Santa Cruz Mid-County Groundwater Agency
2025 Periodic Evaluation

MONTGOMERY & ASSOCIATES
Water Resource Consultants

Board of Directors
December 14, 2023

Topics

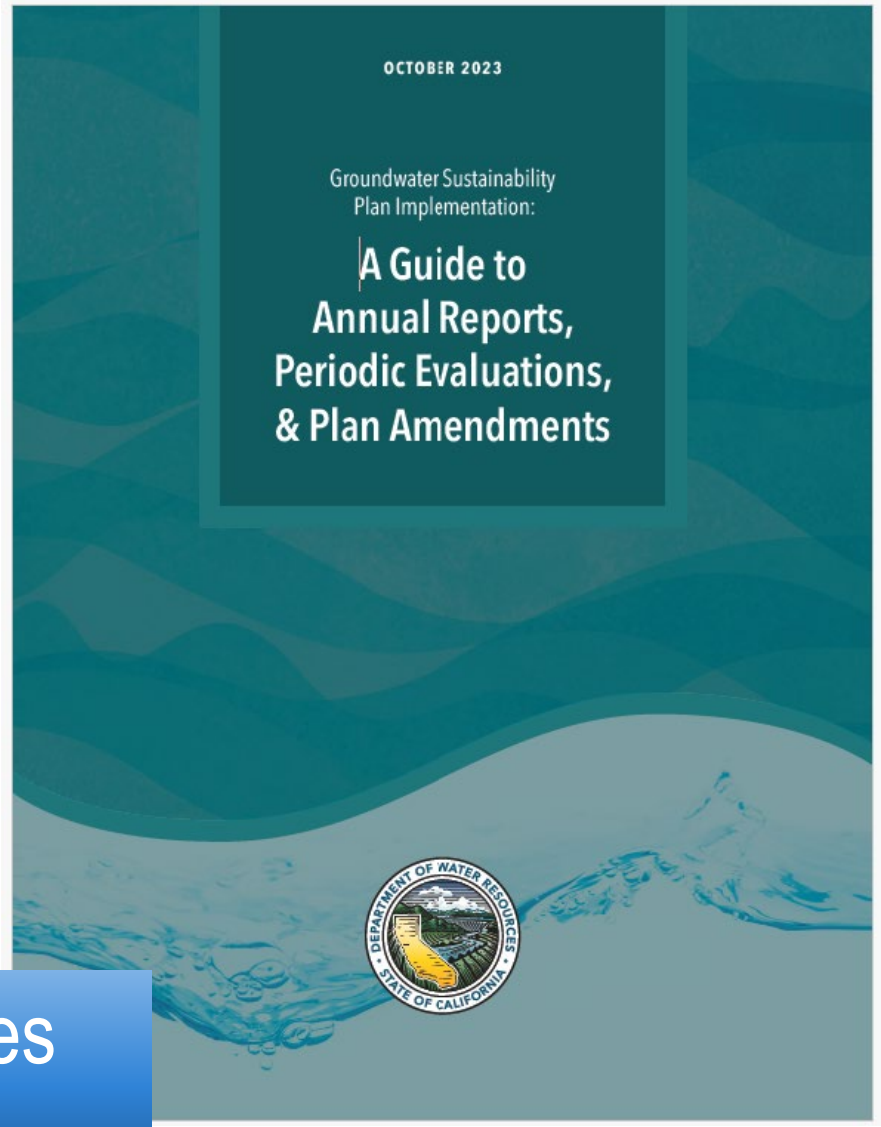
1. Periodic Evaluation & Plan Amendment
2. Progress on 2025 Periodic Evaluation
3. Seascape Area High Chlorides
4. Schedule
5. Discussion

Periodic Evaluation & Plan Amendment

Periodic Evaluation

Goal of Periodic Evaluation

- Assess how Groundwater Sustainability Plan (GSP or Plan) implementation is going
- Provide an explanation and proposed management adjustments if not achieving goals and milestones anticipated



Acts as the document where a GSA articulates whether a Plan Amendment is needed

SMC = sustainable management criteria

Periodic Evaluation Process

Address Recommended Corrective Action

New information collected

Groundwater Conditions Relative to SMC

Status of Projects and Management Actions

Monitoring Network

Changes in Understanding of Basin Setting

Describe:

- GSA Authorities and Enforcement Actions
- Outreach, Engagement, and Coordination with Other Agencies

- Key take-ways from Periodic Evaluation
- Overview of next steps
- How to continue moving towards sustainability goal

If Plan Amendment is needed, provide rationale

What Warrants Plan Amendment?

- Changes made to the overall management of the basin
  - Sustainable Management Criteria or sustainability goal
  - addition or removal of management areas
  - wholesale modifications to the representative monitoring sites network
- Revisions made to Project & Management Actions (PMAs), including addition or removal of PMAs that could affect the projected water budget, sustainable yield, or achievement of Measurable Objectives, or impact the ability to mitigate overdraft
- Modifications made to the administrative management of the basin, including addition or removal of GSAs, or the addition or removal of a GSP from a basin, etc.

What Does an Amended GSP Look Like?

- Stand-alone document; to aid in review DWR prefers both a clean version and a redline strikethrough version of the amended Plan
- Periodic Evaluation accompanying an amendment should clearly describe the portions of the Plan that were amended and the rationale for the changes
- If GSP Amended:
  - Outreach and engagement, including notification to the list of interested persons
  - 90-day public notice and address comments and requests for consultation
  - MGA Board must adopt the Amended GSP

Key Takeaways from DWR on GSPs and Periodic Evaluation

- SGMA is ongoing and adaptive (marathon, not a sprint)
- Periodic Evaluation is good opportunity for checkup on progress
- Be honest when describing what is working and what is not working
- Bar for deciding to amend Plan is fairly high

