusion: ■ All deep groundwater in the Northern Coastal subarea is below sea level ■ 2nd quarter (winter/spring) > 40 feet below sea level ■ 4th quarter (summer/fall) > 60 feet below sea level ■ Groundwater levels remain below protective elevations in all deep target monitoring wells

 Two of the three shallow wells' groundwater levels are below protective elevations

CONCLUSIONS

- Evidence indicating seawater intrusion has not been detected in monitoring and production wells from which water quality samples are collected:
- No groundwater chemistry changes towards seawater in either shallow or deep groundwater
- Chloride concentration trends were stable for most monitoring wells
- Decrease > 20 mg/L in F0-10 Deep and Ord Terrace Shallow
 Sodium/chloride molar ratios at most monitoring wells remained constant or increased over the past year. F0-10 Shallow outside the basin has a molar ratio below 0.86

CONCLUSIONS

- Groundwater level declines in the Laguna Seca subarea continue at a rate of around 0.5 feet per year
- Cal-Am no longer pumps groundwater from Ryan Ranch and Bishop Systems
- Native groundwater production in the Seaside Groundwater Basin for Water Year 2023 was 2,173 acre-feet:
- 698 acre-feet less than Water Year 2022
- 827 acre-feet less than the Decision-ordered Operating Yield of 3,000 acre-feet per year required since October 1, 2020

RECOMMENDATIONS

1. Remove lost transducer and steel cable from SBWM-3

- 2. EKI and MCWD GSA should be informed that SBWM-1 and SBWM-2 are starting to show increasing conductivity in induction logs
- 3. Verify chloride concentrations and water chemistry in the 140 200 foot zone of SBWM-4
- 4. Destroy and replace F0-10 Shallow and F0-10 Deep to prevent cross contamination between the Paso Robles and Santa Margarita aquifers



* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	March 13, 2024
AGENDA ITEM:	2.B
AGENDA TITLE:	Sustainable Groundwater Management Act (SGMA) Update
PREPARED BY:	Robert Jaques, Technical Program Manager

At the State level:

Since the last TAC meeting I have not received anything from the State that impacts the Watermaster.

At the Monterey County level:

Attached are summaries of meetings held in November 2023 through February 2024.

ATTACHMENTS:	Meeting Summaries
RECOMMENDED ACTION:	None required – information only

SUMMARY OF PURE WATER MONTEREY, AND SALINAS VALLEY AND MARINA COAST WATER DISTRICT GROUNDWATER SUSTAINABILITY <u>AGENCY ZOOM MEETINGS</u> IN NOVEMBER AND DECEMBER 2023

Note: This is a synopsis of information from these meetings that may be of interest to the Seaside Basin Watermaster

<u>No meetings were held by any Committees on which I serve or which I monitor during the month of November.</u>

SVBGSA Advisory Committee Meeting, December 7, 2023:

At this meeting the agenda items pertained mainly to the development of a demand management policy, and the setting of a new fee structure, for the SVBGSA. Since neither of these topics directly impacts the Watermaster I did not attend this meeting.

Monterey Subbasin Implementation Committee Meeting, December 13, 2023:

At this meeting items of interest to the Watermaster included:

- A presentation by a County Health Department representative regarding arsenic problems in the groundwater in the Corral de Tierra subarea. She provided information about the locations within that subarea where arsenic levels were the highest, and what options well owner in the impacted areas had available to them to address the problem.
- There was also a presentation regarding the Monterey Subbasin Groundwater Model and planned future updates to that model..

SUMMARY OF PURE WATER MONTEREY, AND SALINAS VALLEY AND MARINA COAST WATER DISTRICT GROUNDWATER SUSTAINABILITY AGENCY ZOOM MEETINGS IN JANUARY 2024

Note: This is a synopsis of information from these meetings that may be of interest to the Seaside Basin Watermaster

MPWMD Monterey Peninsula Water Operations Meeting, January 24, 2024:

At this meeting the agenda items pertained to the Pure Water Monterey Project and its Expansion, and ASR operations. The following information was included in the presentations:

