Agenda

Santa Cruz Mid-County Groundwater Sustainability Plan (GSP)

Advisory Committee Meeting # 10

Wednesday, August 22, 2018, 5:00 – 8:30 p.m.
Simpkins Family Swim Center
Room B - 979 17th Avenue Santa Cruz CA 95062

Meeting Objectives

- Build Advisory Committee familiarity with and understanding of:
  - the role of groundwater modeling in the GSP
  - the use of groundwater models to explain complex local hydrogeology
  - model data input, assumptions, and calibration
  - assumptions used in predictive modeling
  - predictive model scenarios developed to date and what is still to be modeled
  - the types of model results and how they will be used to evaluate Sustainable Management Criteria
- Provide Advisory Committee input on questions to address through the groundwater model

Agenda

Item No.	Time[1]	Topic	Presenter & Materials
	4:30 p.m.	*Arrivals/Committee members collect food for dinner*	
1.	5:00 p.m.	Welcome, Introductions, Meeting Objectives, and Agenda Review • Review updated project timeline • Update on site visit	• Ralph Bracamonte, • Eric Poncelet, Facilitator *Materials:* *1.1 Agenda* *1.2 Santa Cruz Mid-County Groundwater Basin Groundwater Sustainability Plan Process Overview – Phase 2b: July – December 2018* *Refer to PowerPoint Presentation*
2.	5:10 p.m.	Oral communications • *Members of the public to comment on non-agenda items*	• Public

[1] The times allotted on this agenda are approximate and are subject to change

Item No.	Time[1]	Topic	Presenter & Materials
3.	5:20 p.m.	Role of Groundwater Modeling and Description of the Mid-County Model • Role of groundwater modeling • How it works • Data inputs and outputs • Calibrations • Clarifying questions	• Georgina King, Montgomery & Associates • Advisory Committee *Materials:* *3.1 Water Budget – North of Aptos Fault* *Refer to PowerPoint Presentation*
4.	6:25 p.m.	Public comment • *Focus on Groundwater Model*	• Public
5.	*6:35 p.m.*	Break	
6.	6:50 p.m.	Discuss Groundwater Model Predictive Simulations • Assumptions • Types of Results • Discussion o Clarifying questions o What other questions would you like answered by the model?	• Georgina King, Montgomery & Associates • Advisory Committee *Materials:* *6.1 Modeled Projects and Management Actions* *Refer to PowerPoint Presentation*
7.	7:45 p.m.	Public comment • *Focus on Groundwater Model*	• Public
8.	7:55 p.m.	Confirm: • June 27, 2018 GSP Advisory Committee Meeting Summary • July 19, 2018 Joint GSP Advisory Committee/MGA Board Meeting Summary Distribute/Request Review: • Draft Sustainable Management Criteria Proposals for Subsidence and Groundwater Quality	• Advisory Committee • Eric Poncelet, Facilitator • Georgina King, Montgomery & Associates *Materials:* *8.1 Draft Meeting Summary GSP Advisory Committee Meeting # 8, June 27, 2018* *8.2 Draft Meeting Summary Joint MGA Board and GSP Advisory Committee Meeting #9, July 19, 2018* *8.3 Proposed Draft Subsidence Sustainable Management Criteria* *8.4 Proposed Draft Degraded Groundwater Quality Sustainable Management Criteria*
9.	8:25 p.m.	Recap and Next Steps	• Eric Poncelet, Facilitator

Item No.	Time[1]	Topic	Presenter & Materials
	8:30 p.m.	*Adjourn*	

Written Communications and Correspondence (included in the meeting materials packet).

1. Email correspondence from B. Steinbruner, August 13, 2018
2. Email correspondence from R. Solick, July 18, 2018

Santa Cruz Mid-County Groundwater Basin Groundwater Sustainability Plan Process Overview — Phase 2b: July–December 2018

2018 — **PHASE 2: GSP ADVISORY COMMITTEE POLICY DEVELOPMENT**

7/18 | 8/18 | 9/18 | 10/18 | 11/18 | 12/18

Phase 2b. July – December 2018: Projects, Management Actions and Groundwater Modeling

July 19, 2018 *(Joint Advisory Committee/MGA Board Meeting)*

- Discuss projects and management actions and how they relate to GSP.

August 2018

- Describe groundwater model and what goes into the model, including discussion of assumptions for historic and predictive simulations.
- Discuss groundwater modeling results for sample projects and management actions; evaluate project impacts against Minimum Thresholds.

September 2018

- Articulate Problem Statement.
- Identify, confirm and prioritize project evaluation criteria (to be presented in October).
- Discuss cumulative projects to model.

October 2018

- Present groundwater modeling results for cumulative projects; evaluate modeling results against Minimum Thresholds and other evaluation criteria.
- Discuss Minimum Threshold and Undesirable Result options with underlying Significant and Unreasonable Conditions for Groundwater Storage.
- Begin discussing Measurable Objectives and Interim Milestones.

November 15, 2018 *(Joint Advisory Committee/MGA Board Meeting)*

- Discuss elements of possible fee structures.
- Discuss management areas.

December 2018 *(date early in month TBD)*

- Discuss next iteration of groundwater modeling results.
- Confirm projects and management actions, and Measurable Objectives for analysis (e.g., cost allocation, legal issues) in 2019.

7/18 | 8/18 | 9/18 | 10/18 | 11/18 | 12/18

Revised 8/09/18

Water Year	Pumping	Change in Storage	Stream Alluvium	Purisima Highlands	Pajaro Valley	Santa Margarita	To South of Aptos Fault	UZF Recharge
1985	-692.6	-441.0	-296.9	8122.2	-6847.0	84.5	-2013.0	2083.9
1986	-734.0	-1885.7	83.6	7885.9	-6533.1	-150.1	-1840.9	3174.3
1987	-817.6	1135.0	-302.7	7446.6	-6315.0	-329.2	-1776.5	959.4
1988	-788.7	704.5	-160.2	7075.7	-6068.6	-443.5	-1746.5	1427.3
1989	-739.0	454.0	-156.9	6817.0	-5869.6	-511.9	-1718.4	1724.7
1990	-759.8	2210.6	-347.4	6570.0	-5741.9	-546.8	-1697.3	312.6
1991	-753.2	1661.9	-315.9	6401.7	-5593.0	-559.2	-1677.2	834.8
1992	-790.2	906.0	-270.1	6351.8	-5543.8	-566.6	-1669.3	1582.1
1993	-762.8	-477.6	-154.4	6359.6	-5567.0	-564.4	-1657.8	2824.5
1994	-746.8	1313.0	-346.9	6232.0	-5585.5	-556.5	-1657.9	1348.5
1995	-729.5	-1401.2	-13.7	6270.1	-5559.3	-549.8	-1657.1	3640.5
1996	-733.4	-1108.1	34.6	6299.7	-5679.3	-540.6	-1667.0	3394.0
1997	-783.0	-641.4	-107.0	6357.5	-5735.0	-527.2	-1668.5	3104.5
1998	-705.3	-2248.0	29.3	6571.7	-5845.1	-515.4	-1677.7	4390.5
1999	-663.1	-1227.2	-69.5	6576.9	-5985.8	-503.3	-1688.6	3560.5
2000	-663.3	-714.5	-40.6	6538.7	-5974.2	-486.6	-1705.9	3046.4
2001	-658.4	726.4	-341.8	6444.2	-5882.4	-471.7	-1702.7	1886.3
2002	-664.1	-647.4	-121.2	6422.3	-5788.5	-458.4	-1696.4	2953.7
2003	-655.7	-360.7	-197.9	6381.5	-5728.9	-446.7	-1688.7	2697.2
2004	-687.5	295.5	-169.2	6311.7	-5707.8	-435.5	-1687.5	2080.3
2005	-576.6	-2157.5	-10.4	6409.8	-5713.7	-425.0	-1677.1	4150.5
2006	-587.1	-3280.4	310.6	6516.6	-5837.4	-413.3	-1675.6	4966.7
2007	-601.0	862.3	-275.7	6368.3	-5913.5	-400.7	-1682.1	1642.3
2008	-615.4	951.8	-401.1	6307.8	-5781.9	-389.7	-1684.4	1612.9
2009	-598.5	1654.8	-472.0	6189.1	-5677.8	-378.0	-1667.3	949.7
2010	-558.9	-319.5	-186.1	6163.0	-5624.3	-370.7	-1656.6	2553.2
2011	-541.9	-988.2	-224.2	6235.4	-5689.5	-363.3	-1652.0	3223.7
2012	-571.7	1191.2	-448.9	6136.9	-5680.1	-354.8	-1656.2	1383.5
2013	-561.0	952.1	-373.7	6010.2	-5536.8	-344.2	-1649.8	1503.3
2014	-498.1	1953.5	-419.3	5886.2	-5426.0	-333.1	-1636.5	473.4
2015	-427.1	786.4	-421.3	5846.9	-5317.6	-326.4	-1615.5	1474.7

Modeled Projects and Management Actions

Project/Action	Assumptions	Purpose
Projected existing conditions	Demand based on Urban Water Management Plan Climate change scenario	To compare project scenarios against
Reduced Pumping	Reduce municipal pumping to post 2045 projection	Test to evaluate basin impacts of less municipal pumping
Replenish basin with highly purified water	Inject into Purisima A & BC aquifers Slightly more pumped by SqCWD Project modeled for 20 years	Evaluation for SqCWD's Pure Water Soquel EIR
Aquifer Storage and Recovery (ASR)	City of Santa Cruz stores and recovers treated surface water when available	ASR feasibility

To Be Modeled Management Actions

Project/Action	Assumptions	Purpose
Change non-municipal pumping and return flow (use calibration run 1985 – 2015)	Turn off inland pumping and associated return flow	Evaluate impact of private pumping and return flows on groundwater levels and streams
	Move non-municipal pumping from aquifers to alluvium and terrace deposits	
	Turn off non-municipal pumping in lower Soquel Creek and Bates Creek Valleys	
	Reduce septic return flow assuming 50% return flow in septic areas instead of 90% currently assumed	
Modify municipal pumping to reduce potential stream impacts	Move municipal pumping near Soquel Creek deeper to the Tu unit instead of the Purisima	Evaluate effects of pumping near Soquel Creek

Draft Meeting Summary

Santa Cruz Mid-County Groundwater Sustainability Planning (GSP) Advisory Committee Meeting #8

June 27, 2018, 5:00 – 8:30 pm

This meeting was the eighth convening of the Groundwater Sustainability Planning (GSP) Advisory Committee. It took place on June 27, 2018 from 5:00-8:30 p.m. at the Simpkins Family Swim Center in Santa Cruz. This document summarizes key outcomes from Advisory Committee and staff discussions on the following topics: project updates; presentation of a technical staff proposal and options covering two sustainability indicators—Interconnected Surface Water Depletion and Degraded Groundwater Quality Minimum Thresholds; Committee perspectives on Significant and Unreasonable Conditions related to Surface Water Depletion, and Significant and Unreasonable Conditions and Undesirable Results related to Degraded Groundwater Quality under various different options; and requests for Committee review of technical staff incorporation of Advisory Committee input on Groundwater Levels from the May 23, 2018 meeting. It also provides an overview of public comment received. It is not intended to serve as a detailed transcript of the meeting.

Meeting Objectives

The primary objectives for the meeting were to:

1. Discuss and share Advisory Committee input on Undesirable Result Options with Underlying Significant and Unreasonable Conditions for the following Sustainability Indicators:

    a. Surface Water Interactions
    b. Groundwater Quality

Action Items

Key action items from the meeting include the following:

1. Executive Team to provide the Advisory Committee with reference materials on the regulatory framework for Water Quality Protection, Surface Water injection and/or groundwater replenishment.
2. Advisory Committee members to review the draft document on Proposed Draft Chronic Lowering of Groundwater Levels Sustainable Management Criteria and provide any additional feedback to Darcy Pruitt by mid-August.

Meeting attendance

Committee members in attendance included:

1. Kate Anderton, Environmental Representative
2. John Bargetto, Agricultural Representative
3. David Baskin, City of Santa Cruz
4. Rich Casale, Small Water System Management

5. Keith Gudger, At-Large Representative
6. Bruce Jaffe, Soquel Creek Water District
7. Dana Katofsky McCarthy, Water Utility Rate Payer
8. Jon Kennedy, Private Well Representative
9. Jonathan Lear, At-Large Representative
10. Douglas P. Ley, Business Representative
11. Allyson Violante, County of Santa Cruz
12. Thomas Wyner for Cabrillo College, Institutional Representative

Committee members who were absent included:

1. Marco Romanini, Central Water District
2. Charlie Rous, At-Large Representative

Meeting Key Outcomes (linked to agenda items)

1. Introduction and Discussion of GSP Process Timeline and Project Updates

John Ricker, County of Santa Cruz, opened the meeting and welcomed participants. Mr. Ricker asked the GSP Advisory Committee members, Santa Cruz Mid-County Groundwater Agency (MGA) Executive Team, and the consultant support team around the room to introduce themselves. He also addressed members of the public in attendance and asked them for self-introductions.