Progress on 2025 Periodic Evaluation

Tasks Worked On

Address Recommended Corrective Action

New information collected

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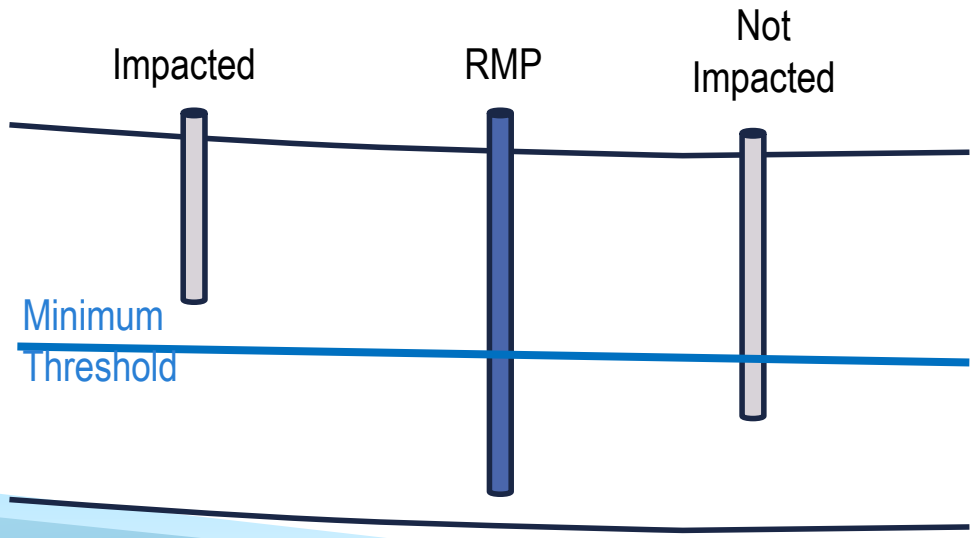
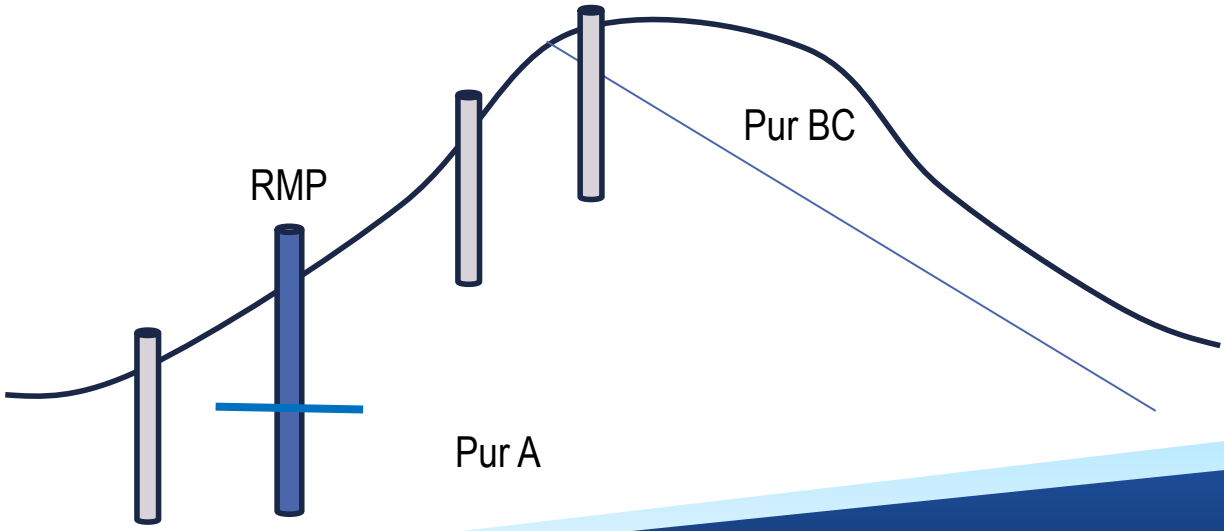
Address DWR Corrective Action

Identify and quantify potential impacts to domestic wells that the Plan describes as potentially needing to be deepened if groundwater level MTs are reached

- This approach works in alluvial basins with low topography and laterally continuous aquifers