- Pure Water Monterey Project:
 - 1,839 AF has been delivered from July 1 to December 31 of 2023.
 - \circ 1,870 AF is in the operating reserve.
 - Anticipate delivering greater than 3,500 AF in Water Year 2024.
 - Delivery of recycled water to the Bayonet/Black Horse golf courses started in February 2023. Through December 2023 420 AF had been delivered to the golf courses.
 - All underground retention time travel time requirements (four months) are being met. The shortest travel time forecasted is from Deep Injection Well-1 (DIW-1) to Cal Am's Paralta well.
 - As of January 9, 2024 tracer study results indicate that:
 - Travel time from DIW-4 to the Ord Grove well is 9.6 months
 - From DIW-4 there is no detection yet at Seaside Muni Well No. 4.
 - Tracer from DIW-3 was detected at ASR-3, but the peak has not yet reached there after 14 months of travel time.
 - With regard to water quality, there have been no violations. There was a coliform detection at monitoring well MW-2AD but after disinfecting the well there was no further detection.
 - In September 2023 there was a total organic carbon (TOC) detection in the product water from the Advanced Purification Water Facility (APWF), but no violation resulted.
- ASR:
 - \circ 2,158 AF of water had been stored as of the end of Water Year 2023.
 - Water year 2024 injection started on January 21, 2024.
 - Injection is only occurring at Wells ASR-1 and ASR-2.
 - As of January 24, 2024 rainfall was 70% of average.
- Pure Water Monterey Expansion Project:
 - The expansion Project will increase the delivery amount to 6,350 AFY. This will include 600 AFY to MCWD and 5,750 AFY to the Seaside Groundwater Basin.
 - The APWF will be expanded from 5 to 7.6 MGD of capacity.
 - Completion of the expansion work is projected to occur in mid-2025.
 - Construction work started in the fall of 2023.
 - Construction of the modifications to the APWF and the wells is currently in progress.
- The next meeting of this group is scheduled for April 2024.

SUMMARY OF PURE WATER MONTEREY, AND SALINAS VALLEY AND MARINA COAST WATER DISTRICT GROUNDWATER SUSTAINABILITY AGENCY ZOOM MEETINGS IN FEBRUARY 2024

<u>Note</u>: This is a synopsis of information from these meetings that may be of interest to the Seaside Basin Watermaster

SVBGSA Advisory Committee Meeting, February 15, 2024:

At this meeting the following discussions of interest to the Watermaster included:

- Jon Lear and Maureen Hamilton of MPWMD made an informational presentation on the ASR project in the Seaside basin, because the SVBGSA is considering an ASR project in the 180/400-Foot Aquifer Subbasin. There was much question-and-answer about this between committee members and the MPWMD representatives. Sarah Hardgrave said that the SVBGSA has a grant to perform an ASR feasibility study for this subbasin. The draft report is expected in early fall 2024. ASR may be considered for other subbasins as well.
- Sarah Hardgrave introduced the topic and Derrick Williams provided a PowerPoint presentation describing the Seawater Extraction Barrier Modeling Update. This is funded by a grant to the 180/400-Foot Aquifer Subbasin. A series of alternative projects were described. These are all at a conceptual-not detailed level of development. They showed how the 500 mg/l chloride boundary would move with the various alternatives. Each was compared to the "No Project" alternative and the "Minimum Threshold" boundary location in the 180/400-Foot Aquifer Groundwater Sustainability Plan. "Cleanup wells" were added in areas when an alternative was unable to stop the advance of the seawater intrusion front in far inland areas. Alternatives that were evaluated were:
 - o No Project
 - Along Highway 1 (outside of the coastal zone) with and without cleanup wells
 - Close to the coast (requires coastal commission approval) with and without cleanup wells
 - On Highway 1 north of the Salinas River only
 - Close to the coast north of the Salinas River only

The model looked at both the 180 and 400 foot aquifers. Each alternative had some effect on pulling back the seawater intrusion line toward the coast. The presentation showed both the predicted locations of the 500 mg/l intrusion boundary as well as chloride concentrations throughout the subbasin. The North of Salinas River Only alternatives were requested by Marina Coast water District. Those do not mitigate seawater intrusion between the Salinas River and the border between the 180/400- Foot Aquifer Subbasin and the Marina Ord Subarea of the Monterey Subbasin.

A full CEQA process would be required before implementing an extraction barrier project. One significant impact would be impacted wells where groundwater levels will be lowered by the barrier. The feasibility study at this point does not provide any cost information, only the potential benefits.

Some Committee member questioned:

- The high cost to install an extraction barrier and will even be economically and politically feasible to implement?
- \circ $\,$ Impacts of sea level rise on wells are located close to the coast.

Lydia Holmes of Carollo Engineers described work that will be done on what treatment types would be needed, infrastructure, well locations, permitting issues, etc. They will then model the revised configurations that come out of this information and develop concept level cost estimates. In her PowerPoint presentation there was a map showing proposed pipelines that could deliver desalinated water from this project to various locations.

