

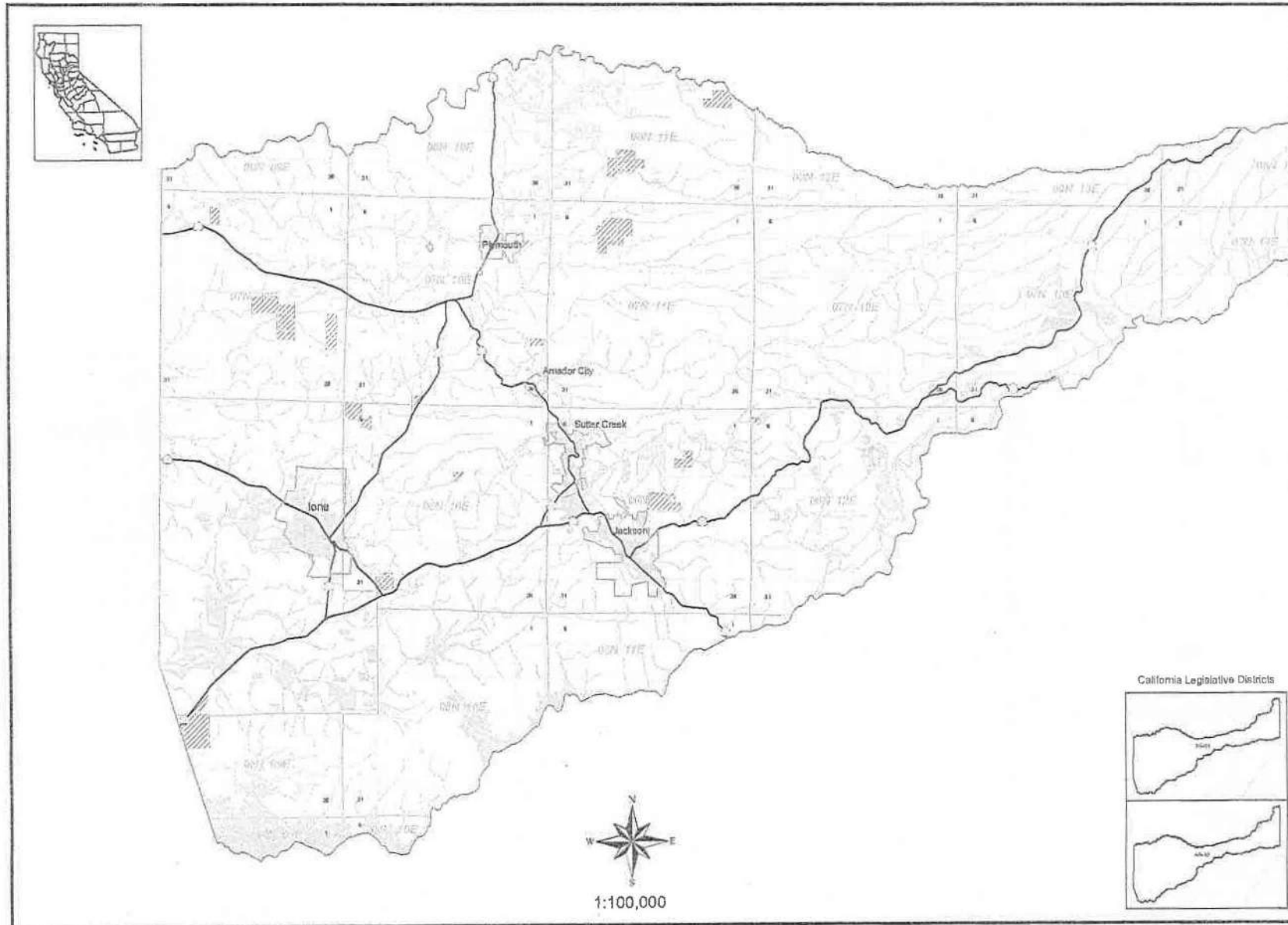
Amador County Williamson Act Lands 2004

THE RESOURCES AGENCY
Michael Chrisman, Secretary for Resources

Land Enrolled in Williamson Act and Farmland Security Zone Contracts as of 01-01-2004

DEPARTMENT OF CONSERVATION
Debbie Sargeram, Interim Director

Department of Conservation
Division of Land Resource Protection



- Williamson Act - Prime Agricultural Land
- Williamson Act - Non-Prime Agricultural Land
- Williamson Act - Non-Prime Land in Non-Renewal
- Non-Enrolled Land
- Urban and Built-up Land
- Water
- City Limits or City Boundary
- Public Land Survey System
- Highways



Williamson Act - Prime Agricultural Land
Land which is eligible under California Land Conservation Act, sections and covered area of the following charts (20, and 2001) under California Government Code Section 720201.
1. Land which is eligible for enrollment under the Williamson Act.
2. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act.
3. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act and which is not currently enrolled in the Williamson Act.
4. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act and which is not currently enrolled in the Williamson Act.
5. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act and which is not currently enrolled in the Williamson Act.
6. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act and which is not currently enrolled in the Williamson Act.

Williamson Act - Non-Prime Agricultural Land
Land which is eligible under California Land Conservation Act, sections and covered area of the following charts (20, and 2001) under California Government Code Section 720201.
1. Land which is eligible for enrollment under the Williamson Act.
2. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act.
3. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act.
4. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act.
5. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act.
6. Land which is eligible for enrollment under the Williamson Act and which is not currently enrolled in the Williamson Act.

Williamson Act - Agricultural Land in Non-Renewal
During the 10-year period, the annual use of the land is not primarily for agriculture and the land is not enrolled in the Williamson Act.

Non-Enrolled Land
Land which is not enrolled in the Williamson Act.

Urban and Built-up Land
Land which is used for urban or built-up purposes.

California Legislative Districts

The California Land Conservation Act of 1975 (Williamson Act) is the primary legislation for the conservation of prime agricultural land in California. The Williamson Act is a voluntary, long-term program that allows landowners to enroll their land in the Williamson Act program for a period of 10 to 20 years. In return, the landowner receives a significant reduction in property taxes. The Williamson Act is administered by the Department of Conservation, Office of State Lands, Planning and Policy. For more information on the Williamson Act program, please contact the Department of Conservation, Office of State Lands, Planning and Policy, at (916) 227-1100. www.dnr.ca.gov

Map showing Williamson Act lands as of 01-01-2004. The map is overlaid on the Williamson Act program area. The map shows the location of the land and the location of the Williamson Act program area. The map is overlaid on the Williamson Act program area. The map shows the location of the land and the location of the Williamson Act program area.

The information necessary to enroll a parcel in the Williamson Act program is available to the public. The information necessary to enroll a parcel in the Williamson Act program is available to the public. The information necessary to enroll a parcel in the Williamson Act program is available to the public.

The Department of Conservation makes no warranty as to the accuracy of the map for any particular purpose.

Copyright, California Department of Conservation, Division of Land Resource Protection, 2004.



Attachment A. Special-Status Species in the Upper Dry Creek Watershed^a

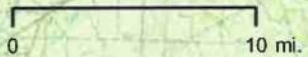
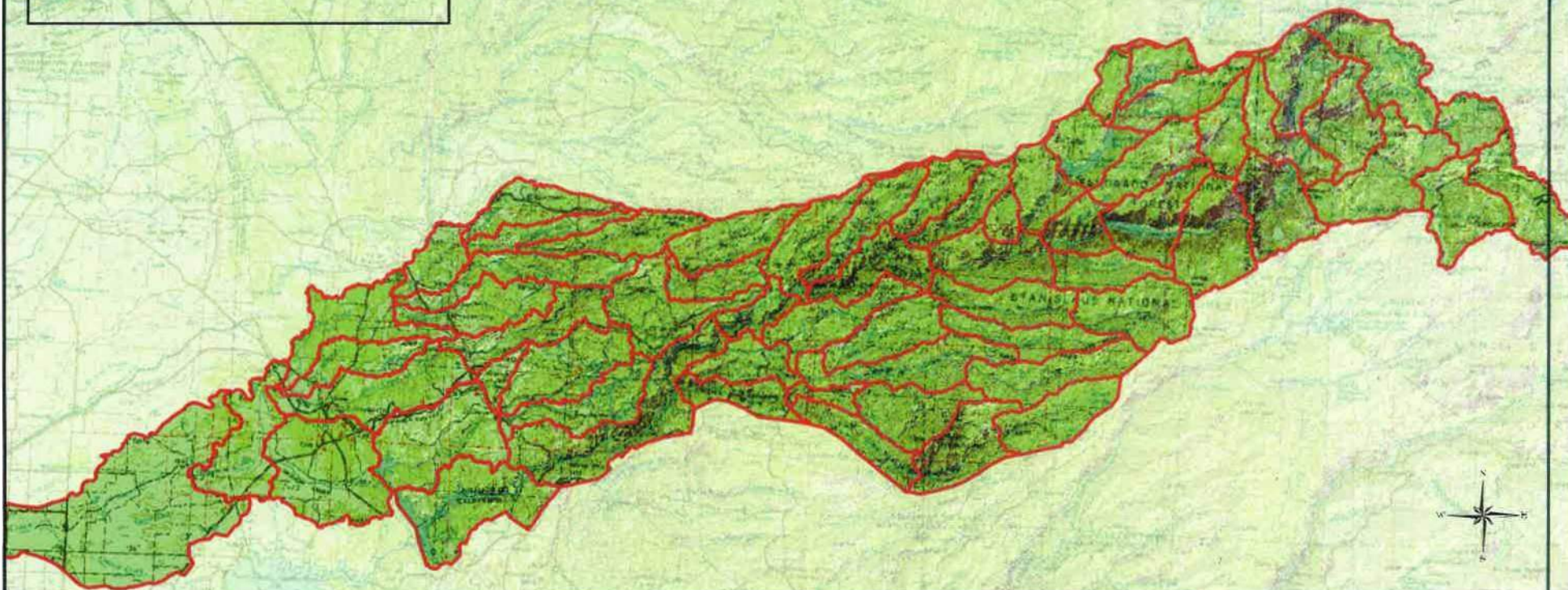
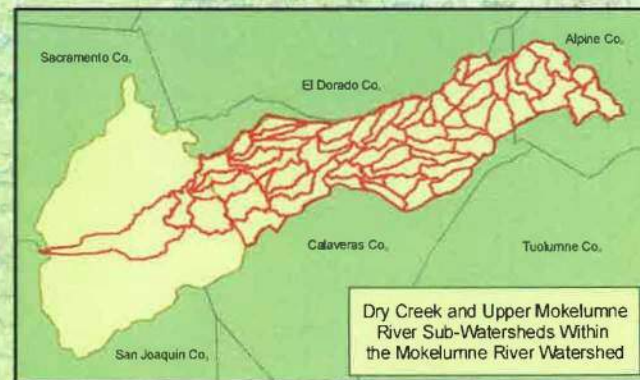
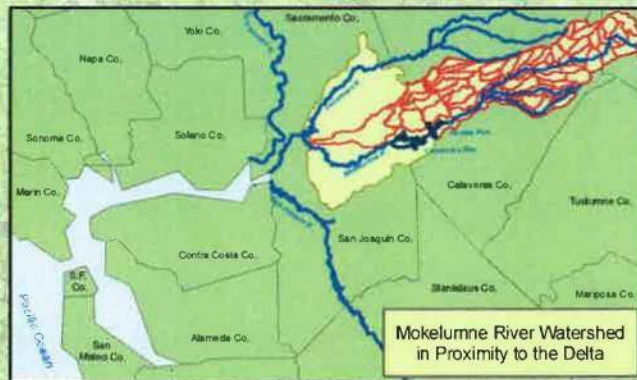
Common Name	Scientific Name	Federal Status		California Status		DFG Species of Concern	CNPS Listing ^b
		Threatened	Endangered	Threatened	Endangered		
Natural Communities							
Ione Chaparral							
Birds							
Tricolored blackbird	<i>Agelaius tricolor</i>					✓	
Reptiles/Amphibians							
Northwestern pond turtle	<i>Emys (=Clemmys) marmorata marmorata</i>					✓	
Invertebrates							
Grady's Cave amphipod	<i>Stygobromus gradyi</i>						
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	✓					
Plants							
Bisbee Peak rush-rose	<i>Helianthemum suffrutescens</i>						3
Ione buckwheat	<i>Eriogonum apricum</i> var. <i>apricum</i>		✓		✓		1B
Ione manzanita	<i>Arctostaphylos myrtifolia</i>	✓					1B
Irish Hill buckwheat	<i>Eriogonum apricum</i> var. <i>prostratum</i>		✓		✓		1B
Parry's horkelia	<i>Horkelia parryi</i>						1B
Pincushion navarretia	<i>Navarretia myersii</i> ssp. <i>myersii</i>						1B
Prairie wedge grass	<i>Sphenopholis obtusata</i>						2
Red Hills soaproot	<i>Chlorogalum grandiflorum</i>						1B
Tuolumne button-celery	<i>Eryngium pinnatisectum</i>						1B

^aData gathered using the California Department of Fish and Game's California Natural Diversity Database Quick Viewer for the following USGS quadrangles: Amador City, Aukum, Fiddletown, Irish Hill, Ione, Jackson, Pine Grove, and West Point. This is not an official CNDDDB report.

^b California Native Plant Society (CNPS) "1B" Listing—Rare or Endangered in California and elsewhere
 CNPS "2" Listing—Rare and Endangered in California, more common elsewhere
 CNPS "3" Listing—Need more information

UPPER MOKELUMNE RIVER WATERSHED DEVELOPMENT AND PLANNING PROJECT

1/23/09
6/12/11



Proposed Project Area: Dry Creek and Upper Mokelumne River Sub Watersheds



3/17/10

MOKELUMNE RIVER
WATER ENTITIES

03/17/10

NAME	CREATED	GOVNC E TYPE	PUPOSE & MISSION	MEMBERS
OTHER ENTITIES				
CABY				
MRA			Mokelumne River Authority	
MRA			Mokelumne River Association.	
MRWS			Mokelumne River Watershed Council	
MWF		MOU	Mokelumne Water Forum - http://www.ebmud.com/about_ebmud/publications/project_factsheets/mokelumne_water_forum_web_3-07.pdf	
DCW			Dry Creek Watershed	
UMRWA	Created 2000		Upper Mokelumne River Water Authority	
MRWPA			Mokelumne River Water and Power Authority	



Water Supply Improvements Division
375 11th Street - MS 407
Oakland, CA 94607

TRANSMITTAL MEMORANDUM

DATE: August 23, 2019

TO: Eastern San Joaquin Groundwater Authority
1810 E. Hazelton Avenue
P.O. Box 1810
Stockton, CA 95201

FROM: Linda Hu, Manager *LH*
Water Supply Improvements Division

Sent via email to info@esjgroundwater.org

SUBJECT: Comments on the Eastern San Joaquin Draft Groundwater Sustainability Plan

Thank you for the opportunity to review the Eastern San Joaquin Draft Groundwater Sustainability Plan (GSP). It represents a significant work effort by the Eastern San Joaquin Groundwater Authority and your consultant. Comments from EBMUD on the Draft GSP are attached and have been compiled using the submittal template.

EBMUD appreciates being able to provide feedback on the Draft GSP. If you have any questions, you can reach Grace Su at 510-287-7013.

Attachment

Eastern San Joaquin Subbasin GSP **Public Draft**
 Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "..."	Comment
1		EBMUD	p. 2-3	2.1.1.1	"Figure 2-2 shows the distribution..."	The text says that a large number of wells do not have construction depth or screen interval information. Were only the wells with construction information used to prepare the GW elevation contour maps for each principal aquifer?
2		EBMUD	p. 2-12	2.1.4.2	4th paragraph of Sec 2.1.4.2, 3rd sentence "Flow in the Mokelumne River below the Camanche Reservoir varies seasonally..."	Please modify the discharge values from Camanche Reservoir discussed in the third and fourth sentence of this paragraph. Releases from the Camanche Reservoir could be as low as 100 cfs during critically dry years and up to 5,000 cfs during the wet season. Since the Camanche Dam was completed in 1964, the maximum daily release from the Camanche Reservoir has not exceeded 5,000 cfs. The Mokelumne River flows recorded below Camanche Dam prior to 1964 are not representative of flows observed after the dam was built.
3		EBMUD	p. 2-48	2.1.9.2.1	"The horizontal hydraulic conductivity varies..."	What is the basis for the statement that the horizontal hydraulic conductivity values in the model are considered low? If the conductivities are higher, what implications would that have on the results?
4		EBMUD	p. 6-19	6.2.5.3	Second paragraph of Sec 6.2.5.3, second sentence "The longer term banking project..."	Please change "will" to "may" in this sentence: The longer term project <u>may</u> use the same concept...
5		EBMUD	p. 6-19	6.2.5.3	Third paragraph of Sec 6.2.5.3, "As part of both the pilot and longer-term projects..."	EBMUD is requesting that this sentence be removed as it does not accurately reflect the terms of the existing Agreement.
6		EBMUD	p. 7-6	7.4.1		EBMUD would like to be informed as the Mokelumne River Loss Study Project moves forward and is interested in being a participant and in providing technical input.

JANE WAGNER-TYACK
COMMUNICATION CONSULTANT

145 South Rose Street, Lodi, CA 95240 ♦ 209-642-5105 ♦ JaneTyack@mac.com

August 25, 2019

VIA E-mail

Eastern San Joaquin Groundwater Authority
1810 E. Hazelton Avenue
P. O. Box 1810
Stockton, CA 95201
info@esjgroundwater.org

SUBJECT: Comments on the Groundwater Sustainability Plan

Following are comments on elements of the GSP that I think need to be strengthened, based on concerns I have heard expressed in the community, including the wider environmental and social justice community.

While the database of interested parties may have been robust, as the GSP asserts (1.3.4.4), actual outreach to two important groups—people reliant on domestic or community water system wells, and disadvantaged communities—has *not* been robust. This is a consequence of a variety of factors, including the nature and jurisdictions of the GSAs in this subbasin; the way DWR has defined disadvantaged communities for SGMA purposes; and the lack of projects to which outreach can be tied at this stage in the process.

It is therefore in the best interests of the GWA to ensure that the GSP adequately covers the kinds of social and environmental justice concerns that might be voiced during robust outreach.

A note regarding style: Credibility of the entire GSP will benefit from greater use of the active voice rather than the passive voice. For example, the statement “Water Quality **is not known** to have adversely affected beneficial uses of groundwater in the Eastern San Joaquin Subbasin, generally” (2.2.4) is in the passive voice, which allows the writer to avoid mentioning any parties responsible for making this determination or the bases on which they have made that determination. Use of the passive voice can make a statement seem both vague and subtly evasive. That will be the case even if, as in this situation, other evidence in the document shows the statement to be literally true: we do not have enough data to know.

Water Quality

The case for setting minimum thresholds only for salinity based on the fact that other constituents of concern are managed through existing management and regulatory programs is not persuasively supported in the GSP.

Nitrate

2.2.4.2 says, “Increased nitrate concentrations have not been found to be related to groundwater management activities in the Subbasin.” This statement does not define “groundwater management activities” and does not identify those responsible for the finding of no relationship. Meanwhile, other evidence appears to contradict the assertions.

Prior to the assertion above, in the same paragraph, is the statement that “recent nitrate measurements above the MCL correspond to the overall historical trends and highlight areas with elevated Nitrate concentrations in more recent years.” What is the evidence that these elevated concentrations are unrelated to groundwater management?

The superficial treatment of dairies in the GSP is notable given the fact that milk was San Joaquin County’s second top commodity in 2017. This is relevant to the discussion of nitrates as well as point source contamination (see below). Dairies are confined animal feeding operations (CAFOs), and CAFOs are linked to nitrates in water.

The Environmental Working Group’s Farm Subsidy Database lists 347 dairies in San Joaquin County that received Dairy Program subsidies between 1995 and 2019. (https://farm.ewg.org/top_recips.php?fips=06077&progcode=dairy&page=0) Not all of these are in the ESJ Subbasin. However, some are in Stockton, Ripon, Farmington, and west of Lodi, areas the GSP notes have higher nitrate concentrations. Was any effort made to track nitrate relative to dairy operations?

According to 1.2.2.2.6, Irrigated Land Regulatory Program and CV-SALTS, The ILRP monitors for “nutrients (such as TDS and nitrates) in surface and groundwater.” “[There] are several representative monitoring sites [in the Eastern San Joaquin River Watershed] for the monitoring of dairies. The ILRP is in the process of developing a comprehensive monitoring network for future use to address ILRP data objectives. The San Joaquin County and Delta Water Quality Coalition members also monitor domestic wells for nitrate in high vulnerability areas.” However, this requirement only began January 1, 2019. So there is not a lot of data yet.

(Note: The effectiveness of any monitoring network depends on actual participation, which even fines will not necessarily ensure.)

At 2.2.4.4.5, Emerging Contaminants, the GSP says, “Several studies, such as by Watanabe et al. in 2010, have recently been published or are underway regarding the potential link between dairies and the occurrence of pharmaceuticals in shallow groundwater in San Joaquin County.” If pharmaceuticals from dairies may be linked to groundwater, it cannot be plausibly argued that nitrate from dairies may not be similarly linked.

Arsenic

2.2.4.3 says, “Increased arsenic concentrations have not been found to be related to groundwater management activities in the Subbasin.” Again, the statement does not define “groundwater management activities” and does not identify those responsible for the finding of no relationship. Meanwhile, 4.3 says “Arsenic will be monitored for information purposes and to track trends in arsenic concentrations. The Groundwater Sustainability Plan (GSP) does not include sustainability

goals, measurable objectives, or minimum thresholds for arsenic.” Why does the GWA plan to monitor arsenic if it is unrelated to groundwater management? Is it likely that goals, objectives, and minimum thresholds will be set later on the basis of monitoring?

(Note: For Figures 2-59, 2-60, and 2-61—why are these showing uniform grids underlying the data points? It suggests that monitoring occurs on a uniform grid.)

The rationale for not setting minimum thresholds for arsenic, nitrogen, and sulfate (at 3.2.3.1.1 Description of Undesirable Results) is that “these constituents are managed through existing management and regulatory programs within the Subbasin.” For example, the GSP mentions monitoring through the Central Valley Regional Water Quality Control Board Waste Discharge Requirement (WDR) Dairy program. The GWA will rely on “coordination with existing agencies” to ensure that regulations are being met. “Additionally, SGMA does not give GSAs land use authority, so a nexus must be present between groundwater conditions and groundwater pumping activities.” We need to explain what “nexus” refers to in this context. Also, how will the GSA coordinate with existing agencies?

Point Sources

As with nitrate and arsenic, the GSP provides no convincing support for the statement at 2.2.4.4 that “Point source contamination has not been found to be related to groundwater management activities in the Subbasin.” In fact, there is considerable evidence to the contrary.

Section 1.2.2.2.4, Division of Drinking Water, says, “DDW data was used in the development of this GSP to identify point-source contamination areas.” However, the use of that data appears to have been restricted in the GSP, which notes (2.2.4.4) that “point sources include leaking underground storage tanks, landfills, historical dry cleaners, **and others**” (emphasis added). CAFOs are point sources under NPDES regulations. Figure 2-62 accompanying the point source discussion shows only Active Investigation and Remediation Sites, not all point-source contamination areas, and the discussion focuses on fuel sites.

The GSP does not provide enough information to demonstrate either that CAFOs do not have any effect on groundwater in the Subbasin or that existing monitoring and regulatory programs will address the situation if there is an effect on groundwater.

The claim that “Point source contamination has not been found to be related to groundwater management activities in the Subbasin” is clearly contradicted by 2.2.4.4.1, which discusses plumes that have been publicized. (It would be better not to introduce this section with the word “publicized,” which suggests that the plumes are included in the GSP primarily because people already know about them.)

In the case of the City of Lodi, it is true that “cleanup [of the Busy Bee plume] [is] moving toward completion under CVRWQCB oversight” (should be “oversight”). However, Section 1.2.3.1.5 says that “...the [Lodi] General Plan recognizes that groundwater contamination and overdraft in the Eastern San Joaquin Subbasin can threaten the City’s ability to meet current water demands and limit future development...” This may or may not refer to the Busy Bee plume, but the City of Lodi clearly would not agree that in general, there is no connection between contamination and groundwater management in the Subbasin.

Similarly, Section 1.2.3.1.8 says that “The [Ripon] General Plan predicts that the City of Ripon may have to abandon a large number of wells as sources of potable water due to contamination...” The source of contamination is not mentioned in the GSP, but again, this concern reflects a connection between contaminated water quality and groundwater management.

2.1.1.2, Groundwater Quality Data, says, “The GAMA [groundwater ambient monitoring and assessment] database contains approximately 6,800 well sites through the Eastern San Joaquin Subbasin with over 1.6 million water quality measurements.” However, “significant data gaps remain.” For chloride, for example, “. . . out of the over 6,800 wells listed in GAMA for the Eastern San Joaquin Subbasin, no more than 700 chloride measurements were taken during any year since 2005.” Having such limited data adds to the implausibility of the claim that water quality is not known to have adversely affected beneficial uses of groundwater in the Eastern San Joaquin Subbasin.

Wells and Well Permitting

Information relative to wells is not robust in the GSP, a situation that is not entirely justified by data gaps. Also, the GSP takes a hands-off approach to well permitting. It is natural for people who learn that the Eastern San Joaquin Subbasin is in a condition of overdraft to expect well permitting to be coordinated with the GSP to achieve sustainability goals.

Section 1.2.1.1 (page 1-19) says that “Though there are overlaps and discrepancies in the designation of wells, domestic wells are largely private residential wells, public wells are municipal-operated wells, and production wells are for irrigation or industrial purposes.” These distinctions appear to overlook, or perhaps categorize as a “discrepancy,” the fact that San Joaquin County has 358 small public water systems, defined as having between 5 and 14 service connections.

<https://www.sjgov.org/departments/envhealth/programs/default?id=26243>

Some of these will be in the Eastern San Joaquin Subbasin. None of the figures showing well density appears to include these.

The present system of well permitting apparently does not provide the kind of information that it is supposed to provide. 1.2.2.1.5., Data Received Directly from GSAs, describes the Online System for Well Completion Reports (OSWCR), a DWR program that includes about 10,000 domestic wells in the ESJ Subbasin. “. . . [Drilling contractors] are required to submit a Well Completion Report to DWR for upload to the interactive OSWCR web site.” According to 1.2.3.4.1, San Joaquin County has established well standards that require “installing monitoring device(s) for groundwater extraction, elevation, and/or water quality.” So theoretically, extraction information is available. But 2.1.1.1 says “Vertical data gaps are . . . pronounced, as lack of construction data is an obstacle.”

In San Joaquin County, well owners can opt out of groundwater monitoring, which is apparently a major reason for data limitations. Section 1.2.2.1.1 says that for the CASGEM network monitored by CCWD, “additional wells may need to be added in the future if owners opt out of the monitoring network.” In San Joaquin County, a large portion of the wells in the CASGEM monitoring network are privately owned, and when SJCFWCWD sent consent forms, “about 40 were signed and returned.” Is it known how many wells are in this network, and what percentage of consent this represents? By contrast, in Stanislaus County, 17 wells in the Eastern San Joaquin Subbasin alone are in the CASGEM plan to be measured semi-annually.

Section 1.2.3.4, Well Permitting, makes it clear that in San Joaquin County and Calaveras County, the purpose of permitting is to prevent groundwater contamination. By contrast, permitting in Stanislaus County has a much broader objective. “In 2014, the DER adopted a Groundwater Ordinance to prohibit unsustainable extraction of groundwater in unincorporated areas of the County.” The GSP should address the question of why the whole Subbasin should not meet this standard. Anecdotal reports of new well drilling in eastern San Joaquin County express a belief that new agricultural wells are adversely affecting existing well owners and exacerbating overdraft in the area, a belief that the GSP does nothing to allay. In the absence of any resource management system with parameters that all groundwater users understand, civil actions will continue to be the only way to resolve disputes between competing users.

Dismissing concerns about the well-permitting process by saying that it is “ministerial” is no longer a convincing argument for the status quo in light of the rejection of Siskiyou County’s argument in the Scott Valley decision that the Public Trust Doctrine does not apply to the county’s issuance of ministerial well construction permits in Scott Valley. Although this decision applies to public uses in navigable waters, it is only a matter of time before the practice of giving a well permit to every property owner who asks for one, without regard to the impact on neighboring groundwater users and the shared aquifer, is subjected to similar scrutiny.

Recommendations

- Prefer the active voice to the passive voice to make clear who is responsible for the content of assertions.
- Reconsider the decision not to set minimum thresholds for nitrate, arsenic, and point sources, or strengthen the case for not doing so.
- Include more information about public water systems.
- Propose a Subbasin-wide well permitting standard that will address sustainability goals, or provide a justification for not doing so.

Jane Wagner-Tyack

cc: Glenn Prasad
Alicia Connelly

Eastern San Joaquin Subbasin GSP **Public Draft**
 Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	Jane Wagner-Tyack	San Joaquin County Public Works	ES-1	Introduction, Paragraph 2	"A Joint Exercise of Powers Agreement...	"Is comprised of" misrepresents the meaning of "comprise." Preferable: "The GWA is composed of 15 Groundwater Sustainability Agencies" or the "The GWA comprises 15 Groundwater Sustainability Agencies." The same is true for the other two uses of "comprise" in this paragraph.
2	JWT	"	ES-1	Introduction, Paragraph 2		SGMA wanted to see an advisory group that included a wide range of stakeholders. This was not supposed to be just outreach to stakeholders to tell them what was being decided. Maybe you want to mention at the end of this paragraph that "Some input from the Sustainability Workgroup (described below) has also been incorporated into the GSP."
3	JWT	"	ES-1	ES-2	"The GWA's jurisdictional area..."	Bulletin 118 and updated--Do you mean "as" updated?
4	JWT	"	ES-2	ES-3	"A stakeholder engagement strategy..."	Please delete "all" in the first sentence. The stakeholder engagement strategy is far from inclusive. Also, mention that this is a 24-member Workgroup.
5	JWT	"	ES-2	ES-4	"The Subbasin is located..."	On the third line, please insert "the" before "San Joaquin River."
6	JWT	"	ES-3	ES-5	"The western and southern portions..."	The last sentence in this paragraph seems unnecessarily vague. What effects has the Sacramento-San Joaquin Delta (note correct name for the Delta) had on groundwater levels in the Subbasin? What surface water has been imported for in-lieu use?
7	JWT	"	ES-3	ES-5	Paragraph beginning with "Groundwater quality..."	"Concerns" and "maximum" misspelled. Also, in the last sentence, "have not been able to be tied"--SOMEONE's analysis has not tied elevated concentrations of other constituents to groundwater management activities. I think the water quality argument will be vulnerable here, and it would be best to mention from the beginning whatever data or prior analysis you have to support this assertion.
8	JWT	"	ES-3	ES-5	"As such..."	Need to correct spelling of "volume" and "concern" in the last sentence of the paragraph.
9	JWT	"	ES-3	ES-5	"While the San Joaquin Delta..."	The Delta is properly referred to as "the Sacramento-San Joaquin Delta." (Do a search of this for the whole document.) Also, third line, "alternations to," do you mean "alterations to"?
10	JWT	"	ES-4	ES-6	"The method prescribed..."	The prior bulleted list is preceded by a statement with a colon. The bulleted item here isn't part of a list. This statement could be made part of the paragraph.
11	JWT	"	ES-6	ES-7	"Under the intermediate climate change scenario..."	Reading that the annual groundwater overdraft is projected to increase to approximately 57,000 AF/year with climate change is likely to send the reader back to find out what the current overdraft is, but I don't see that number above, only a statement that the Subbasin has been overdraft for many years. For comparison purposes, provide an average or range of current overdraft. Also, briefly, what is it about climate change that will lead to greater overdraft?
12	JWT	"	ES-7	ES-8, next to Figure ES-6	"The monitoring networks..."	Line 5, delete "from" before "participating GSA." It isn't necessary.
13	JWT	"	ES-7	Figure ES-6		This map needs a legend for what kinds of wells the different shapes represent.