Eric Poncelet, Facilitator, reviewed the agenda, meeting objectives, and the updated GSP process timeline, and asked staff to provide the following project updates:

- **Draft Environmental Impact Report for Pure Water Soquel**
  Ron Duncan announced that the draft Environmental Impact Report (EIR) for Pure Water Soquel will be released for public review in July 2018.

- **Advisory Committee Field Trip**
  Darcy Pruitt, RWMF, reported that based on Committee responses to the date poll, she is in the process of scheduling a field trip for the Committee in the September/October timeframe. She indicated that the field trip will be three-hours long and on a weekday and that she will continue to update the Committee on further developments.

- **Outreach/Communications**
  Sierra Ryan, County of Santa Cruz, gave a brief introduction of Jason Hoppin, Communications Officer with the County, and stated that he is available to the Committee as a resource related to outreach/communications matters. Jason's email address is: Jason.Hoppin@santacruzcounty.us.

2. Oral Communications (for items *not* on the agenda)

Members of the public provided comments on non-agenda items during this session.

One speaker commented on whether water supply is at issue for solving the regional water issues.

Another speaker shared some details about the June 14th stakeholder meeting and indicated that she is looking forward to hearing about projects at the joint MGA Board/Advisory Committee meeting on July 19. She also briefly commented on the funding for Pure Water Soquel as it relates to possible fees imposed on private well owners.

Another participant followed up the first speaker's comment on the water supply issue and recommended that the Advisory Committee consider studies on alternative water sources, such as Lochquifer.

An Executive Team member offered a general clarifying comment on how projects will be incorporated into modeling. He explained that the Executive Team intends to provide background on projects that are underway and under consideration. He added that the discussion on project implementation and how projects impact the sustainability indicators for the Basin will not occur until early 2019.

3. Surface Water Interactions – Significant and Unreasonable Conditions

John Ricker, County of Santa Cruz, provided an overview of the Surface Water Subcommittee's analytical work over the past weeks on the topic of surface water and groundwater interconnection. Sierra Ryan, County of Santa Cruz, presented on the Subcommittee's investigation into impacts on priority groundwater dependent ecosystems, identifying aquatic species most vulnerable to depletion of surface water interconnected with groundwater. Mr. Ricker and Ms. Ryan then presented a technical staff proposal on considerations for Significant and Unreasonable depletion of interconnected surface water (i.e., conditions we want to avoid) and solicited input from the Advisory Committee accordingly.

The Advisory Committee provided input on the technical staff proposal for Significant and Unreasonable depletion of interconnected surface water, summarized below. Mr. Ricker, Ms. Ryan and Georgina King of Montgomery & Associates will prepare a synthesis of the Advisory Committee input as it informs development of management criteria for that sustainability indicator and share it with the Advisory Committee for review later in the summer (separate from this summary).

General Advisory Committee Input on Depletion of Interconnected Surface Water

The general sentiment expressed by several Committee members was that there may not be adequate information about the interconnection between groundwater and surface water across the basin to set the right groundwater pumping parameters to characterize groundwater influence on streamflow. The Committee referenced staff's presentation, which indicated many factors other than groundwater interactions impact streamflow, including evapotranspiration and surface water extractions, in addition to groundwater pumping. Members of the Advisory Committee who also participated in the Streamflow Subcommittee stated that the staff presentation accurately captured the Subcommittee's consideration of species and habitats that rely on streamflows to support healthy groundwater dependent ecosystems.

Committee Perspectives on Significant and Unreasonable Conditions – Depletion of Interconnected Surface Water

Background: "Significant and Unreasonable Conditions" are the conditions we want to avoid related to depletion of interconnected surface water in the groundwater basin.

Committee members responded to the following technical staff proposal: "Lowering of groundwater levels adjacent to interconnected salmonid bearing streams as a result of groundwater extraction that results in a significant decrease in stream baseflow during the driest period from August-October would be a significant and unreasonable condition."

Committee members expressed the view that the technical proposal was generally appropriate. However, several members wanted additional assurances that all sensitive species and habitats would be protected by identifying salmonid-bearing streams during the August to October time period. A specific concern raised is that Rodeo Gulch is not a salmonid-bearing stream but does contribute freshwater to the sensitive habitat at Corcoran Lagoon. Committee members also wanted to look at groundwater model outputs for surface water and groundwater interaction and discuss the species and timeframes in greater detail when model information is available.

In addition to the concerns expressed about habitats and timeframes, a few Committee members stated that the lack of data regarding surface water/groundwater interactions in the basin is problematic. Some members believed that the lack of definitive data on groundwater pumping's direct and indirect impacts on the gaining and losing reaches of Soquel Creek would make groundwater management a guessing game. Committee members also had concerns about the lack of data for Aptos and Valencia creeks; however, the fact that these creeks seem to be disconnected from groundwater made these data problems less of a priority.

Several committee members stated that the lack of data regarding groundwater pumping's impacts on streamflow made further data collection an important priority, especially in light of the reliance on the groundwater model for setting sustainable management criteria. One Committee member who participated in the Streamflow Subcommittee suggested isotope characterization to determine groundwater's contribution to baseflow as a possible remedy for the lack of data.

DWR's representative at the meeting indicated that other valid methods exist that are less data driven for setting minimum thresholds to protect against depletion of interconnected surface water in the basin. These could include identifying beneficial uses of the surface waters and setting minimum thresholds to prevent surface water depletions from occurring with regard to those beneficial uses. These beneficial uses might be recreational, commercial, or other uses in addition to species and habitat concerns.

<u>Committee Perspective on Undesirable Results – Depletion of Interconnected Surface Water</u>

The Committee did not discuss undesirable results regarding the depletion of Interconnected Surface Water. This topic will be addressed after the groundwater model is developed.

4. Public Comment

During this segment, Mr. Poncelet invited members of the public to comment on the Committee's discussions on Surface Water Interactions and any other Advisory Committee work.

A participant commented that it may be inappropriate to model groundwater extraction resulting in a significant decrease in stream baseflow during the driest period from August-October, as it is difficult to prove that humans are responsible for this. The participant also pointed out that as the dry season

peaks in August (at its peak) and as stream flow increases later in the season, the Committee should consider designating the timeframe for model between July and September.

Another participant agreed with the staff proposal and indicated that she favored using salmonid species as a proxy and expanding the monitoring time span, as it would provide a critical protection baseline for streams, especially in the context of climate change and unpredictability of rain.

A speaker asked about the accuracy of the data being used for modeling Surface Water Interactions and whether historic data will be included. She appealed to the Committee to consider other species in the biotic community other than salmonid. She also requested a discussion on the Aptos Polo Grounds well, as the yield is declining and it is a part of Soquel Creek Water District.

5. Water Quality – Undesirable Results with Underlying Significant and Unreasonable Conditions

Georgina King, from Montgomery & Associates, presented a technical staff proposal and options for degraded Groundwater Quality Minimum Thresholds, which included requests for Advisory Committee members to determine: 1) what they want to avoid for the basin (i.e., what is considered Significant and Unreasonable); and 2) what set of conditions they see as causing significant and unreasonable impacts for the Basin (i.e., Undesirable Results). Prior to soliciting Committee input on the staff proposals, Ms. King provided the Committee with background information on Groundwater Quality in the Basin, including trends. She also provided a list of proposed Representative Monitoring Wells.

The Advisory Committee provided input on the technical staff proposal on degraded Groundwater Quality Minimum Thresholds as summarized below. A separate synthesis of Advisory Committee input on Groundwater Quality management criteria will be prepared by Montgomery & Associates and shared with the Advisory Committee for review at a later time.

General Advisory Committee Input on Water Quality Degradation

In general, Committee members appeared to appreciate the content of staff's background presentation on groundwater quality. Georgina King outlined the requirements that make up California's drinking water standards for potable water and the monitoring conducted to comply with those state or county requirements. She also provided background on the generally high quality groundwater that exists in the basin, and she described issues that may arise as water quality standards are modified and as new standards are set for contaminants of emerging concern (CECs).

Committee Perspectives on Significant and Unreasonable Conditions – Water Quality Degradation

Committee members responded to the following technical staff proposal: "Significant and unreasonable conditions occur when groundwater quality, attributable to groundwater pumping or managed aquifer recharge, exceeds state drinking water standards."

The Committee generally thought that drinking water standards were a good measure of water quality in the basin. They discussed a few of the naturally occurring constituents (arsenic and chromium VI) and CECs that exceed state drinking water standards or may exceed state drinking water standards once standards are set for them. A few expressed concern that the quality of water injected into the basin would be of poor quality and would need to meet state non-degradation policies. They also discussed

what responsibility the Groundwater Sustainability Agency (GSA) would have over naturally occurring constituents in groundwater that exceeds state standards.

Committee Perspectives on Undesirable Results – Water Quality Degradation

Background: "Undesirable Results" are the set of conditions that would cause significant and unreasonable conditions to occur related to water quality degradation in the basin as measured at representative monitoring wells and municipal production wells.

Staff asked Committee members to respond to two technical staff proposals associated with two proposed management areas within the basin: the Aromas and Purisima F, and the Purisima Formation. The rationale for having two management areas is the difference in groundwater quality and confined/unconfined nature of aquifers in each management area.

Technical staff proposal of undesirable results for the Aromas area: "Undesirable results in the basin occur when as a result of groundwater pumping or managed aquifer recharge, 33% or more Representative Monitoring Wells exceed any <minimum threshold> annually."

Technical staff proposal of undesirable results for the Purisima area: "Undesirable results in the basin occur when as a result of groundwater pumping or managed aquifer recharge, 25% or more Representative Monitoring Wells exceed any <minimum threshold> annually."

Many Committee members were not satisfied with the water quality technical staff proposals because they believed that allowing water quality in 25-33% of the representative monitoring wells to fail **any** drinking water standard would be too many. Part of the Committee's concerns about this percentage is that many of the representative monitoring wells identified for water quality monitoring are municipal production wells. Ms. King pointed out that several of the municipal wells recommended as representative monitoring wells, especially in the Aromas area, already fail drinking water standards and are treated before the water is delivered to customers.

There was an extensive conversation around the issue of what would be a better definition for an Undesirable Result related to water quality degradation. The Committee discussed the State Water Resources Control Board's 1968 Resolution 68-16 anti-degradation policy to maintain high quality waters in California. Several Committee members also suggested that other regulatory frameworks related to water quality, water production and water injection projects might provide additional guidance to develop a more representative definition of Undesirable Result for Water Quality in the basin.

6. Public Comment

During this last public comment session, Mr. Poncelet invited members of the public to focus comments on the Committee's recent discussions on Groundwater Quality or on any other Advisory Committee work.

One participant urged Pure Water Soquel to consider the impacts of contamination at wells. She also inquired about the process for participation in the Surface Water Subcommittee.

7. Confirm Various Project Documents

- **May 23, 2018 Advisory Committee Meeting Summary**

  The Advisory Committee members did not have any edits or comments on the draft May 23, 2018 Advisory Committee meeting summary. Mr. Poncelet confirmed it for submission to the Mid-County Groundwater Agency (MGA) Board.

- **Staff incorporation of Advisory Committee input from May 23, 2018 meeting – to inform development of Minimum Thresholds for Groundwater Levels**

  Staff distributed a draft Minimum Thresholds proposal for Groundwater Levels and invited Committee members to review it and provide feedback to Ms. Pruitt through August. Staff also reported that the Subsidence Minimum Threshold proposal is still under discussion with DWR and will be shared with the Committee in due course.

8. Next Steps

In closing, Mr. Poncelet reviewed the anticipated meeting objectives for the July 19th joint MGA Board/ Advisory Committee meeting and provided an overview of the GSP process timeline through December 2018. Executive Team members closed the meeting by thanking the attendees for their participation.

