



SANTA CRUZ MID-COUNTY GROUNDWATER SUSTAINABILITY PLAN

Advisory Committee Meeting #20

Wednesday, June 19, 2019, 5:00 – 8:30 p.m.
Simpkins Family Swim Center, Santa Cruz

Welcome and Introductions

2

- ❑ Groundwater Sustainability Plan (GSP)
Advisory Committee
- ❑ Staff
- ❑ Public

Meeting Objectives

3

- ❑ Discuss and refine final Advisory Committee recommendations for the Sustainability Goal and Sustainable Management Criteria.
- ❑ Identify level of support for Advisory Committee recommendations to the MGA Board.
- ❑ Convey thanks and appreciation to Advisory Committee members.

Agenda

4

- 5:00 Welcome, Introductions, Objectives, Agenda, and GSP Project Timeline and Roll-out/Approval Plan
- 5:15 Oral Communications
- 5:25 Finalize text for Sustainability Goal and Sustainable Management Criteria
- 6:25 Public Comment
- 6:35 *Break*
- 6:50 Advisory Committee Recommendations to the MGA Board
 - Voting/comments
 - Conveyance Memo
- 7:45 Public Comment
- 7:55 Confirm April 24, 2019 and May 16, 2019 Advisory Committee Meeting Summaries
- 8:00 Recap, Next Steps, Commemoration and Gratitude
- 8:30 *Adjourn*

Item 1.2: GSP Process Overview Timeline

GSP 2019 Project Timeline

6

Santa Cruz Mid-County Basin Groundwater Sustainability Plan (GSP) Process Overview Timeline March – November 2019



Revised 05/04/2019

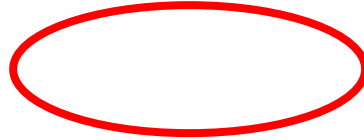
Item 1.3: MGA GSP Release, Review, and Approval Process Timeline

Groundwater Sustainability Plan (GSP)

Release, Review, & Approval—Key Dates

- **June 19th:** GSP Advisory Committee to complete GSP sustainability goal and sustainable management criteria recommendations
- **July 12th:** Draft GSP in MGA Board packet & send notice to Cities of Santa Cruz and Capitola, Santa Cruz County, and interested parties
- **July 18th:** Draft GSP presented to MGA Board
- **July 20th and 22nd:** GSP Open Houses for public comments
- **July 19th – Sept 19th:** GSP Comment period, MGA Board review
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- **Late November:** GSP Submittal to DWR
- **January 31, 2020:** Last date to submit GSP (Basins in Critical Overdraft)
- **April 1st 2020:** First Annual Report due to DWR

Draft Plan will be on Website



QUESTIONS



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Oral Communications

Item 3.1: *Sustainability Goal*

Sustainability Goal Requirements

MGA must establish a sustainability goal that culminates in the absence of undesirable results by 2040 and maintains sustainability to 2070.

Proposed Sustainability Goal

□ *Before joint meeting:*

- ❑ ~~To manage the groundwater basin to ensure beneficial uses and users have access to a safe and reliable groundwater supply to meet current and future expected regional demand without causing undesirable impacts.~~
- ❑ ~~To achieve this goal requires groundwater management that:~~

□ *After joint meeting:*

- ❑ Manage the groundwater Basin to ensure beneficial uses and users have access to a safe and reliable groundwater supply that meets current and future Basin demand without causing undesirable results that:

Proposed Sustainability Goal (con't)

□ ***Before joint meeting:***

- ▣ *Ensures groundwater is available for beneficial uses and a diverse population of beneficial users,*
- ▣ *Protects groundwater supply against seawater intrusion,*

□ ***After joint meeting:***

- ▣ *Ensures groundwater is available for beneficial uses and a diverse population of beneficial users,*
- ▣ *Protects groundwater supply against seawater intrusion,*

Proposed Sustainability Goal (con't)

□ **Before joint meeting:**

- ▣ *Maintains or enhances groundwater levels where groundwater dependent ecosystems exist,*
- ▣ *Maintains or enhances groundwater contributions to streamflow,*
- ▣ ~~*Resolves problems of groundwater overdraft within the MGA Basin,*~~

□ **After joint meeting:**

- ▣ *Prevents groundwater overdraft within the Basin and resolves problems resulting from prior overdraft,*
- ▣ *Maintains or enhances groundwater levels where groundwater dependent ecosystems exist,*
- ▣ *Maintains or enhances groundwater contributions to streamflow,*

Proposed Sustainability Goal (con't)

□ **Before joint meeting:**

- ▣ *Supports reliable groundwater supply and quality to promote public health and welfare,*
- ▣ *Ensures operational flexibility within the ~~AGA~~ Basin by maintaining a drought reserve, and*