14	JWT	"	ES-8	ES-9	"The DMS can be accessed..."	After the link, you might tell the reader to use the Guest login.
15	JWT	"	ES-9	ES-10	"These additional evaluations..."	"modification of levels of pumping reduction" is confusing. You could just say, "These additional evaluations may lead to pumping modifications associated with the attainment of reliability."
16	JWT	"	ES-9	ES-10	"Several projects..."	Delete "several," which suggests a small number.
17	JWT	"	ES-9	ES-10	"The initial set of projects..."	"The initial set of projects WAS reviewed" or "The projects WERE reviewed"
18	JWT	"	ES-9	ES-10	"The projected supply of projects. . ."	"Planned projects are anticipated to provide enough water to offset the projected 2040 supply imbalance of _____ AFY."
19	JWT	"	ES-12	ES-12	"The GSAs will evaluation options..."	It isn't clear how the two bulleted points ("Developing" and "Evaluation") relate to the paragraph that introduces them. Also, "Evaluating" would be the correct parallel to "Developing."

Eastern San Joaquin Subbasin GSP **Public Draft**
 Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	Jane Wagner-Tyack	San Joaquin County Public Works	Page 1-1	1.1.1	Last paragraph: "The Eastern San Joaquin GSP. . ."	Introduce the earlier GBA here to distinguish it from the GSA. There was initial confusion; also, the GBA was responsible for much of the prior planning effort, and you will reference it at 1.1.4.3. ". . . fits in with these prior planning efforts, including the Eastern San Joaquin Groundwater Basin Authority (GBA), building on existing local management. . ."
2	JWT	"	Page 1-3	1.1.4	"The Eastern San Joaquin GSP. . ."	Change 15 to 16 for number of GSAs and add back in Woodbridge Irrigation District (WID).
3	JWT	"	Page 1-8		"Lockeford Community Services District..."	In the second sentence, the references to "currently" and "in 2010" in the same sentence are confusing. "The District provides water and wastewater service to approximately 3,200 residents (as of 2010) in the unincorporated..."
4	JWT	"	Page 1-9		"The City of Escalon..."	"to meet domestic and industrial needs in the City"--which City? Both the City of Escalon and the City of Tracy are named in this sentence.
5	JWT	"	"		"Stockton East Water District..."	Delete "with" before "overlaps." "The SEWD GSA covers 101,000 acres of the District"--meaning unclear. Is this 101,000 acres that are not part of another GSA? Insert "is" between "and" and "provided" at the end of the third line. Last line-- "...two efforts preceding the current GWA that focused..."
6	JWT	"	"			Add back Woodbridge Irrigation District.
7	JWT	"	Page 1-14		"The Eastern San Joaquin Subbasin encompasses..."	I believe that Thornton should be added as an unincorporated community.
8	JWT	"	Page 1-18	1.2.1.1	"Figure 1-11 shows..."	"...within the region that includes the Eastern San Joaquin Subbasin." (Only one of these state parks is actually in the Subbasin.)
9	JWT	"	Page 1-25	1.2.2.1.5	"These data were provided..."	On the first reference to the ESJWRM, write out "Eastern San Joaquin Water Resources Model" so that the reader doesn't have to refer to the list of acronyms. This is a fairly important model not mentioned earlier.
10	JWT	"	Page 1-30	1.2.2.7.4	"Measure the volume of water..."	"with sufficient accuracy"--sufficient for what? This is extremely vague. If you can without misrepresentation, stop this point after "customers". Otherwise, clarify.
11	JWT	"	Page 1-31	1.2.2.8	"All the major irrigation districts..."	No pipelines? At the top of the next page, we learn that OID has over time replaced unlined laterals with PVC pipelines.
12	JWT	"	Page 1-31	1.2.2.8	"While this entire lateral system..."	"105 miles are inconsistent"--meaning unclear. Please clarify.
13	JWT	"	Page 1-32	1.2.2.9	"The observed recharge amount..."	"...for a total recharge volume of about 65,000 AF since the inception of the project."
14	JWT	"	Page 1-34	1.2.3.1.1		Sources are provided for all the other plan information in this section. What is the source of information for the San Joaquin County General Plan? Would it be appropriate to move "(SJC, 2016b)" to the end of this sections as "(San Joaquin County, 2016b)"? And what does "b" refer to?
15	JWT	"	Page 1-35	1.2.3.1.8	"The General Plan predicts..."	"may have to abandon a large number of wells as sources of potable water due to contamination,..."--What kind of contamination? This is relevant to the Water Quality Sustainability Indicator.
16	JWT	"	Page 1-51	1.3.5	"To date..."	This sentence says that there has been "at least one meeting". The next sentence refers to "these meetings." These statements need to be consistent.

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Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	Jane Wagner-Tyack	San Joaquin County Public Works	Page 1-3	1.1.4	Para. 1, "The Eastern San Joaquin GSP..."	End of 7th line, change "comprised" to "consisting."
2	JWT	"	"	"	Para. 4, "The county is presumed..."	Delete. This sentence is redundant.
3	JWT	"	Page 1-5	1.1.4.2	"Each of the 15 GSAs..."	Change "15" to "16" and change "have" to "has"--"Each. . .has a voice. . .and has appointed". Correct parallelism of bulleted list: Approving budgets, Proposing guidance, Adopting rules, Approving any contracts, Reporting to, Approving and implementing a GSP. For second bulleted list, Recommending for both bullets.
4	JWT	"	Page 1-6	1.1.4.3	"Central Delta Water Agency..."	Add (CDWA) after the agency name to conform to the style for the other agencies.
5	JWT	"	Page 1-7	"	"Eastside San Joaquin GSA..."	Delete "comprised of"--"Eastside San Joaquin GSA is a partnership..."
6	JWT	"	"	"	"Calaveras County Water District..."	Second to last line, insert "the" before "Calaveras River".
7	JWT	"	"	"	"Stanislaus County..."	First line, substitute "and" for "that"--"and extends..."
8	JWT	"	Page 1-8	"	"San Joaquin County..."	Change "is comprised of" to "consists of" or "comprises." For a correct usage of "comprise," see the OID description directly above this entry.
9	JWT	"	"	"	"San Joaquin County No.2..."	"Almost 7,000 acres of San Joaquin County plus Cal Water are combined in San Joaquin County No. 2 GSA."
10	JWT	"	Page 1-9	"	"South San Joaquin GSA..."	Substitute "encompass" (as in the SDWA description) for "is comprised of." "Comprise" is not the most accurate word to use in the first bulleted paragraph below. Better: "The cities of Manteca, Ripon, and Escalon account for approximately 20,000 acres of the District area."
11	JWT	"	Page 1-10	"	"Exercise the powers..."	Substitute "on" for "to"--"Exercise the powers conferred on GSAs by SGMA."
12	JWT	"	Page 1-22	1.2.2	"Statewide Monitoring Programs..."	For consistency: add (DWR) after Department of Water Resources; insert Water Data Library before (WDL), add (CV-SALTS) after Central Valley Salinity Alternatives for Long-Term Sustainability. Also, for Dairy CARES--Cares is apparently not an acronym. The correct term is Dairy Cares.
13	JWT	"	Page 1-26	1.2.2.2.3	"However, differences..."	Remove the "s" from "creates." The subject/verb agreement is "differences...create".
14	JWT	"	Page 1-26	1.2.2.2.6	"The 2017 SNMP..."	Change "off" to "on"--"was developed based on a detailed water quality analysis..."
15	JWT	"	Page 1-31	1.2.2.8	"While this entire lateral system..."	Substitute "the entire lateral system historically consisted of open, unlined ditches"
16	JWT	"	Page 1-32	1.2.2.8	"SEWD also uses..."	Second paragraph on the page, 3rd line, substitute "estimated" for "considered."
17	JWT	"	Page 1-32	1.2.2.9	"Direct recharge projects..."	Delete the second "Figure 1-16" in the first sentence, at the end.
18	JWT	"	Page 1-32	1.2.2.9	"Since 2003..."	Add "has"--"Since 2003, SEWD has operated..."
19	JWT	"	Page 1-34	1.2.3.1.1	"Stakeholders informed..."	Change this to "Stakeholder input informed..."
20	JWT	"	Page 1-34	1.2.3.1.5	"The 2010 General Plan Update..."	Insert "input from"--"...the 1991 General Plan was informed by input from community members..."

21	JWT	"	Page 1-35	1.2.3.1.5	"As the primary source..."	Dangling modifier--the General Plan is not the primary source of water supply. But also, groundwater is no longer the primary source of water supply for Lodi, which now gets about 50% of its water most of the time from surface supplies through an agreement with WID. Delete the phrase "As the primary source of water supply for the City of Lodi" and begin the sentence with "The General Plan..."
22	JWT	"	Page 1-40	1.3.1	"Agricultural users..."	Delete "of" after "hold."
23	JWT	"	Page 1-42	1.3.4.2	"The GWA developed..."	Delete "relied" and insert "the Workgroup"--"...to promote stakeholder input and relied upon the Workgroup when developing..."
24	JWT	"	Page 1-42	1.3.4.2	"The Workgroup included members..."	Delete "and"--"members from a variety of organizations who represent one or more..."
25	JWT	"	Page 1-47	1.3.4.3	"With the support..."	Two sentences have been telescoped here. Change to "detailing a stakeholder engagement strategy developed to achieve..."
26	JWT	"	Page 1-47	1.3.4.4	"The database was developed..."	There were no prior GWA engagement efforts (because there was no prior GWA). For "GWA", substitute "Eastern San Joaquin Subbasin engagement efforts..."
27	JWT	"	Page 1-49	1.2.3.4	"Targeted outreach presentations..."	Delete the apostrophe in "Manufacturers." They don't use it. The name style in Table 1-4 is correct.

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1	Jane Wagner-Tyack	San Joaquin County Public Works	Page 2-16	2.1.4.3	"These soils tend..."	"...restricted to metamorphic or pre-Tertiary sedimentary material and that, whereas..." Something is missing here; "that" doesn't make sense in this context.
2	JWT	"	Page 2-16	2.1.4.3	"Hardpan....However, in other areas..."	"Pre-Modesto formations" are mentioned here, but I didn't see those defined earlier, and the Geologic Time Scale in Figure 2-5 appears not to be designed to include them. They are referenced again in Section 2.1.4.5.1. "During the Pleistocene Epoch when the Modesto and Riverbank formations were deposited..." Can you provide a second Time Scale showing more detail for the Pleistocene?
3	JWT	"	Page 2-23	2.1.5	"The Eastern San Joaquin Subbasin..."	This paragraph refers the reader to Figure 2-15 and also refers to "the Central Valley geomorphic province and the granitic Sierra Nevada Geomorphic province." However, neither of these provinces is identified in Figure 2-15. Also, it would be helpful to have Figure 2-15 on the same page as this discussion.
4	JWT	"	Page 2-23	2.1.5	"The most important fresh water-bearing..."	The sentence refers to the Mehrten and Laguna formations, but these have not been introduced earlier, so the reader has no context in which to place them. As with the Pre-Modesto and Riverbank formations mentioned in 2.1.4.3 and 2.1.4.5.1, a geologic time scale should be provided.
5	JWT	"	Page 2-27	Table 2-2	Footnote	This footnote says that "Figure 2-5 contains time scales corresponding to formations." It does not. As noted above, the time scale needs more detail for local formations for the Tertiary and Quaternary periods.
6	JWT	"	Page 2-27	Table 2-2	Water-Bearing Properties	The table says that the Eocene is "Unimportant to fresh water basin except as possible contaminant source." Is saline water the only contaminant, or are there other possible contaminants? Any mention of contaminants is likely to be a red flag relative to groundwater quality discussions.
7	JWT	"	Page 2-27	2.1.5.1.1 and 2.1.5.1.2	"The pre-Ione Eocene rocks..."	Again, if a figure like 2-5 is going to be provided, it should include all the formations referenced in the text.
8	JWT	"	Page 2-28	2.1.5.1.3	"The Oligocene-Age Valley Springs Formation..."	It appears that these local formations are spatial rather than (or in addition to) temporal. Figure 2-16 is intended to show these formations, but it is VERY hard to read, with excessive grid detail that doesn't appear to be relevant to showing the major formations.
9	JWT	"	Page 2-28	2.1.5.1.4	"Overlying the Valley Springs Formation..."	Need different visuals for all formations listed under 2.1.5.1
10	JWT	"	Page 2-32	2.1.6	"Uplift of the Sierra Nevada..."	This sentence concludes with "for the east side of the Great Valley." "Great Valley" is not a term that has been used in this document previously, and it is not a commonly used term in this state. In fact, it isn't clear what it means. Does it refer to California's Central Valley? To the San Joaquin Valley?
11	JWT	"	Page 2-38	2.1.7	"The analysis for this GSP..."	This sentence, at the top of page 2-38, says that water wells and oil and gas wells are "indicated by an asterisk on the cross-sections." The asterisks are completely illegible. In fact, the cross-sections are impossible to read.
12	JWT	"	Page 2-38	2.1.7	"The analysis inferred..."	The sentence at the bottom of the second paragraph on page 2-38 says, "The analysis inferred formation contracts in place where this data was limited..." Can you explain what "formation contracts" are? Or do you mean that the formation contracts (decreases in size)?

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
13	JWT	"	Page 2-42	2.1.9.1.4	"The clay is typically..."	The sentence refers to the condition of the Corcoran Clay "as depicted on Figure 2-22", but it is very hard to discern anything in Figure 2-22.
14	JWT	"	Page 2-47	Table 2-3		Since there is no list of definitions, define "Aquifer Field" in the text or in a footnote to this table.
15	JWT	"	Page 2-49	2.1.9.2.3.1	"The natural geochemical effects..."	"The natural geochemical effects on water quality result to mobilize the elemental makeup of sediments"--meaning unclear. Please rephrase to clarify.
16	JWT	"	Page 2-50	2.1.9.2.3.1	"Per 23 CCR..."	This sentence sounds awkward and unnecessarily legalistic, and it doesn't clearly apply to the rest of the section. That is, it isn't clear that the two lists that follow are intended to summarize the general water quality of principal aquifers; that seems to be covered in the next sections. Can you say this? "General water quality of principal aquifers is summarized in the following sections, as required by 23 CCR"
17	JWT	"	Page 2-50	2.1.9.2.3.1	"Nitrogen, most commonly occurring as Nitrate..."	The sentence says that nitrate (should be lower case) "is well understood as a result of fertilizer application". Actually, nitrate is well understood as a result of studies of the consequences of its agricultural use in fertilizer application. The following sentence says that "Naturally occurring nitrogen must also be discussed to have a complete understanding of the natural conditions" in the Subbasin. A better transition: "Nitrogen also occurs naturally in the Eastern San Joaquin Subbasin. Extensive work..."
18	JWT	"	Page 2-50	2.1.9.2.3.2	"Evaluating the historical trends..."	Suggested rewrite for easier reading: "Evaluating the historical trends of these parameters is not straightforward. GAMA records include some groundwater quality results for the Eastern San Joaquin Subbasin going back to the 1940s. However, a thorough analysis requires a large amount of data on all the major cations and anions mentioned above. A large number of measurements of this kind were taken from 2005 to 2017, as shown in Figure 2-27. Data from 2018 are not included because at the time of writing, that data was incomplete."
19	JWT	"	Page 2-52	2.1.9.2.3.2	"Evaluating the years..."	Delete "a better idea" and just say "an idea," since there is not actually any other idea for "better" to refer to. Regarding the Trilinear Diagrams, is it customary to present these without a legend for the symbols?

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1	Jane Wagner-Tyack	San Joaquin County Public Works	Page 2-1	2	"Current and Historical..."	"e" in "The" should not be boldfaced.
2	JWT	"	Page 2-8	2.1.2	"The Sierra Nevada..."	Delete "is comprised of" and substitute "consists of".
3	JWT	"	Page 2-8	2.1.2	"The material source..."	Add "s" to "source" for correct subject/verb agreement, and add "the" before Sierra Nevada"--"The material sources...are the Coastal Ranges and the Sierra Nevada..."
4	JWT	"	Page 2-9	2.1.3	"The origin..."	Changes "vary" to "varies" for correct subject/verb agreement--"The origin...varies in geologic time..."
5	JWT	"	Page 2-9	2.1.4.1	"Ground surface..."	Change "and" to "to"--"Ground surface elevations vary...from almost 1,000 feet...to around sea level..."
6	JWT	"	Page 2-12	2.1.4.2	"Two major westerly flowing..."	Add "the" before both "Stanislaus River" and "Mokelumne River".
7	JWT	"	Page 2-12	2.1.4.2	"In addition to the Stanislaus..."	Delete "the" before "10 watersheds".
8	JWT	"	Page 2-15	2.1.4.3	"Alluvial fan..."	Change "Figure 3-9" to "Figure 2-9".
9	JWT	"	Page 2-19	2.1.4.4	"Several districts receive..."	Add "the" before "Stanislaus River".
10	JWT	"	Page 2-23	2.1.5	"The most important fresh water-bearing..."	Lower case "f" in "Mehrtens and Laguna formations" and "Riverbank and Modesto formations."
11	JWT	"	Page 2-29	2.1.5.1.6	"The Turlock Lake Formation..."	Substitute "consists" for "as consisting."
12	JWT	"	Page 2-32	Figure 2-18		Add "Water" to title--"Base of Fresh Water Elevation Contours and Stockton Fault"
13	JWT	"	Page 2-39	2.1.9	"The zones are..."	First bullet--"Shallow Zone that consists of" (replace "is comprised of"); Second bullet--"Intermediate Zone that consists of" (replace "is comprised of"). The third bullet is already correct.
14	JWT	"	Page 2-39	2.1.9.1	Third and fourth bullets	Insert "of" after "depth" in each case--"Depth of discrete layers..."
15	JWT	"	Page 2-41	2.1.9.1.1	"The shallow water-bearing..."	Insert "and" after "geologic formations"--"...are present west of the older geologic formations and extend across..."
16	JWT	"	Page 2-42	2.1.9.1.1	"Transmissivities..."	"gpd/ft"--gallons per day per foot? "gpd" is not on the list of acronyms.
17	JWT	"	Page 2-43	2.1.9.1.4	"As depicted on the cross-sections..."	Substitute "have" for "has"--"...thickest sequences...and overbank fines... have been observed."
18	JWT	"	Page 2-45	2.1.9.2	"Recognition of..."	Change "Recognition of" to "Recognizing" so that this bullet point reads like a sentence, as the others to.
19	JWT	"	Page 2-45	2.1.9.2.1	"For depiction purposes..."	Replace "comprised of" with "encompassing."
20	JWT	"	Page 2-47	2.1.9.2.1	"The distribution of production wells..."	Change "are" to "is"--"The distribution...is provided..."
21	JWT	"	Page 2-49	2.1.9.2.3.1	"The USGS..."	Replace "which encompasses" with "which includes." In the next sentence, change "is" to "are" for correct subject/verb agreement--"natural geomechanical effects" is the subject of this clause.
22	JWT	"	Page 2-49	2.1.9.2.3.1	"Rivers draining areas..."	Delete "also" between "rocks" and "have". There is no other condition to which this clearly refers.
23	JWT	"	Page 2-49	2.1.9.2.3.1	"Groundwater quality..."	"...is characterized by Metzger and others in a 2012 study, <i>Test Drilling ...</i> "

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "..."	Comment
24	JWT	"	Page 2-50	2.1.9.2.3.1	"Arsenic is of particular concern..."	Insert "is" between "and" and "hazardous"--"...is naturally occurring..and is hazardous..."
25	JWT	"	Page 2-50	2.1.9.2.3.1	"Arsenic was detected..."	Write out San Joaquin County instead of using SJC. (It is nice not to expect the reader to refer to the acronym list for everything.)
26	JWT	"	Page 2-57	2.1.10	"Aquifer characteristics..."	"actions" should be plural--"...a significant impact on how projects and management actions in one part of the basin..."

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1	JWT	San Joaquin County Public Works	Page 2-76	2.2.3	"While the Delta..."	This section misrepresents the situation in the Delta by suggesting that barriers have been installed to prevent seawater intrusion. No barriers prevent the inland movement of seawater into the Delta; it does occur, and managing it is an ongoing challenge. If you need a reference, I can provide one. Correction: "While the Delta ecosystem evolved with a natural salinity cycle that brought brackish tidal water in from San Francisco Bay, levees installed to allow development of agriculture, followed by development and operation of the Central Valley Project and the State Water Project, have altered the inward movement of seawater through the Delta. Current management practices endeavor to maintain freshwater flows through a combination of hydraulic and physical barriers, and alterations to existing channels." Change "alternations" to " alterations of existing channels". I don't see the Water Education Foundation listed under References. Also, in the last sentence in this paragraph, delete "sources" and change "are" to "is"--"...salinity in the Subbasin is due to other factors..."
2	JWT	"	Page 2-77	2.2.4.1.1	"As shown in Figure 2-52..."	The sentence says that additional measurements above 250 mg/L are scattered throughout SJC (I would just write out San Joaquin County), but the figure does not show any measurements outside the Subbasin.
3	JWT	"	Page 2-95	2.2.4.4.1	"Since the discovery..."	This sentence says that groundwater monitoring and evaluation has resulted in removal of contaminant sources and implementation of remedial activities. That isn't something that just monitoring can do. When groundwater monitoring and evaluation identified point source locations for contamination, the City of Lodi initiated remedial activities.
4	JWT	"	Page 2-94 to 2-95	2.2.4.4.1		This entire section appears to contradict the claim in 2.2.4.4 that point source contamination has not been found to be related to groundwater management activities in the Subbasin. Broadly, for ALL similar statements (for example at 2.2.4.2 and 2.2.4.3), there needs to be a clear explanation of what "related to groundwater management activities" actually means.
5	JWT	"	Page 2-95	2.2.4.4.2	"Approximately 134 sites..."	This sentence says that sites are doing investigation and remediation. The same statement is made in 2.2.4.4.3 and 2.2.4.4.4. What is meant by sites? WHO is doing the investigation and remediation? Is this the responsibility of site owners? The RWQCB? Please name an agent or agents for these activities.

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1	JWT	San Joaquin County Public Works	Page 2-58	2.2.1.1	"To visually show..."	Replace "with" with "that have"--"10 wells that have periods...and that are relatively..."
2	JWT	"	Page 2-62	Figure 2-35	Footnote 3	Delete comma after "line".
3	JWT	"	Page 2-64	2.2.1.2	"Along the eastern side..."	Substitute "to" for "and" in this clause--"...the lateral gradient ranges from approximately 21 ft/mi...to 16 ft/mi..." A range is always "from x...to y" (or "is between x and y").
4	JWT	"	Page 2-76	2.2.4	"The primary naturally occurring..."	Constituents "are related to..." or "relate to..."
5	JWT	"	Page 2-76	2.2.4.1	"San Joaquin Delta Sediments..."	IMPORTANT: There is no San Joaquin Delta, at least not in California. The San Joaquin River and the Sacramento River meet to form the Sacramento-San Joaquin Delta . That is the correct name. I recommend doing Find for the whole GSP document to be sure that all of these uses of the name are correct.
6	JWT	"	Page 2-76	2.2.4.1	"San Joaquin Delta Sediments..."	"Emplace" means to put into position. Suggested revision: "Evaporation of groundwater in discharge areas introduces naturally occurring soluble salts into Sacramento-San Joaquin Delta sediments."
7	JWT	"	Page 2-77	2.2.4.1	"Deep Deposits...This results..."	Comma after second "aquifer"--"This results in a saline aquifer underlying the freshwater aquifer, and well pumping can result..."
8	JWT	"	Page 2-77	2.2.4.1.1	"As shown..."	Change "have" to "has" in the last line--"...the number of measurements...has decreased..." (It is the number, not the measurements, that has decreased.)
9	JWT	"	Page 2-87	2.2.4.2	"Under the ILRP..."	Write out "San Joaquin County" here, since it is part of the name of the Coalition. Otherwise, it sounds like SJC and the Delta Water Quality Coalition are two separate entities.
10	JWT	"	Page 2-94	2.2.4.4.1	""The Busy Bee Plume..."	Delete "and" after "closure" and insert a comma--"...now has regulatory closure, with cleanup moving..."
11	JWT	"	Page 2-95	2.2.4.4.2	"Of these sites..."	Substitute "At" for "Of"--"At these sites, petroleum hydrocarbon constituents..."
12	JWT	"	Page 2-95	2.2.4.4.3	"Of these sites..."	Substitute "At" for "Of"--"At these sites, pesticides..."
13	JWT	"	Page 2-96	2.2.4.4.4	"Of these sites..."	Substitute "At" for "Of"--"At these sites, the most common constituents..."
14	JWT	"	Page 2-96	2.2.5	"Subsidence has not been..."	Revise this sentence as follows: "There are no historical records of significant and unreasonable impacts from subsidence in the Eastern San Joaquin Subbasin."
15	JWT	"	Page 2-100	2.2.8	"The NCCAG database..."	Revise this sentence as follows: "A working group consisting of DWR, California Department of Fish and Wildlife (CDFW), and the Nature Conservancy (TNC) developed the NCCAG database by reviewing publicly available state and federal agency datasets..."
16	JWT	"	Page 2-104	2.2.8	"The Plan identifies..."	Typo: Should be "The Plan identifies GDEs as NCCAG-identified areas that meet all of the criteria below."
17	JWT	"	Page 2-104	2.2.8	"Areas with a depth..."	Comma needed after "region" to prevent misreading, plus "s" on "plant"--"Oak trees are considered the deepest-rooted plants in the region, with a root zone..."
18	JWT	"	Page 2-104	2.2.8	"Areas at least 150 feet from..."	Add "to be"--"...are assumed to be unable to access...and to be dependent on..."

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1						
2	Jane Wagner-Tyack	San Joaquin County Public Works	2-108	2.3.1	"Because this process is new..."	The relationship between these two ideas is not causal but coordinate. Revision: "This process is new and has been developed under time constraints; the water budget assumptions will be refined in the future..."
3	JWT	"	2-113	2.3.4.2	"As private groundwater pumping was estimated..."	"Therefore, groundwater pumping to meet agricultural and rural residential needs is calculated by the model based on meeting remaining demands after appropriate surface water delivery is made to respective areas." Please explain what is meant by "appropriate surface water delivery" and which areas are "respective" (and of what they are respective).
4	JWT	"	2-115	2.3.5	"Inflows..."	Do you want to add "including urban runoff" to the third bullet? Urban runoff is discussed in detail in Footnote 5 of Table 2-13.
5	JWT	"	2-117 to 2-118	Table 2-13		To begin with, please put the table and the footnotes on facing pages. The Hydrologic Period row should show parallel information: For Historical: Water Years 1996-2015 (20-Year Period); for Current: Water Years 1969-2018 (50-Year Period); for Projected, Water Years 1969-2018 (50-Year Period). Without this information, it is hard to fairly evaluate the table in general and Footnote 1 in particular. In Footnote 5, "The historical calibration, with both less precipitation and smaller urban areas..."--since this represents a yearly average, explain why there is less precipitation. Finally, if surface water is diverted from one part of the Subbasin and delivered to another part of the Subbasin, does that show up somewhere here? Does that warrant a footnote?
6	JWT	"	2-119 to 2-120	Table 2-14		Same comments as for Table 2-13 with respect to headings and footnotes.
7	JWT	"	2-121 to 2-122	Table 2-15		Same comments as for Table 2-13 with respect to headings and footnotes. Also, footnote 1 says that differences in scenarios are related partly to "differences in the infiltration parameters related to land use." This need to be explained. Also, please provide a footnote explaining why no South American Subbasin outflows are shown.
8	JWT	"	2-122	Table 2-15		Footnote 4 refers to MAR projects. I'm pretty sure those weren't mentioned earlier in the document. Section 2.3.4.3 would be a logical place to do that.
9	JWT	"	2-123	Figure 2-72		Labels on the bar graph should correspond to the discussion in the text above the graph. Thus, the right-hand bar, for Inflow (and these are actually Surface Water Inflows), would show "Upstream Reservoir Releases" or "Reservoir Releases" rather than "Stream Inflows" for the green section (the source of the majority of inflows). The orange section of the bar would be "Runoff of Precipitation." The yellow section would be "Return Flow of Applied Water." Another color needs to be used for "Stream Gains from Groundwater," as this is MUCH too dark to read. For the Outflow bar, the gray section should be labeled "Downstream Outflows," or better, "San Joaquin River and Mokelumne River Outflows," as in Figure 2-78. The light blue section is "Stream Seepage to Groundwater." Where are "Surface Water Diversions"?

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
10	JWT	"	2-123ff	2.3.5.1, 2.3.5.2, 2.3.5.4		(Should 2.3.5.4 actually be 2.3.5.3?) For ALL the water budget figures, I encourage using a scale for Average Annual Volume that is the same for all hydrologic periods and all systems. This will be inconvenient in terms of document spacing, but it will convey much more clearly the water budget situation across scenarios and will improve the credibility of the document. It is not usually the intention to mislead with this kind of graphic presentation, but that is frequently the effect.
11	JWT	"	2-124	Figure 2-73		Inflow categories in the bar graph correspond to the descriptions in the text except that "Total" is not necessary for either Surface or Groundwater Supply. The dark blue background, both here and in subsequent Land Surface System figures, makes the text too hard to read and should be lightened. For Outflow, the orange area should be "Surface Runoff of Precipitation," and the yellow area should be "Return Flow of Applied Water."
12	JWT	"	2-125	Figure 2-74		Inflow categories in the bar graph correspond to descriptions, except that "Change in Groundwater Storage" is misleading. This is actually a deficit and should be identified that way, and a number could be put on it in the text, which just says "...the inflows do not meet the entire groundwater demand." The amount of the deficit is listed in the text for the current average (on page 2-129) and for the projected average (on page 2-132). Alternatively, you could omit that category from the bar graph and show that the Inflow bar is actually lower than the outflow bar. This would be an honest representation of the situation. Tucking the gray bar in the middle appears deceptive. For the Outflow bar, the orange section should be "subsurface Outflow to Neighboring Basins."
13	JWT	"	2-127	Figure 2-75		See Comment #9 for Figure 2-72. Labels should be consistent between text and graph and across graphs. Also, keep Inflow discussion first, as in the prior discussion and to align with the fact that Inflows are shown in the left-hand bar. This will mean deleting "These" from the beginning of the paragraph directly above.
14	JWT	"	2-129	Figure 2-77		Again, don't bury "Change in Groundwater Storage" in the middle. Call it a deficit, and show it at the top of the bar. It is already identified in the text as 48,000 AF/year. Also, in the text, refer to groundwater use as "Groundwater pumping," as is done in the bar graph and also in the discussion on page 2-124. Using the word "production" looks like an attempt to disguise what is actually going on.
15	JWT	"	2-130	Figure 2-78		As in Figure 2-72, the Inflow categories are "Reservoir Releases," "Runoff of Precipitation," "Return Flow of Applied Water", and "Stream Gains From Groundwater." Outflow categories are "San Joaquin River and Mokelumne River Outflows", "Stream Seepage to Groundwater", and "Riparian Intake from Streams." But again, surface water diversions are missing from the Outflow bar. The text mentions distribution to local growers of 370,000 AF/year. What about urban diversions?
16	JWT	"	2-131	Figure 2-79		See Comment #11 on Figure 2-73 for both Figure 2-76 and Figure 2-79.
17	JWT	"	2-132	Figure 2-80 and accompanying text		Again, don't bury "Change in Groundwater Storage" in the middle, and do call it a Deficit. In the text, (first paragraph) use "groundwater pumping" instead of "groundwater production."