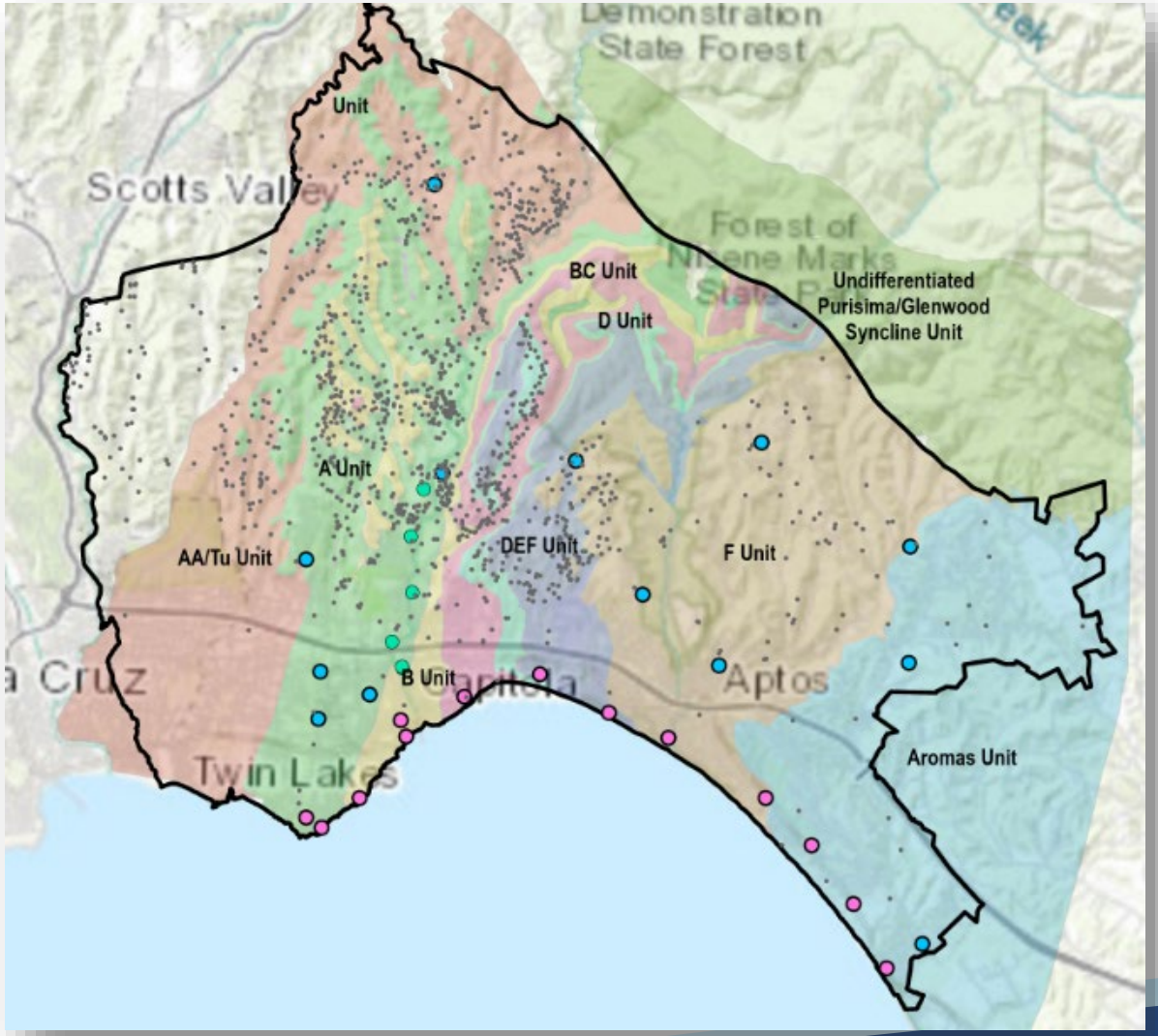


- Does not work for this basin with mountains and dipping stacked aquifers



Approach to Address DWR Corrective Action

1. Attempt to analyze the <50 domestic wells within the relatively flat portion of the basin in the area of municipal pumping
2. Describe how land use practices are unlikely to change in the rural domestic well areas so that current balanced long-term groundwater levels are likely to continue
3. Describe how MGA can directly interact with rural domestic well owners if they experience problems