□ **After joint meeting:**

- ▣ *Supports reliable groundwater supply and quality to promote public health and welfare,*
- ▣ *Ensures operational flexibility within the Basin by maintaining a drought reserve,*

Proposed Sustainability Goal (con't)

□ **Before joint meeting:**

- ▣ *Does no harm to neighboring groundwater basins in regional efforts to achieve groundwater sustainability.*

□ **After joint meeting:**

- ▣ *Accounts for changing groundwater conditions related to projected climate change and sea level rise in Basin planning and management, and*
- ▣ *Does no harm to neighboring groundwater basins in regional efforts to achieve groundwater sustainability.*

DISCUSSION AND CONFIRMATION



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Item 3.2

Sustainability Management Criteria

GSP Sustainability Indicators

- **Chronic lowering of groundwater levels**
- **Reduction in storage**
- **Seawater intrusion**
- Degraded groundwater quality
- Land subsidence
- Depletion of interconnected surface water

Chronic Lowering of Groundwater Levels



Lowering
GW Levels

21

□ Significant and Unreasonable

A significant number of private, agricultural, industrial, and municipal production wells can no longer provide enough groundwater to supply beneficial uses

□ Undesirable Results

The **average monthly** representative monitoring well groundwater elevation falls below the <Minimum Threshold>

Chronic Lowering of Groundwater Levels



Lowering
GW Levels

22

□ Minimum Threshold

Based on the **groundwater elevation required to meet the typical overlying water demand in the shallowest well** in the vicinity of the representative monitoring well.

The minimum threshold is not allowed to be >30 feet below historic low groundwater elevation