Draft Meeting Summary

Joint Santa Cruz Mid-County Groundwater Agency (MGA) Board and Groundwater Sustainability Planning (GSP) Advisory Committee Meeting #9

July 19, 2018, 6:30 – 9:00 pm

This meeting was a joint convening of the Santa Cruz Mid-County Groundwater Agency (MGA) Board and the Groundwater Sustainability Planning (GSP) Advisory Committee. It took place on July 19, 2018 from 6:30 – 9:00 p.m. at the Simpkins Family Swim Center in Santa Cruz. This document summarizes only Agenda Item 8 of the joint meeting, pertaining to potential projects and concepts to support recovery and sustainability of the Santa Cruz Mid-County groundwater basin and relevant to the Advisory Committee's work. The following key discussions topics were covered at the meeting:

- Overview of historical and current work related to potential projects and concepts
- Review of the process in relation to the GSP development
- Board discussion and public input on potential projects and concepts

This summary is not intended to serve as a detailed transcript of the meeting or Agenda Item 8.

Meeting attendance

Advisory Committee members in attendance included:

1. Kate Anderton, Environmental Representative
2. John Bargetto, Agricultural Representative
3. David Baskin, City of Santa Cruz
4. Rich Casale, Small Water System Management
5. Keith Gudger, At-Large Representative
6. Bruce Jaffe, Soquel Creek Water District
7. Dana Katofsky McCarthy, Water Utility Rate Payer
8. Jon Kennedy, Private Well Representative
9. Jonathan Lear, At-Large Representative
10. Marco Romanini, Central Water District
11. Charlie Rous, At-Large Representative
12. Allyson Violante, County of Santa Cruz
13. Thomas Wyner for Cabrillo College, Institutional Representative

Committee members who were absent included:

1. Douglas P. Ley, Business Representative

Agenda Item 8: Key Discussion on Potential Projects and Concepts to Support Recovery and Sustainability of the Santa Cruz Mid-County Groundwater Basin

8.1 Summary of Potential Projects and Concepts

John Ricker, County of Santa Cruz, opened the session after a roll call of the Advisory Committee members and introduction of the Kearns & West facilitation team. Mr. Ricker noted that this is an informational meeting regarding potential projects and concepts, and no Board action is requested.

- **Overview of Historical Work**
  Mr. Ricker presented an overview of historical work related to projects and concepts, describing efforts of the County, City, local water agencies and advisory bodies with respect to regional water supply planning since the 1950s, including various water master plans and studies.

- **Overview of Current Work**
  Rosemary Menard, City of Santa Cruz, and Ron Duncan, Soquel Creek Water District, provided an overview of water resource projects in their respective jurisdictions, including a description of the problem statement and proposed solutions.

  Ms. Menard described how the City of Santa Cruz is currently developing supporting information and evaluating the feasibility and cost of the following efforts:
  - In-Lieu Recharge, in which wet season surface water would be provided to the water district to reduce groundwater pumping;
  - Aquifer Storage and Recovery (ASR), which involves utilizing injection wells for recharging aquifer systems with excess water supplies for temporary storage and later recovery when needed;
  - Advanced treated recycled water to be used as a source for groundwater replenishment, surface water augmentation or, if or when regulations provide a framework to do so, direct potable reuse; and
  - Seawater Desalination.

  Mr. Duncan described several projects Soquel Creek Water District is pursuing under its Community Water Plan:
  - Pure Water Soquel, a proposed groundwater replenishment and seawater intrusion prevention project using advanced water purification methods to purify recycled water for replenishment and protection of the basin. Mr. Duncan noted that the project is currently under California Environmental Quality Act (CEQA) review and that the public comment period on the draft Environmental Impact Report (EIR) ends on August 13, 2018.
  - Purchase of winter surface water from the City of Santa Cruz for direct use by Soquel Creek Water District.
  - Possible purchase of desalinated water from a potential project in Moss Landing.
  - Small-scale stormwater capture for groundwater replenishment.

  A key takeaway from both presentations is that water conservation and groundwater well management are not sufficient solutions to address the groundwater overdraft and to ensure a reliable water supply.

- **Process and Relation to the GSP Development**
  Ms. Menard described the process and relation of the GSP development, referring to various graphics illustrating the relationships of GSP elements and iterative nature of the Advisory Committee's work on the GSP. Projects and management actions will need to be evaluated and incorporated into the implementation section of the GSP to document how sustainability measures will be attained.

- **Public Presentations on Projects and Concepts**
  Tom LaHue, Chair of the MGA Board, invited members of the public to present on other proposed or potential projects.

  Perry Linstrom, Water for Santa Cruz County, presented on a project that uses river water transfers as a solution to water supply replenishment. Mr. Linstrom posed several key questions that the project is attempting to address:
    - How much water does the North Coast have to transfer?
    - How can Santa Cruz replace water sent to Soquel Creek Water District customers?
    - Is the current basin infrastructure sufficient to treat and transfer water?
    - What constitutes a critical dry year and how does that classification impact the community and wildlife?

  In conclusion, Mr. Linstrom emphasized that water supply available for the basin is sufficient and a compatible aquifer and river water infrastructure does exist if the Santa Cruz Water District is willing to make transfers.

  Jerry Paul, Water for Santa Cruz County, provided an overview of the Lochquifer Alternative for drought prevention in the Mid-County Basin. He described the project's key objective as producing large volumes of water at a cost as low as 7% of the cost of other comparable projects. Mr. Paul discussed other key points of the Lochquifer project as follows:
    1. It will render the basin "drought-proof" in three years and fill aquifers within a decade.
    2. It will increase aquifer storage space three to six times over the Loch.
    3. It will produce a net average annual transfer from Santa Cruz Water District to Soquel Creek Water District of greater than 800 MG.

- **Summary of Advisory Committee and Public Questions and Comments**
  Mr. LaHue invited Advisory Committee members and members of the public to ask questions and provide comments on projects discussed. (*Questions are represented as (Q), comments as (C) and responses as (R) below*.)

  (Q) An Advisory Committee member asked when the Pure Water Soquel project will start producing supply.
    - (R) Mr. Duncan indicated that the project will start producing water in 2023.

  (Q) An Advisory Committee member asked a few questions about the City of Santa Cruz's ASR project, and Ms. Menard provided responses accordingly as follows:

- Will withdrawals be made from the ASR in drought years?
  - (R) Ms. Menard indicated that it depends on the characteristics of the aquifer, but essentially the goal is to store water in wet years for use in dry years.
- Will the injection of water occur during wet months?
  - (R) Ms. Menard responded that the injection of water will occur during wet months, as the project analysis first applied all of the water (365 days/year) used for in-lieu recharge. She further explained that the idea is to end up taking water in the wet months, when the levels are above required fish flows and considering water rights constraints.
- Will water not be withdrawn again until it is needed?
  - (R) Ms. Menard confirmed that the water will not be withdrawn again until it is needed and added that the key issue for the City is honing the awareness of future extreme wet/dry seasonal patterns in order to plan and respond accordingly. Ms. Menard stressed that modeling the patterns, accounting for seawater intrusion, maintaining the seawall barrier, as well as looking at alternatives will help drive this planning effort forward.

(C) A member of the public commented that it may be worthwhile to look at the recycled water work that Scotts Valley is doing to raise groundwater levels.

(Q) An Advisory Committee member asked whether any of the options, facilities and infrastructure planning processes incorporate emergency/crisis responses.

- (R) Robert Marani, MGA Board member, responded that it is important to have a diversified portfolio, which includes emergency/crisis response plans.
- (R) Ms. Menard indicated that a recommended process going forward would include the following project components: criteria cost, timelines, adaptive flexibility to climate change, water system infrastructure, and supplies in order to anticipate future needs.

(Q) An Advisory Committee member asked questions regarding Soquel Creek Water District's Community Water Plan, and Mr. Duncan provided responses as follows:

1. How realistic is deep water desalination and the 15-mile pipeline from Moss Landing to Soquel?
   - (R) Mr. Duncan explained that the District is considering all options and not eliminating any ideas at this time.
2. Is the District considering storm water recharge in only two to three areas?
   - (R) Mr. Duncan responded that the District initially looked at the entire Soquel Creek area and eventually reduced the recharge focus to a few sites.
3. With reference to the Draft EIR, where is the District in narrowing down a location for potable water reuse?
   - (R) Under the EIR, an area expanding from Chanticleer Avenue out to Cabrillo College is under consideration for three pipeline routes, and other options are still under discussion.

(Q) An Advisory Committee member asked questions regarding Ms. Menard's presentation, and she responded as follows:

1. Can you comment on how ASR is working toward the 3,000 AFY adjudicated safe yield for the Seaside groundwater basin?
    - (R) The Seaside project is being developed but is not fully implemented yet. Ms. Menard indicated that water has to be treated to drinking water standards for use in ASR, and in order to achieve this standard, the project has to consider building pipelines, a treatment plant and transmission infrastructure, recognizing the variability between size and cost. Ms. Menard added that there are also issues regarding additional storage, comparing past experiences with possible future concerns, sources of water, water rights, and coordination with agencies and stakeholders.
2. What about working with water from the North Coast?
    - (R) Ms. Menard explained that the North Coast has a healthy watershed, but a large part of it is unavailable for transfers as it is heavily dedicated to fish flows.

(Q) An Advisory Committee member asked Mr. Ricker whether the County has considered smaller recharge projects in prime areas (vs. focusing solely on larger projects) and whether they can be included in the GSP?

- (R) Mr. Ricker explained that the County is working with the Resource Conservation District regarding promoting managed recharge for medium projects and small scale stormwater capture and infiltration for both urban and rural property owners. He added that the County is also considering ways to offset climate change by capturing water in the hills.

(Q) An Advisory Committee member asked about the Pure Water Soquel facility and for confirmation that it can produce up to 8M gallon/day of purified water.

- (R) Mr. Duncan indicated that Soquel Creek Water District has a memorandum of understanding with the City of Santa Cruz to deliver 2M gal/day of tertiary sewage, which could produce on average or 1,500 acre-feet per year of purified water. He added that the consideration to build a pipe large enough to transfer that level of water is included in the EIR.

(Q) A public participant asked for clarification on several issues pertaining to the Pure Water Soquel EIR.

1. Alternative 2 under the project seems very similar to the Water Supply Advisory Committee's (WSAC) first recommendation. Is the WSAC recommendation an alternative? And is it setting an unrealistic and high bar for the City and the District to guarantee interagency water exchanges in drought and non-drought conditions when conditions can be very unpredictable?
    - (R) Mr. Duncan urged the participant to submit her questions through the EIR process and added that it is necessary to have a guarantee as Pure Water Soquel's target is to produce 1,500 acre-feet of water, but that it does not mean that the District cannot also draw from river water.

(Q) A member of the public asked about the receptivity in the target recharge area for Pure Water Soquel.

- (R) Mr. Duncan replied that the conditions in the area are analogous to a "pancake" in that it is difficult to get water into the Purisima Aquifer. Therefore, the project would utilize injection wells to deliver water to more permeable layers.

(C) Mr. Paul addressed a comment that water transfers in the Lochquifer project do not appear to satisfy Santa Cruz's demand. He appealed to the group to look at a convergence analysis for the specifications that can confirm sufficient water for transfer.

(C) A member of the public announced that she has organized a study session for public review of the Pure Water Soquel draft EIR on August 8 and referred to her flyer (distributed at registration) for additional details.

(C) Mr. LaHue added that there is also a 20-page community guide available on the Pure Water Soquel project on the Soquel Creek Water District website.

(Q) A member of the public asked the following questions, which were addressed by various members of the Executive Team as follows:

1. Are you modeling shutting off Soquel Creek Water District wells?
   - (R) Mr. Ricker responded that some wells in the vicinity of Soquel Creek will be modelled as shut off, but not all.
2. Why is Laguna Creek not included in the pilot study for water transfers?
   - (R) Ms. Menard clarified that 100 M gallons of water for the pilot study was based on average flow from the Liddell area and not the Laguna site, as the Laguna water is mostly dedicated to fish flow.
3. Will Soquel Creek Water District decision makers allow ratepayers and private well owners impacted by the proposed injection wells and possible contamination to vote on the project before it begins?
   - (R) Mr. Duncan indicated that the Board of Directors will decide these types of issues, and there was 77% support for the project as proposed. He added that this decision is not a part of the EIR process.
4. With the Pure Water Soquel project, how will Soquel Creek Water District verify the required travel time for injected water to nearby wells and that drinking water standards are met?
   - (R) Mr. Duncan explained that the State requires Bromine (or other State-determined substance) to be added to recharge water and tested to empirically ensure travel time and dilution requirements are met.

Mr. LaHue closed Agenda Item 8 of the meeting.

Santa Cruz Mid-County Basin
Proposed Draft Subsidence Sustainable Management Criteria

This proposed draft documents preliminary development of some of the Sustainable Management Criteria to be included in the Groundwater Sustainability Plan (GSP). If needed, other Sustainable Management Criteria, such as minimum thresholds, measurable objectives, and interim milestones, may be developed for subsidence at a later date from the statements in this document.