I expressed concern that the conceptual distribution system for the desalinated water from the extraction barrier desalination project does not show any delivery to the Seaside Basin. I referred to our earlier request to get such water delivered to producers in the Seaside Basin as well as all the other subbasins where that water is being proposed to be distributed. I also pointed out that the Seaside groundwater basin is within the Salinas Valley Groundwater Basin as defined by the Department of Water Resources, and that the Seaside basin should be included in the distribution system. Sarah Hardgrave responded that the SVBGSA is only looking at the parts of the Salinas Valley Basin that are within its jurisdiction, and that does not include the Seaside Basin.

• Piret Harmon, SVBGSA Executive Director, briefly provided an update on public workshops being held for their Demand Management development process and for the Fee Study that their financial consultant is working on. They hope to complete the study in the Fall of 2024.

Monterey Subbasin GSP Implementation Committee Meeting, February 28, 2024:

I did not see anything on the agenda for this meeting that directly impacts the Watermaster, so I did not attend this meeting.

* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	March 13, 2024
AGENDA ITEM:	3
AGENDA TITLE:	Discuss Follow-up Actions Regarding Induction Logging Findings on Sentinel Well No. 4 (SBWM-4)
PREPARED BY:	Robert Jaques, Technical Program Manager

BACKGROUND

At the TAC's December 13, 2023 meeting there was discussion regarding the apparent trend at certain of the Sentinel Wells showing a gradual increase in conductivity at certain depths in the Paso Robles formation, which could be an early sign that seawater was beginning to creep into that formation. A Zoom meeting of our hydrogeologic experts was held to discuss the findings of the induction logging and provide their thoughts and recommendations, and a summary of the main take-aways from that meeting were included in the December 13 TAC agenda packet. The consultants felt that no action was required at this time due to the small conductivity increases, but that we should continue to monitor this apparent trend as future induction logging is performed to try to ascertain whether or not it is significant. They also suggested several issues for the Watermaster to investigate. I held another Zoom meeting with them on February 22, 2024 to further discuss these issues.

DISCUSSION

Attached is a Discussion Paper which was used to guide the discussion in the February 22 Zoom meeting. It provides background information focused on Sentinel Well No. 4 and includes several Discussion Topics for the attendees to weigh in on.

The principal findings and conclusions that came out of the February 22 meeting included:

• The Sentinel Wells are not perforated in the Paso Robles aquifer, only in the Santa Margarita and Purisima aquifers.

• Installing a new monitoring well in the immediate vicinity of SBWM-4 will not be feasible due to permitting and approval requirements involving the Coastal Commission and the State Department of Parks and Recreation. The site where SBWM-4 is located is being revegetated to restore it to its predevelopment condition and no new facilities could be constructed there.

• As previously reported, the SNG well, which is not far from SBWM-4, is believed to have a leaking casing that is allowing seawater intruded water in the Dune Sands to flow downward from the shallow aquifer and into the Paso Robles aquifer. This well was installed in 1966 and has a steel casing so it cannot be induction logged, and it is probably not feasible to repair its casing. The best solution to the problem with this well will be to have it destroyed to prevent further cross-aquifer contamination.

• Monitoring well PCA-W Deep (not PCA-W Shallow because it has a sampling pump stuck in it) as well as PCA-E Shallow or Deep could be induction logged to see how their induction-logged conductivity data compares to that from SBWM-4. In order for the induction logging vehicle to access PCA-W, it would be necessary to clear off the drifting sand that overlies the old access road to it. It would take several years of induction logging data to identify any trends in conductivity, but it may still be useful to compare their conductivity data with the conductivity data from SBWM-4.

• The production well that is the nearest to SBWM-4 is the Coe Avenue well that has been used to irrigate the Seaside Golf Courses. The golf courses are now being irrigated with recycled water, so this

* * * AGENDA TRANSMITTAL FORM * * *

AGENDA ITEM:

3 (Continued)

well will probably not be used in the future. It is a well that was sampled annually when it was in production as part of the Watermaster's monitoring program, and that data did not raise any water quality issues of concern. However, it would be good to reexamine the monitoring data from this well, along with the Piper and Stiff diagrams from it, to see if these are any trends toward increasing chloride or conductivity levels. It was felt that it might be worthwhile to start induction logging this well to see if there is any trend in increasing conductivity there. However, it is a steel casing well installed in 1965 so it cannot be used for induction logging.

• Martin Feeney provided a 2013 technical paper that discussed the benefits of induction logging as a means of detecting changes in chloride concentrations. The wells that were examined in preparing that paper were sampled for chloride concentrations and also induction logged, so it was possible to correlate the induction logging conductivity data with the chloride measurement data in order to develop an equation to relate chloride concentration with conductivity measurements. Ms. Voss said it was her experience that in order to correlate conductivity with chloride levels, it is necessary to have chloride sampling and conductivity data from the same well, or a very nearby well. She felt that there is no general "rule of thumb" equation that can be used to accurately predict chloride concentrations directly from conductivity measurements.