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "..."	Comment
18	JWT	"	2-133	Table 2-17		Where do the numbers for the last row, "Change in Groundwater Storage" come from? They don't appear to arise from anything else in the table, where everything is in balance. Should that row be separated from the rest of the table?
19	JWT	"	2-135	2.3.7.2	"The methods suggested by DWR..."	"...to ensure the resolution would be reasonable..."--What is meant by "resolution" in this context?
20	JWT	"	2-150	Figure 2-100		This title is misleading. Climate change will not produce more groundwater. The title should be "Simulated Changes in Groundwater Pumping due to Climate Change." Delete "production" from the Note.

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Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1						
2	Jane Wagner-Tyack	San Joaquin County Public Works	2-110	Table 2-12	Footnote 2	"Future evapotranspiration rates are assumed to remain the same as historical." Do you want to add any qualifying statement here about climate change?
3	JWT	"	2-110	Table 2-12	Footnote 5	Note that there's an error here for Reference source not found.
4	JWT	"	2-111	2.3.4.1	"Dry creek..."	Change "was" to "were"--"...flow estimates...were used..."
5	JWT	"	2-111	2.3.4.1	"Deliveries to agricultural areas..."	To be consistent, write out all district names, or don't write out any of them. Also, "including" implies that not all entities are listed. If they are all listed, delete "including" and use a colon after "Subbasin." If you include acronyms after names (which is actually a good idea), put them in parentheses rather than brackets. Brackets are correctly used in the section above for parenthetical references within parentheses.
6	JWT	"	2-114	2.3.4.3	"Surface water delivery projections..."	Change "was" to "were"--"...projections... were estimated..." (The noun with which a verb grammatically agrees is frequently not the closest noun.)
7	JWT	"	2-115	2.3.5	"The primary components of..."	Fourth bullet, add "the" between "to" and "stream".
8	JWT	"	2-116	2.3.5	"The estimated water budgets..."	"are provided herein" sounds stiff and formal, which is not the tone of the document overall. Suggestion: "...scenarios are provided below, with results summarized in Table 2-13 and Table 2-15."
9	JWT	"	2-123	2.3.5.1	"Because of these circumstances..."	"...the water budget presented in Table 2-12..." Table 2-12 is a summary of water budget assumptions. It doesn't appear to be a water budget. Also, delete "of" between "estimates" and "contributions"--"...the water budget...not only quantifies...but also estimates..."
10	JWT	"	2-124	2.3.5.1	"A groundwater overdraft estimate..."	Delete "formerly" from this sentence. It is already clear that previous efforts have given a different estimate.
11	JWT	"	2-124 to 2-125	2.3.5.1	"Such previous efforts..."	NSJCGBA is not on the list of acronyms, and I am not aware of such an entity. Does this refer to a groundwater management plan by the Eastern San Joaquin County Groundwater Basin Authority? ESJCGBA should be on the list of acronyms, as well as GBA.
12	JWT	"	2-125	2.3.5.1	"When these changes occurred..."	Sentence is awkward. Suggested revision: "The timing of these changes was often independent of hydrologic conditions..."
13	JWT	"	2-126	Table 2-16		Footnote 6: Substitute "are" for "is"--"Differences...are more related..."
14	JWT	"	2-126	Table 2-16		Footnote 3: Revise: "...averaging of the resulting agricultural demand is less a function of water year type than of the time in the simulation when that water year fell."
15	JWT	"	2-131	2.3.5.2	"Inflows are comprised of precipitation..."	Substitute "consist of" for "are comprised of."
16	JWT	"	2-132	2.3.5.4	"As expected, in wet years..."	(This section should probably be 2.3.5.3.) Change "meets" to "meet" and delete the second "more of"--"...there is more precipitation and surface water to meet the water demand..."
17	JWT	"	2-132	2.3.5.4	"Unlike the historical calibration..."	Insert a comma between "averages" and "and"--"...to calculate meaningful averages, and the supplies and demands are..."
18	JWT	"	2-134	2.3.6	"Therefore, to account for these uncertainties..."	Delete "use of"--"...a range of assumptions (from high-end estimates to low-end estimates)..."

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
19	JWT	"	2-136	Table 2-18		"Reference ET"--Use "Eto" as provided in the list of acronyms.
20	JWT	"	2-136	2.3.7.3.1	"The resolution of these perturbation factors..."	HUC is not on the list of acronyms. Write out "Hydrologic Unit Code" here or include that in the acronyms.
21	JWT	"	2-137	2.3.7.3.1.1	"DWR change factors..."	WY is not on the list of acronyms. Write out "Water Year" here or include that in the acronyms.
22	JWT	"	2-138	2.3.7.3.1.1	"The exceedance curves..."	This sentence is hard to read, but I think what is meant is "...the projected condition scenario and the with-climate-change scenario." Add the hyphens.
23	JWT	"	2-140	2.3.7.3.1.2	"Streamflow simulated..."	Should be "Streamflows" (plural) to agree with "and those derived using..."
24	JWT	"	2-144	2.3.7.3.2	"Change factors are available..."	Insert "are" between "and" and "spatially"--"...are available on a monthly time step and are spatially defined..."
25	JWT	"	2-144	2.3.7.3.2.1	"Months with no precipitation..."	Words appear to be missing. "...were assumed to have a monthly precipitation..."
26	JWT	"	2-146	2.3.7.3.2.2	"Refinement to the simulated..."	Change "are" to "is"--"Refinement...is shown..."

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Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	JWT	San Joaquin County Public Works	Page 3-1	3.1	"The California Water Code (CWC) defines..."	Define "planning and implementation horizon."
2	JWT	"	Page 3-1	3.1	"Groundwater levels in the Subbasin..."	Define "implementation period."
3	JWT	"	Page 3-10	3.2.2.1.2	"It is roughly estimated..."	Avoid using the passive voice to disguise a source of responsibility. WHO has estimated groundwater demand, and HOW? This information is central to the case we are making.
4	JWT	"	Page 3-11	3.2.3.1.1	"Additionally, SGMA does not give..."	"...so a nexus must be present between groundwater conditions and groundwater pumping activities." In plain English, what does this mean?
5	JWT	"	Page 3-12	3.2.3.1.2	"Undesirable results occur..."	"...and where these concentrations are the result of groundwater management activities." What kind of activities? How will we know?
6	JWT	"	Page 3-19	3.2.6.2	"Current or historical issues..."	To avoid obscurity associated with use of the passive voice: "In discussions of interconnected surface water, the GWA Board, Advisory Committee, Workgroup members, and GSA staff did not indicate significant and unreasonable depletions, either currently or historically. Based on this input, this GSP assumes that historical conditions are protective of beneficial uses..." I suggest adding "however" at the beginning of the last sentence: "However, if groundwater levels were to fall lower than historical levels..." Regarding "qualified below", where? In the next paragraph?
7	JWT	"	Page 4-3	4.1.1	"2. Robust and Extensive Historical Data..."	It is worth providing some representative dates for historical data available in this Subbasin, especially since it is noted later that CASGEM data goes back to 2009. Let's not miss any opportunity to note that groundwater conditions have been monitored in this Subbasin for quite a long time.
8	JWT	"	Page 4-9	4.3.1	"3. A Range of TDS Concentrations..."	"Wells with historically "low" TDS concentrations..." What does this mean? Why is "low" in quotation marks? Quotations marks are sometimes used this way when the writer wants to put distance between the implied meaning and the actual situation. That would be unwise in this case.
9	JWT	"	Pages 4-9 and 4-13	4.3.1 and 4.3.4		Section 4.3.1 lists the City of Lodi as one of the agencies monitoring and managing wells for groundwater quality, but the City of Lodi is not shown in Table 4-5. The text should explain why not. Meanwhile, City of Lodi is listed in Table 4-7, but there is a footnote that TDS has not been regularly monitored at White Slough sites. Should this footnoted information appear in Section 4.3.1 as well?
10	JWT	"	Page 4-15	4.7.1	"The DWR's USGS..."	Do you mean "guide for selection of wells" rather than "guide for collection of wells"?

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1	JWT	San Joaquin County Public Works	Page 3-1	Section 3 Introduction	"The sustainable management criteria..."	Delete "meetings" after "Workgroup".
2	JWT	"	Page 3-3	3.2.1.1.1	Second bullet	Delete "of" after "Reduction".
3	JWT	"	Page 3-3	3.2.1.1.3	"Potential causes..."	Sentence is awkward and hard to read. Revision: "Undesirable results due to future chronic lowering of groundwater levels could result from the following: insufficient pumping offset/reduction in the basin that results in localized or basin-wide groundwater level lowering; or delays in implementation of GSP programs or projects due to increased demand or regulatory, permitting, or funding obstacles."
4	JWT	"	Page 3-4	3.2.1.2	"This examination evidenced..."	Substitute "showed" for "evidenced."
5	JWT	"	Page 3-5	3.2.1.2	"The GWA Board determined..."	"...dewatering of domestic wells is a potential undesirable result that could be used to confirm the adequacy..."
6	JWT	"	Page 3-5	3.2.1.2	"The 10th percentile..."	"...to account for the fact that domestic wells may have been drilled..."
7	JWT	"	Page 3-8	3.2.1.3	"The Margin is defined..."	"...the difference between the minimum threshold and the measurable objective."
8	JWT	"	Page 3-10	3.2.2.1.4	"If groundwater levels were to reach..."	Make this all one sentence--no period after "years", and separate with semi-colons-- "...effects could include running out of fresh groundwater to access in drought years; increased cost of access; reduction in beneficial uses, such as domestic supply; and changes to agriculture."
9	JWT	"	Page 3-11	3.2.2.3	"As chronic lowering of groundwater levels..."	This refers the reader to Section 3.2.5.3, but that section just sends the reader somewhere else. It should probably refer to Section 3.2.1.3, where measurable objectives and interim milestones for lowering of groundwater levels are discussed. Also, insert "as" between "milestones" and "for".
10	JWT	"	Page 3-12	3.2.3.1.4	"If groundwater quality..."	Add "s" after "effect" and insert a comma and "which" after "supplies"--"...the effects would potentially include...to access alternate supplies, which can be unaffordable..."
11	JWT	"	Page 3-12	3.2.3.1.4	"Water quality degradation..."	Add "or" after "practices"--"...changes in irrigation practices or crops grown,..."
12	JWT	"	Page 3-14	3.2.3.3	"600 mg/L..."	Delete "are" after "uses" in the last line--"...will protect landscape uses against impacts..."
13	JWT	"	Page 3-15	3.2.4.1.1	"There is the possibility..."	Use the correct name for the Delta: "the Sacramento-San Joaquin Delta".
13	JWT	"	Page 3-15	3.2.4.1.3	"If seawater intrusion..."	Use the correct name for the Delta: "the Sacramento-San Joaquin Delta".
14	JWT	"	Page 3-15	3.2.4.1.4	"Water quality degradation..."	Add "or" after "practices"--"...changes in irrigation practices or crops grown,..."
15	JWT	"	Page 3-18	3.2.5.2	"Historical declines in groundwater levels..."	Add "in the Eastern San Joaquin Subbasin"--"...declines in groundwater levels in the Eastern San Joaquin Subbasin have not resulted..."
16	JWT	"	Page 3-18	3.2.5.3	"As chronic lowering..."	The last line refers the reader to Section 2.2, Current and Historical Groundwater Conditions. It should probably refer to Section 3.2.1.3.
17	JWT	"	Page 3-19	3.2.6.1.2	"An undesirable result..."	Add "in" to clarify parallelism, and use semicolons to make this sentence easier to follow--"...if depletions resulted in the release of stored surface water...; in the decrease of acreage...; in the reduction in availability...; or in the elimination..."

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
18	JWT	"	Page 3-19	3.2.6.1.4	"If depletions..."	Correct parallelism: "...insufficient surface water would be available to support diversions for agricultural or urban uses or to support regulatory environmental requirements."
19	JWT	"	Page 3-19	3.2.6.1.4	"This could result..."	Substitute "pumping" for "production" and correct the parallelism: "This could result in increased groundwater pumping, changes in irrigation practices and crops grown, and adverse effects to property values and the regional economy."
20	JWT	"	Page 4-1	4.1.1	"Representative monitoring..."	Add "the" between "in" and "production"--"...represent overall conditions in the production zone..."
21	JWT	"	Page 4-3	4.1.1	"4. Increased Density..."	Substitute "insight into" for "insightful information about"--"...may provide insight into groundwater dynamics..."
22	JWT	"	Pages 4-3 and 4-4	4.1.2	"The 76 wells..."	Correct the parallelism of the numbered items: "1. They use an existing data source...2. They provide reliable...3. They are in many cases new, having been constructed..." Also correct the parallelism for the second numbered list, on page 4-4, by making the first item a sentence, as the others are: "1. They use an existing data source and have a historical data record;"
23	JWT	"	Page 4-4	4.1.2	"The broad monitoring network..."	Make this two sentences: "...San Joaquin County's Flag City wells). These will be monitored..."
24	JWT	"	Page 4-6	4.1.3	"Taken using a CASGEM-approved..."	Correct agreement: "using a CASGEM-approved ... method..." or "using CASGEM-approved...methods..."
24	JWT	"	Page 4-6	4.1.3	"Typical groundwater level measurement..."	Add an "s" to "include"--"...measurement equipment...includes..."
25	JWT	"	Page 4-7	4.1.4	"The spatial location..."	Change "were" to "was" for correct subject/verb agreement: "...spatial location...was based..."
26	JWT	"	Page 4-8	4.3	"The representative monitoring network..."	Change "are" to "is"--"the representative monitoring network is used..."
27	JWT	"	Page 4-10	4.3.1	"5. Current TDS Monitoring..."	Add comma, and "they" in the second sentence: "These wells are equipped...consistent measurements, and they represent..."
28	JWT	"	Page 4-14	4.3.5	"A total of 10 monitoring wells..."	Revision: "The representative monitoring network consists of a total of 10 monitoring wells, a density of 0.8 wells per 100 square miles."
29	JWT	"	Page 4-14	4.3.5	"The total number of wells..."	Add "s" to "meet"--"The total number...meets DWR's recommendations..."
30	JWT	"	Page 4-14	4.7	"Additionally, areas..."	Insert "a" between "present" and "limitation"--"...wells present a limitation..."

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1	Jane Wagner-Tyack	San Joaquin County Public Works	Page 6-1	6.1	"The Eastern San Joaquin Subbasin..."	Correct spelling of "offest" to "offset."
2	JWT	"	Page 6-1	6.2.1	Bulleted list	Third bullet: correct spelling to "cost-effective."
3	JWT	"	Page 6-2	6.2.3	"The initial set of projects..."	For correct subject/verb agreement, change "were" to "was"--"The initial set...was reviewed..." Next sentence, change "are" to "is"--"A final list...is included..."
4	JWT	"	Page 6-2			PLEASE PROVIDE A MAP SHOWING THE LOCATIONS OF THE PROJECTS.
5	JWT	"	Page 6-3	Table 6-1		Suggest footnoting the annual cost of Project 4 to explain why it is so much higher than the others. (Mostly annual cost of water purchase.)
6	JWT	"	Page 6-4	Table 6-1		For Project 11, Current Status, change "partied" to "parties."
7	JWT	"	Page 6-8ff	Various	"Estimated Costs and Plans to Meet Costs..."	In most of the project descriptions that follow, subject/verb agreement needs to be corrected in one of these ways: "The estimated cost for this project includes..." or "The estimated costs for this project include..."
8	JWT	"	Page 6-11	6.2.4.3	"Installation of other components..."	"Installation" is the subject of the sentence. Everything between that and the verb is part of a modifying phrase. So the verb must be "is", not "are"--"Installation...is in the planning stage."
9	JWT	"	Page 6-12	6.2.4.4	"Trigger for Implementation...The availability..."	Suggest inserting "reduced" before "availability" to better reflect the meaning of the sentence--"The reduced availability...would be the only potential cause for a reduction in SWFT production."
10	JWT	"	Page 6-12	6.2.4.5	"Project status..."	Insert "been" between "has" and "completed"--"...project has been completed..."
11	JWT	"	Page 6-13	6.2.4.5	"Time-Table..."	Insert "been" between "has" and "completed"--"...project has been completed..."
12	JWT	"	Page 6-13	6.2.4.5	"Circumstances..."	Insert "been"--"Construction for this project has been completed" (or "is complete").
13	JWT	"	Page 6-13	6.2.4.6	"As water is diverted..."	Change "has" to "have"--"until 7 years...have elapsed."
14	JWT	"	Page 6-13	6.2.4.6	"However, individual applicants..."	Delete "s" on "on permits", or delete "a."
15	JWT	"	Page 6-15	6.2.4.7	"Project Status"	Delete "at"--"Design for this project is 60 percent complete..."
16	JWT	"	Page 6-15ff	Various		For most of the Time-Table statements that follow, insert "was" before "initiated" or substitute "began."
17	JWT	"	Page 6-15	6.2.4.8	"SEWD and CSJWCD..."	Substitute "overlie" for "overly. Insert "subject to" between "and" and "historical"--"...dependent on groundwater and subject to historical overdraft..."
18	JWT	"	Page 6-16	6.2.4.8	"Project Status...Environmental review..."	For "implemented," substitute "done," or say that a review "may be required."
19	JWT	"	Page 6-17	6.2.4.8	"Circumstances for Implementation..."	Last line, insert hyphen between "as" and "needed"--"...on an as-needed basis..."
20	JWT	"	Page 6-17	6.2.5.1	"How Project...The contract is long-term..."	Correct punctuation: "The contract project is long-term; however, water availability..."
21	JWT	"	Page 6-18	6.2.5.1	"Circumstances for Implementation...As scenarios change..."	Add "the" between "with" and "landowner."

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
22	JWT	"	Page 6-19	6.2.5.3	"NSJWCD will control..."	Change "withdraw" to "withdrawal" and change the second "pumping" to "pumped"-- "NSJWCD will control the withdrawal of the banked water...and then conveying the pumped groundwater...."

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1	JWT	San Joaquin County Public Works	Page 4-16	Figure 4-3		Praise up front: Some of the graphics in this document are very good, and could serve as a model for others that are not so good. Figure 4-3 is sharp, and the colors and shapes can be adequately differentiated. It is worth bearing in mind that fairly or not, every unclear graphic is likely to be perceived as intentionally deceptive.
2	JWT	"	Page 1-4	Figure 1-3		Colors, especially in the legend, are hard to distinguish, and of course Woodbridge Irrigation District will need to be added back. Also, not every area has a corresponding number. Would broadening the color scale from blue/green help?
3	JWT	"	Page 1-11	Figure 1-4		Legend and logo are fuzzy. Sacrifice the second frame?
4	JWT	"	Page 1-12	Figure 1-5		Colors for East Contra Costa and Tracy subbasins are hard to differentiate, and Tracy and Cosumnes are too similar. I-5 symbol is fuzzy.
5	JWT	"	Page 1-14	Figure 1-7		County boundaries are not adequately distinguishable from other lines. Sacrifice the second f
6	JWT	"	Page 1-15	Figure 1-8		Fuzzy. Also, the colors make it hard to distinguish SDACs from DACs at this scale. Make it bigger if possible.
7	JWT	"	Page 1-16	Figure 1-9		Sacrifice the second frame to gain a little size? The map on the facing page doesn't have it. Here and afterward, favor a slightly larger map over a second frame for the figure.
8	JWT	"	Page 1-17	Figure 1-10		Numbers for roads and highways are fuzzy.
9	JWT	"	Page 1-18	Figure 1-11		Fuzzy. Also, Lakes and Waterways are too similar in color to Carnegie SVRA, even though the latter has a border.
10	JWT	"	Page 2-5	Figure 2-3		Highway symbols could be sharper. Landscape orientation is good.
11	JWT	"	Page 2-10	Figure 2-6		Really nice.
12	JWT	"	Page 2-11	Figure 2-7		Identify Bear Creek, as in Figure 1-5.
13	JWT	"	Page 2-14	Figure 2-8		Some colors are too similar for adjacent watersheds, and blue is always problematic if it is also used for Lakes and Waterways.
14	JWT	"	Page 2-15	Figure 2-9		Too small; it is very difficult to read city names. Given general layout issues on this and the following page, there probably isn't much that can be done about this.
15	JWT	"	Page 2-17	Figure 2-10		A bit fuzzy. Especially since there is room, show this with a landscape orientation.
16	JWT	"	Page 2-18	Figure 2-11		A lot of place and feature names on this map are virtually illegible, and the legend is too small. Figure 2-12 is only slightly better. Maybe nothing can be done about this.
17	JWT	"	Page 2-22	Figure 2-13		Fuzzy.
18	JWT	"	Page 2-25	Figure 2-16		The underlying grid distracts from the formations this figure is intended to show, which are hard to distinguish at best. Some colors in the legend are too similar--how is Valley Springs distinguished from Tulare? The letters on the color blocks are illegible, and they are important because they are referred to in the Table that follows. Road and highway designations on the map are fuzzy. Why is the word "Flood" floating on the right in Calaveras County?

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
19	JWT	"	Page 2-31	Figure 2-17		It looks like most of the map units shown in the legend are not features of this subbasin, so maybe this could be simplified by including only those that are. Letters on the color blocks are illegible. It is hard to tell where the Stockton Arch is. Part of the name of "Bear" on the right is missing. Would it be possible to lay the map unit colors and detail over a map with less fuzzy place-name detail and just major roads and water features?
20	JWT	"	Pages 2-35 to 2-37	Figures 2-20 to 2-22		Most of the detail in these cross-sections is completely illegible. Of course most readers will not care about the individual well identifiers, but if this information is important enough to include in the GSP (and it is referred to several times in the text—for example, some of these well identifiers apparently have asterisks), then it is important enough to be legible. Using the full page instead of allowing large margins might help a bit, as would putting each cross-section on its own page. Could the legends go underneath instead of beside the cross-sections?
21	JWT	"	Pages 2-40 to 2-41	Figures 2-23 and 2-24		Well depth colors are indistinguishable, and identifiers could be sharper. Bigger might be better. Landscape orientation would help.
22	JWT	"	Page 2-46	Figure 2-26		There is certainly room here for a landscape orientation, which has just been used for Figure 2-25.
23	JWT	"	Page 2-51	Figure 2-27		Should definitely be shown in landscape. There is room.
24	JWT	"	Page 2-52	Figure 2-28		Why no legend? Is everyone supposed to know what these symbols represent?
25	JWT	"	Page 2-54	Figure 2-31		Different chloride concentrations are impossible to distinguish. I'm working from a hard copy, and just to be sure that I wasn't quibbling about something that would be visible in a different medium, I downloaded this figure and expanded it to fill my desktop computer screen. I still can't tell the difference in concentrations. Don't use a graded color scale?
26	JWT	"	Page 2-55	Figure 2-32		See comments for Figure 2-31. There is room for landscape orientation for both these figures, but that alone won't solve the problem.
27	JWT	"	Page 2-60	Figure 2-34		This figure is remarkably legible, given the detail it has to convey. The legend is nice and sharp.
28	JWT	"	Pages 2-65 and 2-70	Figures 2-37 and 2-38		Use landscape orientation. Maybe we'll be lucky and they will end up on facing pages.
29	JWT	"	Page 2-68	Figure 2-39		Correct name of Swenson Gold Course well. It is Swenson Golf Course. Landscape?
30	JWT	"	Page 2-74	Figure 2-50		This figure is misleading in an important way. The subbasin has a large enough change in groundwater elevation that DWR has put us in the critical overdraft category, but all that shows here is a faintly wavy line at the top of the graph. A separate graph showing everything above 50 MAF at a different scale would more honestly illustrate the situation.
31	JWT	"	Page 2-75	Figure 2-51		In the legend, green and blue, and brown and pink, are too difficult to distinguish, although they work OK in the chart itself. Make the boxes bigger? Landscape orient this figure?
32	JWT	"	Pages 2-78 and 2-79	Figures 2-52 and 2-53		Landscape for both?
33	JWT	"	Page 2-81	Figure 2-54		Yellow hard to see, orange impossible, especially if it is in a city. Landscape?
34	JWT	"	Pages 2-83 through 2-86	Figures 2-55 through 2-58		Symbols for different levels of maximum TDS are indistinguishable. (Figure 2-58 is slightly sharper than the others.) Compare to Figure 4-3. Landscape?

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
35	JWT	"	Page 2-97	Figure 2-64		Road identifiers are REALLY fuzzy, and county names and other features are almost illegible. Numbers in the legend are fuzzy. Is this partly the result of merging the regular subbasin map with InSAR data?
36	JWT	"	Pages 2-98 and 2-99	Figures 2-65 and 2-66		Landscape?
37	JWT	"	Pages 2-101, 2-103, and 2-105	Figures 2-67, 2-68, and 2-69		Yellow is too hard to see. Figure 2-68 is also fuzzier than the other two.
38	JWT	"	Page 2-150	Figure 2-101		This figure warrants its own page, with larger boxes to make the colors in the legend distinguishable. Add labels on the right side of the graph above and below the middle line for Demand and Supply, and split the legend identifiers accordingly to help the reader match them to the colors on the graph.
39	JWT	"	Page 2-151	Figure 2-102		Again, the colors in the legend are hard to differentiate, although they work reasonably well in the graph itself.
40	JWT	"	Page 3-6	Figure 3-2		Colors for Select Unincorporated Communities and Cities are too hard to differentiate.
41	JWT	"	Pages 4-5 and 4-11	Figures 4-1 and 4-2		Fuzzy. Compare to Figure 4-3.

Eastern San Joaquin Subbasin GSP **Public Draft**
 Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	JWT	San Joaquin County Public Works	Page 2-32	Figure 2-18		In earlier comments, I suggested adding "Water" to the title between "Fresh" and "Elevation." If you do that, add "Water" in the legend also.

Memorandum



DATE: August 26, 2019

TO: Eastern San Joaquin Groundwater Authority (info@esjgroundwater.org)

SUBJECT: Groundwater Conditions and Management in the Eastern San Joaquin Subbasin/Comments on Groundwater Sustainability Plan Draft Chapters

Laura Foglia, Ph.D
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1. INTRODUCTION

The Eastern San Joaquin Groundwater Authority (ESJGA), which is a joint power authority, must complete a GSP by January 31, 2020 for the critically overdrafted Eastern San Joaquin Subbasin (ESJ Subbasin, or Subbasin). Larry Walker Associates was asked to review and provide comments on the draft Groundwater Sustainability Plan (GSP) by agricultural interests within the Subbasin. These agricultural interests wish to ensure that the GSP accurately reflects conditions within the Subbasin and effectively addresses overdraft conditions in compliance with the Sustainable Groundwater Management Act (SGMA). This memorandum provides initial comments on the analysis of the groundwater conditions and proposed management in the ESJ GSP, as described in publicly released draft chapters.¹

2. COMMENTS ON EASTERN SAN JOAQUIN GSP DRAFT CHAPTERS

Draft chapters of the ESJ Subbasin GSP were released in three Bundles in May and June 2019. The complete GSP draft was released for public comment on July 10th.

This memorandum provides comments on: (1) the Eastern San Joaquin Subbasin water budget; (2) the draft GSP's characterization of current groundwater conditions; and (3) opportunities for local recharge with surface water to address overdraft conditions.

¹ Available at: <http://www.esjgroundwater.org/>. Although the comment deadline is listed as August 25, 2019, Civil Code 12a extends the deadline to the following business day. We suggest setting future deadlines on business days to avoid confusion.

Topic 1. Eastern San Joaquin Subbasin Water Budget

Water budgets were developed for the draft GSP to provide a quantitative account of water entering and leaving the Subbasin. Water enters and leaves due to natural conditions, such as precipitation and streamflow, and/or through human activities, such as groundwater pumping or recharge from applied water. Interconnection between the groundwater system and river/streams accounts for other exchanges. Quantities presented for the water budget components of the Subbasin provide information on historical, current, and projected conditions as they relate to hydrology, water demand, water supply, land use, population, climate variability, groundwater and surface water interaction, and groundwater flow.

Water budget quantities presented in the GSP are based on simulation results from the Eastern San Joaquin Water Resources Model (ESJWRM). The ESJWRM simulates the major hydrologic processes that affect the land surface, stream, and groundwater systems in the Subbasin. The major hydrologic processes can be represented by separate water budgets which detail inflows and outflows occurring at the stream level, land surface level, and groundwater. Estimated water budgets are prepared for historical conditions, current conditions, and projected conditions scenarios. This examination focuses on the groundwater water budget.

The primary components of the groundwater system are:

- Inflows
 - Deep percolation from precipitation, applied water (surface water and groundwater) for agricultural lands, and applied water (surface water and groundwater) for outdoor use in the urban areas
 - Stream seepage (stream losses to groundwater)
 - Other recharge (including unlined canals/reservoir seepage, local tributaries seepage, and Managed Aquifer Recharge projects)
 - Subsurface inflow
- Outflows
 - Stream gain from the groundwater system
 - Groundwater pumping
 - Subsurface outflow
- Change in groundwater storage: This reflects average annual change in groundwater storage

The average annual water budget for the groundwater system as presented in the GSP is presented in **Table 1**. As shown, the historical groundwater budget has greater outflows than inflows, leading to an estimated average annual decrease in groundwater storage of approximately 41,000 AF/year, or roughly 5% of the total inflow for this period. This overdraft estimate represents a refinement over previous efforts, which formerly estimated levels of overdraft to be between 70,000 AF and 150,000 AF annually. The current conditions scenario estimates average annual inflows of 959,000 AF/year and average aquifer outflows of 1,007,000 AF/year, resulting in an average annual deficit in groundwater storage of 48,000 AF/year, or roughly 5% of the total inflow for this period. Under projected conditions, the groundwater system experiences an average of 939,000 AF/year of inflow each year, and total discharges of 973,000 AF/year, resulting in an annual deficit in groundwater storage of 34,000 AF/year, or roughly 4% of the total inflow for this period (GSP, Table 3-4).

Table 1. GSP Average Annual Water Budget – Groundwater System (AF/year)

Component	Historical Calibration (AF/year)	Current Conditions (AF/year)	Projected Conditions (AF/year)
<i>Hydrologic Period</i>	<i>Water Years 1996 – 2015</i>	<i>50-Year Period</i>	<i>50-Year Period</i>
Total Inflow	811,000	959,000	939,000
Total Outflow	852,000	1,007,000	973,000
Outflow due to Groundwater Pumping	692,000	851,000	801,000
Change in Groundwater Storage	41,000	48,000	34,000

As presented in the draft GSP, the groundwater water budget is approximately in balance. In all three scenarios, groundwater pumping represents the largest groundwater system outflow, representing 81%, 85%, and 82% of total outflow for the historical calibration, current conditions, and projected conditions, respectively. Groundwater pumping for all three scenarios is estimated by the ESJWRM based on the need for additional water to meet remaining demands after surface water deliveries occur. Differences in demand largely drive the amount of groundwater pumped, and sustainability cannot be met if the largest outflow of the water budget, groundwater pumping, is estimated solely based on consumptive use methodology as closure to the groundwater water balance. If this information is available, it should be used. A water budget should also be developed to address reasonably foreseeable drought conditions.