Specifically, the Sustainable Management Criteria included in this document are:

- Subsidence that is considered **significant and unreasonable** (Section A), and
- The set of conditions that cause **undesirable results** that will lead to significant and unreasonable subsidence (Section B).

For each topic above, this document covers the following:

1. Recap of the initial technical staff proposal presented at the May 23, 2018 GSP Advisory Committee meeting.
2. Summary of GSP Advisory Committee input during the May 23, 2018 meeting.
3. Revised technical recommendations to the original staff proposals and rationales to support specific technical recommendations, considering GSP Advisory Committee input.

Additionally, response are provided to questions raised by the GSP Advisory Committee during the May 23, 2018 meeting. Section C of this document addresses the GSP Advisory Committee's recommendation to document reasons why the basin's geology is not susceptible to subsidence related to lowering groundwater levels, and therefore why this sustainability indicator should not apply to the basin.

A. Significant and Unreasonable Subsidence Conditions

Technical Staff Proposal Discussed at May 23, 2018 GSP Advisory Committee
Technical staff's initial proposal was that **any land subsidence occurring** would be considered significant and unreasonable**.**

Summary of Advisory Committee Discussion
The Advisory Committee, in general, supported the technical staff proposal, provided that the plan include an explanation that geologic units in the basin are not susceptible to subsidence. Input related to significant and unreasonable included ensuring the statement on subsidence be related to lowering of groundwater levels only and not subsidence caused by other means, such as earthquakes or natural compaction of shallow soils.

Proposed Revised Statement of Significant and Unreasonable Conditions
Any land subsidence caused by lowering of groundwater levels occurring in the basin would be considered significant and unreasonable.

Rationale: This statement reflects the consensus of GSP Advisory Committee members not wanting subsidence to occur in the basin. The basin is not susceptible to subsidence, as evidenced by the lack of reported historical subsidence associated with periods of historically low groundwater levels. Furthermore, the consolidated nature of the deeper Purisima aquifers and aquitards limits the likelihood of them collapsing due to lowered groundwater levels.

B. Subsidence Undesirable Results

1. **Undesirable Results in Aromas, Purisima A, BC, and DEF Units, using groundwater levels as a proxy for subsidence**

Technical Staff Proposal Discussed at May 23, 2018 GSP Advisory Committee Meeting
Any representative monitoring well in the Aromas and Purisima A, BC, and DEF units with average annual groundwater elevations below their historic lows in any part of the basin would represent an undesirable result for subsidence**.**

Summary of Advisory Committee Discussion
In general, the GSP Advisory Committee was in support of the staff proposal. However, because the proposal uses historic low groundwater levels as a "proxy" to evaluate subsidence and basin geology is not susceptible to subsidence, several Committee

members suggested a groundwater elevation "trigger" that would avoid declaring a "false positive" undesirable result for subsidence without evidence of actual subsidence. Once the trigger level (historic low groundwater levels) is reached, subsidence monitoring would begin rather than an undesirable result for subsidence being declared.

The Committee questioned whether costly subsidence monitoring is warranted when basin geology is not prone to subsidence linked to declining groundwater levels. They suggested that staff explore ideas to address the subsidence sustainability indicator for the Mid-County Basin by: (1) looking at monitoring options that are less costly than inSAR or extensometers, but still effective to document subsidence in the basin; and (2) establishing a case for the insusceptibility of basin geology to subsidence from lowered groundwater levels that negates the need to monitor for sustainability related to subsidence.

The Committee considered the fact that the historic low groundwater elevations needed to trigger subsidence monitoring would also indicate undesirable results occurring for other sustainability indicators, specifically: seawater intrusion, chronic lowering of groundwater levels, and depletion of surface water. Committee members considered the argument that groundwater levels in the basin would not be allowed to fall below historic lows because of the groundwater level thresholds set for these other sustainability indicators.

Proposed Revised Technical Recommendation: Undesirable Results in Aromas, Purisima A, BC, and DEF Units, using groundwater levels as a proxy for subsidence
Any representative monitoring well in the Aromas and Purisima A, BC, and DEF units with average annual groundwater elevations below their historic lows in any part of the basin would trigger quarterly observational monitoring for signs of subsidence. An undesirable result for subsidence in the Aromas, Purisima A, BC, and DEF Units would be any observed subsidence caused by lowering of groundwater levels.

Rationale: No land subsidence has occurred related to groundwater pumping at historic low groundwater levels within the groundwater basin. Staying above those historic low groundwater levels will ensure land subsidence does not occur in the future. If historic low groundwater levels are reached in a representative monitoring well, it will trigger implementation of quarterly observational monitoring for subsidence. Any observed evidence of subsidence linked to lowered groundwater levels would represent an undesirable result for subsidence in Aromas, Purisima A, BC, and DEF Units. Signs of

land subsidence from observational monitoring include: damage to roads, buildings, bridges, and instances of protruding well casings.

2. Undesirable Results in Purisima AA/Tu unit, using ground surface elevations as the metric

Technical Staff Proposal at May 23, 2018 GSP Advisory Committee Meeting
Any land subsidence occurring in the area where the Purisima AA/Tu unit is being pumped or injected into would represent an undesirable result for subsidence**.**

Summary of Advisory Committee Discussion
The Committee generally supported the staff proposal but asked that the proposal be revised to remove the words "or injected into" because aquifer-system compaction/subsidence is associated with lowering of groundwater levels that may be caused by overpumping and not by injection or storage of water in aquifers.

The Committee reiterated its concerns about the costs of subsidence monitoring in a basin with geology not prone to subsidence and high minimum thresholds for groundwater levels related to other sustainability indicators.

Proposed Revised Technical Staff Proposal: Undesirable Results in Purisima AA/Tu unit, using ground surface elevations as the metric
Any land subsidence occurring in the area where the Purisima AA/Tu unit is being pumped ~~or injected into~~ would represent an undesirable result for subsidence in the Purisma AA/Tu unit. Quarterly observational monitoring for signs of subsidence will indicate when an undesirable result for subsidence occurs. An undesirable result for subsidence in the Aromas, Purisima A, BC, and DEF Units would be any observed subsidence caused by lowering of groundwater levels.

Rationale: Observational monitoring of subsidence is needed for the Purisima AA/Tu unit because there is not enough historical groundwater level data to determine the correlation between lowered groundwater levels and subsidence. Signs of land subsidence from observational monitoring include: damage to roads, buildings, bridges, and instances of protruding well casings.

C. Evidence for the Inapplicability of the Subsidence Sustainability Indicator in the Santa Cruz Mid-County Basin

The California Department of Water Resources' (DWR) default position for Groundwater Sustainability Plan (GSP) preparation is that all six sustainability indicators apply in each groundwater basin. However, if a Groundwater Sustainability Agency (GSA) believes a sustainability indicator is not applicable, it must provide evidence in the GSP that the indicator does not exist or could not occur.

In the Santa Cruz Mid-County Groundwater Basin, subsidence due to lowering of groundwater levels is a sustainability indicator for which there is sufficient evidence to support that the basin's geology is not susceptible to subsidence, and that costly monitoring systems are not required to monitor a sustainability indicator that does not exist in the basin.

The primary pieces of evidence supporting the inapplicability of subsidence as a sustainability indicator are: 1) there have been no historical reports of subsidence related to lowered groundwater levels in the basin, 2) basin geology does not include the sediment types associated with aquifer compaction as a result of declining groundwater levels, and 3) the basin's aquifers and aquitards where historic declines in groundwater levels have been documented show no evidence of subsidence. Each of these is explored below.

Typically, conditions that cause land subsidence include:

- Drainage and decomposition of organic soils,
- Underground mining, oil and gas extraction, hydrocompaction, natural compaction, sinkholes, and thawing permafrost, or
- Aquifer-system compaction.

No Historical Reports of Subsidence due to Lowered Groundwater Levels

Damage to roads, buildings, bridges, and instances of protruding well casings are examples of land subsidence related to lowered groundwater levels that have not been observed in the Santa Cruz Mid-County Basin. As the basin has not had reports or observations of land subsidence due to lowered groundwater levels, no land subsidence monitoring has taken place in the past or currently.

Basin Geology is Not Susceptible to Subsidence

The Aromas Red Sands aeolian and Purisima Formation shallow marine depositional environments are not conducive to the deposition of organics that are susceptible to subsidence. Additionally, no underground mining, oil and gas extraction, hydrocompaction, and thawing permafrost occurs in the basin.

Aquifer-system compaction is potentially possible because there have been historic long-term declines in groundwater levels in Purisima Formation aquifers. Typically, compaction that causes land subsidence occurs between aquifer units within unconsolidated aquitards containing fine-grained sediments (silt and clay) which are composed of flat plate-like grains. When fine-grained sediments are deposited, they tend to be deposited in random orientations. These randomly oriented sediment grains have space between them to store groundwater. However, when groundwater levels decline to historically low levels, those randomly oriented sediments are rearranged into stacks and compacted. The rearranged grains occupy less space and also have less space between them to store groundwater.

Aquitards that occur between aquifer units in the Santa Cruz Mid-County Basin are predominantly consolidated to semi-consolidated siltstones and fine-grained sandstones. The consolidated nature of the siltstones and sandstones in the basin significantly reduce their susceptibility to collapse and compaction during periods of very low groundwater levels.

Subsidence Monitoring near the Santa Cruz Mid-County Basin

As mentioned previously, no subsidence monitoring takes place in the basin because subsidence has not occurred and is not a concern. There are, however, two continuous global positioning system (CGPS) stations in the vicinity of the basin in the Aromas area (Figure 1). These CGPS stations are part of the UNAVCO Plate Boundary Observatory network of CGPS stations.

Both CGPS stations are located in areas underlain by the Aromas aquifer where groundwater levels have not experienced any significant declines. One of the stations, the Larkin Valley CGPS station (P212), is within 0.5 miles of some of the Soquel Creek Water District's production well pumping from the Aromas and Purisima F aquifers. Even though the station is outside of the basin, it still hydraulically connected and has the same aquifers as the Santa Cruz Mid-County Basin and is representative of the basin. Unfortunately, no CGPS stations are located in areas of the basin where the main Purisima aquifers are being pumped and where historic long-term declines in groundwater have occurred.

Horizontal (North and East) and vertical displacement charts are shown on Figure 2 for the Larkin Valley CGPS station (P212) and Figure 3 for the Corralitos CGPS station (P214). Both stations show small amounts of elastic subsidence in the vertical dimension (height charts at the bottom) that appear to be annual shifts of up to 2 inches, and are possibly related to seasonal changes in groundwater levels. Although 2 inches appears to be quite a bit of subsidence, the movement is not noticeable in buildings and other structures because it is not differential subsidence but occurs more or less uniformly over a very large area. In comparison, Figure 4 shows significant inelastic subsidence of 1.2 feet that has taken place in Los Baños, in the Central Valley, over the past 14 years. The primary difference between the subsidence measured near the Santa Cruz Mid-County Basin and in Los Baños is that Los Baños has inelastic subsidence, which does not rebound each year like in the Aromas area, and as a result, subsidence increases cumulatively every year.

Note that the North and East charts on Figures 2 and 3 are not related to subsidence. The displacement plotted over time shows the Pacific Plate moving northwest relative to the North American Plate along the San Andreas Fault.

Conclusions

The consolidated nature of the Purisima Formation, where groundwater level declines have historically occurred, is the main reason why land subsidence related to lowered groundwater levels has not occurred in the basin, and why subsidence is unlikely to occur in the future. Implementation of the GSP and avoiding undesirable results in the other five sustainability indicators will ensure that historic low groundwater levels are not repeated. This argument supports the assertion that land subsidence due to lowered groundwater levels will not occur in the future.

With no subsidence occurring in the basin, past, present or future, it is not an effective indicator of sustainability, and does not need to be included in the GSP. This means that subsidence Sustainable Management Criteria are not required, other than perhaps the statement of significant and unreasonable.

In the highly unlikely event that land subsidence caused by lowered groundwater levels does occur in the basin and is identified as such by observational monitoring, the MGA will immediately regulate groundwater pumping in the area of land subsidence. The identification of active land subsidence will trigger the need for dedicated subsidence monitoring and an amendment to the GSP that includes development of Sustainable Management Criteria for the land subsidence sustainability indicator.