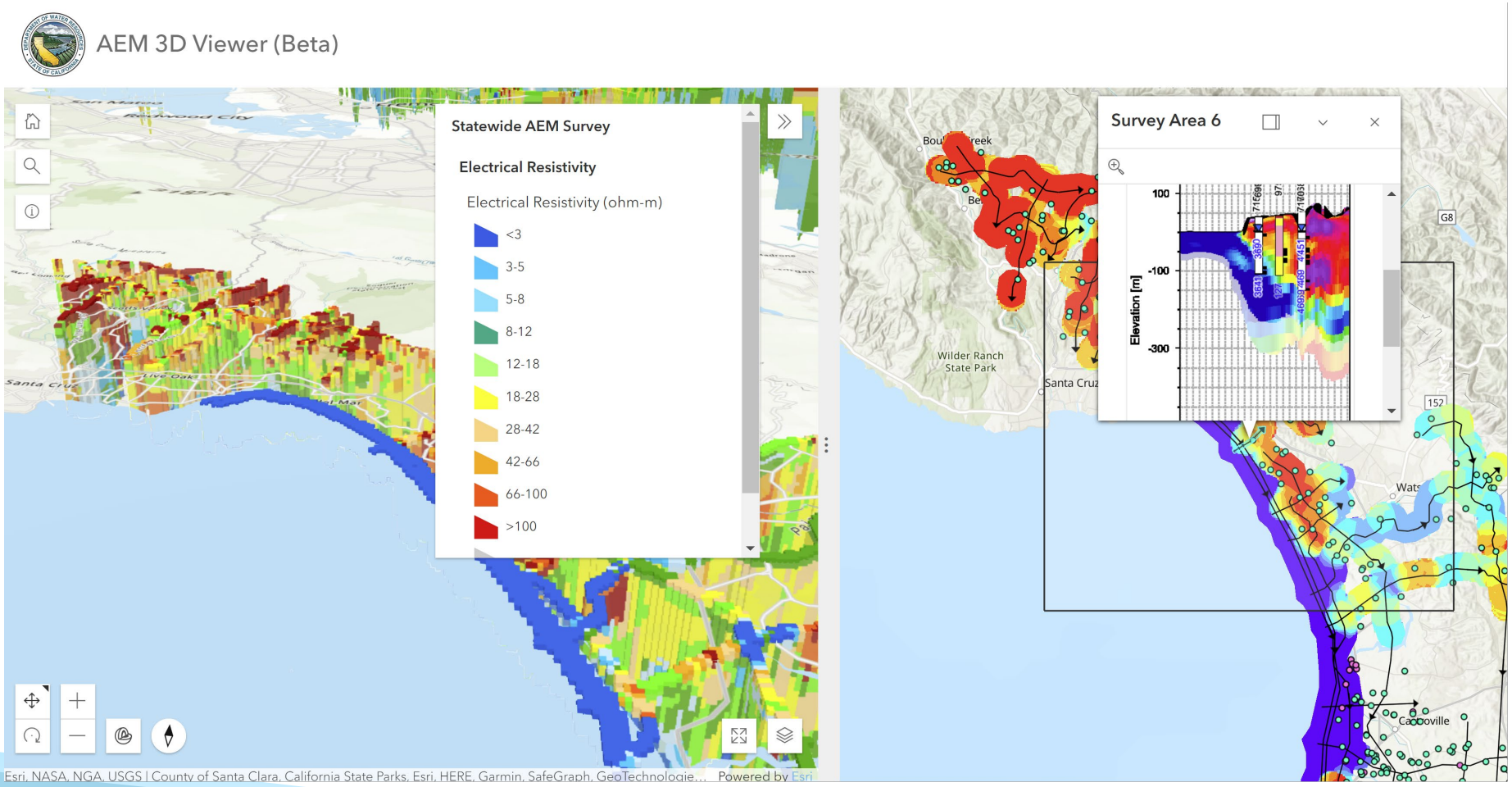


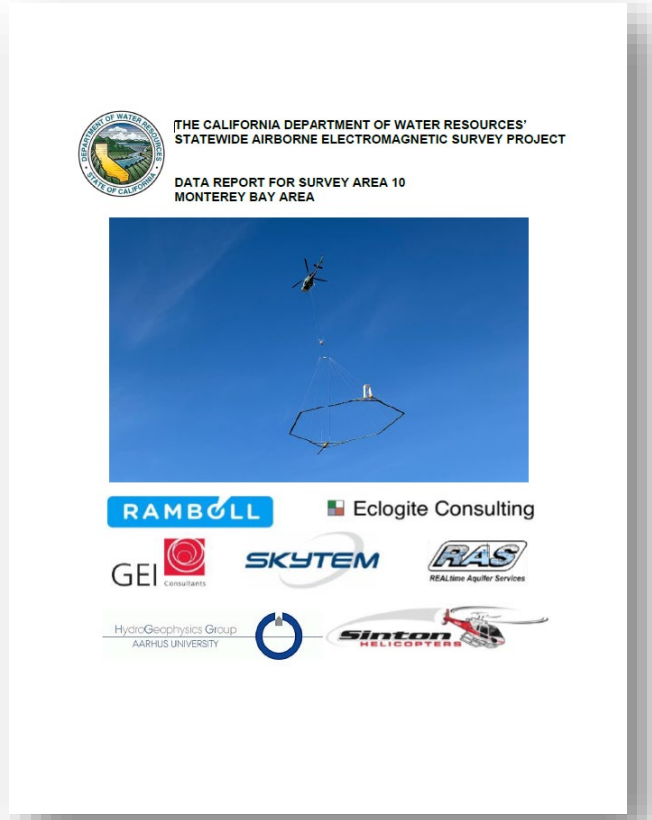
Significant New Information

Significant New Information	Aspects of Plan Affected	Warrants Change to Any Aspects of the Plan?
DWR AEM Interpretative Reports	Potentially basin setting/HCM	Unsure yet
Optimization Study	Optimization of projects	No, because of timing of final report
6 new ISW monitoring wells	Basin setting Monitoring network	- Not sure yet if these new wells change our understanding of where surface water is connected to groundwater - Changes to monitoring network can simply be updated in SGMA Portal
2 new deep coastal monitoring wells	Monitoring network, SMC HCM depth of aquifer contacts	No, changes to monitoring network or addition of RMP can be simply updated in SGMA portal
SWIP wells and monitoring wells	Potentially basin setting/HCM, aquifer properties, contact depths	No
PWS Pilot testing	Aquifer properties in basin setting	No
ASR Pilot testing	Aquifer properties in basin setting	No

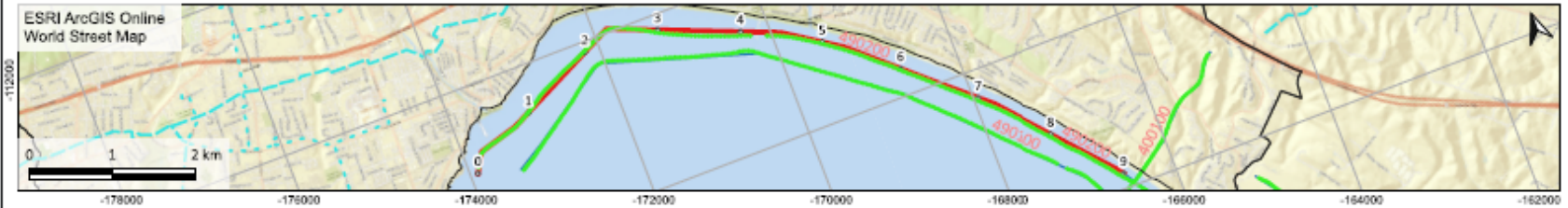
DWR AEM Report and Data

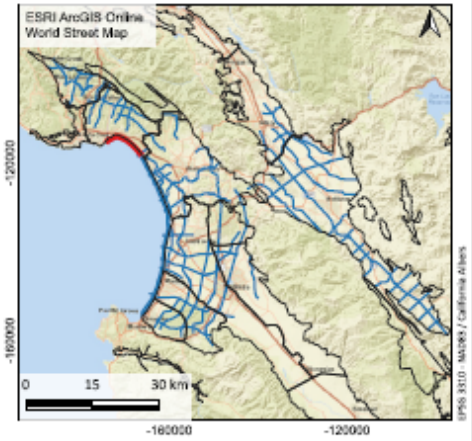
AEM Viewers: Profile Viewer and 3D Viewer (Beta)

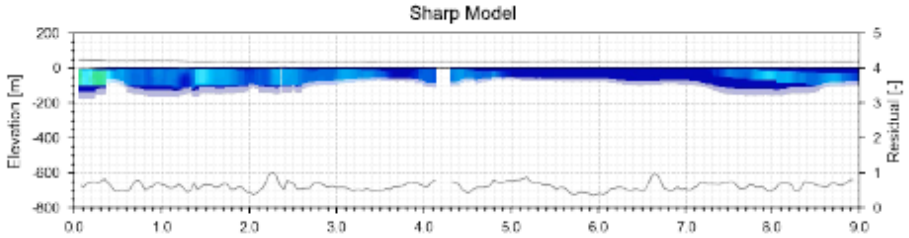


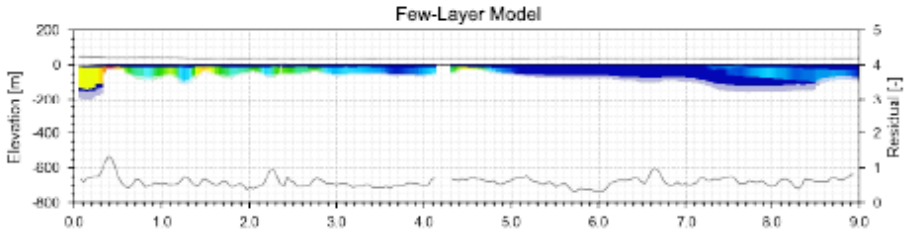


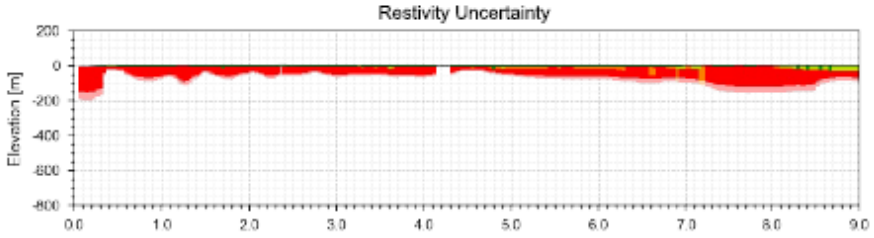
AEM Model Sections and Model Uncertainty