In contrast to the draft GSP’s analysis presenting the groundwater water budget as relatively in balance, the GSP also acknowledges the large groundwater depression in the central portion of the Subbasin (GSP Figures 3-37 and 3-38). Long-term trends from 10 wells distributed across the Subbasin with periods of record greater than 40 years show that groundwater elevations have declined over time throughout most of the Subbasin. The average groundwater decline was quantified as -0.5 ft/yr for the period 1996-2015. However, due to the fact that this analysis only includes two wells near the cone of depression, the investigation should be expanded to focus on additional wells located within the sphere of influence of the problem area. This is also true for the Vertical Gradient analysis provided in draft GSP Section 3.4.1.2.1, which lacks any wells located in the southern portion of the Subbasin (GSP Figure 3-39). Groundwater conditions in additional wells should be depicted in the GSP and monitored in order to track the occurrence of undesirable groundwater effects. Additional wells would also assist in tracking the benefits of recharge (discussed below).

The GSP presents analysis on interconnected surface water systems (GSP Section 3.4.6). This section includes figures showing the Subbasin’s losing and gaining streams (GSP Figure 3-65), as well as the interconnected and disconnected streams (Figure 3-66). Interconnected surface waters are surface water features that are hydraulically connected by a saturated zone to the groundwater system. GSP Figure 3-65 and 3-66 shows rivers at the center of the Subbasin as always losing and disconnected, demonstrating that the general trend is for groundwater not to be able to provide any baseflow to the rivers and with groundwater levels always declining.

Furthermore, draft GSP Figures 3-37 and 3-38 lack districts and landmarks, making it difficult to interpret the location and detail of the groundwater depression, including the overlying water

agencies. In addition, indicating groundwater levels below ground surface (BGS), rather than above mean sea level (MSL) would be helpful to better understand groundwater conditions.

Topic 2. GSP Unduly Minimizes Overdraft Conditions

The California Department of Water Resources (DWR) lists the ESJ Subbasin as critically overdrafted. As defined by SGMA, a critically overdrafted groundwater basin is “[a] basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts.”²

Groundwater levels in the ESJ Subbasin have been monitored since at least the 1950s. A drop of groundwater levels to deeper depths indicates groundwater depletion, while a rise of groundwater levels to shallower depths indicates groundwater recharge. Changes in groundwater levels can arise from seasonal variation and increased groundwater pumping during droughts.

Analysis provided by the Department of Water Resources (DWR) Groundwater Information Center Interactive Map Application³ (**Figure 1**) shows the change in groundwater elevation for three time periods (B: Spring 2004-2014, C: Fall 2006-2016, D: Spring 2008-2018; dark red represents 40 feet of decline, orange represents 20 feet of decline, green represents 10 feet of increase). As shown, during the period spring 2004-2014 (Map B) groundwater levels declined 20 feet in the south-central portion of the Subbasin, while during the period spring 2008-2018 (Map D), groundwater levels declined up to 40 feet in the southern portion of the Subbasin.

Changes for the period Fall 2006-2016 are increasingly pronounced throughout the Subbasin as fall is the lowest period for groundwater elevations due to lack of seasonal recharge, and increased reliance on pumping due to decreased surface water availability during the peak of the irrigation season. It is noted that groundwater elevation changes are impacted year to year by water year type and available surface water deliveries. Although the three time periods do not present a spatially consistent change in groundwater elevation (with the exception of the depression in the south-central portion of the Subbasin), they do depict the overall trend of a persistent decrease in groundwater elevation throughout the Subbasin. While these changes in groundwater elevation are measured by DWR, the GSP presents minimal historical modeled change in storage (GSP Figure 3-50).

² Available at: <https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins>

³ Available at: <https://gis.water.ca.gov/app/gicima/>

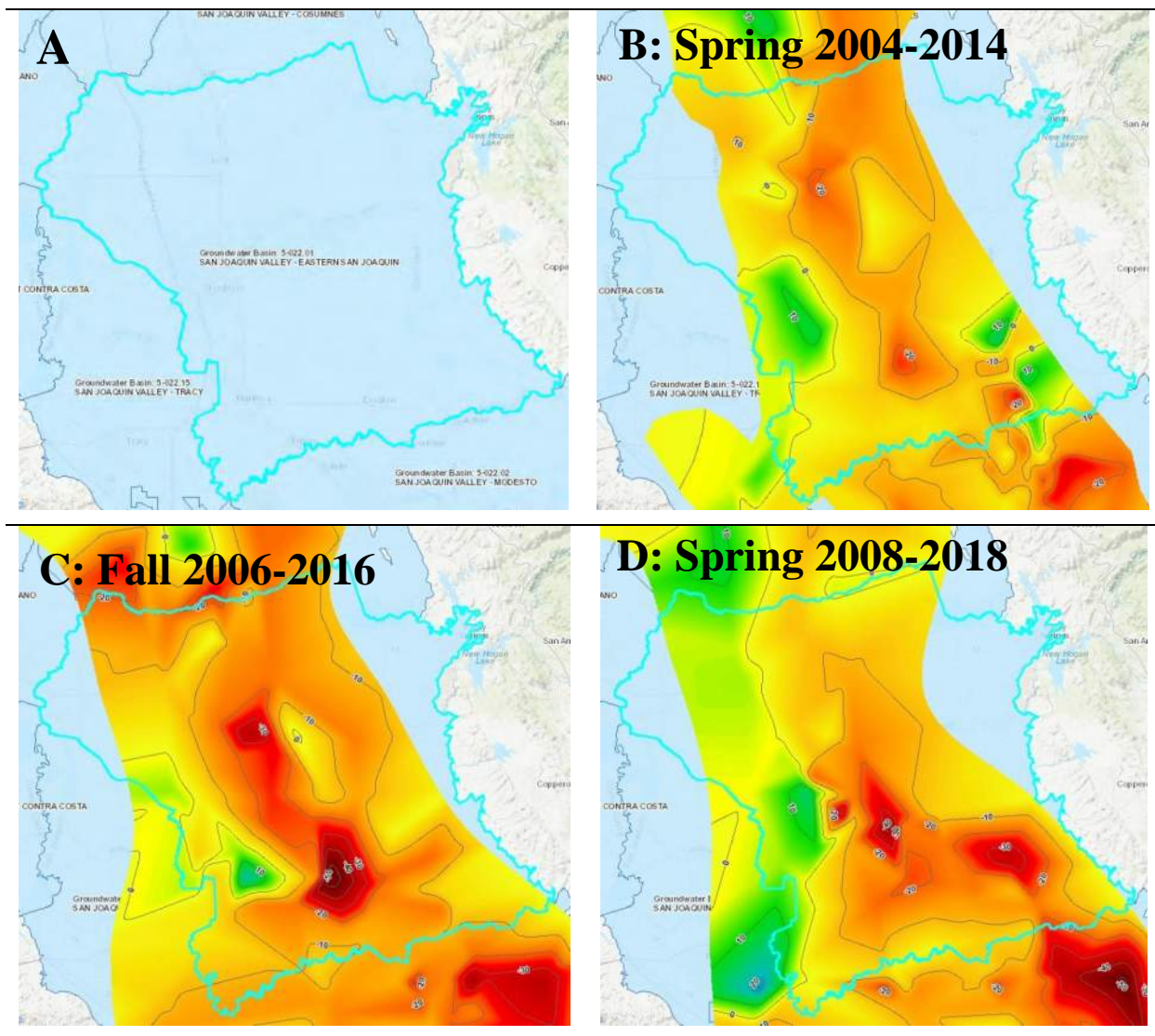


Figure 1. Change in Groundwater Elevation, Eastern San Joaquin Subbasin: Department of Water Resources Groundwater Information Center Interactive Map Application (A: ESJ Boundary; B: Change Spring 2004 – 2014; C: Change Fall 2006 – 2016; D: Change Spring 2008 – 2018)⁴

Draft ESJ GSP Figure 3-34 shows ten groundwater wells spread evenly through the basin. Overall most of the Subbasin shows a long-term decline in groundwater elevations, with an average decline of -0.5 ft/year during the period 1996-2015. Groundwater elevation maps from First Quarter and Fourth Quarter 2017 show a large cone of depression in the center of the basin, with a groundwater elevation deeper than 50 feet below mean sea level (Figures 3-37 and 3-38). The draft ESJ GSP unduly minimizes Subbasin challenges related to groundwater storage and overdraft. Three examples are provided below.

⁴ Dark red represents 40 feet of decline, orange represents 20 feet of decline, light green represents 10 feet of increase.

Section 3.4.2 states:

Figure 3-50 shows annual total storage for the combined ESJWRM fresh groundwater layers (not including the deep saline layer). Figure 3-51 shows the cumulative change in storage against annual storage change and water year type. In 2015, the total fresh groundwater storage was estimated as 53.0 MAF and the cumulative change in storage over 1995-2015 was estimated as -0.91 MAF (-0.09%), or -0.05 MAF/year.

Section 4.2.2.1.1 states the following:

Undesirable results related to groundwater storage in the Subbasin have not occurred historically, are not currently occurring, and are not likely to occur in the future. As discussed in the current and historical groundwater conditions section of this GSP (Section 3.4.2), there is a large volume (approximately 53 million acre-feet [MAF]) of freshwater in storage. Previous analysis of groundwater storage using the ESJWRM showed a range of fluctuation from 1996 to 2015 of approximately 0.001 percent per year.

Section 4.2.2.1.3 states:

Although the Subbasin has enough fresh groundwater in storage to sustain groundwater pumping in conditions of overdraft for centuries, dramatic increases in reliance on groundwater, severe drought, or other major changes in groundwater management over time could cause the volume of freshwater in groundwater storage to decline to a significant and unreasonable level.

Thus, while DWR has listed the ESJ Subbasin as critically overdrafted, the ESJ GSP appears to claim that the Subbasin has a nearly balanced water budget and there are minimal problems with groundwater overdraft.

The ESJ Draft GSP also quotes a series of different groundwater overdraft values, leading to unnecessary confusion regarding conditions in the Subbasin. The Annual Water Budget in Table 2-15 is averaged over the entire basin, with a change in groundwater storage of 41,000 AF/year (1996-2015), 48,000 AF/year (past 50 years) and 34,000 AF/year (future 50 years). However, under DWR's intermediate climate change scenario, the annual groundwater overdraft will increase to 57,000 AF/year, from the previous estimate of 34,000 AF/year. Without climate change, the GSP Executive Summary states that, to reach sustainability, the basin must offset and/or recharge approximately 78,000 AF/year:

This number is larger than the estimated annual overdraft of the projected conditions scenario due to the integrated nature of the groundwater subbasin. As efforts are made to reach sustainability in the Subbasin, flows to and from neighboring basins and flows to and from streams may be impacted, creating the need for additional recharge or pumping reduction greater than the overdrafted amount.

The ESJ Draft GSP should acknowledge the reality of climate change scenarios prescribed by DWR, and highlight the fact that the estimated groundwater pumping offsets and/or recharge of 78,000 AF/year is a conservative estimate that may in reality be closer to 101,000 AF/year (calculated by increasing the change in groundwater storage from 34,000 AF/year (projected conditions for 50-year period) to 57,000 AF/year (climate change scenario).

As explained below, projects that make additional surface water supplies available within the Subbasin would help address these overdraft conditions.

Topic 3. Local Groundwater Recharge Opportunities Should be Expanded

For groundwater recharge, additional surface water supplies can and should be used to offset groundwater pumping or should be directly discharged into the aquifer through groundwater banking. Water districts within the ESJ Subbasin, including the Oakdale Irrigation District (OID) and the South San Joaquin Irrigation District (SSJID) sell and/or transfer surplus surface water to water users outside the Subbasin. Since 2007, for instance, OID has reported that it sold surplus water and raised \$58 million (\$5.8 million per year) in revenue over the last ten years.⁵ SSJID has also transferred/sold a significant amount of water.

Selling surface water to water users within the Subbasin (rather than selling and transferring water out of the Subbasin) would reduce reliance on groundwater sources and encourage groundwater recharge and sustainability. Stanislaus County has conducted groundwater model scenarios investigating the impact of additional surface water deliveries on groundwater elevations. The Stanislaus County Hydrologic Model released a scenario where the Cities of Ceres and Turlock decreased groundwater pumping due to increased surface water delivery of 5,700 and 11,100 AFY, respectively. The scenario also assumes increased agricultural pumping. **Figure 2** compares two released scenarios: Scenario 2 – Reasonable Upper Bound Potential Demand Increase and Scenario 5 – Additional Surface Water Delivery.⁶ By replacing groundwater pumping with surface water delivery, the model found moderate groundwater recharge (shown by warm colors).

⁵ *Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation – Comment Letter 1000-1031*. Comment #62. July 2018.

⁶ Stanislaus County. 2017. *Stanislaus County Hydrologic Model: Development and Forecast Modeling*. Prepared by Mike Tietze. December 20, 2017. Available at: <http://www.stancounty.com/er/pdf/groundwater/draft-tech-memo-schm.pdf>

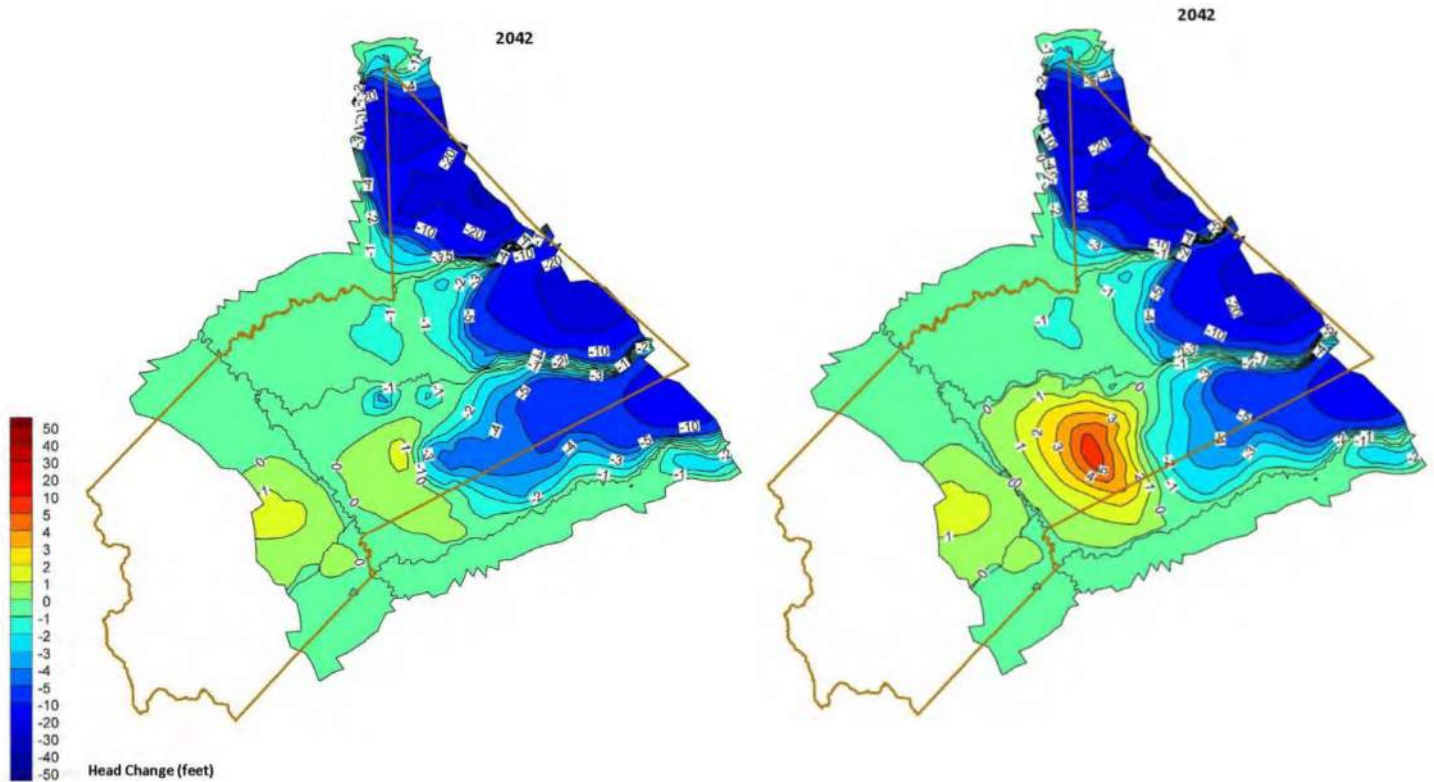


Figure 2. Head Change from the Stanislaus County Hydrologic Model - Scenario 2 (Increased Groundwater Pumping) (left) and Scenario 5 (Replace Groundwater with Surface Water) (right)

Chapter 6 of the ESJ Draft GSP lists 23 potential projects to offset the 78,000 AF/year groundwater overdraft, which include direct and in-lieu recharge, intra-basin water transfers, demand conservation, water recycling, and stormwater reuse. Project 8 proposes in-lieu recharge through long-term water transfers to the Stockton East Water District (SEWD) and Central San Joaquin Water Conservation District (CSJWCD) from OID and SSJID. SEWD and CSJWCD have historical groundwater overdraft conditions and water transfers from OID and SSJID could encourage groundwater recharge (GSP, pp. 6-15 to 6-17). Project 8 is projected to offset 45,000 AF/year in groundwater pumping, with a projected annual cost of \$9 million at \$200 per acre-foot. Due to historical water transfers from OID and SSJID to entities within the ESJ basin, existing infrastructure is adequate for Project 8 to move forward, as stated on pp. 6-16 of the Draft GSP:

Expected project time-table is 2019-2021. A new long-term transfer could begin immediately upon agreement among the parties. Transfers from OID/SSJID to SEWD/CSJWCD have historically been agreed to, with historical transfer amounts varying from 0 to 40,000 AF/year.

According to the 2015 OID Agricultural Water Management Plan (2015 AWMP), transfers from OID to areas outside the Subbasin totaled 325,294 acre-feet between 2005 and 2014 (2015 AWMP Table 5-9.).⁷ OID also reported that its surplus water sales since 2007 raised \$58 million

⁷ Available at: <https://www.oakdaleirrigation.com/2015-ag-water-management-plan>

(\$5.8 million per year) in revenue in the succeeding ten years⁸. These figures (which relate to only one water district) indicate that there is a greater potential for surface water transfers to recharge the overdrafted ESJ Subbasin than acknowledged in the draft GSP.

The ESJ GSP should expand Project 8 to include additional water transfers within the Subbasin for recharge. In addition, Project 8 should not be limited to transfers solely from OID and SSJID to the SEWD and CSJWCD service areas. Instead, all lands subject to declining groundwater levels (GSP Figures 3-37 and 3-38) and with at least Moderately Good recharge potential (GSP, Figure 2-14) should be included. For instance, lands within the Eastside GSA (a cooperative GSA formed by the Calaveras County Water District, Stanislaus County, Calaveras County, and Rock Creek Water District) also have some existing infrastructure to receive transferred water and, according to the draft GSP, these areas also include potential recharge areas (See GSP, Figure 2-14). In addition, if the rate for purchase of surface water was lower, additional purchases may occur voluntarily, potentially increasing recharge. With the expansion of Project 8, overdrafted conditions in the Subbasin would be more readily addressed. To the extent new infrastructure would be needed for an expansion of Project 8, additional Potential Project could be included in GSP section 6.2.5, and could include any necessary improvements to water distribution systems.

The GSP should also promote smaller recharge projects whereby water users may divert surplus surface water supplies for recharge on their own lands. This could be accomplished, for instance, by the creation of a program within the GSP that landowners could join if specified criteria are met. Creation of such a program would assist smaller recharge projects with completion of complex permitting and review requirements.

The efficacy of these projects in their potential to recharge the aquifer should be analyzed using a model scenario with the GSP Eastern San Joaquin Water Resources Model (ESJWRM).

3. CONCLUSION

We hope these comments are helpful in completing a draft GSP that effectively meets the requirements of SGMA. Please contact us if you have any questions.

⁸ *Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation – Comment Letter 1000-1031*. Comment #62. July 2018.

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Eastern San Joaquin Subbasin GSP **Public Draft**
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Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	David Simpson	NSJWCD	NA	NA	NA	Woodbridge ID and recharge projects within the District need to be included in the Final GSP.
2	David Simpson	NSJWCD	NA	NA	NA	The GSP should contain a statement of concern relating to SWRCB plans to reduce flows available for use by 40-60%. The GSP references climate change yet a far greater threat to sustainability in the basin is the reallocation of surface water flows currently being undertaken by the SWRCB. The Draft GSP assumes constant or increased availability of surface water yet the SWRCB has threatened to take 40-60% of the currently available flow in several key rivers. With reduced availability of surface water for existing uses and groundwater recharge, there is little to no hope of achieving groundwater sustainability without massive new infrastructure, draconian pumping restriction and increased regulation.
...						
3	David Simpson	NSJWCD	ES-10, others?	Potential Projects	NSJWCD and Manaserro	Lasko should be spelled Lakso Manaserro should be spelled Manassero

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RESTORETHEDELTA.ORG | (209) 475- 9550 | 925 N YOSEMITE ST, UNIT #3, STOCKTON, CA 95203

September 4, 2019

Eastern San Joaquin Groundwater Authority
1810 E. Hazelton Avenue
PO Box 1810
Stockton, CA 95201
info@esjgroundwater.org

Re: Comments Regarding the Eastern San Joaquin Draft Groundwater Sustainability Plan

To Whom It May Concern:

Restore the Delta works in the areas of public education and outreach so that all Californians recognize the Sacramento-San Joaquin Bay Delta as part of California's natural heritage, deserving of restoration.

We fight for a Delta with waters that are fishable, swimmable, drinkable, and farmable, able to support the health of the estuary, San Francisco Bay, and the ocean beyond. A coalition of California residents, business leaders, civic organizations, community groups, faith-based communities, union locals, farmers, fishermen, and environmentalists, Restore the Delta envisions the Sacramento-San Joaquin Delta as a place where a vibrant local economy, tourism, recreation, farming, wildlife, and fisheries thrive as a result of resident efforts to protect our waterway commons.

To that end, we are writing to offer comments regarding the Eastern San Joaquin Draft Groundwater Sustainability Plan. We acknowledge that we missed the comment deadline. This happened in part because we were busy completing a climate change analysis of the San Francisco Bay-Delta Estuary, which needed to be completed in order for us to offer thoughtful comments on the relationship between climate change impacts on the Delta and the Eastern San Joaquin Groundwater Basin. If our late comments cannot be accepted, can you please let us know how and where we can engage with the process again to share our findings? We believe you will find our findings worth of consideration and inclusion.

Climate Change Analysis

Restore the Delta observes in Table 2-17 (p. 2-133) of the Draft GSP Chapter 2 finds that in wet years groundwater storage is projected to increase by an annual average of 52 TAF; 23 TAF in above normal years; and decrease by 7 TAF in below normal years, 44 TAF in dry years, and 39 TAF in critically dry years. Overall, over the 50-year planning horizon of the Draft GSP, groundwater storage in the Subbasin is projected to decrease an average of 34 TAF. Over 50 years, this is a cumulative loss of stored freshwater of about 1.7 MAF. This is a much smaller amount than other groundwater sustainability agencies are contemplating elsewhere in California, but it still represents a cumulative loss to storage in our Subbasin. This is about 3.2 percent of the total subsurface freshwater storage of 53 MAF cited elsewhere in the Draft GSP.

Elsewhere, the Draft GSP states that “to achieve a net-zero change in groundwater storage over a 50-year planning period, approximately 78,000 AF/year of direct or in lieu groundwater recharge and/or reduction in agricultural and urban groundwater pumping would need to be implemented the Eastern San Joaquin Subbasin. This number is larger than the estimated annual overdraft of the projected conditions scenario due to the integrated nature of the groundwater sub basin.” (p. 2-134) If neighboring subbasins do less to recharge their underground supplies hypothetically it would mean that the GWA would have to do more, and vice-versa, to avoid undesirable results. Restore the Delta urges the GWA to recognize this interrelationship more explicitly and to adopt a policy of encouraging neighbors to do their fair share of net recharge (combining “additional recharge or pumping reduction”) activities as they implement their GSPs. We recommend also that the Final GSP incorporate reviews of what neighboring GSAs and their GSPs are contemplating in this regard so that readers of the GWA’s GSP understand what this “neighborhood baseline” consists of when it comes to assessing undesirable results indicators and evaluating the success or failure of neighbors’ implementation projects.

Restore the Delta is by and large disappointed with the Draft GSP’s climate change analysis. The Draft GSP provides no broad overview of what effects climate change is likely to have on Subbasin groundwater resources. There is not even a summary of the California Fourth Climate Change Assessment commentary on what effects are expected in California as we step-by-step enter that climate future. Instead, the Draft GSP presents only a turgid, technical description of its use of DWR climate-change models and the results of those models. This should have been limited to an appendix, and the results simply summarized in the Draft GSP. Instead, the modeling results are presented with little context. The state has presented a comprehensive, region-by-region analysis of climate change effects, and the Draft GSP needs to apply it—both to educate the Subbasin publics (including disadvantaged communities) and to place DWR-based climate change analytic results in context. As drafted, the climate change analysis has been done; GSA staff can check the box for providing a minimally adequate GSP to the state. The water users of the Subbasin deserve more, however. They deserve a Final GSP that tells them what the

analysis means for the future of Subbasin groundwater resources and communities, and how it plays out relative to each of the sustainability indicators the Draft GSP puts forward.

Draft GSP Sustainable Indicators/Policies

SGMA’s “undesirable results” include:

- chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon;
- significant and unreasonable reduction of groundwater storage;
- significant and unreasonable seawater intrusion;
- significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies;
- significant and unreasonable land subsidence that substantially interferes with surface land uses; and
- depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of surface water.

In our testimony to the State Water Board on California WaterFix in 2016, we noted there was a cone of depression in the central part of the Eastern San Joaquin groundwater basin and that salt water intrusion was a risk, especially if freshwater was withdrawn via diversions at the WaterFix north Delta intakes. This condition persists, according to the Draft GSP. We note from Figures 2-37 and 2-38 (pp. 2-65 and 2-66 of the Draft GSP) that as of 2017 the cone of depression is still very much present. This existing condition has undesirable results *now*. There are extensive losing stream reaches in the Eastern San Joaquin groundwater basin: Dry Creek along the north boundary, the Mokelumne River below Camanche Reservoir, and Calaveras River and Mormon Slough for nearly their full lengths across the basin. When compared with the groundwater elevation maps that show the cones of depression (Figures 2-37 and 2-38), it is evident that the cones of depression are located directly beneath the Calaveras River and Mormon Slough, which are losing streams—their flows are now disconnected from the groundwater system, as shown in Figure 2-66 (p. 2-99). There also appears to be a portion of a cone of depression beneath Dry Creek near to the Mokelumne River as well, though this is not labeled with the same color as the cone of depression in the Eastern San Joaquin basin. This means that there is great potential for saltwater intrusion, which the draft GSP gently acknowledges. Net subsurface flow is from the west to the east. But the draft GSP is silent about the ecological consequences of having losing streams spanning the groundwater basin. It means that to the extent these streams have riparian vegetation corridors along them, the trees and shrubs that comprise them are stressed, and to the extent stream reaches are devoid of riparian vegetation, river biota are starved of nutrients and shade.

Comments Regarding the Eastern San Joaquin Draft Groundwater Sustainability Plan

Restore the Delta considers such conditions to be undesirable results of existing conditions along the basin's most significant losing streams and should be an object of policy for restoration and recovery.

Disadvantaged communities (also known as “environmental justice communities” and “climate justice communities”) are located along the western edge of the Eastern San Joaquin groundwater basin—portions off the central and eastern Delta in the northeastern portion of the basin, the Stockton area, parts of Lodi and eastern Lodi, as well as the central basin (Figure 1-8, p. 1-15). This latter central basin DAC area directly coincides with the location of the losing stream reaches of Calaveras River and Mormon Slough, both of which overlie the cone of depression, which is caused by over-drafting of local aquifers largely by agricultural pumping activities. Disadvantaged communities are forced to live with existing disadvantaged streams—losing streams. The Draft GSP appears to do little to rectify these existing undesirable conditions—undesirable at least from the standpoint of the disadvantaged communities forced to live without healthy riverine ecosystems and recreational and angling beneficial uses of them in their midst.

The Draft GSP tracks the SGMA-defined “undesirable results” in its Sustainability Indicators (Section 3.2).

It defines an undesirable result of “chronic lowering of groundwater levels” as “experienced if sustained groundwater levels are too low to satisfy beneficial uses within the Subbasin over the planning and implementation horizon of this GSP.” Indicators of this undesirable result include number of wells “going dry,” reduction of pumping capacity of existing wells, increased pumping costs due to greater lift, and need for deeper well installations or lowering of pumps. The Draft GSP sets a threshold of 25 percent of representative monitoring wells (5 of 20 such wells in the Subbasin) have their elevations fall below their minimum level thresholds for two consecutive years that are non-dry (that is, below-normal, above-normal, or wet years). In other words, a SGMA-undesirable result would occur when groundwater levels fall for two consecutive years when there should be instead a net recharging of Subbasin aquifers during non-dry years.

This particular indicator lacks any recognition of the differential impact of falling groundwater elevations on disadvantaged communities relative to other groundwater pumpers like cities and agricultural enterprises. While the plan identifies disadvantaged communities (which we note above), it does not correlate explicitly the degree to which disadvantaged communities in the Subbasin are predominantly reliant on municipal/public or private water systems, or whether they are predominantly reliant on private wells. The Draft GSP provides no policies or program recommendations and needs that would address the question: if these conditions develop where disadvantaged residents lose their pumped groundwater supplies, what steps will the GWA take

to mitigate such events and recover the utility of their public/private systems or wells? The Draft GSP would, it appears, wait until impacts on disadvantaged and other communities occur before any actions to prevent such occurrences would be taken. For example, if one year of non-dry groundwater elevation decline results in 5 of the 20 monitoring wells happens, the Draft GSP would appear to require that the GWA wait a full year before any kind of action might be taken. Moreover, what actions should be taken if such dramatic events occur are not specified (pumping restrictions/moratoria? pump taxes to discourage excessive pumping? revolving loan funds for drilling deeper wells?).

The cost indicator is indeed relevant here. The Draft GSP recognizes just “increase in pumping costs due to greater lift” as an undesirable result relating to lowered groundwater elevations. The Draft GSP fails to provide any cost threshold beyond which point the GWA would presumably act on this triggered indicator. What level of cost increase is reasonable due to greater lift needs? Do public and private well systems need to be treated differently from a cost standpoint than single private wells? Will increased costs for wells operated by members of disadvantaged communities be treated the same or differently than other systems? Restore the Delta recommends that they should be treated differently so that ability to pay is taken into account. Just as important, what remedial action does the GWA commit to in order to stem impacts to disadvantaged community groundwater users when pumping costs rise? ***In short, whose groundwater pumping costs are going to be the GWA’s yardstick for determining undesirable results, and what actions will the GWA commit to in redressing undesirable results?***

For the lowering of groundwater elevation and reduction in groundwater storage indicators, the definitions in the Draft GSP are too vague about which beneficial uses have to be affected by the undesirable result. There needs to be more clear specification of undesirable results in relation to specific beneficial uses. If the GWA means “all beneficial uses” for these indicators, then state “all beneficial uses.” As worded, these indicators give the GWA license to pick favored beneficial uses over others. The cost issue just discussed is an example of this.