• The apparent gradual inland movement of seawater in some zones of the aquifer is being caused by the groundwater levels in the main production well locations in the Northern Coastal Subarea being below sea level. The obvious solution to this would be to raise those groundwater levels to protective elevations.

• Undiluted seawater typically has about 35,000 mg/l of TDS.

• It would be good to more closely examine the Sentinel Well induction logging data prior to 2019 to see if the trends date back further in time.

• Ms. Voss pointed out that if an aquifer is lost to seawater intrusion it is very difficult if not impossible to reverse the damage.

• The Watermaster's Seawater Intrusion Response Plan (SIRP) describes actions to be taken if certain indicators of possible sweater intrusion are detected. It only includes a handful of "trigger" wells for which chloride levels have been statistically developed to trigger implementation of the SIRP. These trigger wells do not include any of the Sentinel Wells. Sentinel Wells are no longer used for groundwater quality monitoring due to their long screened intervals that do not provide consistent data.

• It may be desirable to update the SIRP to reassess the methodology of determining when to implement it. Using specific chloride trigger levels for a small number of wells may not be adequate. It may be better to use a rate-of-increase in chloride levels, rather than discrete chloride values, as triggers. Trigger levels for induction-logged conductivity measurements should be considered for possible inclusion in the SIRP. However, most people are more comfortable using chloride measurements rather than inductionlogged conductivity measurements to trigger any basin management actions.

• The recently conducted Airborne Electromagnetic (AEM) surveys conducted by the State Department of Water Resources (DWR) did not include a transect perpendicular to the shoreline at the location of SBWM-4 because there are limitations on conducting AEM surveys in areas where there is infrastructure installed. However, the surveys parallel to, and just offshore of, the coast indicated that the top 150 feet of the strata is fully seawater intruded all along the coastline between SBWM-4 and SBWM-1. Land-based electromagnetic surveying, rather than airborne surveying, might be possible, but there are some limitations on the depth that such surveys can examine.

* * * AGENDA TRANSMITTAL FORM * * *

AGENDA ITEM:

3 (Continued)

- The 2023 induction logging showed that SBWM-1 and 2 had lower conductivity levels than SBWM-4.
- There is probably no benefit to returning to semi-annual rather than annual induction logging, because the trend of increasing conductivity is already apparent.
- It might be possible to install a new monitoring well east of Highway 1 in the vicinity of SBWM-4 in order to obtain water quality data from the current zone of interest in SBWM-4. The new monitoring well could also be induction logged. However, if future induction logging identifies other zone(s) of interest, a perforation in the current zone of interest would not enable collecting water quality data from those other zone(s). In any event installing a new monitoring well would be a costly undertaking

TECHNICAL PROGRAM MANAGER'S CONCLUSIONS AND RECOMMENDATIONS

Input from several of our consultants after the February 22 meeting, along with some analysis and research I did, provided this additional information:

- The example plots in Figures 6 and 7 of the Discussion Paper, show what induction logging looked like in a coastal area where seawater intrusion has started to occur. For these sentinel wells (located near Carpenteria in southern California), there was an increase in conductivity of about 110 mmho/m (1,100 µmhos/cm) over the 3 year time period between 2019 and 2022, or about 370 µmhos/cm per year. The highest conductivity measurements in those sentinel wells during that time period, occurring in 2022, were between 1,200 and 1,700 µmhos/cm.
- The conductivity increase in the zone of interest in SBWM-4 has been about 600 μmhos/cm over the 4 year time period between 2019 and 2023, or about 150 μmhos/cm per year. The highest conductivity measurement in SBWM-4 during that time period, occurring in 2023, was about 4,600 μmhos/cm.
- According to a reference source, at 50°F (10°C) undiluted seawater typically has an electrical conductivity of approximately 0.038 S/cm. This is equivalent to 38,000 μmhos/cm. See <u>Attachment 2</u> for the source of this information. However, Mr. Feeney reports that he measured an electrical conductivity of 50,000 μmhos/cm in the near shore seawater of Monterey Bay.

I reviewed the Watermaster's Annual Reports to compile data on the Coe Avenue Well, and that data is contained in <u>Attachment 3</u>. It appears from the lack of data in many of the years that the well may not have been in production at the time it was visited for water level measurements, so no water quality samples could be collected or analyzed in those years. The sparse data that I was able to find shows some variations in the chloride, conductivity, and TDS levels, but there is probably not enough data to show any apparent trend toward increasing chloride or conductivity levels.