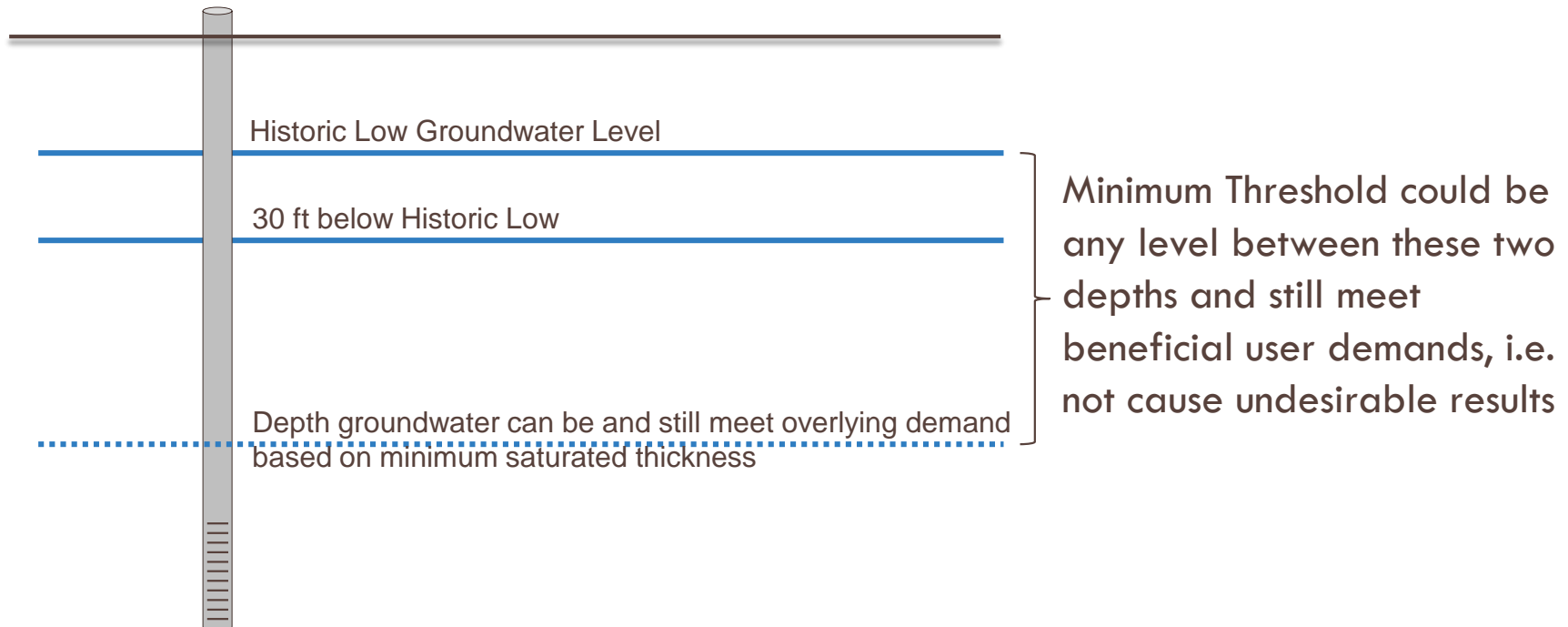
Chronic Lowering of Groundwater Levels



Lowering
GW Levels

23

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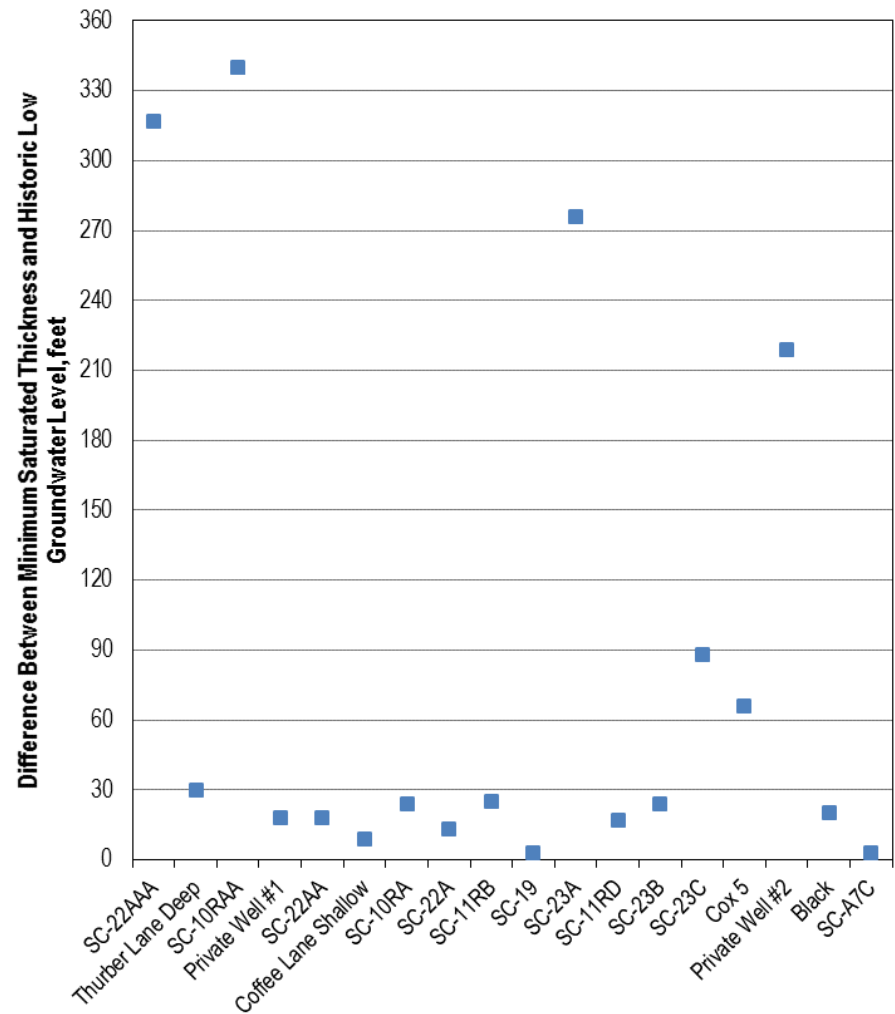


Chronic Lowering of Groundwater Levels



Lowering
GW Levels

- Why 30 feet below historic low was selected as the limit?
- Majority of representative monitoring wells have minimum saturated thicknesses ≤ 30 ft