The matter of groundwater storage reduction presents different problems. The Draft GSP confidently states that “there is a large volume (approximately 53 million acre-feet [MAF] of freshwater in storage” in the Subbasin, and there appears to be very little fluctuation historically in this volume on a percentage basis. The Draft GSP states that “it is roughly estimated that groundwater demand for beneficial use occurs within the top 23 MAF of the Subbasin.” (p. 3-10) No geographic description of where this 23 MAF occurs is provided. The “threshold” for undesirable result in the Draft GSP on the storage indicator then becomes “when storage is insufficient to satisfy beneficial uses within the Subbasin. Therefore, undesirable results would occur if groundwater storage were reduced to less than 30 MAF.” (Ibid.)

Comments Regarding the Eastern San Joaquin Draft Groundwater Sustainability Plan

Here the Draft GSP fails to connect the already existing undesirable results noted above with this level of groundwater storage in the Subbasin (that is, the cone of depression with the presence of losing streams immediately overlying them, for example, and their occurrence immediately beneath and down-gradient of disadvantaged communities in the Subbasin). The Draft GSP takes current groundwater storage at 53 MAF as an acceptable baseline when it actually represents a storage level that is undesirable given existing surface and subsurface conditions. Restore the Delta urges the GWA to rethink, redefine, and redraft this particular indicator discussion so that existing undesirable conditions can experience recovery and restoration to sustainable conditions as the GSP planning and implementation horizon plays out.

We appreciate that the Draft GSP specifies beneficial uses to be addressed in its “degraded water quality” discussion (beginning p. 3-11). We recommend, however, that this indicator go beyond salinity to factor in any and all surface impaired water ways identified by the Central Valley Regional Water Quality Control Board and the State Water Resources Control Board, connected or disconnected from groundwater systems. This will ensure that no water quality or toxic constituent “falls through the cracks” between SGMA implementation and Clean Water Act enforcement. This will help GWA staff stay abreast of 303d affairs carried out by the water regulators, especially where losing streams or percolation and recharge areas may become contaminated.

The Draft GSP sets a threshold of 3 of 10 water quality monitoring well sites exceeding minimum thresholds for two consecutive years and where these concentrations are the result of groundwater management activities. We ask a similar question as above of the GWA: if a toxic plume suddenly spikes at three or more of the ten water quality monitoring wells, is the Draft GSP to be interpreted as meaning that the GWA would wait up to two years before taking any kind of action to protect public health and safety and address the contamination? Why does this indicator even have a time/duration threshold before enabling the GWA to identify, prevent, or mitigate an undesirable result? As with the cost discussion, what actions does the GWA commit to in order to stem the breaching of the minimum water quality thresholds it has put forward? Would it really allow saltwater intrusion, for example, to proceed for two years before acting to push back the isohaline toward the Delta? That would cost a lot more in water injections and scarce dollars, for example, than if authority for action contained in the Draft GSP allowed more prompt assessment and prevention of saltwater intrusion.

The remaining three indicators in the Draft GSP address sea water intrusion, land subsidence, and depletion of interconnected surface water. Restore the Delta feels that these three indicators in the Draft GSP would all benefit from similar critical review and treatment (including redefinition to include existing undesirable baseline conditions) that we have outlined above for the first three indicators; indeed, our specific comments on reconnecting losing streams to groundwater systems apply to Section 3.2.6 on depletion of interconnected surface water,

Comments Regarding the Eastern San Joaquin Draft Groundwater Sustainability Plan

including our comments about the relationships of disadvantaged communities to these natural hydrologic systems.

In closing, California Water and the City of Stockton Municipal Utility District depend, in part, on groundwater wells to provide safe and affordable drinking water supplies to residents of environmental justice communities within the City of Stockton. Residents from our environmental justice communities, made it clear during the recent California EPA Environmental Justice Initiative for Stockton, that they do not have confidence in our local drinking water supply due to issues of taste and discoloration. Furthermore, small urban businesses and farms which provide affordable local produce to residents living within Stockton's food deserts are also dependent on the health of our region's groundwater system and deserve to be protected from future impacts of saltwater intrusion and pollution plumes. We believe, consequently, that the GWA has a responsibility toward helping ensure that water quality and quantity is protected, and even improved, for the Subbasin, requiring further analysis of climate change impacts as described above.

Thank you for the opportunity to comment.

Sincerely yours,



Barbara Barrigan-Parrilla
Executive Director



Tim Strohane
Policy Analyst

Cc: Mayor Michael Tubbs, City of Stockton
Mel Lytle, City of Stockton
Gordon MacKay, City of Stockton
Supervisor Kathy Miller, San Joaquin County
Supervisor Chuck Winn, San Joaquin County
Supervisor Tom Patti, San Joaquin County
Supervisor Bob Elliott, San Joaquin County
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25 August 2019

Via email: info@esjgroundwater.org and ESJgroundwater@sjgov.org

Re: Eastern Joaquin Groundwater Sustainability Plan – Public Draft July 2019

The Sierra Club has adopted a water policy to promote proper management for a healthful and aesthetically pleasing natural environment. The policy calls for thorough water inventories including historic water yields and uses, with priority where substantial demands are anticipated. The Eastern San Joaquin (ESJ) Subbasin is a high priority basin which is critically overdrafted requiring that managers of the resource comprised of 15 Groundwater Sustainability Agencies (GSAs) develop a groundwater sustainability plan (GSP) by January 2020.

The Draft GSP was released in July 2019 and the Delta-Sierra Group has prepared generalized comments regarding the following topics:

1. Initial Notification of GSP Preparation
2. GSP Funding
3. Beneficial Users Outreach
4. Wells
5. Recharge Areas
6. Interconnected surface waters
7. Groundwater dependent Ecosystems
8. Water Quality
9. Data Management System
10. Monitoring
11. Modeling
12. Notice of Intent to Adopt GSP

Initial Notification of GSP Preparation

The 15 GSAs along with 2 now former Eastern San Joaquin GSAs agreed to develop one GSP for the Eastern San Joaquin Groundwater Subbasin. The basis for this cooperation is outlined in the Joint Powers Agreement¹ which established the Eastern San Joaquin Groundwater Authority (GWA) to oversee the GSP development. According to the Notice of GSP Plan Development submitted to DWR: “The agreement specifies that the 17 GSAs will coordinate via the GWA to develop and implement a single GSP.”²

The GSP must contain four main components:

1. A description of the plan area and groundwater basin setting (including an assessment of current and future groundwater conditions) and a water budget.
2. Sustainability goals which must avoid all six undesirable results
3. Projects and management actions that will achieve the community’s sustainability goal, and
4. A monitoring plan that will measure progress over time.

The Eastern San Joaquin groundwater basin is characterized as an alluvial basin because most all the underlying sediments were deposited by flowing water and that have been allowed to accumulate over a million years or more³. The area overlying the basin is located in three counties: San Joaquin, Calaveras, and Stanislaus. Most of the basin lies within San Joaquin County.

¹ https://www.sierraclub.org/sites/www.sierraclub.org/files/sce-authors/u14441/Fully%20Executed%20Eastern%20San%20Joaquin%20Groundwater%20Authority%20JPA_02082017.pdf. Fully authorized by signatories October 2017.

² <https://sgma.water.ca.gov/portal/gsp/init/preview/82> Accessed 8.24.19.

³ PAGE R.W., Geology of the Fresh Ground-Water Basin of the Central Valley, California, with Texture Maps and Sections REGIONAL AQUIFER-SYSTEM ANALYSIS; U.S. GEOLOGICAL SURVEY PROFESSIONAL PAPER 1401-C; 1986.

GSP Funding

To develop the GSP a contract was signed with Woodard & Curran for \$2,176,420 that is in effect through the submittal of final GSP to DWR in January 2020. To fund the contractual obligation there was a uniform distribution of the local share costs between the then 17 GSAs. The Disadvantaged Community Grant, supported by Sierra Club, reduced the local cost share associated with the \$1,500,000 Proposition 1 grant that was awarded to the GWA. Additionally, San Joaquin County Zone 2 Groundwater Investigation Assessment funds were distributed to 16 of the GSAs to further lower local cost shares to approximately \$28,000/GSA within San Joaquin County. There was a much more robust discussion about funding the development of the GSP than for implementing the GSP. Table 1 below provides a summary of the GSA's areas and composition, both factors with groundwater extraction volumes should be considered when determining GSP implementation contributions.

Table 1. GSA's Area and Primary Land Use

Groundwater Sustainability Agency	Area (Acres)	Primary Land Use
Central Delta Water Agency GSA	52,000	Agricultural
Central San Joaquin Water Conservation District GSA	73,000	Agricultural
City of Lodi GSA	8,710 ⁴	Urban 4,565 population density/mile ⁴
City of Manteca GSA	13,000	Urban 3,784 population density/mile ⁴
City of Stockton	39,000	Urban 4,730 population density/mile ⁴
Eastside San Joaquin GSA	126,000	Agricultural: Calaveras County Water District, Stanislaus County, and Rock Creek Water District (1,800 acres).
Linden County Water District	3,000	Urban 1,800 residents
Lockeford Community Services District	800	Urban 3,200 residents
North San Joaquin Water Conservation District GSA	149,000	Agricultural: Approximately 50% is irrigated land
Oakdale Irrigation District	31,000	Agricultural – supplier of surface water to Urban and Agricultural
County of San Joaquin GSA - Eastern San Joaquin 1	51,000	Agricultural with unincorporated community service districts
County of San Joaquin GSA - Eastern San Joaquin 2- Calwater	7,000	Urban – 42,000 connections – County MOA ⁵ with California Water Service, an investor owned utility
South Delta Water Agency GSA	18,000	Agricultural surface water users, groundwater unusable due to high salinity
South San Joaquin GSA	64,000	Agricultural and Urban: South San Joaquin Irrigation District distributes water for agricultural and urban users; City of Ripon 14,700 residents, and City of Escalon 7,400 residents.
Stockton East Water District GSA	101,000	Agricultural

In June 2019, an Ad Hoc Committee was established by the GWA to evaluate the role of the GWA going forward because many members believed that the JPA was only a coordinating agreement so that a

⁴ <https://www.census.gov/quickfacts/fact/table/mantecacitycalifornia,stocktoncitycalifornia,lodicitycalifornia/LND110210> data not included in the draft GSP.

⁵ https://www.sierraclub.org/sites/www.sierraclub.org/files/sce-authors/u14441/Cal%20Water%20MOA_A-17-146_06052017_0.pdf.

single plan could be prepared covering the entire Eastern San Joaquin Groundwater Subbasin rather than individual GSAs preparing their own plans.

The uncertainty related to ongoing governance exists in part because the Ad Hoc Committee was created especially so that Brown Act notifications to the public were not required. Whether or not coordination between the 15 GSAs continues during implementation will be in large part determined by what this Ad Hoc Committee reports to the GWA for their consideration. It is expected that this report will be made available either in September 2019 GWA agenda materials or at the September 2019 GWA meeting. In either case long after comments on the draft GSP are due in August 2019. The postponing of these important governance and funding discussions creates a situation of urgency which will likely preclude widespread public outreach and consideration of beneficial users' comments. The deficiencies related to individual GSA water budgets casts serious doubts about how funding allocations will be made so that basin-wide monitoring and implementation activities are accomplished. A frequent comment has been, why should we fund someone else's misuse and lack of planning when we have been funding efficiency improvements all along.

Beneficial Users Outreach

To satisfy the requirement to consider all beneficial users when developing the GSP, the Stakeholder Workgroup was formed in June 2018 to convey to the Groundwater Authority the perspectives of beneficial users in the basin. The approach to create a stakeholder committee for outreach to all beneficial user types was presented at the March 2018 GWA meeting. The presentation included the role of the Stakeholder Committee and the flow of information: staff Advisory Committee to Groundwater Authority Board then to Stakeholder Committee, and after the Groundwater Authority Board is "comfortable with everything, the topics will be ready for public presentations".

The goals of the Stakeholder Workgroup are outlined in the June 2018 *Draft Eastern San Joaquin Groundwater Authority Groundwater Sustainability Plan and Sustainable Groundwater Management Program Stakeholder Engagement and Public Outreach Plan*. The Workgroup may provide to the consulting team developing the GSP, input regarding the following groundwater-related issues:

- Annual work plans and reports (including mandatory 5-year milestone reports)
- Community outreach
- Development, adoption or amendment of the Groundwater Sustainability Plan
- Fee proposals
- General advisory
- Inter-basin coordination activities
- Local regulations to implement Sustainable Groundwater Management Act ("SGMA")
- Modeling scenarios
- Monitoring programs
- Projects and management actions to achieve sustainability
- Sustainability goals and objectives
- Confirmation of community values

Early on Stakeholder Workgroup members expressed frustration that specific technical information was not available for review in advance of meetings; that during meetings new information was made available on PowerPoint slides only; that meetings were rushed because there was an emphasis on presenting information rather than engaging in meaningful dialogue that could be communicated to the GWA. These issues and others are included in the results of the DWR Facilitation Grant situational assessment completed in December 2018. *The Eastern San Joaquin Groundwater Sustainability Work*

Group Stakeholder Assessment Highlights Report and *Highlights presentation*⁶ were available in December 2018 and satisfied the requirements of the Department of Water Resources (DWR) Public Outreach Facilitation Agreement signed in September 2017. Since the GWA did not meet in December 2018 or January 2019 a video⁷ was prepared for GWA review.

Frequently, information was requested by Workgroup Members so that meaningful comments could be prepared. These requests were:

- For more complete descriptions of management projects before final selection included in the GSP.
- For how responsibilities for funding the implementation of the GSP were to be allocated between the GSAs.

While Stakeholder Workgroup members were apprised of these two major aspects of the GSP, the members had too little detailed information to develop comments to convey their ideas to the GWA. Because information flow was limited, it is questionable about how robust engagement was during the GSP development.

Members expressed frustration that there were no demand management options to curtail continued development of the groundwater resource in areas where overdraft have been identified. Wells of any size can be drilled in San Joaquin County and Calaveras County with no requirement for metering to verify that permit application estimates of groundwater demand are valid. Stanislaus County, on the other hand has taken a discretionary approach so that new wells installed do not further impact aquifer overdrafted conditions. This discretionary approach as well as the ministerial approach to groundwater well permitting are currently under consideration by the California State Supreme Court Case No. S251709.

Many of the problems related to outreach that were discussed in 2018 continued and are in part summarized in a July 2019 letter submitted by multiple organizations including the League of Women Voters – San Joaquin County, the Delta-Sierra Group of the Sierra Club, Restore the Delta, Environmental Justice Coalition for Water, and Puentes⁸.

On August 12, 2019 the members of the Stakeholder Workgroup were notified that scheduling for the final 1.5-hour meeting was underway and would be held in September 2019 to discuss responses to comments received on the Draft GSP, and “conclude with a small thank you ceremony.” Likely, rather than a discussion, this meeting will include a presentation of a few comments or the GSP adoption process. This statement is based on the fact that the Stakeholder Workgroup was informed at the May 2019 that the June 2019 meeting was to include a discussion of Bundle 1 draft GSP comments and only a brief comment was made regarding one stakeholder group’s comments – the Nature Conservancy regarding groundwater dependent ecosystem identification. Instead of a discussion of comments there was an overview presentation of draft GSP Bundles 2 and 3.

Wells, Recharge Areas, Interconnected Surface Waters, and Groundwater Dependent Ecosystems

Wells

The GSP Wellhead protection areas and recharge areas Section 1.2.3.4, addresses wellhead protection programs in San Joaquin County, Calaveras County, and Stanislaus County. The discussion regarding wellhead protection areas seemed to be restricted to annular seals on wells which do prevent surficial contamination from entering the aquifer. No analysis was offered as to the variation of well construction

⁶ <https://www.sierraclub.org/sites/www.sierraclub.org/files/sce-authors/u14441/Eastern%20San%20Joaquin%20%20Groundwater%20Sustainability%20Work%20Group%20Stakeholder%20Assessment%20Highlights%20Report.pdf> and <https://www.sierraclub.org/sites/www.sierraclub.org/files/sce-authors/u14441/ESJ-Assessment-DRAFT.pdf>

⁷ <https://www.youtube.com/watch?v=JKIHfbvTmPs&t=178s> not distributed to GWA based on available public records.

⁸ <https://www.sierraclub.org/sites/www.sierraclub.org/files/sce-authors/u14441/Collective%20Comments%20on%20GSA%20outreach%20activities%20%20071719%20final.pdf>

standards and location requirements that might relate to wellhead protection areas. A brief summary of well construction standards and location requirements for the three counties is included in Table 2. With the exception of Stanislaus County, there are no restrictions on pumping or new well installations, of any size and depth due to the ministerial approach adopted by San Joaquin and Calaveras Counties. Continued issuance of well permits of any size occurs including in areas where cones of depression have been identified due to historic groundwater extraction exceeding groundwater recharge.

Despite the fact that GSAs are able require water management devices on non-de minimis water wells no metering of wells of any size was proposed in the draft GSP. De minimis wells produce less than two acre-feet per year for domestic purposes. Reporting of extraction volumes and meters on all wells not de minimis is required should the State Water Resource Control Board have to regulate a basin. There are several thousand or more wells that are not de minimis that extract groundwater within the Eastern San Joaquin Groundwater Subbasin. The Delta-Sierra Group recommends that the largest non-de minimis extraction wells be metered with an annual reporting requirement. Requiring the metering of the largest extraction wells is a good step towards validating the results of modeling based on acreage and crop types.

Table 2. County Regulation for Well Installation

San Joaquin County ⁹	Stanislaus County ¹⁰	Calaveras County
San Joaquin County Environmental Health Department oversees a well permitting program	Stanislaus County Department of Environmental Resources oversees a well permitting program	Calaveras County Environmental Health Department oversees a well permitting program
Setbacks for Public Water System Wells (Lots recorded after 1972): Property Line 25 ft (10 ft) Septic Tank 100 ft (50 ft) disposal 100 ft (100 ft) Sewer Line 50 ft (50 ft) Stream, Creek, 50 ft (50 ft) River, Canal	In 2014, the DER adopted a Groundwater Ordinance to prohibit unsustainable extraction of groundwater in unincorporated areas of the County. The DER reviews each Well Permit Application and determines whether the well is subject to, or exempt from, the prohibitions in the Groundwater Ordinance. Permit Applications for wells intended to extract 2 AF/year of groundwater or less are exempt from the prohibitions in the Groundwater Ordinance	Setbacks ¹¹ Property line <5 acres 10ft Property line >5 acres 50 ft Septic Tank 100ft Disposal 100ft Sewer Line 50 ft Surface Water 25 ft
The minimum depth of the annular seal for wells in San Joaquin County: Public Water Supplies 100 ft Individual Domestic Well 100 ft Industrial Wells 100 ft Agricultural Wells 50 ft	All wells shall have an annual seal except for Agricultural wells located 300 feet or more from a domestic well ¹² : Minimum seals as set forth in Chapter II of the Department of Water Resources Bulletin No. 74, "Water Well Standards" (February 1968), or as subsequently revised or supplemented, which are incorporated in this chapter and made a part of this chapter. (Prior code §3-313) ¹³ Community water supply 50 ft Industrial 50 ft Individual domestic 20 ft Agricultural well 20 ft	The minimum dept of the annular seal for wells in Calaveras County ¹⁴ : Public drinking water well 50 ft Commercial well 50 ft Industrial well 50 ft Individual domestic well 20 ft Agricultural well 20 ft Vertical geothermal exchange wells 20 ft Wells within twenty-five (25) feet of a water way 20 ft below the bed of the water way.

⁹ <https://www.sjgov.org/uploadedfiles/sjc/departments/ehd/forms/well%20standards.pdf>

¹⁰ <http://www.stancounty.com/er/pdf/application-packet.pdf>

¹¹ http://ema.calaverasgov.us/Portals/EMA/Documents/EH/Wells/Minimum_Well_Setbacks.pdf

¹² https://qcode.us/codes/stanislauscounty/view.php?version=beta&view=mobile&topic=9-9_36-9_36_070

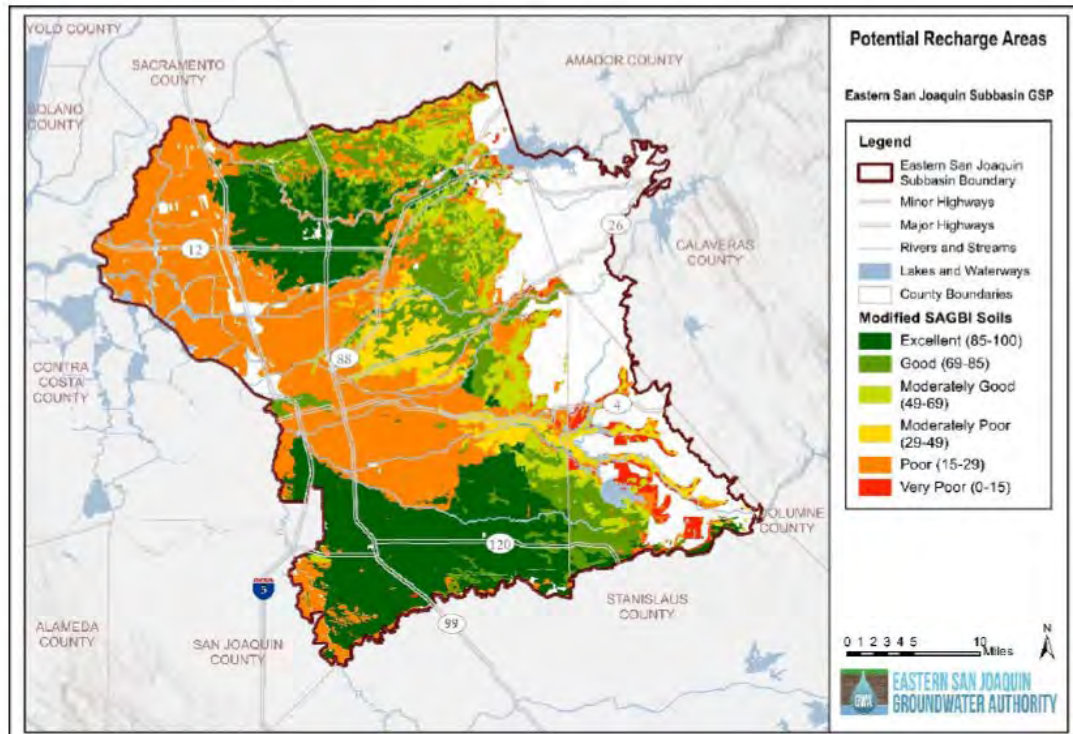
¹³ http://wdl.water.ca.gov/waterdatalibrary/docs/historic/Bulletins/Bulletin_74/Bulletin_74-90_1991.pdf

¹⁴ http://ema.calaverasgov.us/Portals/EMA/Documents/EH/Wells/Well_Ordinance.pdf

Recharge Areas

Groundwater recharge areas were not specifically addressed in GSP Section 1.2.3.4 but instead were discussed in 2.1.4.5.3: Description of Potential Recharge Areas. Modified SAGBI data was used to categorize 310,098 acres out of 610,890 acres (51 percent) of agricultural and grazing land within the Subbasin as moderately good, good, or excellent for groundwater recharge. The Modified SAGBI data show higher potential for recharge than unmodified SAGBI data because the modified data assume that the soils have been or will be ripped to a depth of 6 feet, which can break up fine grained materials at the surface to improve percolation. A generalized map was provided of potential recharge areas as shown below, but a map identifying existing recharge areas that substantially contribute to the replenishment of the groundwater basin was not found in the draft GSP.

Figure 2-14 Potential Recharge Areas



SGMA requires that a map identifying existing and potential recharge, and specifically identifying the existing recharge areas that substantially contribute to the replenishment of the groundwater basin. This map shall be provided to the appropriate local planning agencies so that appropriate protection measures may be considered for adoption. In order to enhance recharge opportunities, land use planning that restrict paving and build over in an important mechanism. Good land use policies are necessary components to achieve the sustainability goals for the basin; so that existing recharge can continue and that development of additional regional recharge areas can become part of local water resource and community development plans.

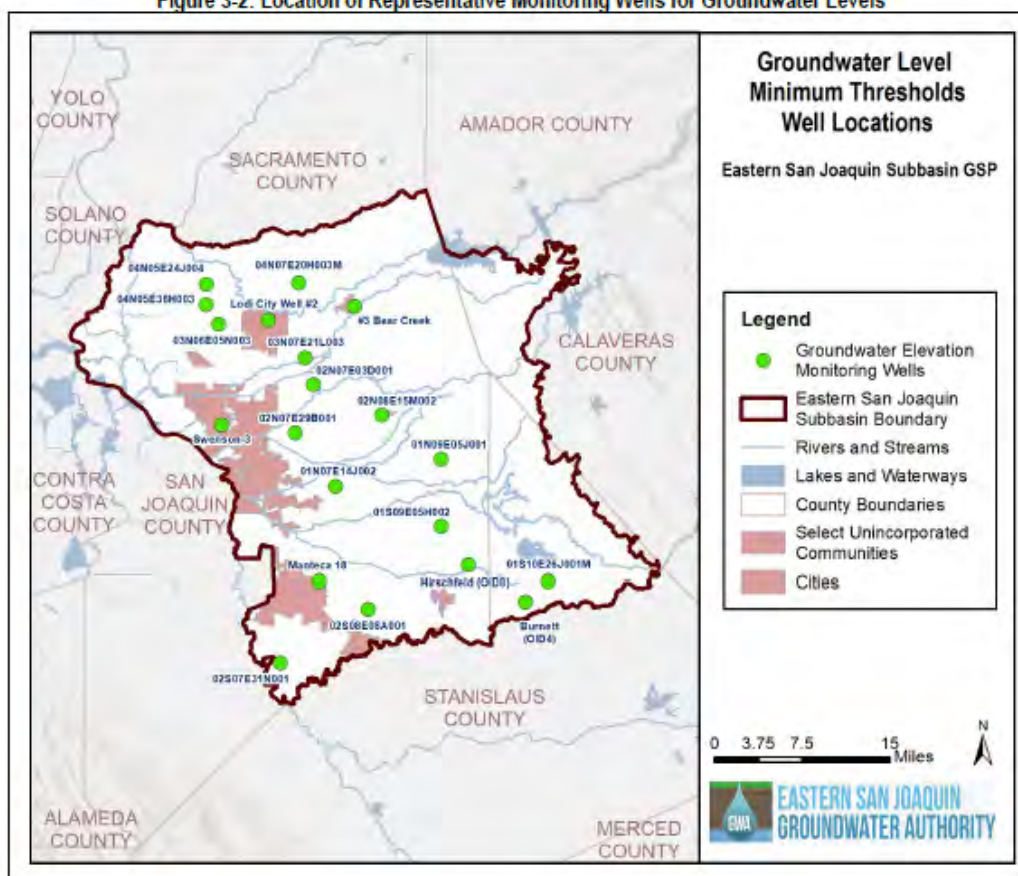
Interconnected Surface Waters

Depletion of interconnected surface waters is an undesirable effect and the minimum threshold is the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water. Surface water supplies are available to many beneficial users including those with water rights granted by the State Water Resources Control Board directly or based on historical rights and environmental users including wildlife with and without narrow temperature ranges, and recreational users. When wells of any size are allowed to be drilled as near as 25 feet to 50 feet of a surface water source, it is likely that those wells are influenced to a large degree by surface water flows and contribute to surface water depletions in most circumstances.

The GSP noted in section 3.2.6 Depletion of Interconnected Surface Water that “quantification of depletions is relatively challenging and requires significant data on both groundwater levels near streams and stage information supported by groundwater modeling.” Without restricting the installation of wells within areas of influence that intersect surface waterways, further depletion of interconnected surface waters will continue.

The draft GSP uses groundwater level minimum thresholds as a proxy for the depletion of interconnected surface water sustainability indicator. As such, the minimum thresholds for the interconnected surface water sustainability indicator are the same as the minimum thresholds for the chronic lowering of groundwater levels sustainability indicator. The use of the existing representative groundwater level monitoring wells is inadequate to assess whether or not surface waters are depleted by groundwater extraction wells near surface waterways. Figure 3-2 from the draft GSP shows the minimum threshold compliance well locations. Based on the scale of the legend the nearest well to a surface waterway is Bear Creek #3 which may be up to approximately 1 mile away from Bear Creek (0.5/2*3.75 miles) and operated by the Lockeford Community Services District which also operates wastewater infiltration ponds in the vicinity as shown in the snapshot from the 2007 Central Valley Regional Water Quality Control Board Waste Discharge Requirements¹⁵

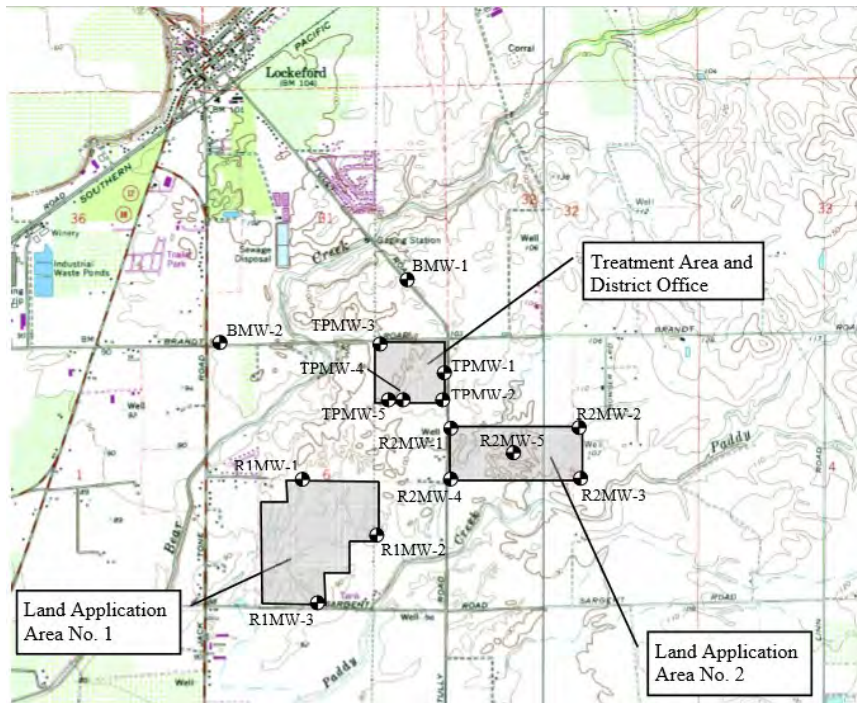
Figure 3-2: Location of Representative Monitoring Wells for Groundwater Levels



The CVRWQCB permitted the Lockeford Community Services District in 2007, a monthly average land application flow rate not to exceed 300,000 gallons per day, and upon approval of the Recycled Water Expansion Report by the Executive Officer, the monthly average flow rate may be increased to a maximum of 400,000 gallons per day. The location of Bear Creek #3 is not specified on the CVRWQCB map shown below.