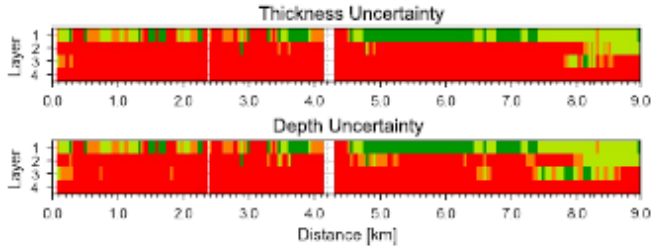










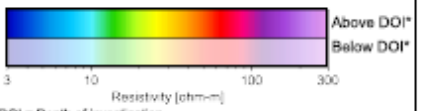


Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards (Land IQ, 2018)
- Highlight
- Section (Other pages)
- AEM data used for inversion
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Legend for Model Sections

Sharp model: Spatially constrained inversion - 30 layers
Few-layer model: Spatially constrained inversion - 4 layers



*DOI = Depth of investigation

Resistivity uncertainty: Standard Deviation Factor (STDF) of layer resistivity
Thickness uncertainty: Standard Deviation Factor (STDF) of layer thickness
Depth uncertainty: Standard deviation factor (STDF) of layer depths

Initial Re-Evaluation of Sustainable Management Criteria (SMC)

- Appear to generally be on track to meet the Sustainability Goal
  - Reviewed WY 2022 groundwater conditions for sustainability indicators relative to SMC (Minimum Thresholds, Measurable Objectives and Interim Milestones)
  - Evaluated potential sustainability concerns identified in the GSP
  - Have yet to implement City of Santa Cruz ASR and Pure Water Soquel projects so some interim milestones for groundwater levels and change in storage indicators have not been achieved
- Complete re-evaluation of SMC after WY 2023 Annual Report
  - Seascape area is the only currently known area of concern because chlorides are increasing even though groundwater levels are above seawater intrusion protective elevations at the coast

Re-evaluate Monitoring Network

- Data gaps identified in the 2020 GSP addressed:
  - 2 deep coastal monitoring wells
  - 6 shallow wells associated with creeks (GSP identified a second well at Balogh that was not drilled due to access issues)
  - Last shallow well (Olive Springs) to be installed January 2024
  - 5 stream flow gages collocated with shallow wells
- Groundwater level monitoring network:
  - 18 new wells (8 data gaps wells + Beltz #8 MW + 9 Pure Water Soquel (PWS) monitoring wells)
  - 2 wells removed due to access issues
- Groundwater quality monitoring network:
  - 12 new wells (2 deep coastal + Beltz #8 MW + 9 PWS monitoring wells)
  - 1 removed due to access issue

Re-evaluate Monitoring Network

- Looking critically at monitoring frequencies to provide member agencies minimum required frequencies that are consistent with how undesirable results are determined
- No remaining actions left and currently no additional data gaps identified to improve monitoring networks