Chronic Lowering of Groundwater Levels



Lowering
GW Levels

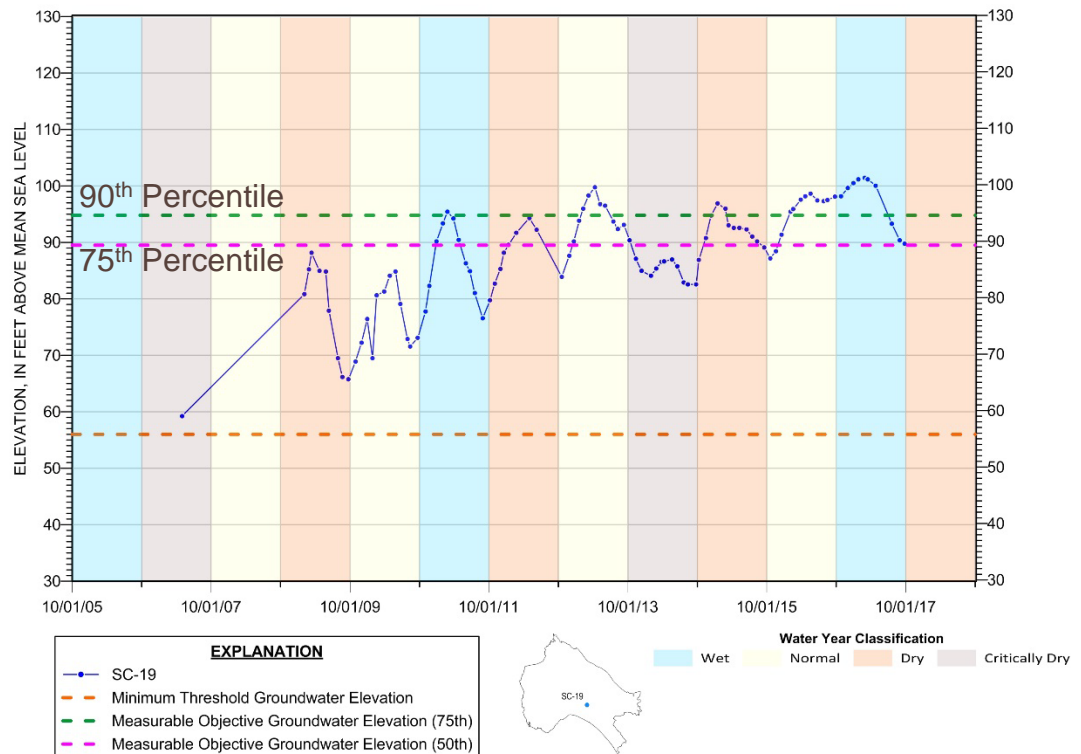
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□ Measureable Objectives

75 90th percentile of historical groundwater elevations
for the period of record

Measurable Objective =
75th Percentile of available data

Minimum Threshold =
groundwater elevation required to
meet the typical overlying water
demand in the shallowest well in the
vicinity of the monitoring well, and
≤ 30 ft below historic low



Discussion on Chronic Lowering of Groundwater Levels

Reduction in Storage

27

□ Undesirable Results

Five-year average net extraction exceeding the Sustainable Yield (minimum threshold) for any one of the following groups of aquifers:

- Aromas aquifer and Purisima F aquifer
- Purisima DEF, BC, A, and AA aquifer
- Tu aquifer

Note: GSP regulations only require one volume for the basin but staff recommends separate volumes by aquifer group

Aquifer Grouping

28

- Based on how wells are typically screened
 - ▣ Most municipal wells in Aromas area are screened in both Aromas Red Sands and underlying Purisima F unit
 - ▣ There are municipal wells screened in both Purisima AA and Tu but:
 - Most flow comes from the Tu unit
 - There is vertical separation of flow between the A-unit and Tu
 - ▣ In Purisima area, wells are screened across:
 - Purisima DEF and BC
 - Purisima BC and A
 - Purisima A and AA



Reduction
of Storage

Aquifer Grouping cont.

29

- There are aquitards between the Purisima aquifer units but we do not recommend developing SMCs for each individual aquifer because:
 - ▣ If an undesirable results is observed in any aquifer unit, the most likely management action to eliminate the undesirable result is to change net pumping from the aquifer unit
 - ▣ A change in net pumping will be determined by what is necessary to eliminate the undesirable result, not based on the reduction of groundwater in storage criteria

Reduction in Storage

30

□ Minimum Threshold

Sustainable Yield representing the net annual volume of groundwater extracted (pumping minus annual volume of managed aquifer recharge) for any one of the groups of aquifers. *Sustainable Yield still to be determined*

□ Measurable Objective

The maximum net annual groundwater to be extracted that ensures if there were four subsequent years of maximum projected net groundwater extraction, net annual groundwater extractions greater than the minimum threshold will not occur for any one of the following groups of aquifers

Discussion on Reduction of Storage

Seawater Intrusion

32

- Significant and Unreasonable

Seawater moving farther inland than has been observed from 2013 – 2017

- Undesirable Results for:

- ▣ Chloride isocontour (required)

- ▣ Protective groundwater elevations (proxy)

Seawater Intrusion



33

□ Undesirable Results for Chloride Isocontours

Intruded coastal monitoring wells:

chloride concentration above their 2013-2017 maximum chloride concentration. This concentration must be exceeded in 2 or more of the last 4 consecutive quarterly samples

Unintruded coastal monitoring wells:

chloride concentration above 250 mg/L. This concentration must be exceeded in 2 or more of the last 4 consecutive quarterly samples

Unintruded inland monitoring & production wells closest to the coast: chloride concentration above 150 mg/L. This concentration must be exceeded in 2 or more of the last 4 consecutive quarterly samples



Seawater Intrusion

34

□ Undesirable Results for Protective Elevations

Five-year average groundwater elevations below protective groundwater elevations for any coastal representative monitoring well