¹⁵ https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/san_joaquin/r5-2007-0179.pdf accessed 8.25.19

Snapshot from CVRWCD WDR for Lockeford Community Services District



The draft GSP included Bear Creek #3 well construction details (780 feet total depth with screened intervals from ground surface to depth of 96 feet to -684 feet mean sea level [msl]), The well could possibly be influenced by land application recharge as well as nearby Bear Creek. The current groundwater level for Bear Creek #3 is -49.3 ft msl with an objective of -50.3 ft msl or approximately 150 feet below ground surface. The minimum threshold for groundwater lowering which is being proposed as a basis for assessing depletion of groundwater is -72.3 ft msl. The minimum threshold is the quantitative threshold for each sustainability indicator used to define the point at which undesirable results may begin to occur. Reduction of groundwater levels approximately 20 feet while possibly causing some domestic or agricultural wells to go dry is not adequate to determine that surface water depletions are or are not occurring. The use of groundwater level reductions is inadequate to assess interconnected surface water impacts.

Groundwater Dependent Ecosystems

Groundwater-dependent ecosystems (GDEs) are defined in the GSP regulations as “ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface.” SGMA requires the identification of GDEs but does not require that sustainable management criteria be established to manage these areas. GDEs exist where vegetation accesses shallow groundwater for survival; without the access to shallow groundwater, these plants would die. Thus, this Plan identifies GDEs within the Eastern San Joaquin Subbasin based on determining the areas where vegetation is dependent on groundwater as a reduced subset of potential GDEs identified in the Natural Communities Commonly Associated with Groundwater (NCCAG) database. The significant reduction of GDEs as compared to the NCCAG database was related to co-occurrence of surface water sources including irrigation canals. The Delta-Sierra Group objected in February 2019 to the disqualification of local ecosystems as GDEs if sources other than groundwater are available. Specifically, the criteria to not have other sources of water is defined as being at least 50 feet from irrigated land or 150 feet from either managed wetlands or from perennial surface water bodies. These water sources if not receiving water from groundwater will be discharging to groundwater. In either case freshwater species that are critical for ecosystem sustainability benefit: either the in-stream and riparian ecosystems or groundwater dependent ecosystems. The criteria used when removing GDE from the NCCAG database reduced the importance that these areas represent in the Subbasin. This reduction of designated GDE areas may

negatively affect future consideration and management actions and result in negative impacts to GDEs within the Eastern San Joaquin Subbasin. As no sustainable management criteria are required for GDEs, the Delta-Sierra Group recommends that a less restrictive method be used if reductions to the NCCAG are desired, and that the Nature Conservancy and California Department of Fish and Wildlife be consulted.

Water Quality, Data Management System, and Monitoring

Water Quality

The Eastern San Joaquin Subbasin groundwater quality is negatively impacted by contaminants not currently proposed for monitoring or inclusion in the Data Management System. Recent reports of a school using a contaminated well creates a reminder of the many contaminant plumes in the Subbasin including petroleum hydrocarbons, solvents, and emerging contaminants. Additionally, monitoring for nitrates in groundwater samples collected from monitoring wells and on-site domestic wells is now a requirement of the Irrigated Lands General Permit¹⁶ with results submitted in the State of California GeoTracker database. Nitrate contamination is a significant problem in agricultural areas related to the handling of wastes and applications of fertilizers.

Data Management System

An important part of the initial steps of implementation will be to have several workshops for beneficial users that are interested in accessing the database and creating reports or accessing pre-made report formats. Probably those staff that will be inputting data will also require training. Ideally, as work continues with the database, methods to incorporate contaminant data stored by the State of California in various databases can be explored. Another possibility is that GSAs exercise their powers and authorities to require that other groundwater management data be included in an expanded database. Fees could be charged of those with reportable results to submit to the database. The fees could offset time required by staff to input the data. Perhaps, San Joaquin Environmental Health could administer the database because they already have access to small water system monitoring data under permit. Those using groundwater and those making important planning decisions would benefit from a centralized location for groundwater quality.

Monitoring

Descriptions of monitoring frequencies need to be revised to consistently described the planned semi-annual monitoring. Staff involved with the California Statewide Groundwater Elevation Monitoring (CASGEM) well monitoring suggested that conditions could exist that more frequent monitoring may be necessary to capture valid seasonal fluctuations. Consideration should be given to the sampling of representative groundwater level compliance wells quarterly, a reduction of the DWR monthly monitoring suggestion. Semi-annual monitoring may miss transient changes in response to unseasonable conditions. Understanding these transient changes may help refine the conceptual model.

The monitoring protocols described in *The DWR Best Management Practices for the Sustainable Management of Groundwater Monitoring Protocols, Standards, and Sites* are used within the existing CASGEM program. The statement that “these protocols and existing resources will be used when possible in data monitoring and collection in support of this GSP” suggests that some wells being monitored by agencies not using these protocols may elect to continue to use their current protocol. A clear commitment that all representative groundwater wells will have well construction details and have data collected consistently using DWR’s best management practices.

Modeling

The Delta-Sierra Group began asking for model specifics in 2017 and submitted correspondence in June 2018 summarizing those requests followed up with November 2018 and January 2019 correspondence.

¹⁶ https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/lrp_wdrs_res_final_web.pdf accessed 8.25.19

Public information requests with the DWR and San Joaquin County Counsel resulted in the report being made available in March 2019, six months after the report publication date and one year after it was due to DWR. Efforts are still underway to understand the complexities of the model and evaluate baseline conditions parameters used for model validation. The August 2018 Model Report included a reference to an April 25, 2018 Eastern San Joaquin Water Resources Model IDC Workshop that was not noticed or advertised despite stakeholder collaboration being the first topic discussed. Going forward as the model is refined under contract, the Delta-Sierra Group suggests that model refinement include multiple opportunities for interested parties that are stakeholders to become more familiar with the model.

The sustainable conditions scenario for the water budget results in groundwater outflows almost equal to groundwater inflows with a basin sustainable yield estimated to be 715,000 AF/year \pm 10 percent. The water budget that was used to identify the 78,000 AF/year of offset needed to balance the groundwater budget over 50 years, is based on model results. This statement is confusing especially given the description of the model results under climate change, as it is unclear which number is being referred to:

This number is larger than the estimated annual overdraft of the projected conditions scenario due to the integrated nature of the groundwater subbasin.

Examples of offsets that could satisfy the groundwater deficit include direct or in lieu groundwater recharge and/or reduction in agricultural and urban groundwater pumping. Projects that reduce projected groundwater pumping and/or increase recharge will help the Subbasin reach sustainability.

Under the intermediate climate change scenario prescribed by DWR, the depletion in aquifer storage is expected to increase by about 68 percent to an average annual storage change of 57,000 AF/year, from 34,000 AF/year in the projected conditions scenario. If the 68 percent is applied to 78,000 AF/year, deficient an additional 53,000 AF/year will be needed and the planned projects projected to achieve sustainability included in the GSP will be insufficient.

Notice of Intent to Adopt GSP

Between 8.20.19 and 8.25.19, the esjgroundwater.org website was updated with the Notice of Intent to Adopted GSP. The website indicated that the Notice was posted on 8.16.19 and sent by mail and email. The Notice stated that no sooner than 90 days public hearings will be held to consider adoption of the GSP. The GSAs that were listed included Woodbridge Irrigation District which has withdrawn GSA standing with the Eastern San Joaquin Subbasin GWA and the Department of Water Resources. As of 8.25.19, the Notice of Intent to Adopt GSP was not forwarded to the ESJ interested parties list although interested parties were directed to the esjgroundwater.org website for meeting information and public hearing dates. The Notice of Intent to Adopt GSP did include email addresses of GSA representatives in addition to mailing addresses and FAX numbers.

Thank you for the 45 day comment period for the Eastern San Joaquin Groundwater Subbasin Draft Groundwater Sustainability Plan. If any questions arise regarding these comments, please contact me at mebeth@outlook.com.

Sincerely,



Mary Elizabeth M.S., R.E.H.S.
Delta-Sierra Group Conservation Chair
Sierra Club

Eastern San Joaquin Subbasin GSP **Public Draft**
 Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	BN	SSJGSA	1-1	1.1.1	The following figure (Figure 1-1) shows flagship reports from these efforts	Add Ag Water Mangement Plans and General Plans to the list.
2	BN	SSJGSA	1-3	1.1.4		Suggest mentioning that Lathrop signed on to the JPA then voluntarily withdrew citing the Basin Boundary modification approved by DWR.
3	BN	SSJGSA	1-3	1.1.4	California Water Service	Suggest referencing Memorandum of Agreemnt between Calwater and County
4	BN		1-3	1.1.4	WID	WID reinstatement as a GSA
5	BN	SSJGSA	All	Throughout		Replace GWA with ESJGWA
6	BN	SSJGSA	1-6	1.1.4.2	Decisions of the GWA...	Should also reference the JPA document posted to www.esjgroundwater.org
7	BN	SSJGSA	1-9	1.1.4.3	<u>South San Joaquin Irrigation District</u>	Escalon is contracted to receive treated surface water ffrom SSJID but has yet to install infrastructure to connect to the system.
8	BN	SSJGSA	1-9	1.1.4.4	The GWA's JPA ...	Sentaence should read: The ESJGWA's JPA calls out the following powers granted to GSA's by SGMA.
9	BN	SSJGSA	1-11	Figure 1-4		Include DWR Subbasin Basin Numbers for San Joaquin Basin and 5-22.01
10	BN	SSJGSA	1-12	Figure 1-5		Include DWR Subbasin Basin Numbers for San Joaquin Basin and all adjacent basins.
11	BN	SSJGSA	1-13	Figure 1-6		Sac Co. ans San Joaquin Co/ shades are too similar.
12	BN	SSJGSA	1-17	Figure 1-10		Call out USDA CropScape 2015 as Data source.
13	BN	SSJGSA	1-19 and 20	Figures 1-11 and 1-12		Call out DWR WDL as data source.
14	BN	SSJGSA	1-23	1.2.2.1.1		Might want to call out that the Board of Supervisors of San Joaquin County also act as the Board of Suerpvisors of the SJCFWCD. The SJCFWCD Public Works Department also staffs the SJCFWCD.
15	BN	SSJGSA	1-24	1.2.2.1.1		Technically, the SJCFWCD should be called out, not SJC.
16	BN	SSJGSA	1-25	1.2.2.1.5		Not a Technical Review Committee. Participants possessed technical expertise sch as staff and consultants represeting many of the GSAs forming the ESJGWA.
17	BN	SSJGSA	1-32	1.2.2.8	concrete linbed and replaced with	replace "PVC" with "buried"
18	BN	SSJGSA	1-35	1.2.3.1.8		Checking with Ripon on GP description
19	BN	SSJGSA	1-36	1.2.3.4.1		Confirm and insert that Municipal codes prohibit private supply wells.
20	BN	SSJGSA	1-39	1.2.4	Current opportunities to participate in plan...	The GP Update is complete so the opportunity to comment is actually through the discretionary approval process which includes CEQA, Planning Commission, appeals, etc.
21	BN	SSJGSA	1-40	1.3.1	Agricultural users and domestic well	Delete "of"
22	BN	SSJGSA	1-47	1.3.4.3	Keep interested list of stakeholders	Suggested Edit: and/or their preferred mode of communication
23	BN	SSJGSA	2-1	2.2.1.1	The California Statewide Groundwater Elevation Monitoring (CASGEM)	Consistency: SJCFWCD is the CASEGEM Entity and the SJCFWCD Public Work staffs the SJCFWCD which is a separate legal entity.
24	BN	SSJGSA	2-4 and 2-6	Figure 2-6		Suggest deleting figure 2-4 amd reference on page 2-4.

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25	BN	SSJGSA	2-13	Table 2-1		Suggest clarifying the numbers as the drainage area or sub-watershed area vs. watershed area. There may be some confusion as to watershed area vs sub-watershed area .
26	BN	SSJGSA	2-14	Figure 2-8		Same comment above.
27	BN	SSJGSA	2-16	2.1.4.3	The Farmington Groundwater Recharge/Seasonal Habitat Study	"MWD" should be "MWH"
28	BN	SSJGSA	2-64	2.2.1.2	Current groundwater elevation conditions	Suggest describing measurements as Spring and Fall rather than by quarter.
29	BN	SSJGSA	2-104	2.2.9		See attached spreadsheet of polygons that have been investigated by staff and determined to be non-GDE's. The attached spreadsheet lists the reason for the determination.
30	BN	SSJGSA	2-110	Table 2-12		See Table note 5: Reference error
31	BN	SSJGSA	2-115	2.3.4.3	As private groundwater pumping	Suggest referencing IDC in Model Report.
32	BN	SSJGSA	2-123	2.3.5.1	The Joint Powers Agreement (JPA) selected	Replace with "The ESJGWA selected"
33	BN	SSJGSA	2-123	2.3.5.1	When analyzing the water budget for the stream system	Rplace "...potential significant effects..." with "... a calculated increase..."
34	BN	SSJGSA	2-125	2.3.5.1	Additionally, a portion of the reduction seen in the overdraft estimate	Replace "...may be due to a shift to..." with "... are the result of converting from groundwater use to surface water supplies..."
35	BN	SSJGSA	2-126	Table 2-16	3 Agricultural demand is based on	Replace 2nd sentence in footnote 3 with : As agricultural land use continually evolves through changes in crop types and urbanization over the historical calibration, averaging of the resulting agricultural demand is less a function of water year type and rather dependent more on when in the simulation that year type fell.
36	BN	SSJGSA	2-126	Table 2-16	4 Urban demand evolves	Replace footnote 4 with: "Urban demands in the Historic Water Budget are reported values from cited sources. Averaging urban demands by year type may not explicitly depict urban growth patterns during the historical model period"
37	BN	SSJGSA	2-127	2.3.5.2	The current water budget quantifies inflows	Replace "basin" with "Subbasin"
38	BN	SSJGSA	2-128	2.3.5.2	Based on 2014 cropping patterns and	Ad to beginning of sentence: The analysis fixes the land use to current conditions and is based on...
39	BN	SSJGSA	2-128	2.3.5.2	The almost 2.4 MAF/year of	Replace "The almost" with "Approximately"
40	BN	SSJGSA	2-129	2.3.5.2	The current conditions scenario simulates	I'm not sure what this sentence means if you've defined the current condition as 2014 land use and 2015 population

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
41	BN	SSJGSA	2-130	2.3.5.4	Due to the expansion of urban area in all the major municipalities, agricultural acreage is reduced by less than 40,000 acres.	Replace two sentences with: An important assumption made in the project water balance analysis that due to projected urban growth, agricultural acreage is expected to decrease by approximately 40,000 acres. While there is agricultural growth anticipated in the eastern areas of the Subbasin and potential conversion of existing agricultural land to permanent irrigated crops, no reliable projections were available to include in the simulation; therefore, no additional agricultural land growth was added to the projected conditions scenario.
42	BN	SSJGSA	2-134	2.3.6	As efforts are made to reach sustainability in the Subbasin	Replace "be impacted" with "vary due to a number of proposed management actions resulting in increased groundwater levels...". Impacted only sounds negative.
43	BN	SSJGSA	2-134	2.3.7.1	Consistent with Section 354.18(d)(3) and	an analysis was performed for the Subbasin evaluating the projected water budget with and ...
44	BN	SSJGSA	3-4	3.2.1.2	Each of the three conditions scenarios	Delete "scenarios"
45	BN	SSJGSA	3-4	3.2.1.2	The GSP authors reviewed prior groundwater-related planning documents	Suggested re-write: Previously adopted groundwater-related planning documents were reviewed including the ... These documents provided a starting point for setting minimum thresholds.
46	BN	SSJGSA	3-4	3.2.1.2	The 2014 IRWMP indicates Fall 1992	The reference to Fall 1992 actually was developed as part of the 2007 IRWMP and was used as the basis for comparison in a subsequent Programmatic EIR..
47	BN	SSJGSA	3-5	3.2.1.2	The GWA Board determined that dewatering of domestic wells may be a potential undesirable result that could potentially be used to confirm the adequacy of the minimum threshold methodology.	Proposed re-write: The GWA Board determined that dewatering of domestic wells may be a potential is undesirable result that and could potentially be used to confirm the adequacy of the minimum threshold methodology.

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48	BN	SSJGSA	3-5	3.2.1.2	The 10th percentile domestic well depth (i.e., the depth of the top 10th percent most shallow well) was examined within a radius around the monitoring well representative of local conditions. A radius of 3 miles around the representative monitoring well was used in all cases except for well 03N07E21L003, where a 2-mile radius was used due to variations in local well depth due to proximity to the Mokelumne River. An average of 400 domestic wells were captured within a 3-mile radius of each representative monitoring well, covering approximately 76 percent of the domestic wells in the Subbasin.	Suggest replacing with: A radius of 3 miles around each representative monitoring well was used to identify the 10th percentile domestic well construction depth. For representative monitoring well 03N07E21L003, a 2-mile radius was used due to variations in groundwater levels due to its proximity to the Mokelumne River. The 3-mile radii (including the 2-mile radius of monitoring well 03N07E21L003) of each representative monitoring well, includes an average of 400 domestic wells each capturing approximately 76 percent of the domestic wells in the OSCWR dataset..
49	BN	SSJGSA	3-5	3.2.1.2	Domestic well data was retrieved from Online System for Well Completion Reports (OSCWR), and information on casing, screening, and age of well is not available in most locations. The 10th	Consider re-write: Domestic well data obtained from the OSCWR dataset is sparsely populated with information on total casing depth, screening intervals, and the age of the well. The 10th percentile well depth was chosen due to the uncertainty in the database and to account for domestic wells that may have been drilled to a very shallow depth prior to the current well drilling standards enforced by local jurisdictions and/or have reached the end of their lifecycle. The 10th percentile domestic well depth for groundwater levels is protective of 90 percent of the domestic wells in the OSCWR dataset and is used as the minimum threshold for
50	BN	SSJGSA	3-5	3.2.1.2		Consider adding the OSCWR domestic well depth dataset to the Appendix.
51	BN	SSJGSA	3-10	3.2.2.1.1	The undesirable result...	Delete: "The undesirable result related to reduction in groundwater storage is defined in SGMA as: Significant and unreasonable reduction in groundwater storage."

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
52	BN	SSJGSA	3-10	3.2.2.1.1	An undesirable result for reduction in groundwater storage in the Eastern San Joaquin Subbasin is experienced if sustained groundwater storage volumes are too low to satisfy beneficial uses within the Subbasin over the planning and implementation horizon of this GSP.	Consider replacing with "The ESJGWA has determined that an undesirable result for the reduction of groundwater storage is experienced if sustained groundwater storage volumes are too low to satisfy beneficial uses within the Subbasin over the planning and implementation horizon of this GSP."
53	BN	SSJGSA	3-10	3.2.2.1.2	It is roughly estimated that groundwater...	It is estimated that overlying pumpers have limited access equating to approximately the shallowest 23 MAF of groundwater storage in the Subbasin; therefore an undesirable result would occur if groundwater storage levels were depleted by 23 MAF.
54	BN	SSJGSA	3-10	3.2.2.1.3	Although the Subbasin has enough fresh groundwater in storage to sustain	Suggested edit: Depletion of 23 MAF within the SGMA panning horizon of 2040 is highly unlikely. There would need to be an event of a catastrophic nature or proonged and exgerated increases in the mining of groundwater, extreme and severe drought, or other major changes in groundwater management over time could to cause a depletion of groundwater storage to a significant and unreasonable level.
55	BN	SSJGSA	3-10	3.2.2.1.4	If groundwater levels were to reach	Suggest adding degredation of produced water quality from groundwaeer sources
56	BN	SSJGSA	3-11	3.2.2.2	As noted above, the amount of groundwater	Suggest replacing "... until storage reached 30 MAF..." with "...until storate was depleted by 23 MAF..."
57	BN	SSJGSA	3-12	3.2.3.1.1	GSA members and their affiliates	"cities" should be Cities and add SJCFWCDD
58	BN	SSJGSA	3-12	3.2.3.1.2		Give examples of groundwater or water management activities that causes groundwater quality degredation.
59	BN	SSJGSA	3-12	3.2.3.1.3		Suggest adding that increases in salinity only occurred in parts of the Subbasin
60	BN	SSJGSA	3-12	3.2.3.1.4	If groundwater quality were degraded resulting in undesirable results, the effect would potentially include	Replace first part of first sentence with: The potential effects of degraded groundwater quality would include:

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
61	BN	SSJGSA	3-12	3.2.3.2	The minimum threshold of 1,000 mg/L was	Suggested edits: A minimum threshold of 1,000 mg/L was selected based on stakeholder concerns for drinking water and agricultural beneficial uses. The minimum threshold selected by the GWA Board was also informed by stakeholder input. There was a meeting held in Fall 2018 with GSA representatives from San Joaquin County, City of Lodi, City of Manteca, City of Stockton, and Cal Water and an additional meeting with agribusiness members of the Stakeholder Workgroup.
62	BN	SSJGSA	3-17	3.2.5.1.4		Replace unrecoverable with irrecoverable
63	BN	SSJGSA	3-19	3.2.6.1.2		Proposed re-write: An undesirable result will have been deemed to occur if depletions resulted in an impact to a senior water right holder such as if the release of stored surface water occurred in higher frequency and volume to meet fish and wildlife requirements or a decrease in the amount of supply available for a senior water right holder including riparian diverters, or a potential reduction in acreage of groundwater dependent ecosystems.
64	BN	SSJGSA	4-1	4.	Whole Chapter	Replace "GWA" with "ESJGWA"
65	BN	SSJGSA	4-3	4.1.2	The 76 wells included in the broad monitoring network	Suggested edit: Of the 107 wells in the broad monitoring network, 76 wells included are wells used in CASGEM...
66	BN	SSJGSA	4-13	4.3.3		SiC also has a monitoring protocol and safety manual which could be referenced in the GSP and also update at a later date possibly to include data handling and database management..
67	BN	SSJGSA	4-15	4.7.3	Monitoring Frequency	Suggest reiterating the monitoring frequency for all well categories. Quarterly for representative wells for levels; semi-annually for broad network for levels, and both representative and broad network for water quality.
68	BN	SSJGSA	4-15	4.7.1	The DWR's USGS National Field Manual for the Collection of Water Quality Data...	Reference also Calaveras, Stanislaus and San Joaquin Counties applicable monitoring well drilling standards.
69	BN	SSJGSA	5-1	5.	Whole Chapter	Replace "GWA" with "ESJGWA"
70	BN	SSJGSA	5-8	Table 5-4		San Joaquin County should be San Joaquin County Flood Control and Water Conservation District
71	BN	SSJGSA	6-1	6.	Whole Chapter	Replace "GWA" with "ESJGWA"
72	BN	SSJGSA	6-31	6.2.6.5	SSJID currently operates a 3,800-acre pilot...	The project is called the Division 9 Project
73	BN	SSJGSA	6-35	Table 6-2		Table needs an update of upcoming Important Dates
74	BN	SSJGSA	7-1	7.	Whole Chapter	Replace "GWA" with "ESJGWA"
75	BN	SSJGSA	7-4	Table 7-2		Some costs appear low. Discussions are ongoing as to governance, costs, and accountability measures. Costs should be re-estimated higher to avoid sticker shock later during implementation.
76	BN	SSJGSA	7-6	7.4.1	Mokelumne River Loss Study Project	Suggest lumping the study in with Model Refinements in section 7.4.2. Also suggest study could be expanded to include other rivers.
77	BN	SSJGSA	7-12	7.9		GSP Implementation funding lacks specifics. The ESJGWA Board may wish to bolster and affirm the funding commitment in the resolution when adopting/affirming the GSP.

FID	Land Use Description Based on	Location	
0	School Sports Field	APN	224-490-11
1	Grazing Pasture	APN	200-140-36
2	Grazing Pasture	APN	200-140-18 and 200-14-05
3	Golf Course Drain	APN	200-130-04
4	Grazing Pasture	APN	206-110-08
5	French Camp Outlet Canal (SSJID Drain)	APN	241-310-32
6	French Camp Outlet Canal (SSJID Drain)	APN	241-310-32
7	School Sports Field	APN	224-490-11
8	Grazing Pasture	APN	218-060-14
9	Grazing Pasture	APN	218-060-04
10	Grazing Pasture	APN	218-060-03
11	Grazing Pasture	APN	218-060-10

		Location	
0	State Highway Intersection	NE Corner HWY 120 and Airport Way	
1	State Highway Intersection	NW Corner HWY 120 and Airport Way	
2	Golf Course	Riparian	Stanislaus River - Jack Tone Golf Course
3	State Highway Intersection	NE Corner HWY 120 and Union Road	
4	Willows	APN	257-300-07
5	Wastewater Plant	APN	241-310-58
6	Golf Course	Riparian	Stanislaus River - Jack Tone Golf Course
7	Wastewater Plant	APN	259-110-07
8	Golf Course	Riparian	Stanislaus River - Jack Tone Golf Course

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Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	Stockton East Water District	Stockton East Water District GSA	Page 1 - 27	Section 1.2.2.4	"Periodic subsidence reporting within the Eastern San Joaquin Subbasin is not known to occur.	This sentence does not make sense. Suggest revision to: "There has been no documented subsidence reported within the Eastern San Joaquin Subbasin."
2	Stockton East Water District	Stockton East Water District GSA	Page 1 - 36	Section 1.2.3.4.1`	"San Joaquin County has established water well standards. . ."	A more accurate statement would be "San Joaquin County has established water well standards <u>for new wells</u> that define property line setbacks . . . ETC." as these requirements apply only to new wells.
3	Stockton East Water District	Stockton East Water District GSA	Page 2 - 111	Section 2.3.4.1	"Streamflows entering the Subbasin are regulated releases from respective reservoirs."	This is not entirely accurate, streamflows entering the subbasin do induce regulated releases from respective reservoirs, but also include inflow from unregulated streams downstream of regulating reservoirs. This should be noted.
4	Stockton East Water District	Stockton East Water District GSA	Page 2 - 112	Section 2.3.4.1	<u>Riparian Diversions</u>	Stockton East Water District should be included in the list of districts with riparian diversions off major streams.
5	Stockton East Water District	Stockton East Water District GSA	Page 2 - 112	Section 2.3.4.1	"Data on private pumping was not available. . ."	Data on private pumping is available from Stockton East Water District, was provided to the consultant, and is more accurate than that calculated by the consumptive use methodology.
6	Stockton East Water District	Stockton East Water District GSA	Page 2 - 112	Section 2.3.4.2	<u>Calaveras River</u>	The cited stream flow data does not include inflow into the Calaveras River below New Hogan Dam, including Cosgrove Creek and others. Similarly, the data list does not include flow for other nonregulated reservoirs in the watershed.
7	Stockton East Water District	Stockton East Water District GSA	Page 2 - 113	Section 2.3.4.2	<u>Riparian</u>	Stockton East Water District should be included in the list of districts with riparian diversions off major streams.
8	Stockton East Water District	Stockton East Water District GSA	Page 2 - 113	Section 2.3.4.2	"As private groundwater pumping was estimated. . ."	Data on private pumping is available from Stockton East Water District, was provided to the consultant, and is more accurate than that calculated by the consumptive use methodology.
9	Stockton East Water District	Stockton East Water District GSA	Page 2 - 115	Section 2.3.4.3	<u>Riparian</u>	Stockton East Water District should be included in the list of districts with riparian diversions off major streams.
10	Stockton East Water District	Stockton East Water District GSA	Page 2 - 115	Section 2.3.4.3	"As private groundwater pumping was estimated. . ."	Data on private pumping is available from Stockton East Water District, was provided to the consultant, and is more accurate than that calculated by the consumptive use methodology.
11	Stockton East Water District	Stockton East Water District GSA	Page 6 - 9	Section 6.2.4.2	"This is an existing surface water right."	More accurately, these are existing surface water <u>entitlements</u> under contract.
12	Stockton East Water District	Stockton East Water District GSA	Page 6 - 13	Section 6.2.4.6	"However, individual applicants. . ."	Grammatical correction - the word "a" should be deleted before the word "streambed."
13	Stockton East Water District	Stockton East Water District GSA	Page 7 - 12	Section 7.9	"Prior to implementing. . ."	The sentence should be rewritten to state: "Prior to implementing any fee or assessment program, the GSAs would complete a rate assessment study or other analysis <u>if required by</u> consistent with the regulatory requirements."

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
14	Stockton East Water District	Stockton East Water District GSA	Page 7 - 12	Table 7-4		In the first and third boxes under "Certainty" the Proposition 218 process should be qualified with "if applicable."

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August 21, 2019

VIA EMAIL

Eastern San Joaquin Groundwater Authority
1810 E. Hazelton Avenue
P. O. Box 1810
Stockton, CA 95201
(info@esjgroundwater.org)

Re: Public Comments Concerning the Public Draft of the July 2019 Eastern San Joaquin Groundwater Subbasin Groundwater Sustainability Plan.

Dear Board Members,

My name is Martin Harris and I am an authorized representative for Terra Land Group, LLC (“TLG”).

In July 2019, the Eastern San Joaquin Groundwater Authority (“ESJGA”) released a Draft July 2019 Eastern San Joaquin Groundwater Subbasin Groundwater Sustainability Plan (“GSP”) for public review and comment. TLG reviewed the public comment submittal template as provided through the website, but we feel the scope of the project involved merits a longer response than the template provides for. Therefore, we are submitting this formal letter with enclosures attached to do justice to the full environmental impact report.

Section ES-1 of the GSP provides an introduction that details twenty-three potential projects and other actions being considered to meet the requirements of the California Sustainable Groundwater Management Act.

Section ES-7 details water budgeting related to projected groundwater pumping and offsets required to achieve sustainability.

Page 1-16 of the GSP states that *“crop type varies by region, with orchards and vine crops comprising the majority of agriculture in the Sub-basin...alfalfa and irrigated pasture were the next most dominant crop.”*

COMMENT: TLG believes that due to a growing number of economic and other environmental factors affecting the ability of farmers to profitably grow crops and operate dairies in the San Joaquin Valley, any water sustainability plan to be considered must take into consideration that many farmers are abandoning lower-priced crops like alfalfa and silage corn to seek higher-priced food crops that may be less tolerant to the salinity levels typical of recycled water (See Project 19/Manteca Recycled Water Project as described on pages 6-28 and 6-29 of the GSP)

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Page 1-31 of the GSP discusses the recharge benefits relating to *“canal seepage, generally considered a loss to Districts in the short term, has played and will continue to play a crucial role in the long-term sustainability of groundwater resources in the Eastern San Joaquin Sub-basin.”*

COMMENT: TLG agrees with this comment on page 1-31, but also believes that open canals currently being utilized in the sandy areas of the sub-basin must be properly managed and maintained to offset the potential effects of sedimentation and erosion.

Page 2-12 of the GSP states that *“the San Joaquin River is the principal drainage outlet of the Northern San Joaquin Valley, flowing northward on the west margin of the Eastern San Joaquin Sub-basin to its confluence with the Sacramento River in the San Joaquin-Sacramento Delta.”*

COMMENT: TLG believes that channel flow deficiencies and back-water effects in and along the South Delta need to be fully considered and mitigated as part of any GSP to be considered. (See Enclosures 1-18)

Page 2-134 of the GSP states: *“There are uncertainties associated with projections in the ESJWRM (Eastern San Joaquin Water Resources Model) scenarios due to the sequence of the hydrologic period, population projections, future cropping patterns, and irrigation practices and technologies, as well as uncertainties inherent in the representation of the physical groundwater and surface water system by the model.”*

Page 2-151 of the GSP states: *“The approach developed for this GSP is based on the methodology in DWR’s guidance document (DWR, 2018 b) and uses “best available information” related to climate changes in the Eastern San Joaquin Sub-basin. There are limitations and uncertainties associated with this analysis. One important limitation is that Cal Sim II does not fully simulate local surface water operations. Thus, the analysis conducted for this GSP may not fully reflect how surface and groundwater basin operations would respond to changes in water demand and availability caused by climate change.”*

COMMENT: The uncertainties as detailed on pages 2-134 and 2-151 of the GSP appear to be especially important when considering Section 6.2.6.6 of the GSP describes project #23 (SSJID Storm Water Reuse) which may find it difficult to drain any and all potential storm water drainage flows to be created along and through the South San Joaquin Irrigation District (“SSJID”) distribution system to the San Joaquin River via the French Camp Outlet Canal. (See page 6-32 of the GSP)

TLG also believes that SSJID drainage into the San Joaquin River may also prove problematic at other San Joaquin River outlet locations currently being considered.