Seascape Area High Chlorides

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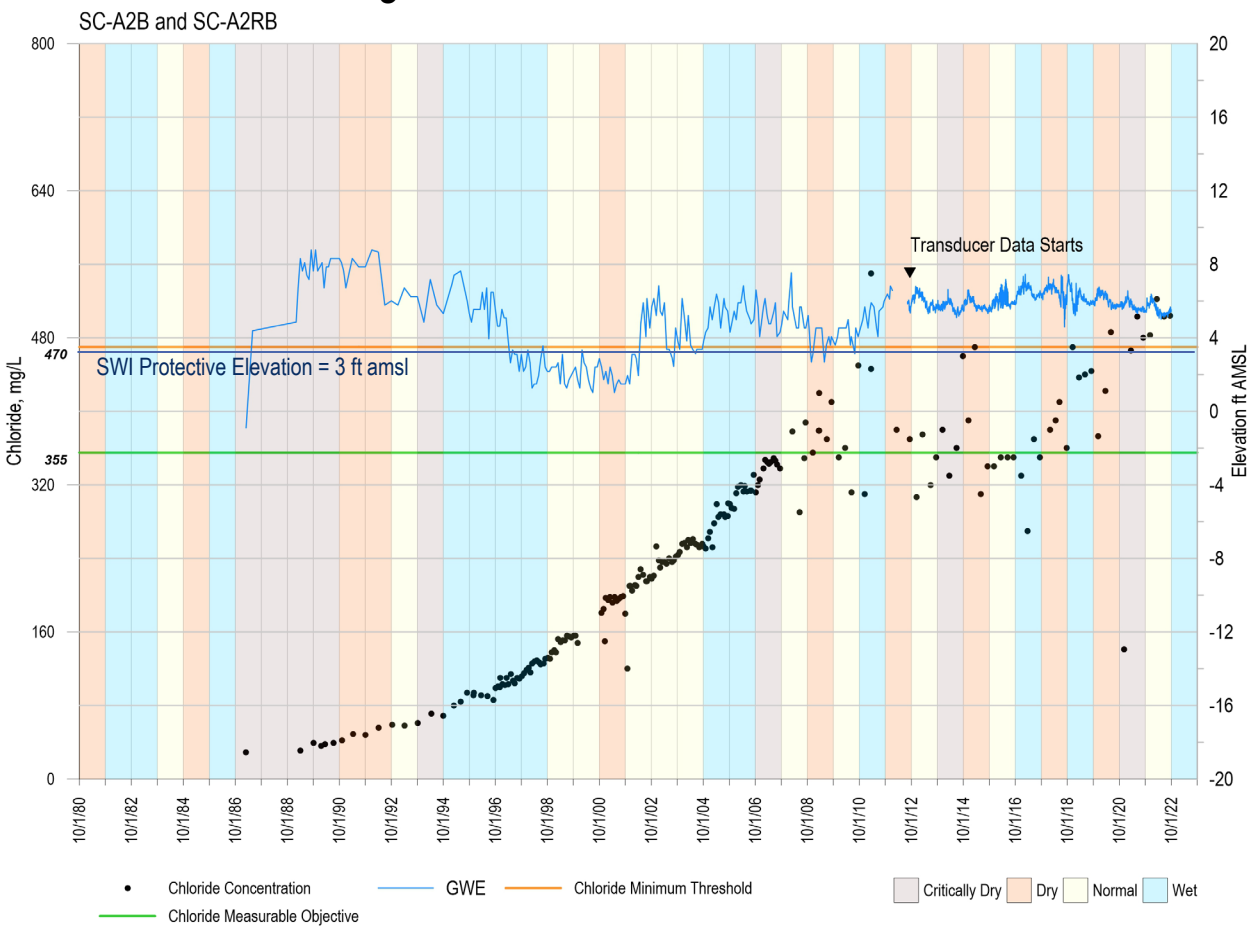
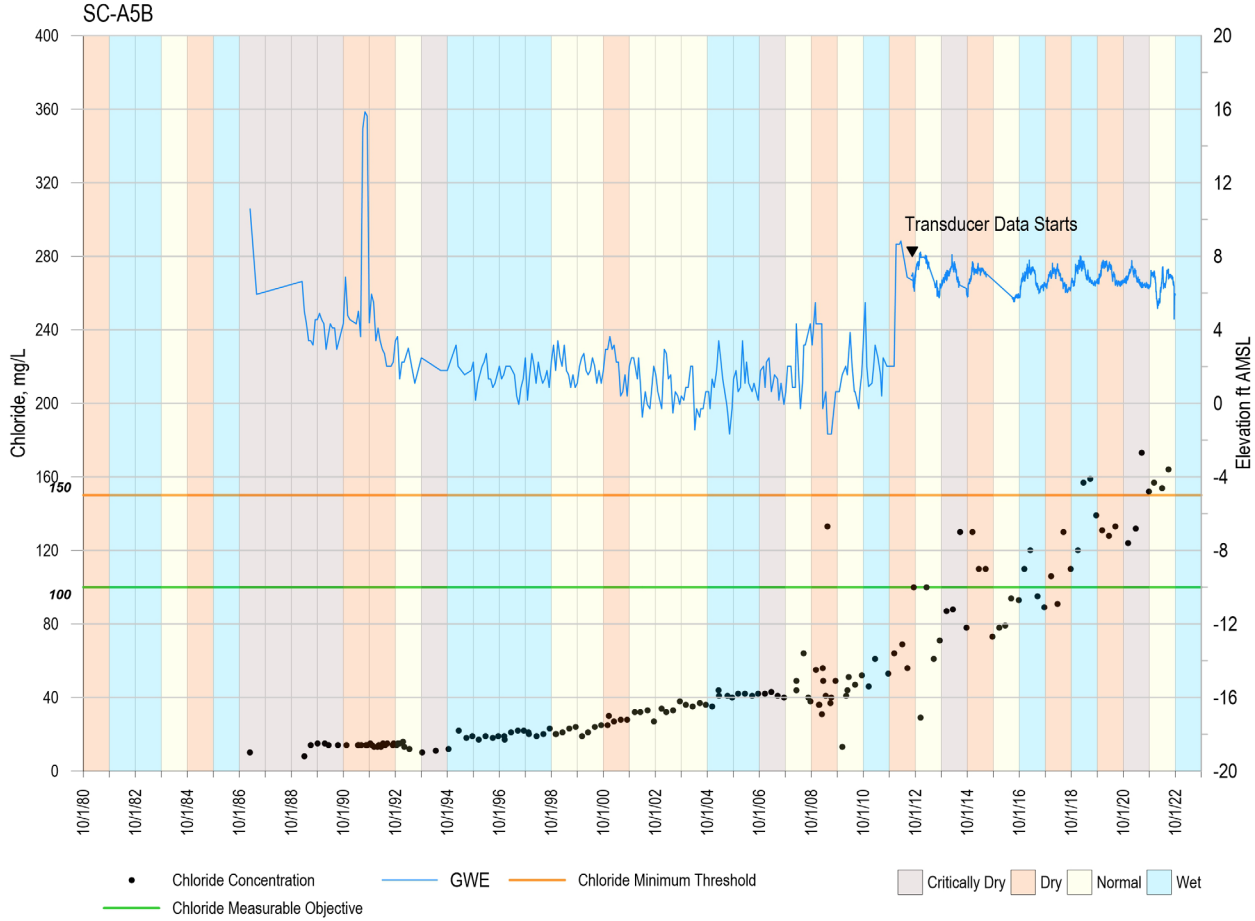
Issue: monitoring well completions (B) above SWI have increasing chlorides even though GWLs are higher than recent past