Seawater Intrusion

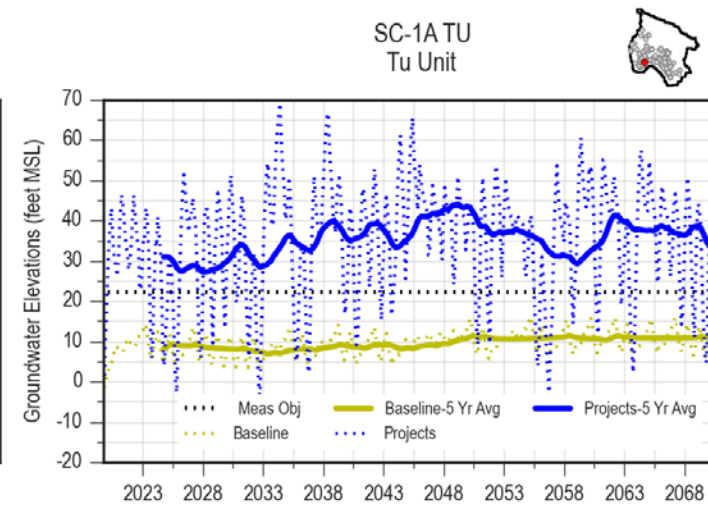
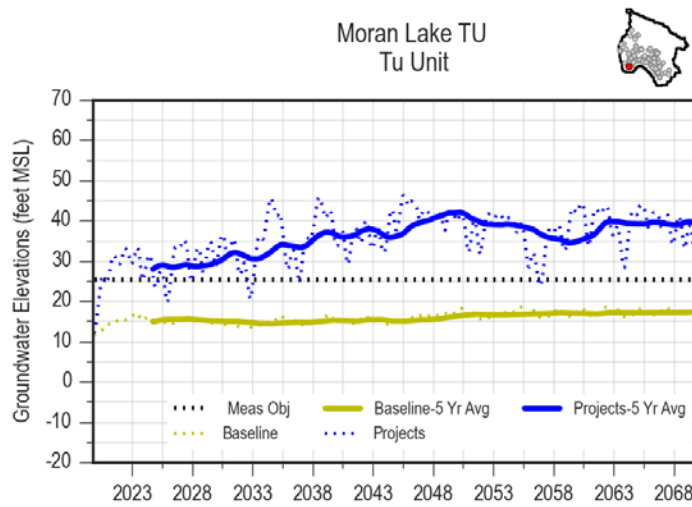
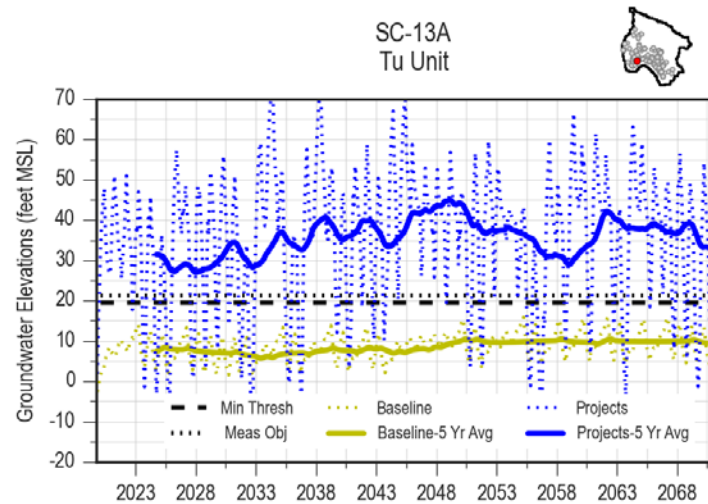
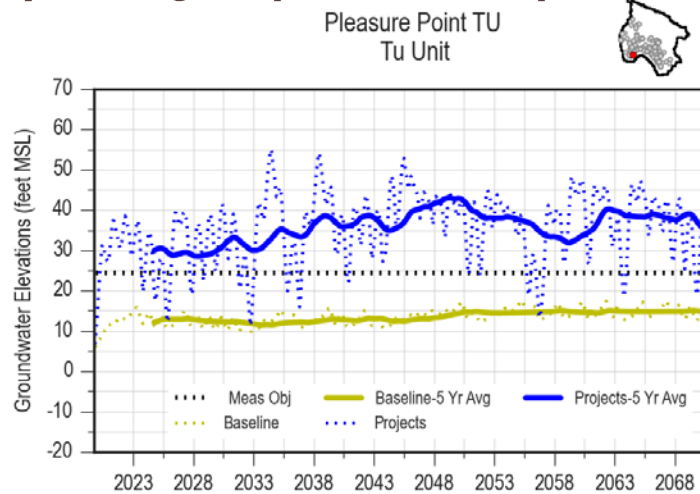