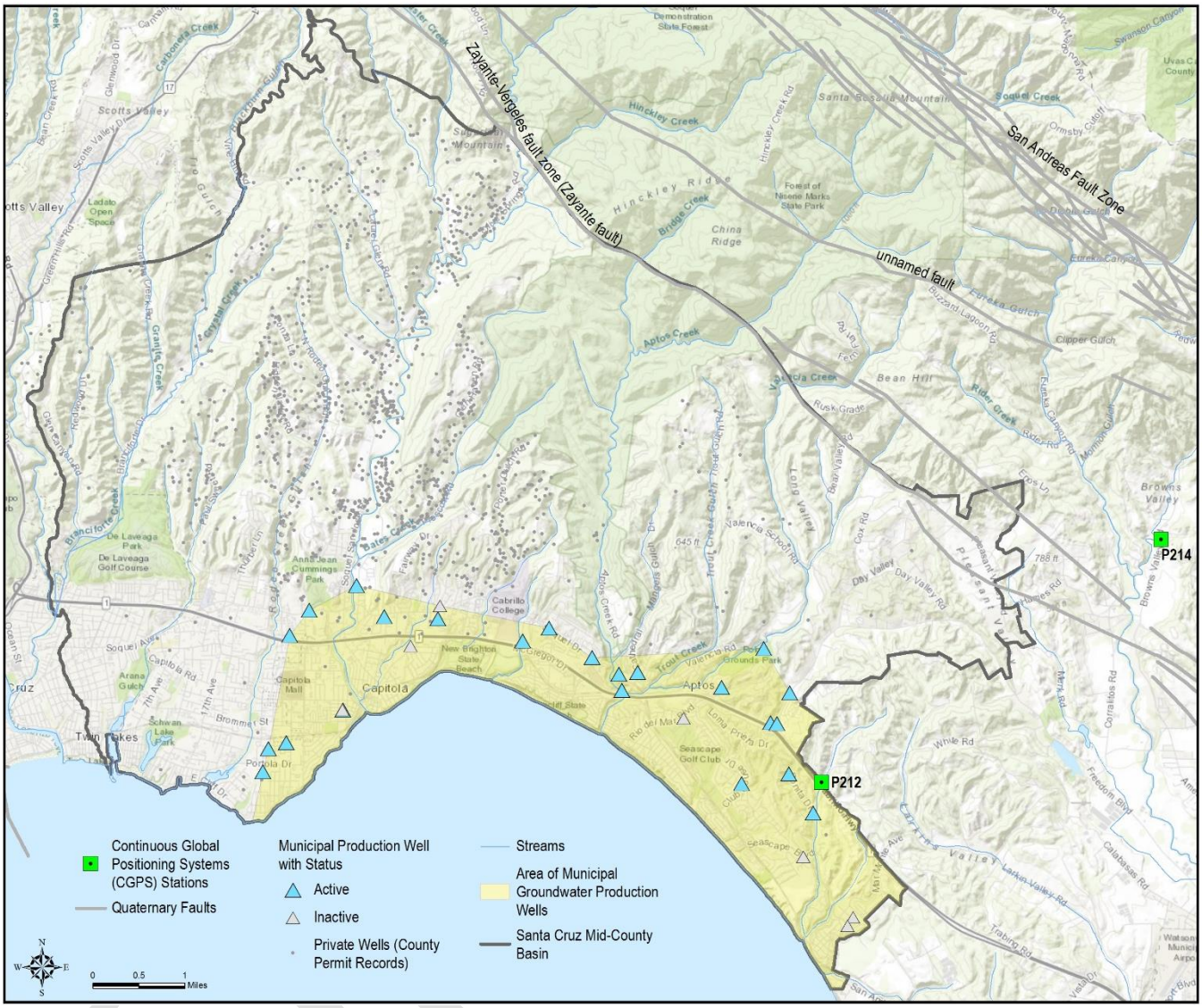

Figure 1. Location of Continuous GPS Stations near the Santa Cruz Mid-County Basin