Coastal Monitoring Well



Inland Monitoring Well next to Seascape Well



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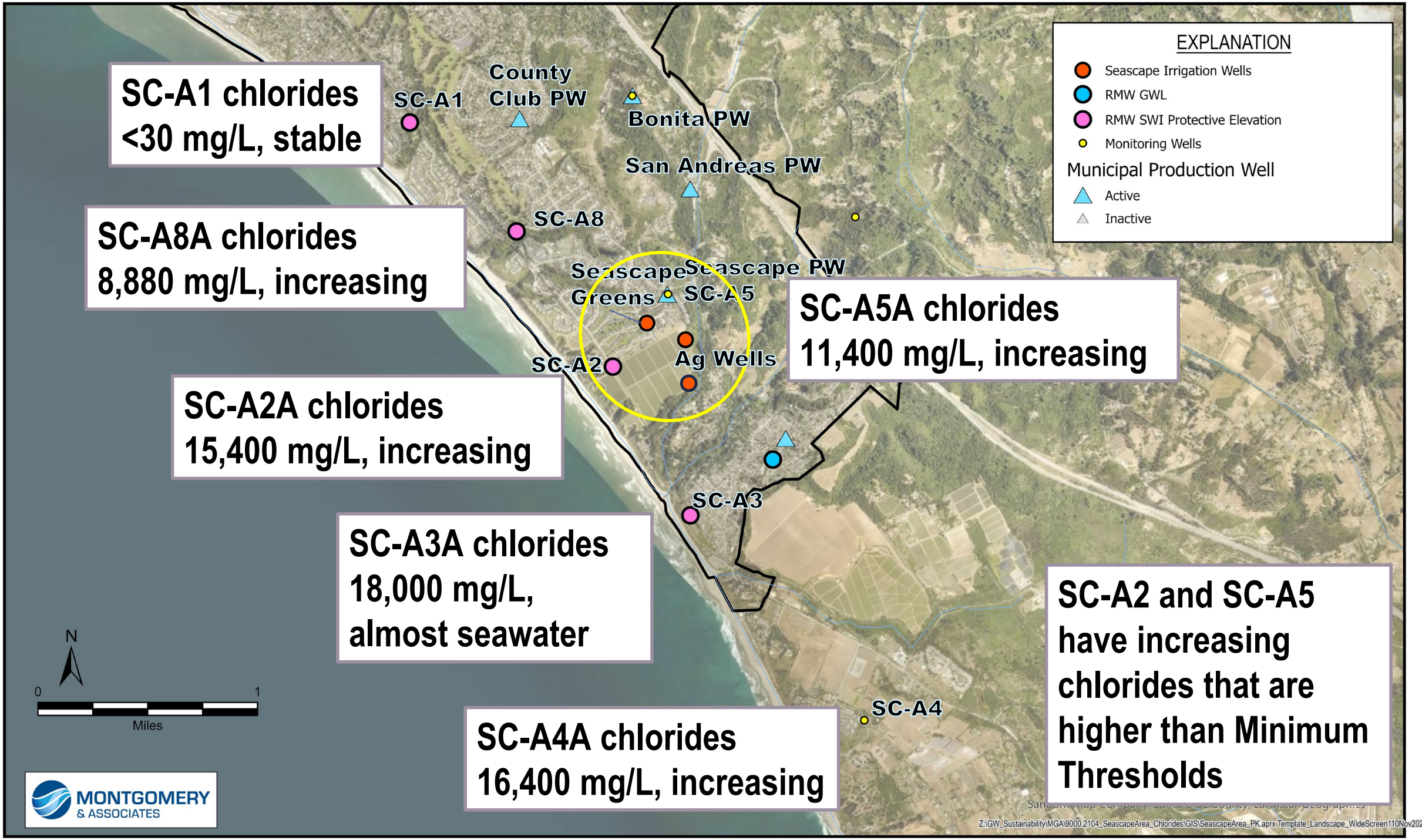
SC-A1 chlorides
<30 mg/L, stable
SC-A8A chlorides
8,880 mg/L, increasing
SC-A2A chlorides
15,400 mg/L, increasing
SC-A3A chlorides
18,000 mg/L,
almost seawater
SC-A4A chlorides
16,400 mg/L, increasing
SC-A5A chlorides
11,400 mg/L, increasing
SC-A2 and SC-A5
have increasing
chlorides that are
higher than Minimum
Thresholds
EXPLANATION
Seascape Irrigation Wells
RMW GWL
RMW SWI Protective Elevation
Monitoring Wells
Municipal Production Well
Active
Inactive
SC-A1
County
Club PW
Bonita PW
San Andreas PW
SC-A8
Seascape
Greens
Seascape PW
SC-A5
SC-A2
Ag Wells
SC-A3
SC-A4
N
0
1
Miles
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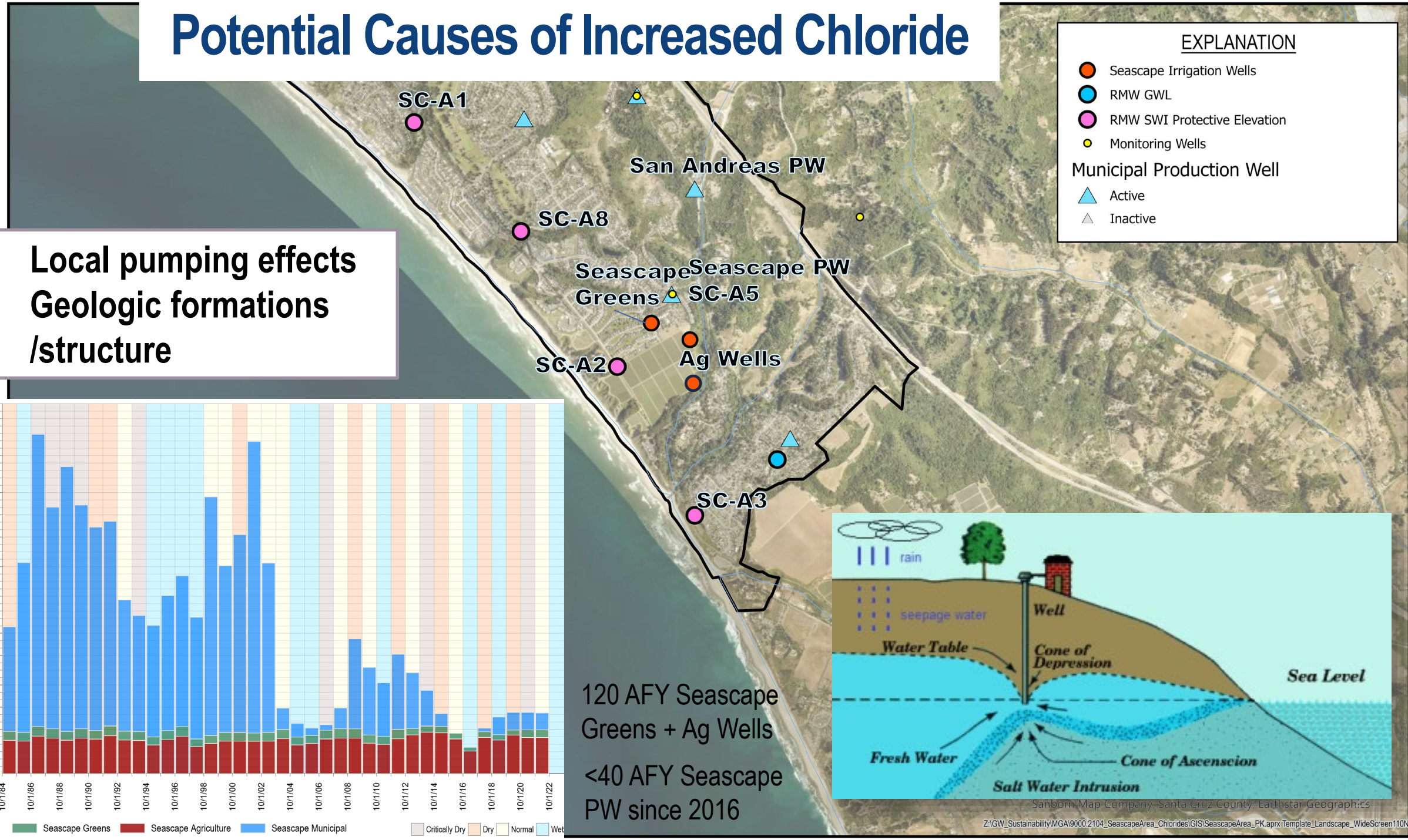
Z:\GW_Sustainability\MGA\9000.2104_SeascapeArea_Chlorides\GIS\SeascapeArea_PK.aprx Template_Landscape_WideScreen110Nov2023