The conductivity levels in SBWM-4 are far below those that would be indicative of the arrival of undiluted seawater at that location. However, one cannot compare electrical conductivity (a water quality parameter) with induction-logged conductivity because induction-logged conductivity includes the combined conductivity of the sediments and water while electrical conductivity is just the water. But if one assumes that the conductivity of the sediments is not changing, it would be logical to assume that some seawater may be migrating into the shallower aquifers at that location, but that the actual seawater intrusion front has not yet arrived there. The conductivity data does not indicate that seawater migration is occurring at the strata levels where the Paso Robles or Santa Margarita aquifers are being used to supply production wells. However, we do not want to wait until that happens because it takes years to make and implement plans to

* * * AGENDA TRANSMITTAL FORM * * *

AGENDA ITEM:

3 (Continued)

stop intrusion. Delaying doing anything until full strength seawater is detected would not be good basin management.

A monitoring well constructed to collect water quality samples from one specific strata level would not be able to collect water quality samples from other strata levels. However, multiple casings in a single borehole to create a nested monitoring well, rather than a single-completion monitoring well, could potentially be constructed. In either case, monitoring wells would be very expensive to construct. The small, gradual increases in apparent salinity at SBWM-4 do not represent a large enough or rapid enough rate of increase to justify installing additional monitoring wells at this time, so I do not recommend the construction of any new monitoring wells at this time, However, the costs and benefits should be reassessed as new data are obtained.

I do recommend that the Watermaster undertake the following actions in response to the SBWM-4 induction logging findings of an apparent trend toward increased conductivity in the shallow aquifers near the coast:

- 1. More closely examine the Sentinel Well induction logging data prior to 2019 to see if the trends date back further in time.
- 2. See if access for the induction logging vehicle to reach monitoring well PCA-W can be made available, and if so, include that well in the Fall of 2024 induction logging event. This would enable data to start being compiled from that location to supplement the data from the Sentinel Wells.
- **3.** Examine the Piper and Stiff diagrams for the Coe Avenue well from the SIARs for those years in which such diagrams were prepared to see if they show any indications of water quality changes that might indicate increasing chloride or conductivity levels.
- 4. Continue the effort that was recently initiated through the Watermaster's legal counsel to have the SNG well either repaired or destroyed so it will not provide a conduit for cross-aquifer contamination.
- 5. Investigate the feasibility, cost, and potential benefit of doing land-based geophysical surveys capable of penetrating to the required depths. Transects could be done, one from the coastline to and beyond SBWM-4 to see if the expected seawater pattern is present, and a second transect between and extending beyond SBWM-4 and the SNG well to see if the data indicates that the SNG well is contributing to the increasing conductivity in SBWM-4 might provide useful information.
- 6. Obtain a proposal from Montgomery & Associates to prepare an updated SIRP. The update would be intended to address the issues discussed at the February 22 meeting with our consultants, and any other recommendations that either the TAC or our consultants feel warrant should be addressed. Seek Board approval to provide funding in the 2025 Watermaster budgets to have the SIRP update prepared.

ATTACHMENTS:	 February 22, 2024 Zoom meeting Discussion Paper Seawater conductivity data source
	3. Tabulation of Coe Avenue Well Water Quality Data
RECOMMENDED	Continue to discuss these issues and develop recommendations to the
ACTION:	Board on any actions that should be taken

ATTACHMENT 1

SENTINEL WELL SBWM-4 INDUCTION LOGGING DISCUSSION PAPER February 21, 2024

BACKGROUND

Induction logging performed in October 2023 showed small increases in conductivity over time in Sentinel Wells SBWM-1, 2, and 4 within the Paso Robles Formation. Apart from localized conductivity increases in certain zones (depths) of the Paso Robles Formation, the remaining parts of the induction logs plotted similarly to previous years. This suggests increased conductivity is preferentially confined to coarser-grained zones in the Paso Robles Formation and does not extend throughout the Paso Robles Formation or into the Santa Margarita Formation.

Sentinel wells SBWM-1 and SBWM-2 are outside the Seaside Basin and closest to the known seawater intrusion in the 180-foot aquifer in the Salinas Valley – Monterey Subbasin. Of the 3 Sentinel wells, SBWM-4 has the greater increase in conductivity. SBWM-4 is located in the central coastal portion of the Seaside Basin's Northern Coastal Subarea (as shown in Figure 2) in which the majority of the Basin's groundwater extraction occurs. It is the closest Sentinel Well to a production well in the Seaside Basin.