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- Protective elevations are estimated based on cross-sectional models that are quasi-steady state, i.e., they represent long-term averages needed to maintain the interface at the desired location
 - Basin is considered in critical overdraft because of seawater intrusion
 - Control of seawater intrusion is defined by not one year but a multi-year average to ensure critical overdraft is considered eliminated
 - Achieving protective elevations in a single year should not represent elimination of the Basin's critical overdraft condition

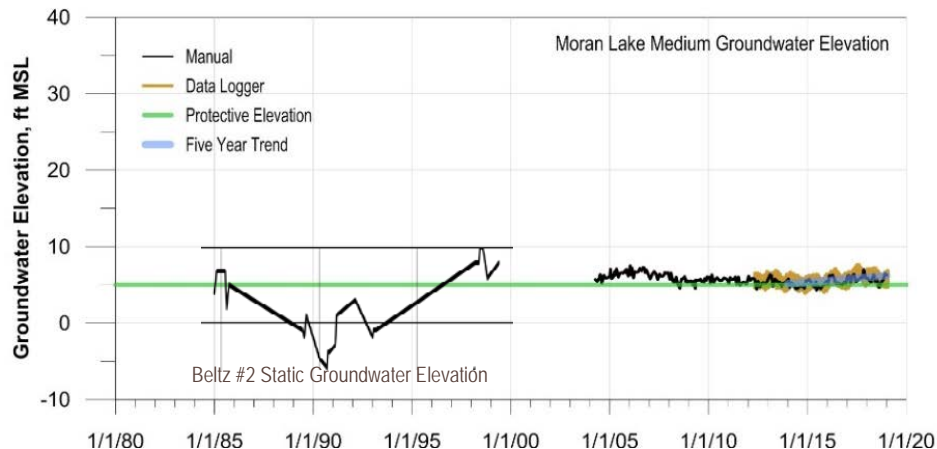
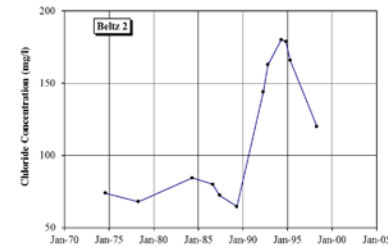
Seawater Intrusion

□ Hydrograph Examples



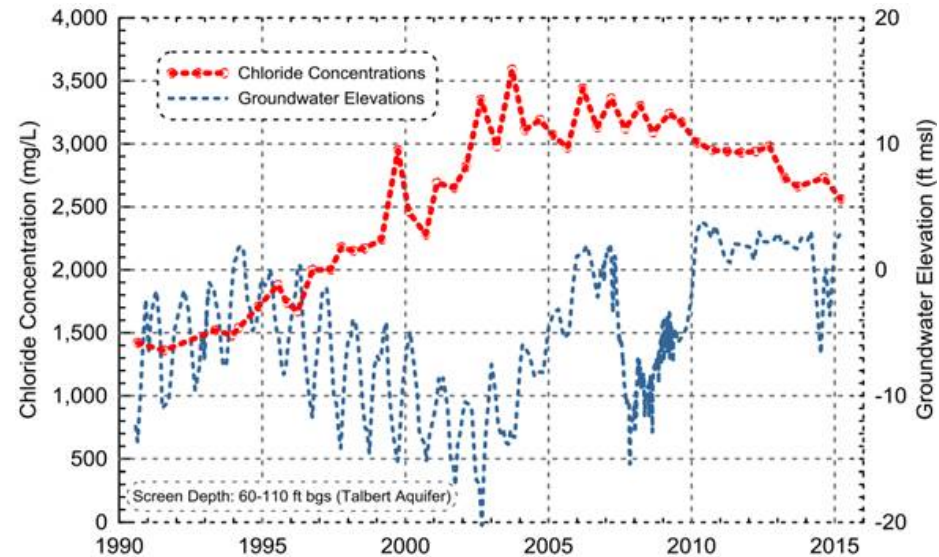
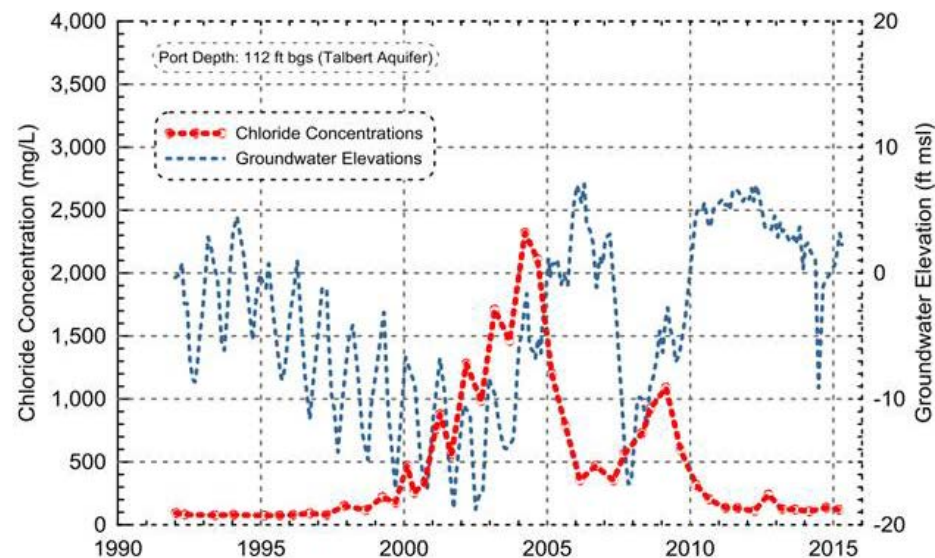
Seawater Intrusion