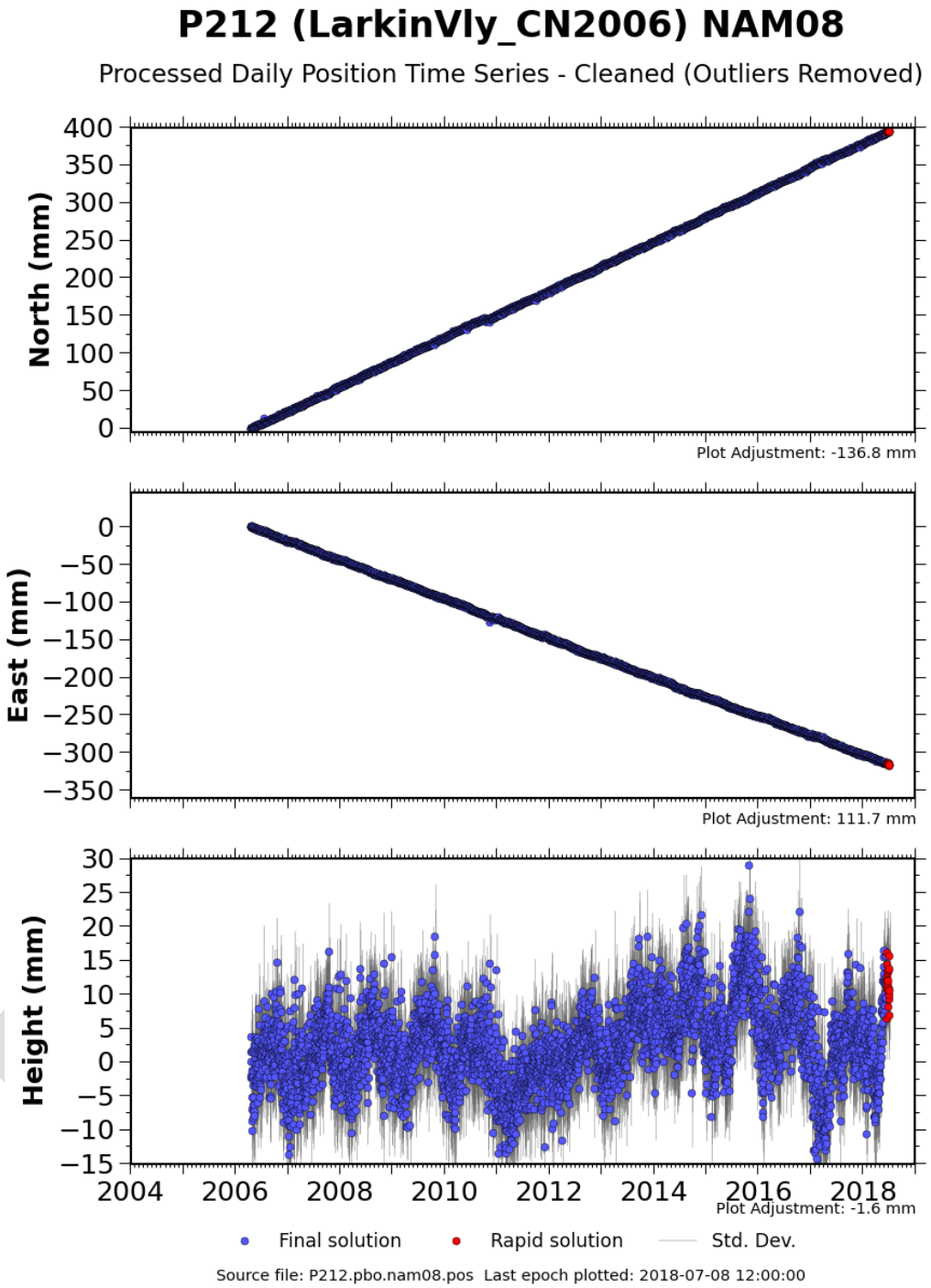

Figure 2. P212 Larkin Valley CGSP Station Daily Position

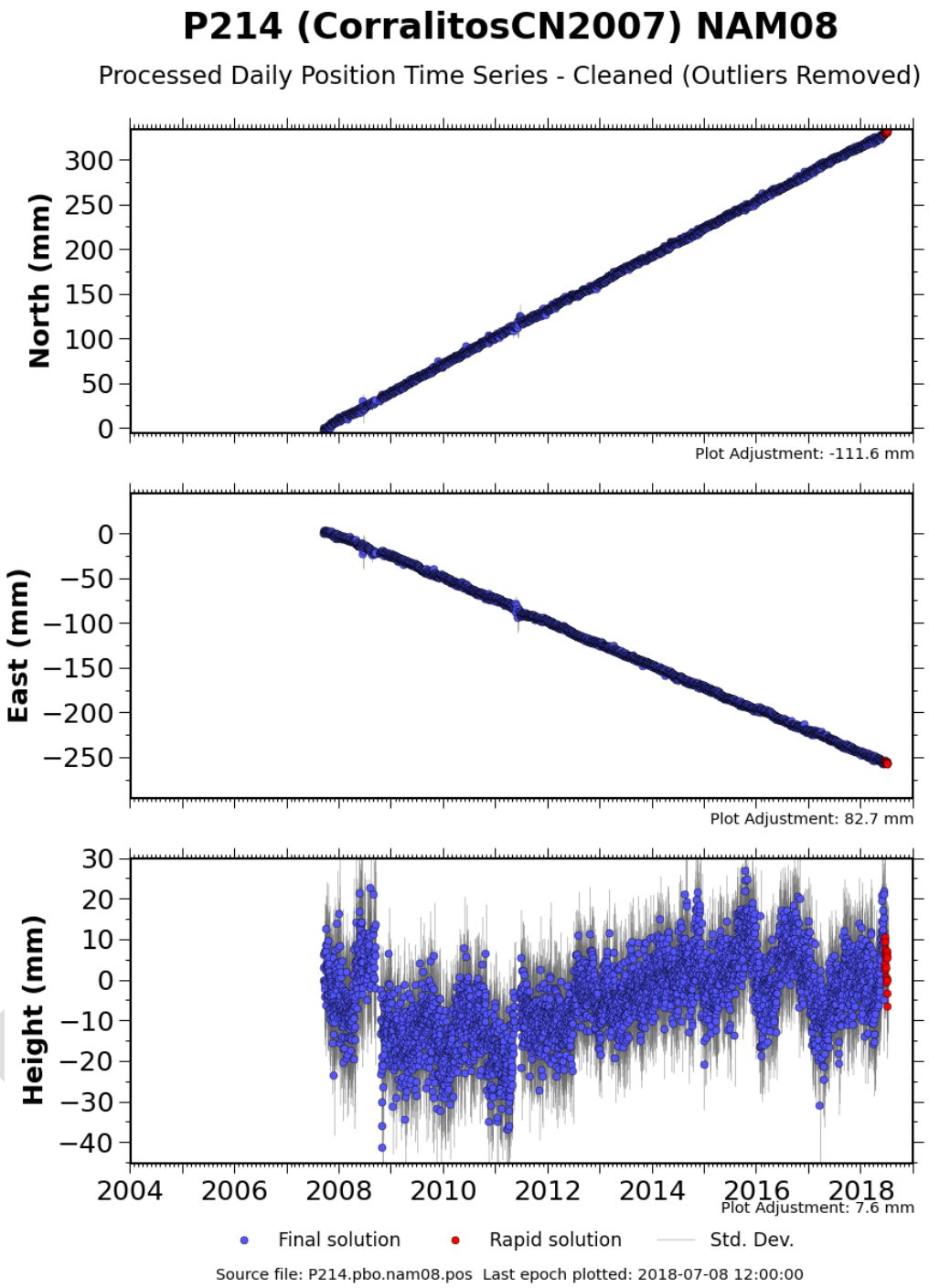

Figure 3. P214 Corralitos CGSP Station Daily Position

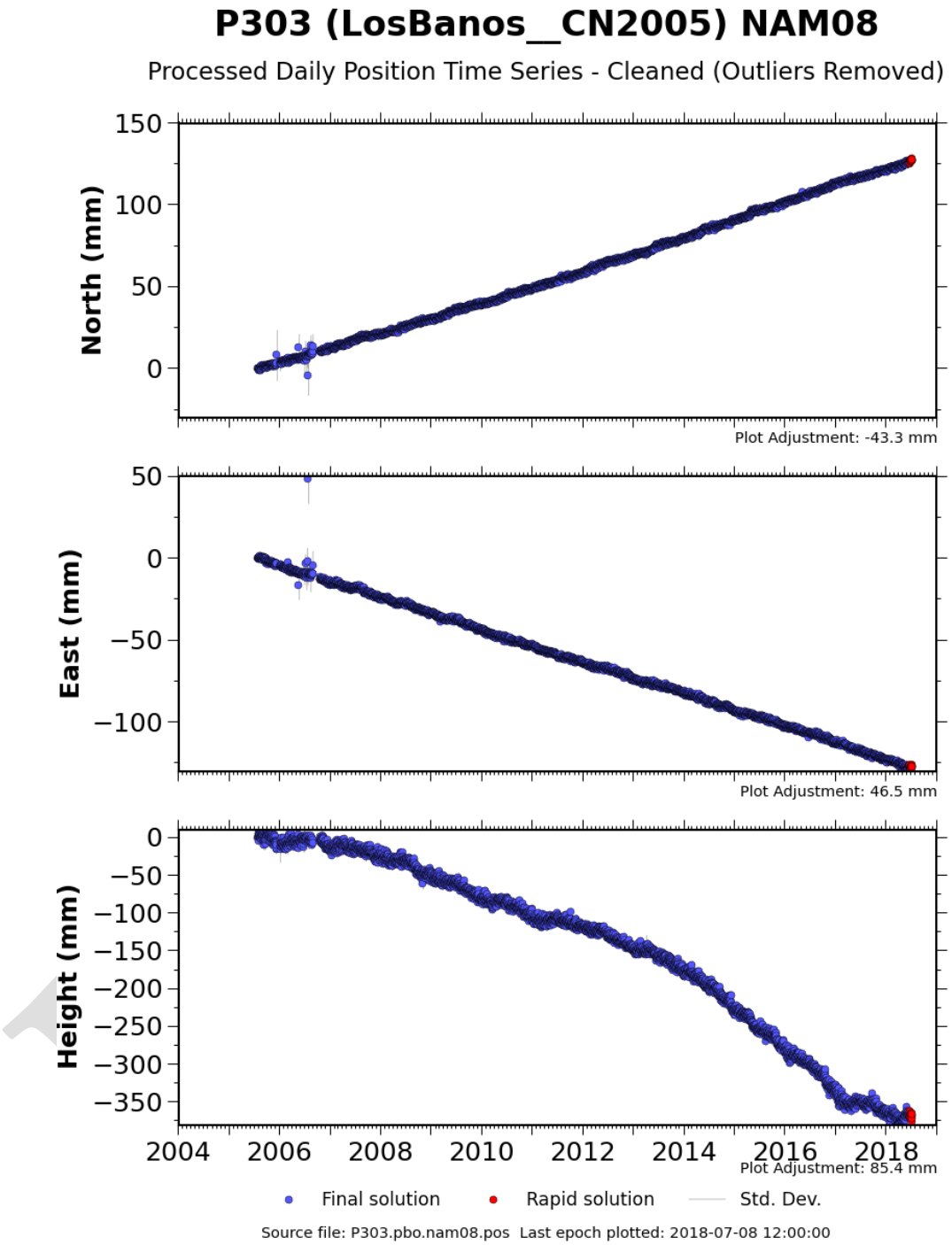

Figure 4. P303 Los Banos CGSP Station Daily Position

Santa Cruz Mid-County Basin
Proposed Draft Degraded Groundwater Quality
Sustainable Management Criteria

This proposed draft documents preliminary development of some of the Sustainable Management Criteria for degradation of groundwater quality to be included in the Groundwater Sustainability Plan (GSP). Other Sustainable Management Criteria that will be developed from the statements in this document, at a later date, are numerical values for measurable objectives and interim milestones.

Specifically, the Sustainable Management Criteria included in this document are:

- Degraded groundwater quality that is considered significant and unreasonable (Section A).
- The set of conditions that cause undesirable results that will lead to significant and unreasonable degraded groundwater quality (Section B).

For each topic above, this document covers the following:

1. Recap of the initial technical staff proposal presented at the June 27, 2018 GSP Advisory Committee meeting.
2. Summary of GSP Advisory Committee input provided during the June 27, 2018 meeting.
3. Revised technical recommendations to the original staff proposals, with a rationale for specific recommendations, taking into account GSP Advisory Committee input.

Additionally, in response to concerns about the use of supplemental water in the Basin, Section C provides an overview of existing regulatory policies related to groundwater quality. Section D provides ideas on the role the Mid-County Groundwater Agency (MGA) can take in regulating groundwater quality in the basin.

A. Degraded Water Quality - Significant and Unreasonable Conditions

Technical Staff Proposal Discussed at June 27, 2018 GSP Advisory Committee

Technical staff's initial proposal was that **significant and unreasonable conditions would occur when groundwater quality, attributable to groundwater pumping or managed aquifer recharge, exceeds state drinking water standards**.

Summary of Advisory Committee Discussion

The Committee thought that drinking water standards were a good measure of groundwater quality in the basin. There was some discussion about a few of the naturally occurring constituents (arsenic and chromium VI) and constituents of emerging concern (CECs) that exceed state drinking water standards or may exceed state drinking water standards once standards are set for them. There was some concern that the quality of water injected into the basin would be of poor quality and would need to meet state non-degradation policies. There was also discussion about what responsibility the Groundwater Sustainability Agency (GSA) would have for naturally occurring constituents in groundwater that exceeds state standards.

Proposed Revised Statement of Significant and Unreasonable Conditions

Significant and unreasonable conditions would occur when groundwater quality, attributable to groundwater pumping or managed aquifer recharge, ~~exceeds~~ fails to meet state drinking water standards.

Rationale: Recognizing there are naturally occurring groundwater quality issues in the Basin, this statement reflects the general consensus of GSP Advisory Committee members that any project implemented or management actions taken by the GSA to achieve sustainability must not cause groundwater quality degradation that results in groundwater quality to be worse than drinking water standards.

There was some discussion during the Advisory Committee meeting about changing "managed aquifer recharge" to "anthropogenic aquifer recharge" to be more encompassing than just recharge projects. However, projects to be implemented under the GSP and for which degraded groundwater quality sustainable management criteria will be set, will likely be limited to recharge of stormwater, river water, and treated wastewater, or in-lieu recharge. In-lieu recharge is use of water from outside the basin, in-lieu of pumping groundwater from within the basin. All of these forms of recharge fall under the category of managed aquifer recharge. Using the term anthropogenic aquifer recharge would include recharge from septic systems which is not an MGA

project but rather an ongoing practice that has known impacts in the basin limited to the Aromas area.

B. Degraded Groundwater Quality Undesirable Results

Technical Staff Proposal Discussed at June 27, 2018 GSP Advisory Committee Meeting

Aromas Area:

Undesirable results in the basin occur when, as a result of groundwater pumping or managed aquifer recharge, 33% or more Representative Monitoring Wells exceed any <minimum threshold> annually.

Purisima Area:

Undesirable results in the basin occur when, as a result of groundwater pumping or managed aquifer recharge, 25% or more Representative Monitoring Wells exceed any <minimum threshold> annually.

Summary of Advisory Committee Discussion

Many Committee members were not satisfied with the groundwater quality technical staff proposals because they believe that allowing groundwater quality in 25-33% of representative monitoring wells to fail **any** drinking water standard would be too many. Part of the Committee's concerns about this percentage is that many of the representative monitoring wells identified for groundwater quality monitoring are municipal production wells. Staff pointed out that several of the municipal wells recommended as representative monitoring wells, especially in the Aromas area, already fail to meet drinking water standards and are treated before the water is delivered to customers. The Committee supported the view that the groundwater quality minimum thresholds should be the same as drinking water standards.

There was an extensive conversation around the issue of what would be a better definition for an Undesirable Result related to groundwater quality degradation. The Committee briefly discussed the State Water Resources Control Board's (SWRCB) 1968 Resolution 68-16 anti-degradation policy to maintain high quality waters in California. Several Committee members also suggested that other regulatory frameworks related to injection projects might provide additional guidance to develop a more representative definition of Undesirable Results for groundwater quality in the basin.

Proposed Revised Technical Recommendation: Undesirable Results in both Aromas and Purisima areas:

Undesirable results in the basin occur when as a result of groundwater pumping or managed aquifer recharge, ~~33% or more~~ any Representative Monitoring Wells exceeds any <minimum threshold> annually.

Rationale: Because the focus is on degraded groundwater quality from projects and management actions implemented to achieve sustainability in the GSP, any Representative Monitoring Wells in either the Aromas or Purisima areas failing to meet drinking water standards would mean the projects implemented under the GSP are causing degradation of the basin. No flexibility for avoiding undesirable results is built into this statement. If flexibility is needed, the average annual concentration could be specified instead of any concentration over the year.

Further discussion with the Advisory Committee is required for definition for undesirable results. Other issues to consider in that discussion include:

- It may be difficult to establish if exceedances of minimum thresholds are related to GSP projects or management actions, or another source.
- Need to factor how many representative monitoring wells already exceed drinking water standards.

D. MGA Role vs Groundwater Quality Regulatory Agencies Role

MGA members are likely going to be proponents for supplemental water projects in the Basin. The MGA members, however, will not enforce groundwater quality standards in their projects; rather they will monitor groundwater quality under other regulatory programs. The MGA will rely primarily on existing or proposed groundwater quality regulations to protect the Basin from degraded groundwater quality.

We anticipate that the RWQCB will be the primary agency enforcing groundwater quality standards related to MGA member projects. Projects will also be subject to evaluation and mitigation of environmental impacts pursuant to the California Environmental Quality Act (CEQA). Project proponents are required to meet specific requirements before a project can be constructed and during operation of the project. Each project will have site-specific groundwater monitoring requirements that are focused on potential project impacts. These site-specific requirements are much more comprehensive and rigorous than the degraded groundwater quality sustainability indicator monitoring is

intended to be. Monitoring wells constructed as part of future projects may be added as Representative Monitoring Wells after submittal of the GSP, if appropriate.

The MGA is reliant on existing regulations and oversight by the RWQCB, plus regulation compliance by project proponents to ensure undesirable groundwater quality results do not occur in the Basin. Because project proponents are members of the GSA, a direct line of accountability to the GSA is established.

GSAs could take a more direct approach to groundwater quality regulation. According to California Water Code Section 10725.2(b), a GSA "may adopt rules, regulations, ordinances, and resolutions for the purpose of this part…". This means that a GSA may adopt groundwater quality regulations and ordinances if needed, but not necessarily so. The MGA should not take this more direct approach because it will be a financial and resource burden to take on responsibility of groundwater quality regulation. If, however, the MGA felt the RWCQB was not responsive in enforcing groundwater quality regulations and undesirable results were occurring in the Basin, the MGA has the authority to adopt new regulations to prevent undesirable groundwater quality results, even after GSP implementation.

If the MGA's role is not regulatory with regards to groundwater quality, its main role is to monitor, assess, and report on the overall Basin groundwater quality. Projects proponents only have to monitor their own wells while the MGA is the sole agency with responsibility for the entire Basin.

The MGA should also have the following roles that may affect groundwater quality:

1. Decide on which projects are included in the GSP. These must be projects that do not degrade groundwater quality in underlying aquifers to the point that groundwater fails to meet drinking water standards (i.e., quality is better than minimum thresholds), and that contribute to meeting measurable objectives.

2. Decide on how to deal with non-MGA sanctioned projects that get implemented by others, especially if they only result in groundwater quality that is better than minimum thresholds, and that do not contribute to meeting measurable objectives. The MGA would need to provide comments during the CEQA process for the specific projects and would need to petition the RWQCB to impose more stringent permit requirements, if needed to avoid undesirable results.

3. Once the GSP is implemented, if a MGA-sanctioned project causes unforeseen degradation of groundwater quality, the MGA needs to have the authority to change operations of the project, or even halt its operation if needed.

It is recommended that the MGA Board use these initial thoughts on the role they may play in groundwater quality regulation to discuss the issue and develop policy that supports their role.

C. Existing Regulatory Policies Related to Groundwater

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and guidelines (referred to generally as "regulatory requirements") relevant to groundwater resources. The text is almost entirely from Pure Water Soquel's Draft Environmental Impact Report (EIR). The full Draft EIR document can be found at: https://www.soquelcreekwater.org/PWS-CEQA

Federal and State Regulations

FEDERAL ANTIDEGRADATION POLICY

Section 303 of the Clean Water Act (CWA) (33 U.S.C. § 1313) requires that states adopt water quality standards for waters of the United States within their applicable jurisdiction. Such water quality standards must include, at a minimum, (1) designated uses for all waterbodies within their jurisdiction, (2) water quality criteria necessary to protect the most sensitive of the uses, and (3) antidegradation provisions. Antidegradation policies and implementing procedures must be consistent with the regulations in 40 C.F.R. § 131.12. Antidegradation is an important tool that states use in meeting the CWA requirement that water quality standards protect public health and welfare, enhance water quality, and meet the objective of the Act to "restore and maintain the chemical, physical and biological integrity" of the nation's waters. The CWA requires that states adopt antidegradation policies and identify implementation methods to provide three levels of water quality protection to maintain and protect (1) existing water uses and the level of water quality, (2) high quality waters, and (3) outstanding national resource waters.