The zones of increasing conductivity in SBWM-4 are from 160 to 200 feet deep. These translate to elevations of -88 to -138 feet in NAVD 88. See the blue bands in Figure 1. For reference, mean sea level is at elevation +2.97 in NAVD 88.

The closest extraction well in the Paso Robles Formation to SBWM-4 is the Bayonet and Black Horse golf courses' Coe Avenue irrigation well located about 0.6 miles away. This well is screened in the Paso Robles Formation at the elevations shown in Figure 1. Almost all Seaside Basin water supply wells are screened in both the Paso Robles and Santa Margarita Formations. California American Water Company's closest water supply wells to SBWM-4 are Playa #3 (0.8 miles to the south) and Luzern Well #2 (0.9 miles to the southeast). Other CAWC and City of Seaside water supply wells are over one mile away.

A map of well locations throughout the Seaside Basin is shown in Figure 2. A map showing the wells closest to SBWM-4 is in Figure 3.

Conductivity changes shown on Figures 4 and 5 do not allow direct measurement of TDS or chloride concentrations in the aquifer. They do, however, provide a means of seeing changes in salinity over time. Induction logging in previous years indicated salinity in the Dune Sands and Aromas Formation overlaying the main production aquifers fluctuates from season to season, becoming more saline in the fall months when stresses on the aquifer are greatest.

As a point of reference, Mr. Feeney provided copies of induction logs taken from another of his clients that has its own sentinel wells along the coast. These are shown in Figures 6 and 7. Zone "C"

in these figures illustrates how induction logging will look if seawater intrusion starts to occur, and demonstrates the value of performing induction logging.

The Basin's Seawater Intrusion Response Plan (SIRP; HydroMetrics, 2009c) identifies chloride concentrations, sodium/chloride molar ratios, cation and anions, and spatial chloride changes as indicators of seawater intrusion. Since the Sentinel wells are no longer sampled due to inconsistent results because of the depths of their screens, water quality as an additional line of evidence from the Sentinel wells are not available. Further, the SIRP provides threshold values in certain monitoring wells, excluding the Sentinel wells, that trigger a series of intrusion contingency actions.

The closest monitoring well to SBWM-4 is PCA-West Shallow (790 feet away). The well is screened from 525 to 575 feet deep (elevations -458 to -508 NVGD 88) and cannot be used to verify chloride concentrations at SBWM-4 because the screens are over 300 feet below the zones where conductivity is increasing in SBWM-4 (see Figure 1). PCA West Shallow will likely not show any increase in chloride because of the heterogeneous nature of the Paso Robles Formation that appears to confine, at least for now, the increasing conductivity zone to the coarse-grained portions of the formation. Induction logging of PCA-West Shallow could potentially be used to determine if increased conductivity is also occurring in the Paso Robles Formation at that location, but data would need to be collected over a period of at least several years to see if there is a trend toward increased conductivity.

CDM-MW2 monitoring well is not screened and only extends into the Dune Sands, so it is too shallow to be helpful.

It will not be feasible to directly measure chloride levels in the zone of increasing conductivity in SBWM-4, because that would require construction of a new monitoring well targeting that zone. Since SBWM-4 is in the coastal zone and within the Fort Ord Dunes State Park, it would likely not be possible to obtain permission from the Coastal Commission and the State Department of Parks and Recreation to construct a new well at that location.

Because of this, ways to use existing wells should be explored to determine if chloride is increasing within the Basin in the Paso Robles Formation in the vicinity of SBWM-4.

SOME DISCUSSION TOPICS

1. Why is it important to get actual water quality data? Doesn't the Sentinel Well induction logging conductivity data tell us what we need to know?

2. Since it wouldn't provide actual water quality data, would induction logging PCA-W Shallow provide any meaningful information?

3. Would there be any way to get water quality samples from SBWM-4 at the zone of interest?

4. Is there any way to use one of the wells near SBWM-4 to collect water quality samples from the zone of interest?

- 5. Does DWR's recent AEM survey data provide any useful information about this issue?
- 6. The SNG well is near SBWM-4. Water quality samples from it indicate its casing is leaking water from the Dunes sands down into its perforations in the Paso Robles aquifer which run between elevations -124 and -554 NGVD 88 (see Figure 1). The zone of the perforations overlaps the zone of

interest in SBWM-4. Could this be the cause of the increased conductivity that SBWM-4 is exhibiting?