- Examples where seawater intrusion has been reduced with sufficiently high groundwater levels
- ▣ The Moran Lake example shows that intrusion has been reversed with groundwater levels at protective elevations at a single location in the Basin



Seawater Intrusion

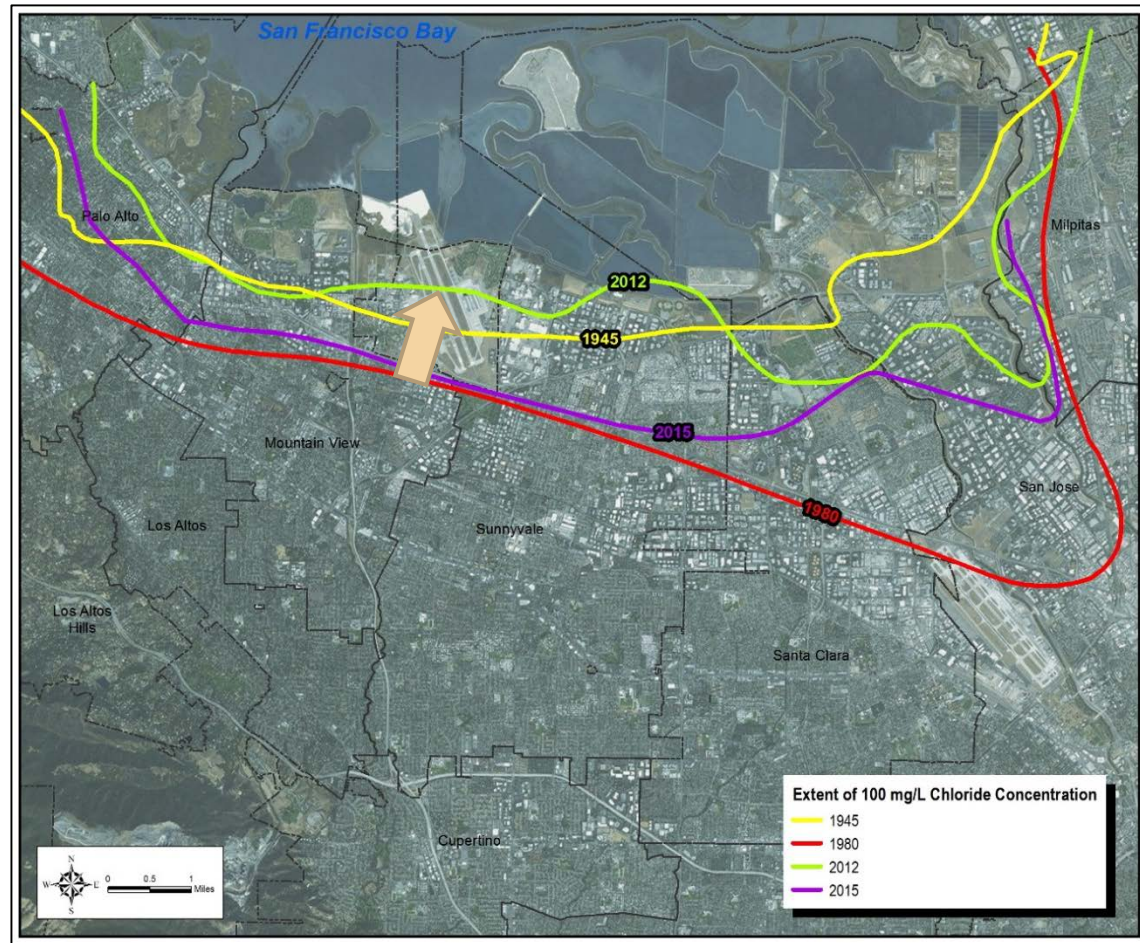
- Orange County Talbert Seawater Barrier example shows that even during short periods (1-3 years) of lower groundwater levels chlorides levels can increase significantly and the importance of achieving higher groundwater levels averaged over multiple years