Other GSP Projects to consider:

- (i) GSP Section 6.2.6.2 describes Project #19 (Recycled Water Transfer to Agriculture) (See GSP Pages 6-28 and 6-29); and
- (ii) GSP Section 6.2.6.5 describes Project #22 (Pressurization of SSJID Facilities) (See GSP pages 6-31 and 6-32)

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QUESTION: What drainage and backwater effects may be created in conjunction with GSP Projects #19, 22, and 23?

With a number of unresolved hydrology and other environmental issues that may significantly affect drainage in and along the South Delta, TLG presents the following additional comments for the project staff's consideration.

As you may be aware, the South Delta-Lower San Joaquin River Basin, including the areas south of Manteca and Lathrop, is a recognized floodplain. The area narrowly escaped the impacts of flooding when a levee breach occurred on February 20, 2017 in South Manteca on the San Joaquin River, thanks to the efforts of several quick-thinking farmers who risked their lives to repair it. The breach occurred when the river channel was flowing at approximately 40,000 cubic feet per second ("cfs"). This flow rate was well below the design capacity of 66,080 cfs that the San Joaquin River levees called for in the 2014 draft copy of the Lower San Joaquin and Delta South Regional Flood Management Plan. TLG believes this breach could be a warning sign of a more disastrous flood to come, and TLG has been urging local and state authorities to take action to protect the region before a more devastating flood occurs.

TLG believes there appears to be an unsustainable level of development growth and changes to land uses affecting the areas in and along the South Delta-Lower San Joaquin River Basin. TLG believes that this growth may create and/or increase flood risks to the urban and rural residents, businesses, and property owners located in the areas to be affected. As the area continues to grow, more residents and businesses will move in, creating more people and valuable property to be affected. The potential damages and impending liability will only increase over time.

TLG is not necessarily opposed to development growth, provided however, that the urban and urbanizing areas already approved or to be considered for development growth must fully identify, allow for, and provide for timely mitigation measures. These measures should fully offset any and all upstream and downstream flood water, storm water, waste water, potable and agricultural/irrigation water delivery, back water, and other hydrology-related short-term as well as long-range impacts that may be created.

TLG believes that this can only be accomplished by putting an end to the continuing delays and immediately performing a full and comprehensive environmental review. This should be performed in conjunction with an updated general plan and related environmental justice element that fully considers and mitigates for the growing storm water, waste water, potable water, irrigation water, transportation, and transit needs affecting the areas in and along the South Delta.

This review should also consider any and all development-related flood and other hydrology-related impacts as affected by the federally-approved Lower San Joaquin River Flood Management Project (100-year level of protection) in association with California Senate Bill No. 5 ("SB5") (200-year level of protection) requirements as well as any Stanislaus River Basin Drainage Plan (sponsored by the South San Joaquin Irrigation District and Oakdale Irrigation District Tri-Dam Project), or Ripon/South Manteca Stanislaus River Right Bank Levee Breach Flood Fight Action Plan to be considered.

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Over the last few years, TLG has presented hundreds of letters, documents, engineering and survey data, and other forms of evidence to the authorities involved to support our concerns. TLG has also attended dozens of council, commission, and board meetings and has spoken to various authorities both publicly and privately to seek answers regarding federal, state, and local involvement related to water management decisions and potential impacts to our community. These letters and documents are available on request. The enclosures attached to this letter explain our concerns in detail, linking them to evidence as presented in the previously-released environmental impact reports and feasibility studies. Please review the enclosures attached to understand the full potential for impacts involved.

In summary, TLG is concerned regarding the following points:

1. Backwater effects and changes to drainage patterns, in conjunction with anticipated 200-year flood protection improvements as affected by a San Joaquin River and/or Stanislaus River right bank levee breach, could have a devastating effect on the urbanizing and non-urbanizing areas in and along the South Delta/Lower San Joaquin River Basin. **(See Enclosures 1-15)**
2. The City of Manteca has been experiencing exponential development growth and urban expansion. Many of the involved projects appear to have been approved with no apparent meaningful consideration for their individual contribution to total cumulative drainage impacts. The accompanying changes to grade, land elevations, and drainage patterns may be creating irreversible impacts to the surrounding community, and could increase flood risk to those affected. **(See Enclosures 1-4 and 6-15)**
3. TLG believes that these continued project approvals (and associated impacts) directly conflict with the goals and policies stated in the Manteca General Plan 2023 (enacted on October 6, 2003) and fail to adequately address public risk due to recently-discovered San Joaquin River channel flow deficiencies in conjunction with unresolved sedimentation and climate change issues affecting the areas in and along the South Delta.
4. The Paradise Cut Expansion project, in the form presented in the “Conceptual Design Technical Memo/Paradise Cut Expansion Project/April 9, 2019,” may or may not prove adequate in offsetting the full range of development and other hydrology-related impacts that may be created. Also, TLG believes that the Paradise Cut Expansion Stage reductions called for between the Paradise Weir and the Airport Way (Vernalis Bridge) may not fully address the potential for additional drainage impacts to be created. **(See Enclosures 1-15)**

This is especially concerning when considering pages 4 and 5 of the Mossdale Tract Program: 2019 Annual Adequate Progress Report Update for Urban Level of Protection-Final Report (included as Attachment 2 to the 8/20/2019 MCC Meeting Agenda Item B.3), which states that, “the Urban Flood Risk Reduction Study remains incomplete and the Climate Adoption Policy is underway. As such, a new determination that the project meets the appropriate Standard of Protection will need to be made in conjunction with the 2020 Annual Report.”

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QUESTION: How will what appears to be a very real potential for unresolved and continuing sedimentation and climate change issues in and along the South Delta be considered and allowed for in the final Mossdale Tract Drainage Plan? (See Enclosures 1-15 & 18)

5. The San Joaquin River may be unable to handle any and all potential combinations of storm water or waste water flows that may be drained into or along the river channel.
6. With all of the various development and infrastructure projects being approved and considered by the different agencies in and around Manteca and the South Delta region, TLG is concerned that there is a lack of integration and cohesion between the agencies related to the projects. Without a single oversight agency in charge of the “big picture,” or all the hydraulic decisions being made, there may be a potential for the various projects to cause conflicting hydraulic effects and impacts to the upstream and downstream communities that may be affected. A list of forty-one such currently ongoing and planned projects can be found in **Enclosure 1**. (Also See Enclosures 2-15)

QUESTION: How can local, regional, state, and federal authorities work closer together to create an updated water plan that provides water deliveries at the local, regional, and state level while protecting the urban and rural areas along the South Delta from any increases to flood water, storm water, waste water, and other hydrology-related impacts that may be created?

7. Projects appear to continue to be approved by various agencies without the agencies fully understanding the total potential for flood water, storm water, and waste water impacts involved. Agencies, city councils, and districts appear to be more interested in supporting development and in avoiding liability than they are in safeguarding the residents and businesses that may be affected.

QUESTION: What effect will the Daniels Street extension have on stormwater drainage flows currently being drained in and along the French Camp Outlet Canal? (See the July 16, 2019 Manteca City Council meeting agenda item B.4. Also See Enclosure 3)

QUESTION: What effect will the proposed formation of the San Joaquin County Flood Control & Water Conservation District (“SJFCWCD”) Zone 9 Flood Conveyance and Levee Maintenance Benefit Assessment District (and related projects) have on changing drainage patterns and associated outfall locations currently existing and relied upon by the South San Joaquin Irrigation District and its members? (See July 18, 2019 SJAFCA meeting agenda item 5.1. Also See Enclosures 1-15)

8. The Manteca General Plan 2023 states several goals and policies which appear to indicate that Manteca is committed to protecting the community from flooding related to existing and projected development. (See Enclosure 1) It appears that both the cities of Manteca and Lathrop plan on redirecting storm water drainage and/or effluent wastewater flows along and through the urbanizing and non-urbanizing areas in and along the South Delta-Lower San Joaquin River Basin. However, no meaningful solution has been clearly presented to identify City of Manteca effluent waste water spray field discharge facilities

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to replace those to be abandoned due to planned construction of several new development projects.

QUESTION: What effect will filing and/or extending an Exclusive Negotiating Agreement for the Recycled Water Project have on sustaining total potable and irrigation water (ie. groundwater and surface water) volumes available to the urban and rural areas in and around Lathrop and Manteca? (See the July 16, 2019 Manteca City Council meeting agenda item B.8. (**See Enclosure 3**; Also within **Enclosure 1**, see its own Enclosure 4)

9. Further, TLG believes that the San Joaquin County (and other local community) general plan(s) have failed to meet the public safety and environmental impact disclosure and mitigation requirements as called for in California Senate Bill No. 1000 ("SB 1000") (environmental justice) and CEQA. San Joaquin County, as well as the various other non-federal sponsors involved, should be acting in a good-faith manner to fully identify and mitigate the potential for flood and other hydrology related impacts and health risks to the disadvantaged communities that may be affected.
10. The City of Manteca General Plan 2023 indicates that the French Camp Outlet Channel "is the limiting factor that sets the flow rates for drainage systems in the City of Manteca." TLG believes that due to SB5 200-year flood protection requirements, various flood drainage impacts and back-water effects may be created affecting the hydraulic capacity of the system. TLG also believes this may be particularly true for certain outfall locations that may be proposed in areas not currently protected by a 200-year flood protection levee. (**See Enclosure 1**)
11. The effect of 200-year flood protection and related potential for underestimating drainage and back water effects associated with the location of the Raymus Expressway as depicted in the proposed Land Use Map Alternatives "A" and "B" to be considered by the Manteca City Council in association with the Manteca City Council 7/30/2019 meeting agenda item C.1. (**See Enclosures 10 & 11**)

QUESTION: What short term and/or long range changes to flood water, storm water, waste water, potable and irrigation water delivery, and other hydrology related drainage and conveyance patterns may be irreversibly altered due to approval of the proposed Raymus Expressway roadway alignment as detailed in the 5/22/19 Manteca General Plan Land Use Alternative Maps "A" or "B"? (See 7/30/2019 Manteca City Council meeting agenda item C.1 (19-360) Attachments 1 and 2)

12. Undetermined back water and other potential drainage effects associated with the Upper Jones Tract (RD 2029) and Lower Jones Tract (RD 2038) consolidation. (**See Enclosures 12 & 13**)

QUESTION: Will drainage impacts in and along the South Delta be reduced or adversely affected due to any future improvements to be considered in association with the Upper Jones Tract (RD 2039)/Lower Jones Tract (RD 2038) consolidation?

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13. What appears to be a potential for system-wide ESJGA drainage modeling deficiencies and unmitigated impacts due to apparent ground surface grade and elevation level variations associated with the growing number of collaborative watershed and agricultural landscape easements being acquired on properties located in and along the South Delta. (**See Enclosure 19**)
14. Changing climate and increasing flood risks across the country. Levees are only one solution to flood control; they have their limits. (**See Enclosure 5**)

On August 5, 2019, the City of Manteca issued a Request for Proposal for Storm Drain Zones 36 & 39 Engineering, Environmental and Permitting (CIP 20004). ("Request for Proposal")

(i) Section 2.1 of the Request for Proposal states: *"With the exception of Drain #11 near the southern boundary of Zone 39, there are no regional drainage facilities in the study area."*

However, TLG believes that it is important to mention that a second drain (SSJID drain #10) exists with a location beginning at a point situated adjacent to Airport Way (just north of the Airport Way/Fig Avenue public roadway intersection); and extending in a direction approximately west to the City of Manteca Storm Drainage Zone 39 eastern boundary; and thence turning and continuing in a generally southern direction along the Zone 39 eastern boundary until meeting and connecting with SSJID Drain #11 near the southern boundary of the current City of Manteca city limits.

In addition, a growing number of South Manteca land owners and residents are starting to consider the potential for various changes in drainage patterns, flow volumes and other environmental effects that may significantly impact SSJID drains #10 and #11 as those drains merge together and continue through Drain #11 along the southern boundary of the City of Manteca and into Walthall Slough.

QUESTION: Are local authorities aware that SSJID Drain #11, in its present form, has deviated from a course that appears to be called for in **Enclosure 16**?

QUESTION: Will any and all flow impedances and back water effects be considered as part of any drainage analysis to be performed? (**See Enclosures 14 & 15**)

QUESTION: For what purpose are San Joaquin County land use and/or zoning reclassifications in and along the South Delta being considered? (**See Enclosure 17**)

(ii) In addition, the Request for Proposal does not appear to consider City of Manteca storm drainage Zone 34.

QUESTION: If the French Camp Outlet Canal (FCOC) is abandoned or no longer able to accept drainage flows from the developing areas of Zone 34, where will Zone 34 storm water be drained to? (**See Enclosures 14 & 15**)

QUESTION: What effect will any public facility/infrastructure rehabilitation or improvement projects in and along Little Johns Creek have on the continued

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operation of the FCOC as well as other upstream and downstream areas to be affected?

(iii) The Request for Proposal further states:

4.1 Drainage

Planning and design of storm water collection, conveyance, and storage systems are predicated on the following assumptions:

1. *Runoff is attenuated through detention basins prior to discharge to regional Facilities. Detention basins will be sized to store a 10-yr, 48-hr event. Detention basins will empty by gravity or pumps, over a 96-hr period. The bottom elevation of the detention basin will be a minimum of 2 ft above the groundwater elevation.*
2. *The high-water level in the storage system will be a minimum of 1 ft below the lowest grade elevation of the property served.*
3. *Minimum pipe diameter of storm drains will be 12-inches. Pipe velocities will range from 2.5 to 10.0 ft per second (ft/sec). Storm drains will have a minimum cover of 30-inches.*
4. *Manholes will be located at junction points, changes in alignment, and changes in pipe size. Manholes will be spaced every 300 ft for pipe diameters less than 21-inches and 500 ft for pipe diameters greater than 21-inches.*
5. *Detention basin pump stations will be designed to discharge the 10-yr, 48-hr storm volume from the basin during a period of not less than 96 hours. Pump stations will be equipped with a minimum of one standby unit. Pump stations will be designed with trash racks sediment dams.*
6. *Drainage channels will be designed to confine the peak 100-yr discharge with 2 ft of freeboard.*
7. *Water surface elevation (WSEL) in the San Joaquin River at the railroad bridge crossing near the OLWD storm drain outfall is: (a) 20.6 ft for 10-yr event; (b) 28.0 ft for 100-yr event; and (c) 29.0 ft for 200-yr event. All elevations reference NAVD88 datum.*

QUESTION: Are the effects of climate change and unresolved sedimentation issues along the South Delta being fully considered while making the assumption that the water surface elevation in the San Joaquin River at the railroad bridge crossing near the Oakwood Lake Water District storm drain outfall is: (a) 20.6 feet for a 10-year event; (b) 28.0 feet for a 100-year event; (c) 29.0 feet for a 200-year event. **(See Enclosures 1-15)**

QUESTION: In the event of a right bank San Joaquin River or Stanislaus River levee breach, how will flood waters be drained from the urbanizing and non-urbanizing areas south of Manteca?

QUESTION: When considering the magnitude of 100-year, 200-year, or other periodic levels of flood events that are expected to occur, isn't it likely that water elevations (NAV D88 datum) on the land side (east of the San Joaquin River in the areas south of Manteca) could exceed the 29'-0" elevation as forecasted in the Request for Proposal?

QUESTION: What facilities and other actions are planned to safeguard and protect our local urban and rural communities against the unplanned release of right bank San Joaquin

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River levee breach flood waters that historically accumulate and rise in height against the South Manteca portion of the RD 17 dryland cross levee?

In closing, TLG urges authorities and project team members involved to stop the delays and recommend and support a full and comprehensive environmental review in conjunction with any and all previously-approved and reasonably-foreseeable projects to determine the total cumulative drainage impacts and backwater effects. This should be done before approving or recommending any ESJGA Groundwater Sustainability Plan or related project to move forward that does not fully identify and mitigate any and all drainage and other impacts to be expected. (See Enclosures 1-19)

Thank you for your attention to this very important matter.

Respectfully,



Martin Harris
for Terra Land Group, LLC.

MH/cm

Enclosures:

Enclosures with hyperlinks can be accessed and downloaded via Dropbox.

1. 2019-07-08 letter from TLG to the Manteca Planning Commission
(https://www.dropbox.com/s/gb5m4idk7w968wr/2019-07-22_LTR_MPC_AgIts6.1.pdf?dl=0)
2. 2019-07-10 letter from TLG to the Tri-Valley San Joaquin Regional Rail Authority
(https://www.dropbox.com/s/av5zp60u1f2pyw7/2019-07-10_LTR_TVSVRRR_ValleyLink.pdf?dl=0)
3. 2019-07-15 letter from TLG to the Manteca City Council
(https://www.dropbox.com/s/6suvyxweqb8wo0i/2019-07-15_LTR_MCC_AgItsB.4.pdf?dl=0)
4. 2019-07-16 letter from TLG to the San Joaquin Area Flood Control Agency
(https://www.dropbox.com/s/rwumj9hlh8qfyws/2019-07-16_LTR_SJAFCA_AgIts5.1.pdf?dl=0)
5. 2019-07-19 Manteca Bulletin article "As flood risks increase across USA it's time to recognize limits of levees"
6. 2019-07-22 letter from TLG to the Central Valley Flood Protection Board
(https://www.dropbox.com/s/nzqls8yeelwxk6q/2019-07-22_LTR_CVFPB_AgIts5F.pdf?dl=0)

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7. 2019-07-08 letter from TLG to the San Joaquin County Local Agency Formation Commission
(https://www.dropbox.com/s/kt4dteou08jt7zp/2019-07-08_LTR_LAFCo_Aglt3.pdf?dl=0)
8. 2019-06-10 letter from TLG to the San Joaquin County Local Agency Formation Commission
(https://www.dropbox.com/s/mj03mzwpu3hb24g/2019-06-10_LTR_LAFCo_Aglts3-5.pdf?dl=0)
9. 2019-06-17 letter from TLG to the American Rivers and San Joaquin County Resource Conservation District
(https://www.dropbox.com/s/q24qx0vu98nokdr/2019-06-17_LTR_AmRivers_ParadiseCut.pdf?dl=0)
10. Attachments 1 and 2 from the 07-30-2019 Manteca City Council Special Meeting, agenda item C.1 (19-360)
11. 2019-07-29 letter from TLG to the Manteca City Council
(https://www.dropbox.com/s/w7cu83tzs7io9ll/2019-07-29_LTR_MCC_AglTc.1.pdf?dl=0)
12. 2018-09-10 letter from TLG to the San Joaquin County Local Agency Formation Commission
(https://www.dropbox.com/s/p43d2hsn9kbiow7/2018-09-10_LTR_LAFCo_AglT4.pdf?dl=0)
13. 2018-12-12 letter #2 from TLG to the San Joaquin County Local Agency Formation Commission
(https://www.dropbox.com/s/krkzs9w7vpwguo3/2018-12-12_LTR2_LAFCo_AglTpubComm.pdf?dl=0)
14. 2018-05-14 letter from TLG to Greg Showerman
(https://www.dropbox.com/s/8oao37q42u7u4e5/2018-05-14_LTR_GShowerman_TM2.2.pdf?dl=0)
15. 2018-11-28 letter from TLG to Greg Showerman
(https://www.dropbox.com/s/hftxivtlgfnupdw/2018-11-28_LTR_Showerman_Drainage.pdf?dl=0)
16. South Manteca assessor's map showing Dredger Cut
17. San Joaquin County Zone Classification application No. PA-1700172 of San Joaquin County: December 7, 2017 Notice of Public Hearing--Item Rescheduled, documentation and supporting maps
18. 08-14-2019 Reservoir storage and release data (as published by the CA Department of Water Resources on the California Data Exchange Center website)
19. American Rivers/CDFW property easement at the Kisst Dairy property as included on the San Joaquin County Habitat Conservation and Open Space Plan (included as Agenda Item 4Q in the August 22, 2019 Joint Meeting of the Board of Directors for the San Joaquin Council of Governments and SJCOG Inc.)

cc:

San Joaquin Flood Control and Water Conservation District, % Fritz Buchman

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San Joaquin Area Flood Control Agency, Attn: Marlo Duncan, Project Manager
Manteca City Council, % Lisa Blackmon, City Clerk
City of Manteca Community Development Director, Greg Showerman
Central Valley Flood Protection Board, Attn: Ryan Jones
Central Valley Flood Protection Board, Attn: Leslie Gallagher, Executive Officer
South San Joaquin Irrigation District Board of Directors, % Danielle Barney, Executive Secretary/Clerk of the Board
San Joaquin Council of Governments, % Diane Nguyen
San Joaquin Local Agency Formation Commission, Attn: James Glaser
South San Joaquin Groundwater Sustainability Agency, % Danielle Barney
Reclamation District No. 17, % Nomellini, Grilli & McDaniel PLC
Reclamation District No. 2075, Attn: Pam Forbus
Reclamation District No. 2094, Attn: Pam Forbus
Tri-Dam Project Board of Directors
Eric Thorburn, Oakdale Irrigation District, Water Operations Manager / District Engineer
American Rivers, Attn: Aysha Massell, Associate Director
Lathrop City Council, % Teresa Vargas, City Clerk
Diane Lazard, City of Lathrop
Michael Mierzwa, Lead Flood Management Planner, California Department of Water Resources
Jon Ericson, Hydrology and Flood Operations Officer, California Department of Water Resources
California Department of Water Resources, Attn: Mary Jimenez

Enclosure 5

2019-07-19 Manteca Bulletin article "As flood risks increase across USA it's time to recognize limits of levees"

As flood risks increase across USA it's time to recognize limits of levees

P E R S P E C T I V E

New Orleans averted disaster this month when tropical storm Barry delivered less rain in the Crescent City than forecasters originally feared. But Barry's slog through Louisiana, Arkansas, Tennessee and Missouri is just the latest event in a year that has tested levees across the central U.S.

Many U.S. cities rely on levees for protection from floods. There are more than 100,000 miles of levees nationwide, in all 50 states and one of every five counties. Most of them seriously need repair: Levees received a D on the American Society of Civil Engineers' 2018 national infrastructure report card.

Levees shield farms and towns from flooding, but they also create risk. When rivers rise, they can't naturally spread out in the floodplain as they did in the pre-flood control era. Instead, they flow harder and faster and send more water downstream.

And climate models show that flood risks are increasing. During this year's unusually wet winter and spring, dozens of levees on the Missouri, Mississippi and Arkansas rivers were overtopped or breached by floodwaters. Across the central U.S., rivers are becoming increasingly hard to control.

Remaking the Missouri In my book, "A River in the City of Fountains," I describe the complexities of flood control in Kansas City, which sits at the junction of the Missouri and Kansas rivers.

The Missouri, the larger of these two, is America's longest river, rising in Montana's Rocky Mountains and flowing east and south for 2,341 miles until it joins the Mississippi River north of St. Louis. Historically it was wide and shallow, full of sand bars and snags that created challenges for steamboats.

In the late 19th and early 20th centuries, Kansas City business leaders began lobbying for federal navigation subsidies to counter the influence of the railroads. Until the river could be narrowed and deepened, navigation was unreliable. And without levees, industry in the floodplain was at risk.

Major floods inundated Kansas City in 1903, 1908, 1943 and 1951, leaving thousands homeless and causing heavy economic damage. These disasters

in damages, showed the limitations of this strategy. Floodwaters rose to unprecedented levels, eventually breaching or overtopping more than 1,000 levees.

After the waters ebbed, federal and state officials paid to move some homes and communities off floodplains to higher ground. However, this trend quickly reversed. By 2008, Missouri had authorized more than \$2 billion of new development in zones that were flooded in 1993.

Many Kansas City residents still believe that higher, stronger levees will hold back future floods, and Congress has authorized millions of dollars to build them. But experienced engineers like retired Army Brigadier General Gerald Galloway, who coauthored a federal government assessment of the 1993 floods, warn that "there's no such thing as absolute protection."

For their part, many scientists and engineers have found that levees can exacerbate floods by pushing river waters to new heights. One 2018 study estimated that about 75% of increases in the magnitude of 100-year floods on the lower Mississippi River over the past 500 years could be attributed to river engineering.

What about commercial benefits from channeling rivers? Kansas City is still an economic hub, but railroads and highways have been more important than barges. The Missouri carries only a fraction of the tonnage shipped on other navigable rivers, such as the Mississippi, even though its channel has been expensively built and maintained for over 100 years.

Rethinking river control Levees also constrain cities' relationships with rivers, walling off any connections for purposes other than commerce. Author William Least Heat-Moon captured this paradox when he traveled across the U.S. by boat in the late 1990s and observed that "Kansas City, born of the Missouri, has turned away from its great genetrix more than almost any other river city in America."

More recently, however, Kansas City has begun to remember its interest and love for the Missouri. Riverside development and public spaces are fostering new physical and cultural interfaces with the river.

convinced civic leaders that more than piecemeal navigation and flood control projects along the lower Missouri were needed.

In 1944 they got their wish when Congress passed the Flood Control Act, which authorized construction of dozens of dams nationwide. One section of the bill, the Missouri Basin Plan, sought to convert the entire Missouri into what historian Donald Worster calls an “ornate hydraulic regime,” with five upstream dams for hydroelectric power, irrigation and recreation, as well as levees and a navigable barge channel from Sioux City to St. Louis.

Over the next decade engineers built levees and straightened and dredged the river channel. Upstream dams curbed the Missouri’s spring rise. In August 1955, Life Magazine reported that “U.S. engineers have finally clinched their victory over the rampaging Missouri River. Flood control ... is already bringing prosperity to the valley it drains.”

The limits of levees Today Kansas City and many other U.S. river towns are fortified behind levees and floodwalls, but faith in the idea of engineered flood control is starting to erode.

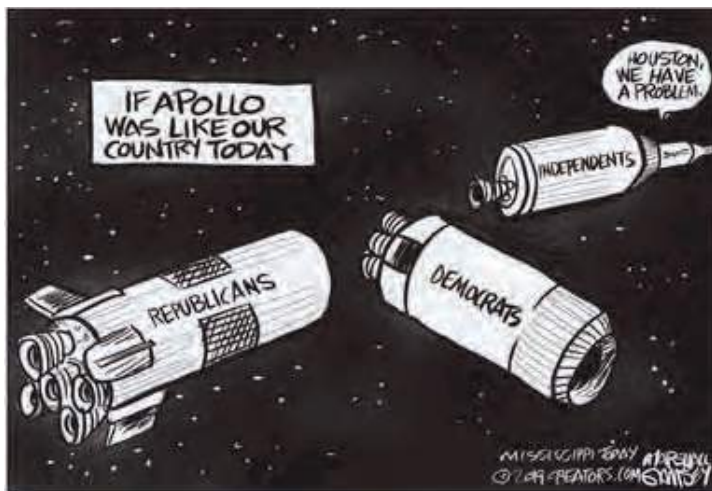
Disastrous Midwest flooding in the summer of 1993, which killed 50 people and caused US\$15 billion

In my view, this year’s floods should lead to more of this kind of rethinking. River towns can start by restricting floodplain development so that people and property will not be in harm’s way. This will create space for rivers to spill over in flood season, reducing risks downstream. Proposals to raise and improve levees should be required to take climate change and related flooding risks into account.

Davenport, Iowa has embraced this approach. With a population of over 102,000, it is the largest U.S. river city without levees or a permanent floodwall. Instead Davenport has emphasized adapting to flooding by increasing public green spaces in the flood zone and elevating buildings that flank the Mississippi River.

Kansas City and other towns could advance this discussion by moving beyond strictly commercial visions of their waterways and considering this question: What does a healthy river of the future look like?