Figure 2 Basinwide Map of Well Locations



EXPLANATION

- Monitoring Wells used for 0 **Groundwater Levels**
- Monitoring Well with Water Level and Quality Data
- Production Well with Water Level and Quality Data



Adjudicated Seaside

- Basin Boundary

Subarea Boundary



Figure 3 Map of Well Locations Nearest to SBWM-4

Figure 4 Sentinel Well SBWM MW-4 Induction Log





<u>Figure 6</u> Example of Logging from Other Sentinel Wells Along the Coast



Induction Logs

<u>Figure 7</u> <u>Example of Logging from Other Sentinel Wells Along the Coast</u>



Induction Logs

ATTACHMENT 2



Electrical Conductivity of Seawater vs. Temperature and Salinity

<u>Source</u>: <u>https://www.engineeringtoolbox.com/sea-water-properties-d 840.html</u> <u>Note</u>: (Salinity is expressed in the graph above in parts per thousand. A TDS of 35,000 mg/l is 35 parts per thousand).

YEAR	CHLORIDE, mg/l	ELECTRICAL	TDS, mg/l						
		CONDUCTIVITY,							
		μS/cm							
2010 ⁽¹⁾	83-107	488-748	312-488						
2011	No Data	No Data	No Data						
2012	No Data	No Data	No Data						
2013	No Data	o Data No Data							
2014	No Data	No Data	No Data						
2015	No Data	No Data	No Data						
2016	79	523	311						
2017	No Data	No Data	No Data						
2018	No Data	No Data	No Data						
2019	128	945	486						
2020	No Data	No Data	No Data						
2021	125	874	524						
2022	No Data	No Data	No Data						
2023	No Data	No Data	No Data						

<u>ATTACHMENT 3</u> <u>Coe Avenue Well Historical Water Quality Data</u>

<u>Footnotes</u>: (1) The first data value was from the October 2009 sample. The second data value was from the July 2010 sample.

* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	March 13, 2024
AGENDA ITEM:	4
AGENDA TITLE:	Discuss Proposed Change in TAC Presentation of 2024 Seawater Intrusion Analysis Report (SIAR)
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY: At the TAC's December 13, 2023 meeting it was decided that TAC members should consider a proposed different schedule for having the 2024 SIAR approved in order to avoid having to hold a December 2024 TAC meeting and a January 2025 Board meeting.

Each year we run into a problem getting the SIAR completed in time for it to be presented to the TAC at the November TAC meeting. This is true even though we normally move the November meeting back one week to give more time for all of the water level, water quality, and water production data to be received, compiled, and analyzed. In 2024 I am proposing that instead of presenting the Draft SIAR to the TAC at a meeting, the Draft SIAR would be posted to the Watermaster's website and TAC members would have about a week to review it there. If any TAC members had questions or concerns about the Draft SIAR, they could be communicated to me and I would work with Montgomery & Associates to have them addressed by editing the Draft SIAR into a Final version. I would report any edits that were made to the Draft version orally at the Board's December meeting, which would be held on December 4, 2024, so the Board could approve it. At that same meeting the Board would also be approving the Annual Report, and the Final Version of the Annual Report would include the Executive Summary from the Final SIAR. This would enable the SIAR and the Annual Report to be completed without having to have a December TAC meeting or a January Board meeting, and still get the Annual Report filed with the Court by the January 15th submittal deadline.

I would appreciate getting feedback from TAC members as to whether or not they would be comfortable with this revised schedule and approach to having the SIAR approved. If the TAC feels it would prefer to have the SIAR presented to them at a TAC meeting, as has been done in the past, then we will likely need to have December TAC meeting to be able to do that, and then a January Board meeting as well.

ATTACHMENTS:	None
RECOMMENDED	Provide direction to the Technical Program Manager regarding how and
ACTION:	when the 2024 SIAR should be presented to the TAC

* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	March 13, 2024
AGENDA ITEM:	5
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 are performing certain portions of the work.

Attached is the updated schedule for 2024 activities.

ATTACHMENTS:	Updated Schedule of Work Activities for FY 2024
RECOMMENDED ACTION:	Provide Input to Technical Program Manager Regarding Any Corrections or Additions to the Schedules