Seawater Intrusion

■ Santa Clara Valley
Extent of chloride
changes based on
groundwater
management activities
to raise groundwater

Shows importance of
managing to changes in
chloride concentrations
as well as levels



Seawater Intrusion



40

- Use of chloride concentrations together with protective groundwater elevations
 - Significant and unreasonable conditions are defined as seawater moving farther inland than observed from 2013 through 2017
 - Significant and unreasonable conditions are not defined by meeting protective elevations
 - Even if groundwater level proxies are being met, exceedances of chloride concentrations represent significant and unreasonable conditions that will require action to meet sustainability requirements under SGMA

Seawater Intrusion



41

- Actions when measurable objectives for chloride are exceeded
 - ▣ Not required under SGMA, but is already part of basin management
 - ▣ Exceedance of chloride measurable objectives in wells is a trigger for actions to prevent significant and unreasonable conditions from occurring
 - Unintruded wells – if chloride > 100 mg/L in 2 of 4 quarterly samples
 - Intruded wells – if $>$ average 2013-2017 chloride in 2 of 4 quarterly samples

Seawater Intrusion



42

- Recommended management actions to take if trigger conditions occur:
 - Pumping to be reduced at the municipal wells nearest to the monitoring well with the exceedance
 - Raise groundwater levels as quickly as possible
 - If protective elevations are being met but chloride measurable objective is being exceeded, this indicates the groundwater level proxy is not protective enough and should be revised
 - Protective elevations should be raised, or
 - Averaging period should be shortened

Seawater Intrusion

43

- Benefit of using five-year average for groundwater level proxies
 - It can be achieved by a wider range of projects than using a shorter period
 - Projects relying on surface water may not have a consistent supply
 - Unnecessarily requiring groundwater level proxies to be achieved every single year may limit options for achieving groundwater sustainability and meeting drought demand, or increase requirements on projects

Seawater Intrusion

44

□ Minimum Thresholds

Chloride Isocontour: Separate 250 mg/L chloride isocontours for Aromas and Purisima aquifers based on current chloride concentrations in coastal monitoring wells

Protective Elevations (proxy): coastal wells with protective groundwater elevations that keep the equilibrium position of the freshwater / seawater interface from impacting underlying aquifers from which production wells pump

Seawater Intrusion

45

□ Measurable Objectives

Chloride Isocontour: Same locations as the minimum threshold isocontour but the concentration is reduced from 250 mg/L (minimum threshold) to 100 mg/L

Protective Elevations (proxy): higher groundwater elevations than minimum thresholds that are more protective of the full depth of the aquifer

Discussion on Seawater Intrusion

Public Comment

Break

Item 6: *Process Preview* Advisory Committee Recommendations

Advisory Committee Recommendations

50

- ❑ Single package of recommendations with two main components
 - ❑ Sustainability Goal
 - ❑ Sustainable Management Criteria for all Sustainability Indicators

Support for Recommendations

51

- ❑ “A ‘**recommendation**’ from the GSP Advisory Committee will be achieved if a majority of Committee members present expresses support for a particular decision item.”
- ❑ Voting/Levels of Support – from Charter
 - ❑ General support (“I like it”)
 - ❑ Qualified support (“I have some issues with it, but I can live with it”)
 - ❑ Fundamental disagreement (“I don’t like it and cannot live with it”)

Proposed Voting Process

52

- ❑ Step 1: Discuss and confirm complete package of recommendations
 - ❑ Make final refinements as needed
- ❑ Step 2: Vote on complete package; capture results
 - ❑ Each Committee member shares level of support and provides rationale (reasons for agreement or disagreement); 2-3 minutes each
 - ❑ Staff captures information
 - ❑ If fundamental disagreements exist (i.e., no majority), seek resolution
 - ❑ Any disagreements will be shared with MGA Board
- ❑ Step 3: Transmit final recommendations to MGA Board
 - ❑ “Conveyance letter” will provide overview of process

Conveyance Memo

53

- Background – Advisory Committee Charge and MGA Board Guidance
- Recap of Process to Develop Advisory Committee Recommendations
- Summary of Level of Support for the Recommendations
 - ▣ Indicate voting results
 - ▣ Identify areas of concern

DISCUSSION



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Public Comment

Confirm

56

- April 24, 2019 GSP Advisory Committee Meeting Summary and
- May 16, 2019 Joint MGA Board/GSP Advisory Committee Meeting Summary

Recap and Next Steps

Groundwater Sustainability Plan (GSP)

Release, Review, & Approval—Key Dates

- **July 12th:** Draft GSP in MGA Board packet & send notice to Cities of Santa Cruz and Capitola, Santa Cruz County, and interested parties
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Commemoration and Gratitude



THANK YOU!

FOR ANY QUESTIONS, PLEASE CONTACT:

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