SWRCB RESOLUTION 68-16 ANTI- DEGRADATION POLICY

In 1968, the SWRCB adopted an anti-degradation policy (policy) aimed at maintaining the high quality of waters in California through the issuance of Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California"). They apply to both surface waters and groundwaters (and thus groundwater replenishment projects), protect both existing and potential beneficial uses of surface

water and groundwater, and are incorporated into Regional Water Quality Control Board (RWQCB) Water Quality Control Plans (e.g., Basin Plans).

The policy requires that existing high water quality be maintained to the maximum extent possible, but allows lowering of water quality if the change is "consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated use of such water (including drinking), and will not result in water quality less than prescribed in policies." The policy also stipulates that any discharge to existing high quality waters will be required to "meet waste discharge requirements which will result in the best practicable treatment or control of the discharge to ensure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

The policy prohibits actions that tend to degrade the quality of surface and groundwater. The RWQCBs oversee this policy (SWRCB, 1968). The anti-degradation policy states that:

- Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.

- Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

SWRCB has interpreted Resolution No. 68-16 to incorporate the federal anti-degradation policy, which applies if a discharge that began after November 28, 1975 would lower existing surface and groundwater quality. This policy would apply to any project that brings in supplemental sources of water into the Basin because the projects would be required to comply with the state resolution maintaining the existing water quality.

Furthermore, one of the requirements for any recycled water project is that it must be compatible with State Board Resolution 68-16 and the Recycled Water Policy (see below). This can be evaluated on a project-specific localized impacts basis or can be evaluated in terms of the utilization of basin-wide groundwater assimilative capacity. Utilization of

more than 10% of basin-wide assimilative capacity for compliance with anti-degradation policy has typically required a Salt and Nutrient Management Plan for the basin or a similar level of evaluation (Brown and Caldwell, 2018).

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents established for the reasonable protection of beneficial uses. The SWRCB administers water rights, water pollution control, and water quality functions throughout California, while the Central Coast RWQCB (CCRWQCB) conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish a regional Basin Plan with water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional basin plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are allowed if the change is consistent with the maximum beneficial use of the State waters, it does not unreasonably affect the present or anticipated beneficial uses, and it does not result in water quality less than that prescribed in the water quality control plans. The basin plan regulations also apply to groundwater. The Basin Plan for this location is discussed below in the local regulations subsection.

This Act would apply to any project where any supplemental sources of water are brought into the Basin because they would have potential to affect water quality and beneficial uses in the Basin. Thus, it is likely that most supplemental water supply projects would be required to comply with the Basin Plan water quality objectives established by the CCRWQCB to protect the beneficial uses of groundwater. This is discussed in the Local Regulations subsection below.

STATE WATER RESOURCES CONTROL BOARD POLICIES RELATED TO GROUNDWATER

Sources of Drinking Water Policy

The Sources of Drinking Water Policy (adopted as Resolution 88-63) designates the municipal and domestic supply (MUN) beneficial use for all surface waters and groundwater except for those waters: (1) with total dissolved solids exceeding 3,000 mg/L, (2) with contamination that cannot reasonably be treated for domestic use, (3) where there is insufficient water supply, (4) in systems designed for wastewater collection or conveying or holding agricultural drainage, or (5) regulated as a geothermal energy

producing source. Resolution 88-63 addresses only designation of water as drinking water source; it does not establish objectives for constituents that threaten source waters designated as MUN.

Recycled Water Policy

The Recycled Water Policy, adopted by the SWRCB in February 2009, and amended in 2013 to include monitoring for CECs (discussed below) for groundwater replenishment projects. The Recycled Water Policy was a critical step in creating uniformity in how RWQCBs were individually interpreting and implementing the Anti-degradation Policy in Resolution 68-16 for water recycling projects, including groundwater replenishment projects. The critical provisions in the Policy related to groundwater replenishment projects are discussed in the following subsections.

Constituents of Emerging Concern

As defined in the SWRCB Recycled Water Policy, CECs are chemicals in personal care products, pharmaceuticals including antibiotics, antimicrobials, agricultural and household chemicals, hormones, food additives, transformation products and inorganic constituents. These chemicals have been detected in trace amounts in surface water, wastewater, recycled water, and groundwater. The Recycled Water Policy includes monitoring requirements for six CECs for subsurface application groundwater replenishment projects using recycled water, four of which are used as health-based indicators and others serving as performance-based indicators. In addition to the Recycled Water Policy CECs, as part of the SWRCB regulations for groundwater replenishment projects with recycled water, a project sponsor must recommend CECs for monitoring in recycled water and potentially in groundwater in the project's Engineering Report. For recharge projects that use recycled water that has been treated using reverse osmosis (RO) and an advanced oxidation process (AOP), the monitoring requirements in the Recycled Water Policy only apply to recycled water prior to and after RO/AOP treatment (i.e., no groundwater sampling). None of the CECs currently have regulatory limits. The Recycled Water Policy includes monitoring trigger levels (MTLs) for the four health-based CEC indicators and response actions to be taken by groundwater replenishment project sponsors based on monitoring results compared to the MTLs. The MTLs were based on Drinking Water Equivalent Levels. A Drinking Water Equivalent Level represents the amount of a CEC in drinking water that can be ingested daily over a lifetime without appreciable risk (MRWPCA and MPWMD, 2016). The following CECs from the Recycled Water Policy are those with health-based indicators, treatment/performance- based indicators, or both as indicated below in parentheses.

- 17-β-estradiol - steroid hormone (health-based indicator)
- Caffeine – stimulant (health-based and performance-based indicator)

- N-nitrosodimethylamine (NDMA) – disinfection byproduct (health-based and performance- based indicator) [Note: NDMA's current California NL is 0.01µg/L]
- Triclosan – antimicrobial (health-based indicator)
- N,N-diethyl-metatoluamide (DEET) – ingredient in personal care products (performance- based indicator)
- Sucralose – food additive (performance-based indicator)

Salt and Nutrient Management Plans

In recognition that some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed Basin Plan groundwater objectives, and that some Basin Plans do not have adequate implementation measures to achieve compliance, the Recycled Water Policy includes provisions for managing salts and nutrients on a regional or watershed basis through development of Salt and Nutrient Management Plans (SNMP) rather than imposing requirements on individual recycled water projects (which had been the practice prior to adoption of the Recycled Water Policy). Unfavorable groundwater salt and nutrient conditions can be caused by natural soils, discharges of waste, irrigation using surface water, groundwater, or recycled water, and water supply augmentation using surface or recycled water (although treating the recycled water through RO prior to application would typically prevent this from occurring). The Recycled Water Policy recognizes that regulation of recycled water alone will not address these conditions. SNMPs are to be developed for every groundwater basin/sub-basin by May 2014 (May 2016 with a RWQCB-approved extension). SNMPs were not prepared for the Santa Cruz Mid-County Basin because it does not contain salts and nutrients in excess of Basin Plan objectives. If a SNMP is not prepared for a basin underlying a project or a project is using a limited amount of be available assimilative capacity (described below), the recycled water policy requires the preparation of a dedicated anti-degradation evaluation.

Anti-degradation and Assimilative Capacity

Assimilative capacity is the ability for groundwater to receive contaminants without detrimental effects to human health or other beneficial uses. It is typically derived by comparing background ambient chemical concentrations in groundwater to the concentrations of the applicable Basin Plan groundwater quality objectives. The difference between the ambient concentration and groundwater quality objective is the available assimilative capacity.

The Recycled Water Policy establishes two assimilative capacity thresholds in the absence of an adopted SNMP. A groundwater replenishment project that utilizes less than 10% of the available assimilative capacity in a groundwater basin/sub-basin (or multiple projects utilizing less than 20% of the available assimilative capacity in a groundwater basin/subbasin) are only required to conduct an anti-degradation analysis verifying the

use of the assimilative capacity. In the event a project or multiple projects utilize more than the designated fraction of the assimilative capacity (e.g., 10% for a single project or 20% for multiple projects), the project proponent must conduct a RWQCB-deemed acceptable (and more elaborate) anti-degradation analysis.

A RWQCB has the discretionary authority to allocate assimilative capacity to groundwater replenishment projects. There is a presumed assumption that allocations greater than the Recycled Water Policy thresholds would not be granted without concomitant mitigation or an amendment to the Basin Plan groundwater quality objective to create more assimilative capacity for allocation. Groundwater replenishment projects that utilize advanced treated recycled water will use very little to essentially none of the available assimilative capacity because of the high quality of the water.

Regional Water Quality Control Board Groundwater Requirements

The Recycled Water Policy does not limit the authority of a RWQCB to impose more stringent requirements for groundwater replenishment projects to protect designated beneficial uses of groundwater, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation with the California SWRCB Division of Drinking Water (DDW). The Recycled Water Policy also does not limit the authority of a RWQCB to impose additional requirements for a proposed groundwater replenishment project that has a substantial adverse effect on the fate and transport of a contaminant plume (for example those caused by industrial contamination or gas stations), or changes the geochemistry of an aquifer thereby causing the dissolution of naturally occurring constituents, such as arsenic, from the geologic formation into groundwater. These provisions require additional assessment of the impacts of groundwater replenishment projects on areas of contamination in a basin and/or if the quality of the water used for replenishment causes constituents, such as naturally occurring arsenic, to become mobile and impact groundwater.

SWRCB DIVISION OF DRINKING WATER (DDW)

California's drinking water program was originally created in 1915, when the California State Board of Health established the Bureau of Sanitary Engineering. In 1976, two years after the Safe Drinking Water Act was passed, California adopted its own safe drinking water act (contained in the Health and Safety Code) and adopted implementing regulations (contained in Title 22 California Code of Regulation). The state's act had two main goals: (1) to continue the state's drinking water program, and (2) to be the delegated authority (referred to as the "primacy") by the EPA for enforcement of the federal Safe Drinking Water Act. As required by the federal act, California's program must set drinking water standards that are at least as stringent as the EPA's standards. Each public

water system also must monitor for a specified list of contaminants, and the findings must be reported to the state.

The DDW regulates public water systems, oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and performs a number of other functions. DDW has adopted enforceable primary and secondary maximum contaminant levels (MCLs). The MCLs are either based on the federal MCLs or as part of DDW's own regulatory process. For example, California has an MCL for perchlorate while there is no federal MCL. The MCLs account for not only chemicals' health risks, but also factors such as their detectability and treatability, as well as costs of treatment. Health and Safety Code Section116365(a) requires a contaminant's MCL to be established at a level as close to its Public Health Goal (PHG) as is technologically and economically feasible, placing primary emphasis on the protection of public health. The Office of Environmental Health Hazard Assessment (OEHHA) established PHGs. They are concentrations of drinking water contaminants that pose no significant health risk if consumed for a lifetime, based on current risk assessment principles, practices, and methods. OEHHA establishes PHGs pursuant to Health and Safety Code Section116365(c) for contaminants with MCLs, and for those for which MCLs will be adopted. Public water systems use PHGs to provide information about drinking water contaminants in their annual Consumer Confidence Reports. Certain public water systems must provide a report to their customers about health risks from a contaminant that exceeds its PHG and about the cost of treatment to meet the PHG, and hold a public hearing on the report. Action levels (AL) are included in CCRs for certain constituents where no MCLs have been established, i.e., under the lead and copper rule. If a constituent exceeds its AL, this triggers treatment or other requirements.

There are also a variety of chemicals of health concern whose occurrence is too infrequent in conventional drinking water sources to justify the establishment of national standards, but are addressed using advisory levels. The DDW, with the assistance of OEHHA, has established notification levels (NL) and Response Levels (RL) for that purpose. If a chemical is present in drinking water that is provided to consumers at concentrations greater than the RL (10 to 100 times greater than the NL depending on the toxicological endpoint of the constituent), DDW recommends that the source be taken out of service. If the source is not taken offline and a chemical concentration is greater than its NL in drinking water that is provided to consumers, DDW recommends that the utility inform its customers and consumers about the presence of the chemical, and about health concerns associated with exposure to it.

Final Groundwater Replenishment with Recycled Water Regulations hereafter, referred to as "Groundwater Replenishment Regulations," went into effect June 18, 2014 (SWRCB,

2014). The overarching principles taken into consideration by DDW in developing the Groundwater Replenishment Regulations were:

- Groundwater replenishment projects are replenishing groundwater basins that are used as sources of drinking water.
- Control of pathogenic microorganisms should be based on a low tolerable risk that was defined as an annual risk of infection from pathogen microorganisms in drinking water of one in 10,000 (10-4). This risk level is the same as that used for the federal Surface Water Treatment Rule for drinking water.
- Compliance with drinking water standards for regulated chemicals.
- Controls for unregulated chemicals.
- No degradation of an existing groundwater basin used as a drinking water source.
- Use of multiple barriers to protect water quality and human health.
- Projects should be designed to identify and respond to a treatment failure. A component of this design acknowledges that groundwater replenishment projects inherently will include storage in a groundwater aquifer and include some natural treatment.