	2024	M	0	Se	as to	sic rir	le ng W	e E gia /o	Ba ar orl	ns nc (;	ir I I So	n N Ma ch	W ar ne	at na d	ei ge	rn er e	na ne	en	te it	r P	ro	g	ra	m																		
ID	Task Name	31	Jan 7 1	'24 4 21	28 4	Feb	24	25	M	ar '2	24	131	Ap	r '24	128	M	lay ':	24 19 2	62	Jun	24	23 30	Ju	142	12	1	ug '	24	5 1	Sep	'24 5 22	29	Oct	'24 3 20	27	No 3 10	v '24	1	1	ec '	24	29
1	MANAGEMENT & ADMINISTRATION																																									
2	Replenishment Assessment Unit Costs for Water Year 2025																																									
3	B&F Committee Develops Replenishment Assessment Unit Cost for 2025 Water Year																						_			6																
4	If Requested, Technical Program Manager Provides Assistance to B&F Committee in Development of 2025 Water Year Replenishment Assessment Unit Cost																																									
5	Board Adopts and Declares 2025 Water Year Replenishment Assessment Unit Cost																												9/4													
6	Replenishment Assessments for Water Year 2024																																									
7	Watermaster Prepares Replenishment Assessments for Water Year 2024																																			C						
8	Watermaster Board Approves Replenishment Assessments for Water Year 2024 (At December Meeting)																																					1	2/4 �			
9	Watermaster Levies Replenishment Assessment for 2024																																						12	10		
10	2024 Annual Report																																									
11	Prepare Preliminary Draft 2024 Annual Report																																			2						
12	TAC Provides Input on Preliminary Draft 2024 Annual Report																																			11/	13					
13	Prepare Draft 2024 Annual Report (Incorporating TAC Input)																																			ſ	4					
14	Board Provides Input on Draft 2024 Annual Report (At December Board Meeting)																																					1	2/4 ♦			
16	Watermaster Submits Final 2024 Annual Report to Judge			_																			_																¢	12/1	17	
17	MONITORING AND MANAGEMENT PROGRAM					_										-																								٠		
18	Monitoring & Management Program (M&MP) Plan and Budgets for															-																										
19	Discussion of Potential Scope of Work for 2025 M&MP											8							-				7/10																			
20	Prepare 2025 M&MP																						-							_												
21	TAC approves 2025 M&MP																										B/14															
22	Prepare 2025 O&M and Capital Budgets																										•															
23	TAC approves 2025 O&M and Capital Budgets																										8/14															
24	Budget & Finance Committee Approves 2025 M&MP and 2025 O&M and Capital Budgets																										8	122														
25	Board approves 2025 M&MP AND 2025 O&M and Capital Budgets																												9/4													
2024 (Consultants Work Schedule 3-13-24																																							Pa	age	1

	2024	S¢ Mon	eas ito	id rin	e B g a	an an	sin d N	M Ma	/at na	er ge	m em	as	ste nt	er Pi	ro	gra	an	n															_
ID	Task Name	Jan '2		-eb '2		Mar	'24		pr '24			y '24		Jun	'24		Jul '2	4	A	ug '2	4	Se	ep '2	4	0	ct '24	0.07	No	v '24		Dec	24	I
26	M.1 PROGRAM ADMINISTRATION	31 7 14	21 28 4	111	825	3 10	17 24	31 7	14 2	21 28	51	219	26 2	2 9	16 23	30	/ 14	212	8 4	11 1	8 25	1 8	15	22 2	96	132	027	3 11)172	41	81	522	29
27	Prepare Initial Consultant Contracts for 2025																																-
28	TAC Approval of Initial Consultant Contracts for 2025																						1					11/	13				
29	Board Approval of Initial Consultant Contracts for 2025																													12/4		_	
30	M.1.g – Sustainable Groundwater Management Act Reporting Requirem																																T
31	Montgomery & Associates Prepares Draft Groundwater Storage Analysis)																											
32	Submit SGMA Documentation to DWR					3/	18																									_	T
33	I.2.a DATABASE MANAGEMENT																																T
34	I.2.a.1 Conduct Ongoing Data Entry/Database Maintenance																																
35	1.2.6 DATA COLLECTION PROGRAM																1				1		1								Π		
36	I.2.b.2 Collect Monthly Water Levels (MPWMD)																																
37	I.2.b.3 Collect Quarterly Water Quality Samples (MPWMD)															11	1				1												Ĺ
38	I.2.b.6 MPWMD provides annual water quality and water level data to Montgomery & Associates for inclusion in the 2024 SIAR																											11/8 •					
39	I.4.c Annual Seawater Intrusion Analysis Report (SIAR)																															_	H
40	Montgomery & Associates Provides Draft 2024 SIAR to Watermaster					_																							11/2:	2		_	
41	Draft 2024 SIAR Posted to Watermaster Website for TAC Review																																
42	TAC Provides Comments/Questions About Draft 2024 SIAR to Technical Program Manager																																
43	Board Approves 2024 SIAR																														12/4		
2024 0	Consultants Work Schedule 3-13-24																														P	ade	2

* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	March 13, 2024
AGENDA ITEM:	6
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