Potential Causes of Increased Chloride

- Local pumping effects
- Geologic formations /structure



B
(Southwest)

SC-A2R CLUSTER

2017 IRRIGATION (projected 1,700')

SEASCAPE GREENS IRRIGATION

SC-A5 CLUSTER SEASCAPE

B'
(Northeast)

ELEVATION IN FEET MEAN SEA LEVEL

200
100
0
-100
-200
-300
-400

39.5 mg/L

504 mg/L
15,000 mg/L

Aromas Red Sands

Purisima F Unit

40.9 mg/L

17.2 mg/L

17.3 mg/L

164 mg/L

11,400 mg/L

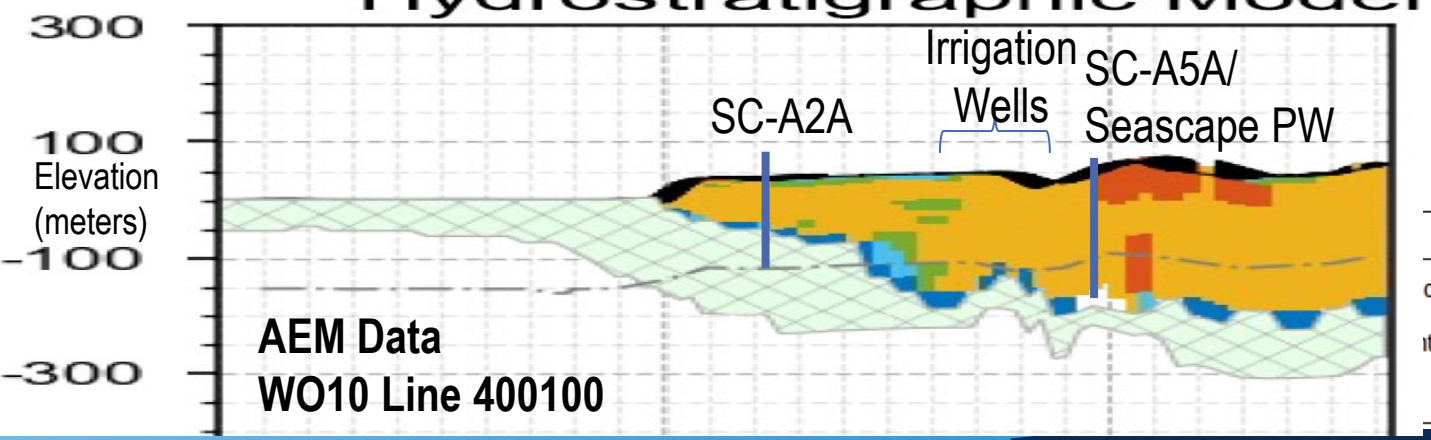
-500
-600

2000

chloride concentration (mg/L)

ıtact

Hydrostratigraphic Model



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Next Steps

- Contact private well owners
  - Inform them about the issue
  - Request more information on wells locations, water levels and quality
  - Better characterize the extent of the problem
- Extend analysis north, south, and east of Seascape
  - Coordinate with Pajaro Valley Water
  - Identify and collect additional potentially helpful data such as groundwater levels from private wells, water chemistry, and electromagnetic surveys

Schedule

SMC = sustainable management criteria

Upcoming Tasks

Address Recommended Corrective Action

New information collected

Groundwater Conditions Relative to SMC

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Changes in Understanding of Basin Setting

Describe:

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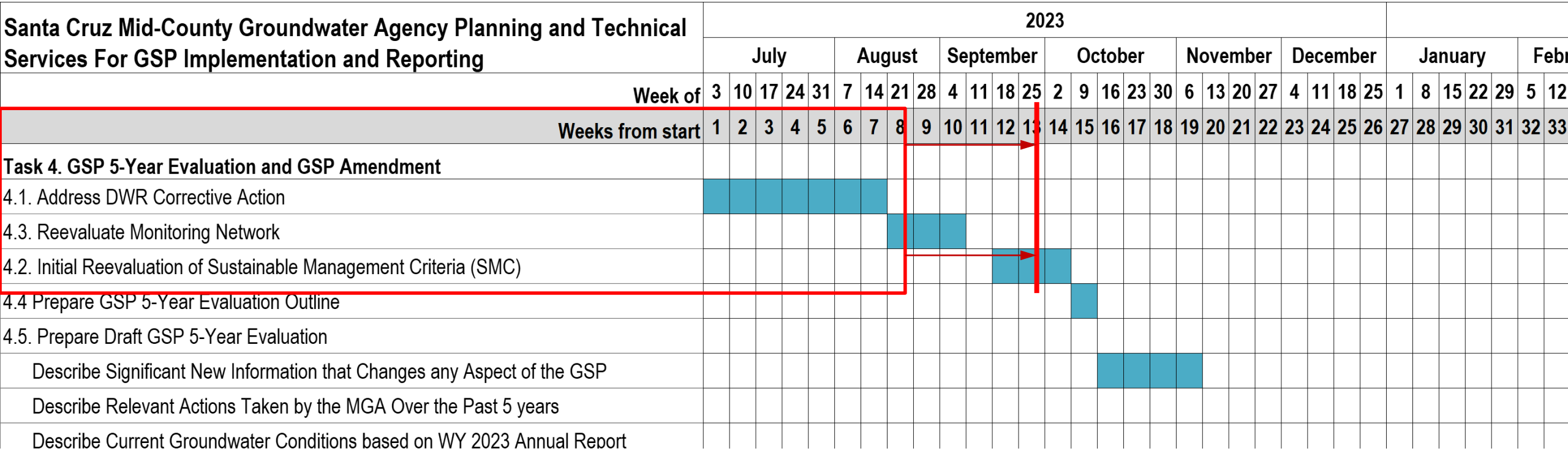
Initial Schedule



Discussion