CENTRAL COAST REGIONAL WATER QUALITY CONTROL PLAN (BASIN PLAN)

The CCRWQCB, under the authority of the California Water Code, is responsible for authorizing and regulating activities that may discharge wastes to surface water or groundwater resources.

This authority includes adoption of Basin Plans (Section 13240) with beneficial uses and water quality objectives (both narrative and numeric) to reasonably protect those uses (Section 13050). The Basin Plan also establishes guidelines for water used for irrigation. The Basin Plan for the Central Coast was originally adopted in 1971 and was last amended in 2011.

Groundwater beneficial uses for the Basin are listed as agricultural water supply (AGR), municipal and domestic water (MUN). The Basin Plan has:

- For MUN beneficial uses – groundwater criteria for bacteria and DDW primary and secondary MCLs.
- For AGR beneficial uses – objectives to protect soil productivity, irrigation, and livestock watering and guidelines to interpret a general narrative objective to prevent adverse effects on the beneficial use.

Permit limits for groundwater replenishment projects are set to ensure that groundwater does not contain concentrations of chemicals in amounts that adversely affect beneficial

uses or degrade water quality. For some specific groundwater sub-basins, the Basin Plan establishes specific mineral water quality objectives for total dissolved solids, chloride, sulfate, boron, sodium, and nitrogen.

WATER WELL STANDARDS

Under California Water Code Section 231, enacted in 1949, California Department of Water Resources (DWR) is responsible for developing standards for the protection of well water quality. Authority for enforcing the standards as they apply to the construction, destruction, and modification of water wells rests with the Santa Cruz County Environmental Health Services, which also implements additional local requirements. The California Water Code requires contractors that construct or destruct water wells to have a C-57 Water Well Contractor's License, follow DWR well standards, and file a completion report with DWR (Water Code Sections 13750.5 et seq.).

WELL COMPLETION REPORTS

DWR is responsible for maintaining a file of well completion reports (DWR Form 188), which must be submitted whenever a driller works on a water well. Well completion reports must be filed with DWR within 60 days from the date of the work and must also be filed with the County. Well completion reports may be used by public agencies conducting groundwater studies, and may also be made available to the public as long as the owner's name is not made public (Water Code Sections 13751 and 13752).

GROUNDWATER RIGHTS

In California, water rights involve the right to use water, not the right to own water. While the Water Code implies the existence of groundwater rights, their doctrinal bases and characteristics are essentially the product of the decisions of the courts. There are three types of groundwater rights:

Overlying Rights. All property owners above a common aquifer possess a mutual right to the reasonable and beneficial use of a groundwater resource on land overlying the aquifer from which the water is taken. Overlying rights are correlative (related to each other) and overlying users of a common water source must share the resource on a pro rata basis in times of shortage. A property overlying use takes precedence over all non-overlying uses.

Appropriative Rights. Non-overlying uses and public uses, such as municipal uses, are called appropriative uses. Among groundwater appropriators, the "first in time, first in right" priority system applies. Appropriative users are entitled to use the surplus water available after the overlying user's rights are satisfied.

Prescriptive Rights. Prescriptive rights are gained by trespass or unauthorized taking that can yield a title because it was allowed to continue longer than the five year statute of limitations. Claim of a prescriptive water right to non-surplus water by an appropriator must be supported by many specific conditions, including a showing that the pumpage occurred in an open manner, was continuous and uninterrupted for five years, and was under a claim of right.

From a water law standpoint, rights of public agencies to store water via in-lieu recharge and to recapture water in the Santa Cruz Mid-County Basin can be summarized by the following general rules:

- The agencies have the right to recapture water that has been added to the groundwater supply as a result of in-lieu recharge;

- The agencies have the right to prevent other groundwater producers from extracting the replenished supply, although this could require litigation, and in some cases, adjudication of all rights to the groundwater basin may be necessary to determine rights to the total supply; and

- The underground storage and recovery of the groundwater basin cannot substantially interfere with the basin's native or natural groundwater supply.

Material Injury. Groundwater case law has generally adopted the threshold that "…material injury… turns on the existence of an appreciable diminution in the quantity or quality of water…" (District, 2010) A reasonable definition of "appreciable" would render a nearby well incapable of meeting its:

1. Historically measured maximum daily production level;
2. Historically measured dry-season production levels; or
3. Historically measured annual production levels under drought conditions.

Local Regulations

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, or transmission of water supplies are exempt from local (i.e. city and county) building and zoning ordinances. However, they would not be exempt from the requirements of Local Coastal Programs.

COASTAL ZONE MANAGEMENT ACT FEDERAL CONSISTENCY REVIEW

The federal consistency requirement set forth in Section 307 of the Coastal Zone Management Act (CZMA) requires that activities approved or funded by the federal government (e.g., the federally-funded California Clean Water State Revolving Fund Program) that affect any land or water use or natural resource of a state's coastal zone, must be consistent with the enforceable policies of the state's federally approved coastal management program.

California's federally approved coastal management program consists of the California Coastal Act, the McAteer-Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission implements the California Coastal Act and the federal consistency provisions of the CZMA for activities affecting coastal resources outside of San Francisco Bay. Subparts D and F of the federal consistency regulations govern consistency review for activities involving a federal permit and federal funding, respectively. These sections generally require the applicant to provide the subject state agency (e.g., the Coastal Commission) with a brief assessment of potential coastal resources impact and project conformity with the enforceable policies of the management program.

The Coastal Commission considers an application for a coastal development permit to satisfy the Subpart D and F conformity assessment requirements. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit. In cases where the coastal development permit is issued by a local government with a certified local coastal program (LCP), the Coastal Commission will typically provide its response in a letter, following the permit issuance and the completion of any appeals process.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone. Of primary relevance to groundwater and water quality are Coastal Act policies concerning protection of the biological productivity and quality of coastal waters. For example, Article 4 of the Act details policies related to the marine environment, such as biological productivity and water quality. Specifically, and relevant to groundwater hydrology and water quality, the Act requires the quality of coastal waters, streams, wetlands, estuaries appropriate to maintain optimum populations of marine organisms and for the protection of human health, to be maintained and, where feasible, restored through, among other means, preventing depletion of groundwater supplies (Cal. Pub. Res. Code §§ 30231).

SANTA CRUZ COUNTY ENVIRONMENTAL HEALTH SERVICES

At the local level, the Santa Cruz County Environmental Health Services enforces the well drilling and reporting requirements of the California Water Code (Sections 13750.5 et seq.) through enforcement of Title 7, Chapter 7.70, Water Wells, of the Santa Cruz County Code. The Santa Cruz County Environmental Health Services well program provides permitting for the construction, destruction, and repair/modification of all wells, including geothermal heat exchange wells, cathodic protection wells, test wells, and monitoring wells.

From: Becky Steinbruner <ki6tkb@yahoo.com>
Date: August 13, 2018 at 11:00:58 PM PDT
To: Darcy Pruitt <dpruitt@cfscc.org>
Cc: Tom LaHue <toml@soquelcreekwater.org>, Rob Marani <rjmarani@icloud.com>, Richard Casale <richcasale3@gmail.com>, Becky Steinbruner <ki6tkb@yahoo.com>
Subject: Correspondence for MidCounty Groundwater Agency Advisory Committee and Board Agenda Packets
Reply-To: Becky Steinbruner <ki6tkb@yahoo.com>

Dear Ms. Pruitt,
Please include the following letter in the Agenda Packet for the next Advisory Committee and Board meetings.
Thank you.

Sincerely,
Becky Steinbruner
****

Dear MidCounty Groundwater Agency Board and Advisory Committee,
I appreciated the Joint Meeting of your groups last month and was able to attend most of it. Due to work and traffic, I did unfortunately miss the beginning, and so did not understand that I could have, as a member of the public, presented the information about Dr. Andy Fisher's work that I handed some of you at the door as you left for the evening. I truly feel that this work is not discussed much at either of your group meetings but holds real promise for improving groundwater levels with minimal technological and energy requirements.

I therefore would like to request that both of your agencies invite Dr. Fisher to give a presentation to you about his very promising work in mapping Groundwater Recharge Suitability in our County. Below is the copy of the map that I handed to some of you as you exited the meeting (please note that a significant amount of land in the MidCounty area has relatively high suitability for Managed Aquifer Recharge (MAR) to improve groundwater levels. Here is a link to the complete information and excellent discussion: https://mavensnotebook.com/2017/09/20/dr-andy-fisher-enhancing-groundwater-recharge-with-stormwater/

I hope that your groups will invite Dr. Fisher soon. I also would like to ask that your groups extend an invitation to Mr. Brian Lockwood, General Manager of Pajaro Valley Water Management Agency for a presentation, to realistically demonstrate that the MidCounty Groundwater Agency is coordinating efforts with neighboring groundwater basin stakeholders.

Please respond.
Sincerely,
Becky Steinbruner

From: Randa Solick [mailto:rsolick@gmail.com]
Sent: Wednesday, July 18, 2018 12:17 PM
To: Darcy Pruitt <DPruitt@cfscc.org>
Subject: Re: Starting water transfers - for your board members

Printing the letter in the August and September packets would be fine. Thank you, Randa

On Wed, Jul 18, 2018 at 11:50 AM, Darcy Pruitt <DPruitt@cfscc.org> wrote:

Dear Ms. Solick,

Thank you for your letter to the MGA Board. Their next meeting is a joint session with the GSP Advisory committee on July 19, 2018 beginning at 6:30 (tomorrow night) on the topic of water supply.

The board packet was published on Friday, July 13, 2018.

Submissions for the packet were due on Monday, July 9, 2018 by 5:00 pm. You can find a copy of the MGA communication policy here.

The Brown Act, which governs public meeting transparency, does not allow us to provide additional materials to board members before the meeting that were not provided to the public in the meeting packet.

You are welcome to bring copies of your letter tomorrow if you would like to pass them out at the meeting.

Your letter is timely for the August GSP Advisory Committee packet and the September MGA Board packet.

Please let me know if you would like me to include your letter in those future meeting packets.

Best,

Darcelle Pruitt Senior Planner
Groundwater Sustainability Planning for the Santa Cruz Mid-County Groundwater Agency
REGIONAL WATER MANAGEMENT FOUNDATION
COMMUNITY FOUNDATION SANTA CRUZ COUNTY
7807 Soquel Drive | Aptos, CA 95003 | 831.662.2052
dpruitt@cfscc.org | www.cfscc.org | www.midcountygroundwater.org

From: Randa Solick [mailto:rsolick@gmail.com]
Sent: Wednesday, July 18, 2018 11:31 AM
To: Darcy Pruitt <DPruitt@cfscc.org>
Subject: Starting water transfers - for your board members

Dear Darcy - this is a copy of an email I sent to the ScQWD board members. Please distribute it to yours as well. Thank you, Randa Solick

I'm a customer of SqCWD. My water rates are already rising. They will rise SO much more with the sewage treatment proposal - which we may well need in a few decades, as the world warms, but for now, NOW we have a solution!!!

Congratulations on your plan to start water transfers this year! I heard Rosemary Menard say with my own ears she's willing and ready to give water to Soquel when they're ready. You're ready!

I heard Bruce Daniels say, with my own ears, that he'll take whatever water is available.

The compatibility study is done. The 'dry year' myth is exploded. There is water running into the sea that Soquel can take – and we need it as soon as possible because of salt water intrusion.

Still, the District is only emphasizing the sewage treatment solution – even though you promised us, and I heard it with my own ears, that the water transfer solution would get as much promotion in your literature as the sewage treatment. That hasn't happened, which is sad –

Because customers don't know that possibility! Even though transfers are the number one WSAC choice, even though it's much cheaper than a sewage treatment system, even though it can be done now! And with a wider pipe we can have as much water as the sewage treatment plant could give, for so much less money and time!

A customer of the Central Water District said in their meetings the directors said they didn't understand why Soquel is reluctant to take SC City water either. Now we're all eagerly watching for the implementation of the plan to begin transfers.

So thank you for the plan to start the transfers. I'll copy this to the MGA so they can see we've been long supporting water transfers, want them to make sure transfers happen and continue, and hope they can facilitate the bigger intertie so amounts can increase. Thank you all.