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AMAHIA MALLEA

Drake University

TERRA LAND GROUP, LLC

Enclosure 10





















Attachments 1 and 2 from the 07-30-2019 Manteca City Council Special Meeting, agenda item C.1 (19-360)

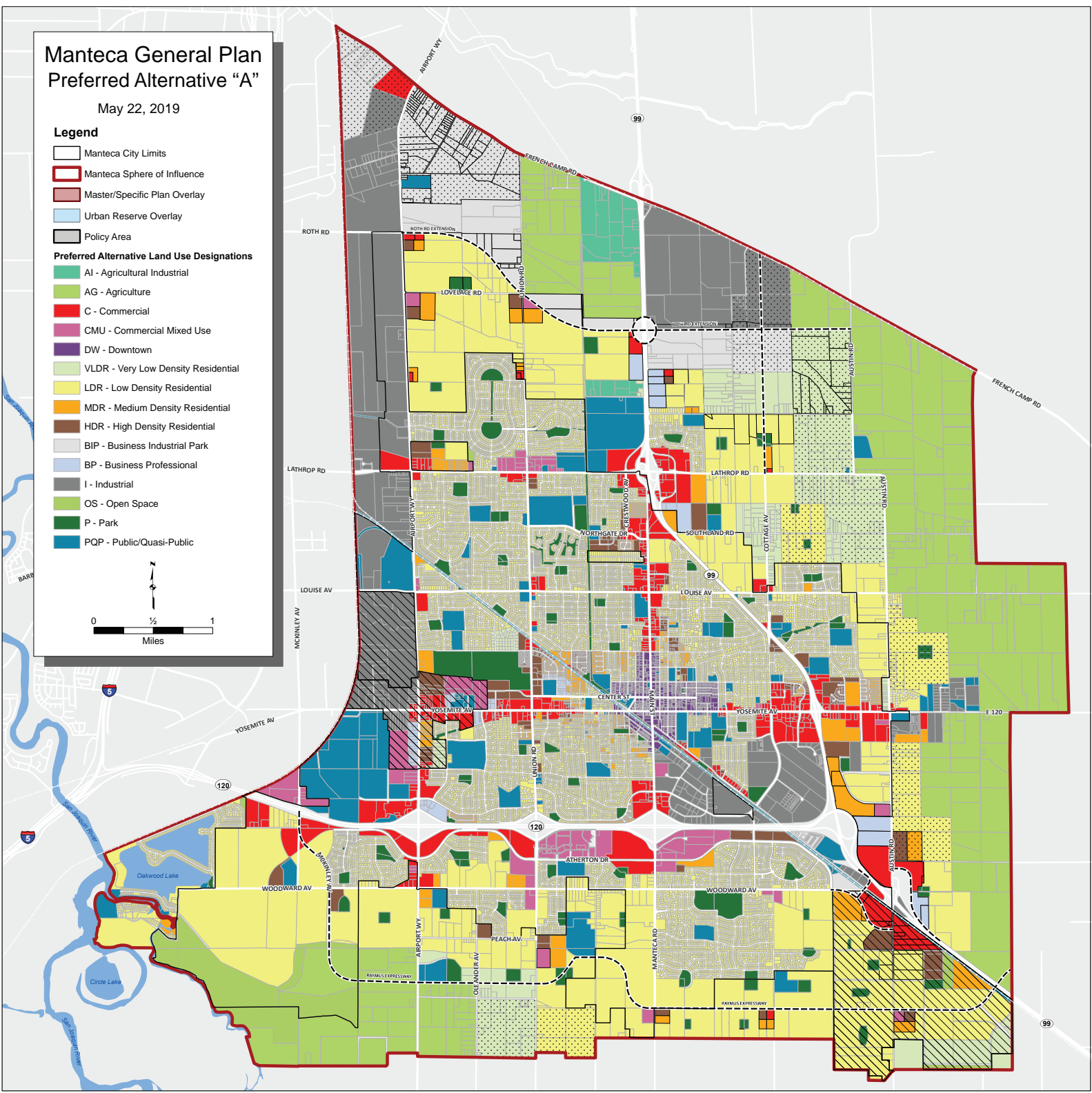
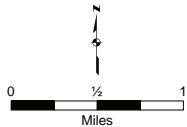
5151 E. ALMONDWOOD DRIVE MANTECA, CA 95337

Manteca General Plan Preferred Alternative "A"

May 22, 2019

Legend





















-  Manteca City Limits
 -  Manteca Sphere of Influence
 -  Master/Specific Plan Overlay
 -  Urban Reserve Overlay
 -  Policy Area
- Preferred Alternative Land Use Designations**
-  AI - Agricultural Industrial
 -  AG - Agriculture
 -  C - Commercial
 -  CMU - Commercial Mixed Use
 -  DW - Downtown
 -  VLDR - Very Low Density Residential
 -  LDR - Low Density Residential
 -  MDR - Medium Density Residential
 -  HDR - High Density Residential
 -  BIP - Business Industrial Park
 -  BP - Business Professional
 -  I - Industrial
 -  OS - Open Space
 -  P - Park
 -  PQP - Public/Quasi-Public

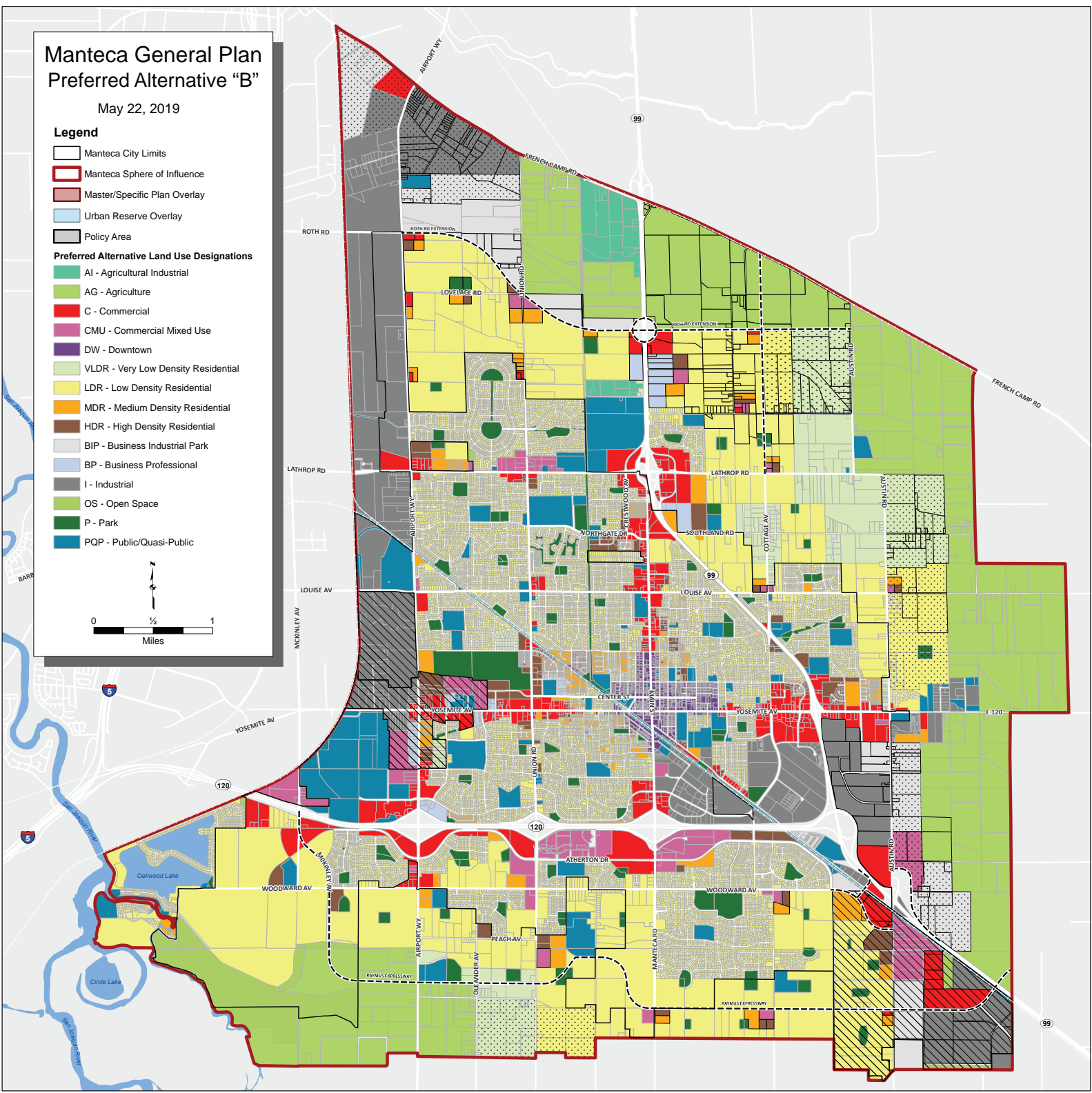
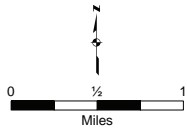


Manteca General Plan Preferred Alternative "B"

May 22, 2019

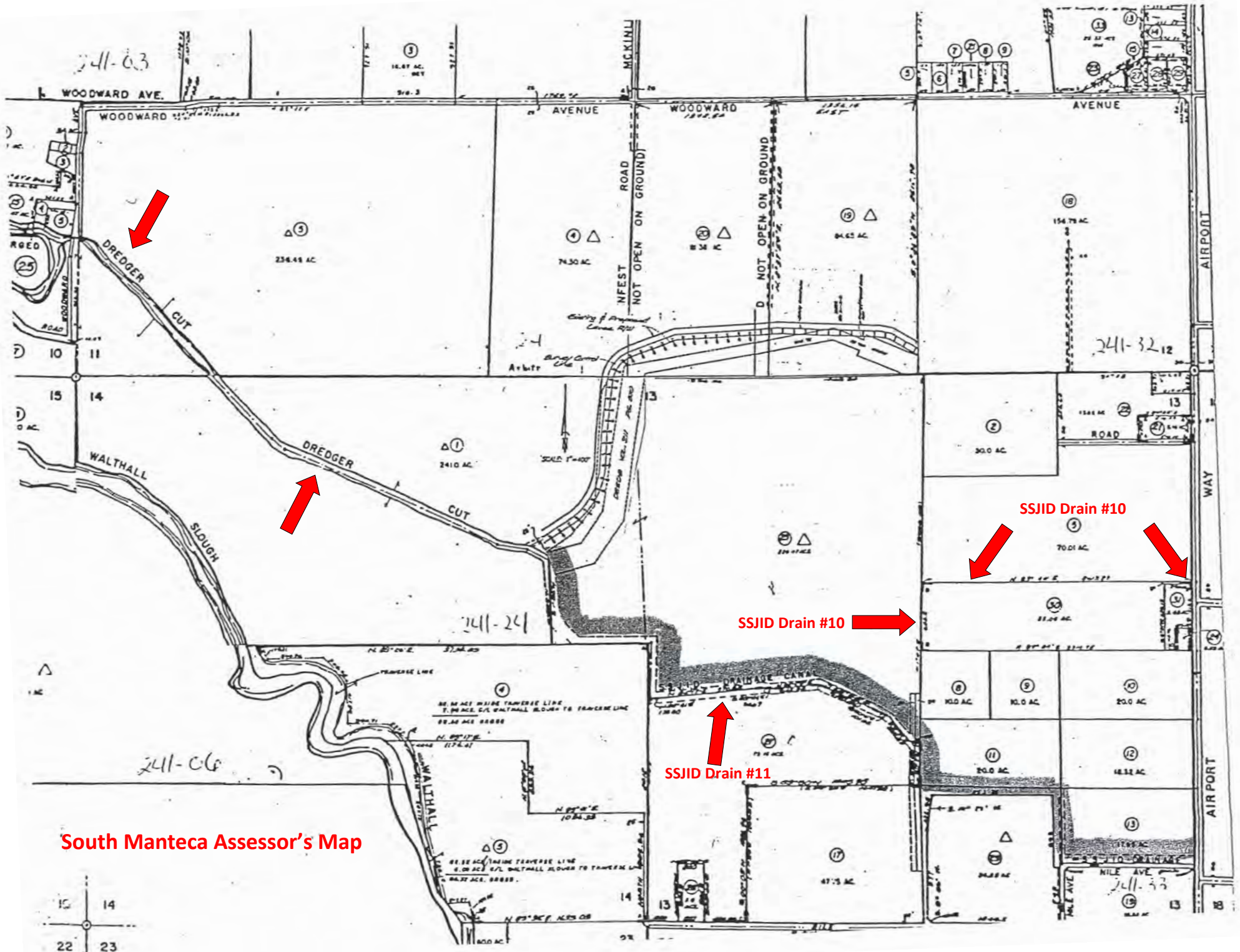
Legend

-  Manteca City Limits
 -  Manteca Sphere of Influence
 -  Master/Specific Plan Overlay
 -  Urban Reserve Overlay
 -  Policy Area
- Preferred Alternative Land Use Designations**
-  AI - Agricultural Industrial
 -  AG - Agriculture
 -  C - Commercial
 -  CMU - Commercial Mixed Use
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 -  MDR - Medium Density Residential
 -  HDR - High Density Residential
 -  BIP - Business Industrial Park
 -  BP - Business Professional
 -  I - Industrial
 -  OS - Open Space
 -  P - Park
 -  PQP - Public/Quasi-Public



Enclosure 16

*South Manteca assessor's map showing Dredger Cut and
SSJID Drains; Figure 5-1 showing future drainage improvements
as published in the City of Manteca 2013 Storm Drain Master
Plan*



South Manteca Assessor's Map



CITY OF MANTECA
PUBLIC WORKS DEPARTMENT



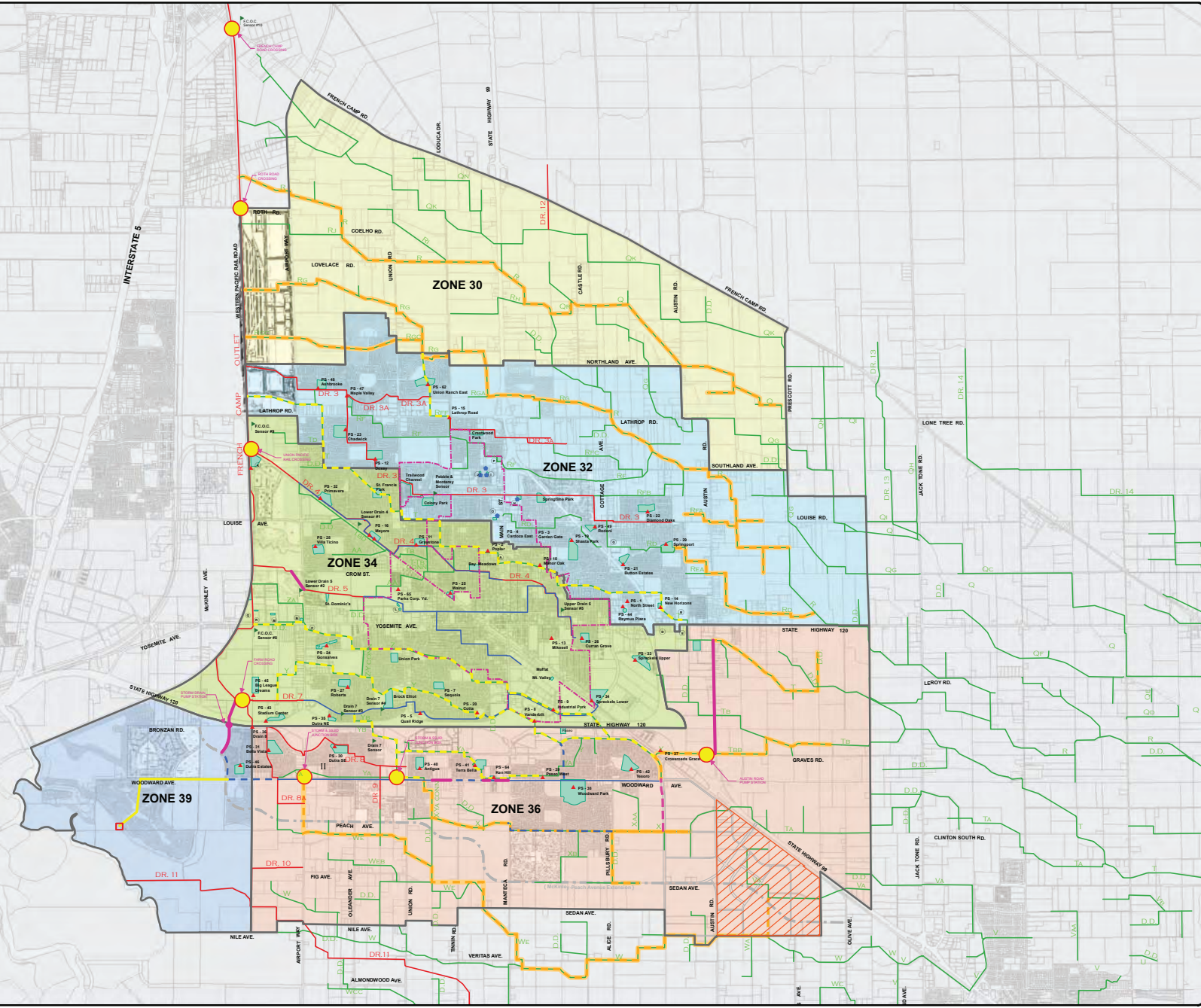
Figure 5-1
Future Drainage Improvements

Legend:

- CITY DRAIN (IN USE)
- CITY DRAIN (NOT IN USE)
- SSJID DRAIN
- SSJID LATERAL
- EXISTING SSJID/CITY DUAL USE LATERAL
- PROPOSED SSJID/CITY DUAL USE LATERAL BY DEVELOPER
- PROPOSED LATERAL (DEVELOPER)
- PROPOSED DRAIN BY CITY
- PROPOSED LATERAL (CITY/SSJID)
- ▲ CITY TELEMTRY
- ▲ MONITORING STATION
- ▲ PRIVATE TELEMTRY
- A PRIVATE PUMP STATION
- DIRECT DISCHARGE AREA
- PARCELS
- STORM DRAIN IMPROVEMENT
- NON_RESIDENTIAL AREA FOR INFILTRATION BASIN
- REGIONAL PIPELINE FOR DEVELOPABLE AREA
- REGIONAL PUMP STATION FOR DEVELOPABLE AREA

0 0.5 1 2 Miles

\\utopia\GIS\Workspace\PWSDMPE\Exhibits\Future_Drainage_Improvements_24x36(fig.5-1).mxd



Enclosure 17

San Joaquin County Zone Classification application No. PA-1700172 of San Joaquin County: December 7, 2017 Notice of Public Hearing - Item Rescheduled, documentation and supporting maps

RECEIVED NOV 30 2017



**SAN JOAQUIN COUNTY
COMMUNITY DEVELOPMENT DEPARTMENT**

1810 E. HAZELTON AVE., STOCKTON, CA 95205-6032
PHONE: 209/468-3121 FAX: 209/468-3163

November 21, 2017

RE: December 7, 2017 Notice of Public Hearing – Item Rescheduled

To Whom It May Concern:

Please note Zone Classification application No. PA-1700172 of San Joaquin County to process the zone reclassifications for the Landowner Requests of the 2035 General Plan Update has been removed from the December 7, 2017 San Joaquin County Planning Commission hearing agenda and the item is now scheduled for the December 21, 2017 San Joaquin County Planning Commission hearing. You will receive an updated Notice of Public Hearing for the rescheduled item at a future date.

If you have any questions please feel free to contact me at (209) 468-0222 or alisa.goulart@sjgov.org

Sincerely,

A handwritten signature in cursive script, appearing to read "Alisa Goulart".

Alisa Goulart
Associate Planner

NOTICE OF PUBLIC HEARING
Before the
SAN JOAQUIN COUNTY PLANNING COMMISSION

On Thursday, December 7, 2017, at 6:30 p.m., or as soon as possible thereafter, in the Auditorium of the San Joaquin County Department of Public Health Services, 1601 East Hazelton Avenue, Stockton, California, the Planning Commission will hold a public hearing to consider:

PROJECT:

ZONE RECLASSIFICATION APPLICATION NO. PA-1700172 OF SAN JOAQUIN COUNTY to process the zone reclassifications for the Landowner Requests of the 2035 General Plan Update that were approved and adopted by the Board of Supervisors. The adopted Landowner Requests changed the General Plan designation of the subject parcels. Adoption of these Zone Reclassifications will assign zoning to the subject parcels that is consistent with the General Plan. The project site is located Countywide (Supervisorial District: All).

ENVIRONMENTAL REVIEW OF PROJECT:

Based on the Initial Study, which indicates that this project will not have a significant effect on the environment, and a Negative Declaration has been prepared.

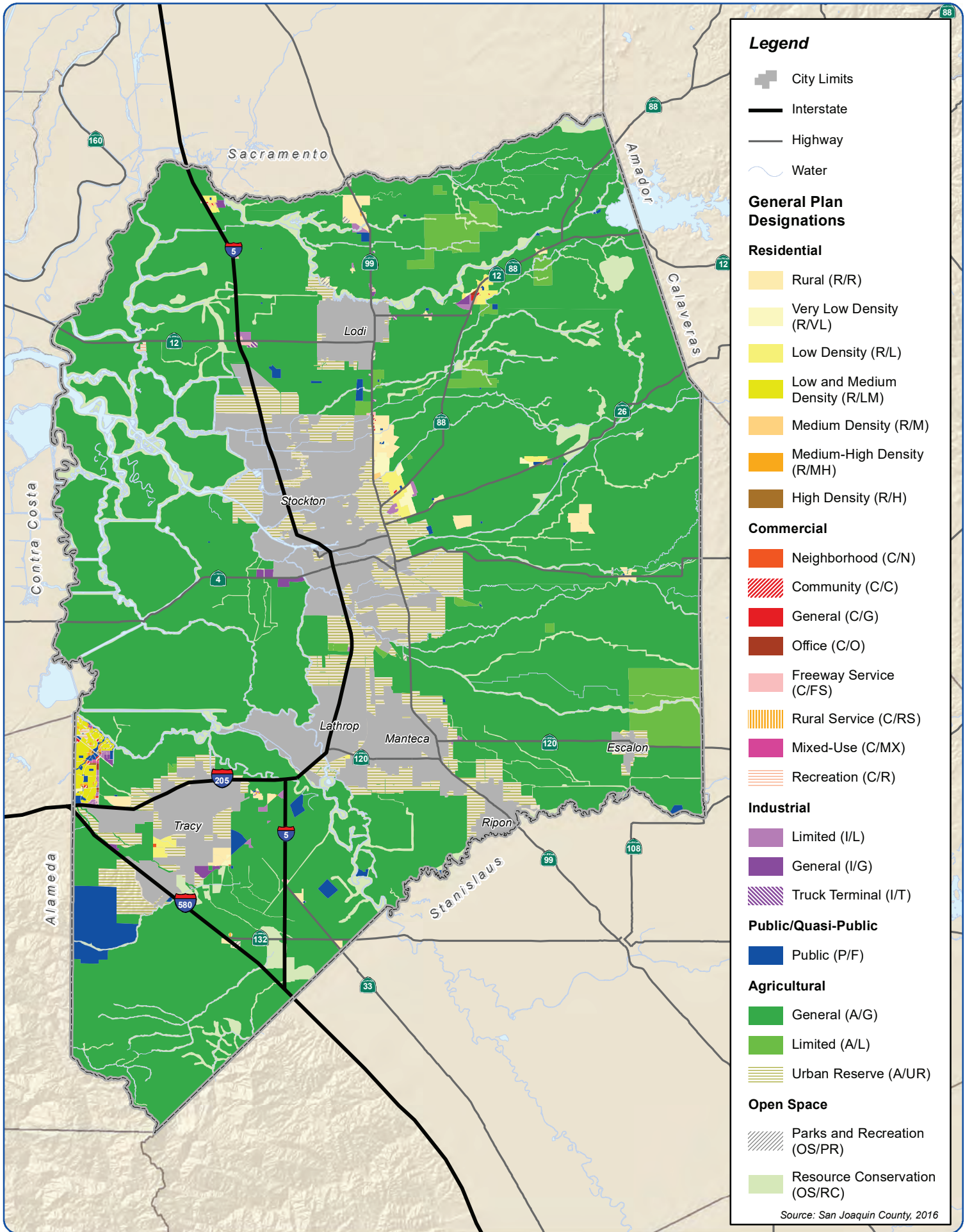
PUBLIC HEARING PROCEDURE:

Following is a brief explanation of Planning Commission hearings. For meetings with large agendas, or if an item is particularly controversial, the time limits noted below may be applied by the Chairman:

- Staff report and recommendation are presented.
- Primary project proponents give their testimony (limited to 20 minutes). Other project proponents give their testimony (limited to 5 minutes).
- Primary project opponents give their testimony (limited to 20 minutes if there is an agreed upon spokesperson). Other project opponents give their testimony (limited to 5 minutes).
- Applicant may rebut the opponents' testimony (limited to 10 minutes).
- Time limits do not apply to responses to questions from Planning Commissioners or staff.
- Chairman will close the public hearing and bring the matter back to the Planning Commission for discussion and decision.

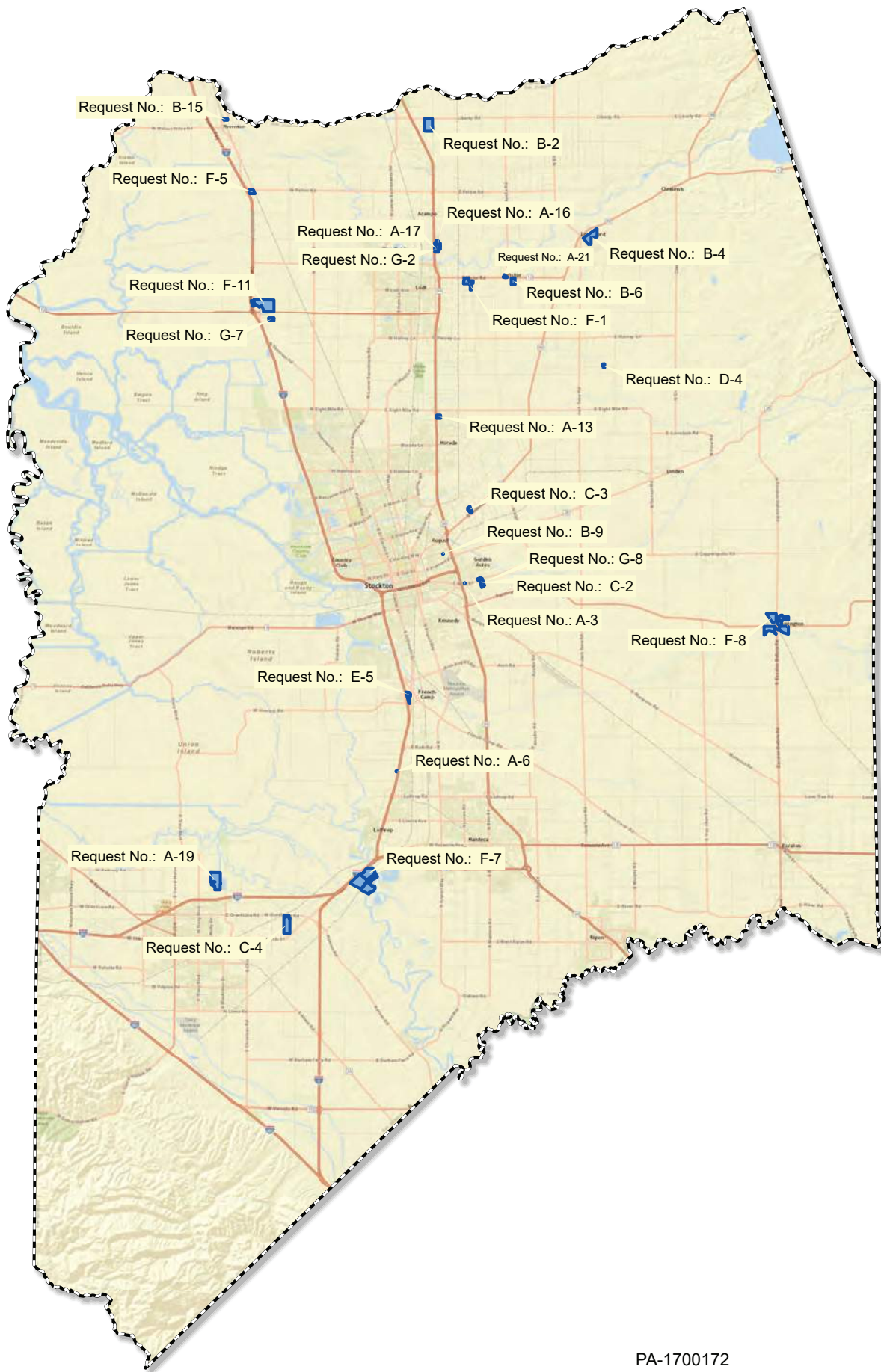
All persons interested in this matter are invited to be present at this hearing and submit oral statements regarding either the project or the Environmental Determination. Any written materials or statements you want to be considered at the hearing must be submitted to the Community Development Department no later than noon on the Friday before the public hearing. Only those persons who attend the hearing or participate by making oral or written comments may appeal any Planning Commission actions to the Board of Supervisors. If you challenge the nature of any proposed actions in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the Community Development Department prior to the public hearing. If you have any questions about this matter, please contact San Joaquin County Community Development Department, 1810 East Hazelton Avenue, Stockton, CA 95205. Phone: 209-468-3120.

Kerry Sullivan, Director
San Joaquin County
Community Development Department

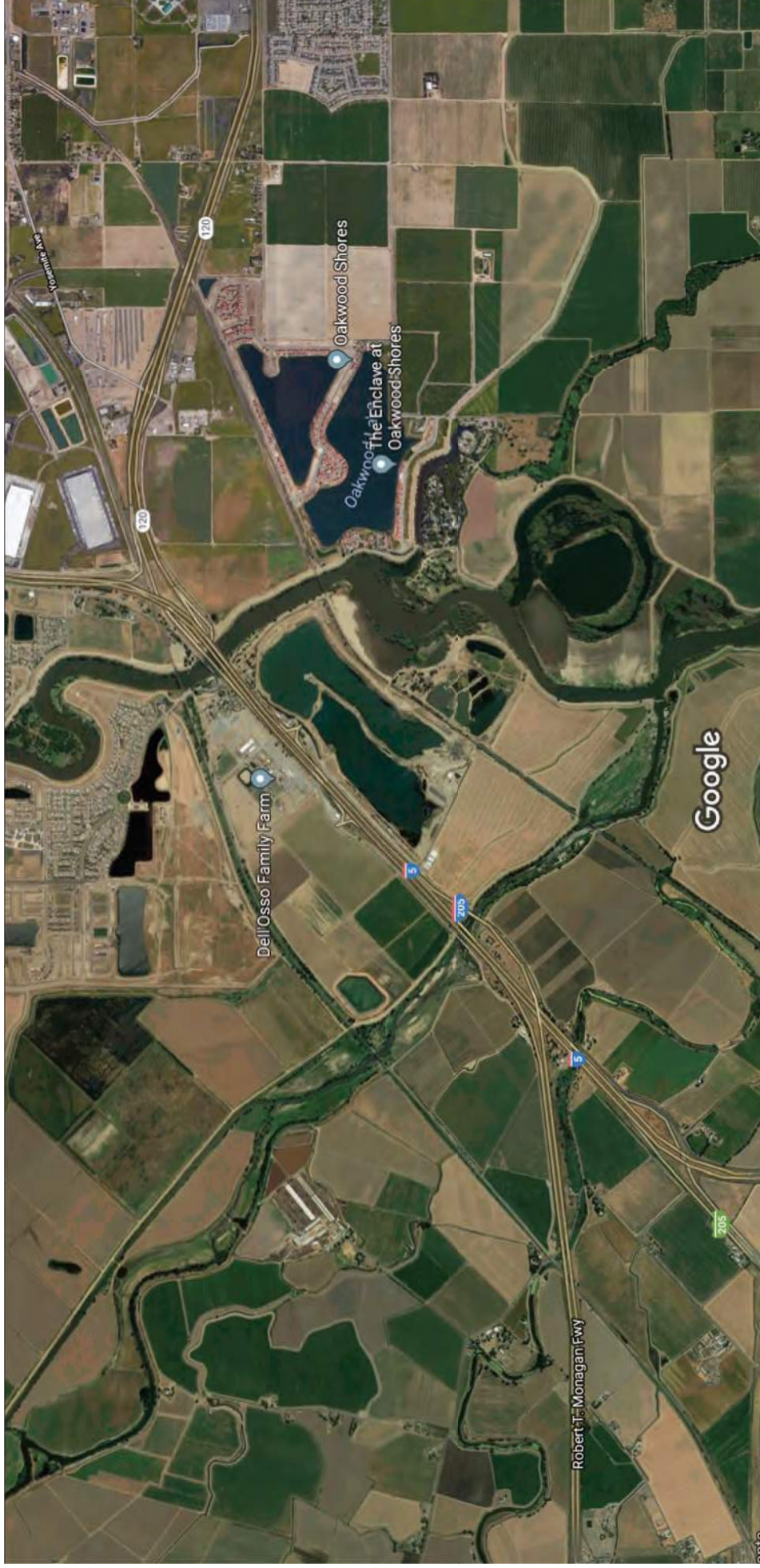


0 2.5 5 10 Miles

Figure LU-1
General Plan Land Use Diagram



PA-1700172
REQUEST LOCATOR



Imagery ©2017 Google, Map data ©2017 Google 2000 ft

TERRA LAND GROUP, LLC

Enclosure 18

*2019-08-14 Reservoir Data from the CA Department of
Water Resources*

5151 E. ALMONDWOOD DRIVE MANTECA, CA 95337

Archived Report Products: 2019-08-14

Daily Reservoir Storage Summary

ENDING AT MIDNIGHT - 08/13/2019

FOR SELECTED RESERVOIRS IN NORTHERN AND SOUTHERN CALIFORNIA

Report generated: August 14, 2019 13:05

WATER STORAGE											
Reservoir Name	StaID	Capacity (AF)	Elevation (FT)	Storage (AF)	Storage Change	% of Capacity	Average Storage	% of Average	Outflow (CFS)	Inflow (CFS)	Storage-Year Ago This Date
TRINITY RIVER											
TRINITY LAKE	CLE	2,447,650	2,352.28	2,168,353	-2,125	89	1,890,588	115	1,587	587	1,617,834
WHISKEYTOWN	WHI	241,100	1,208.51	236,338	-381	98	237,572	99	1,292	1,124	236,528
LEWISTON	LEW	14,660	1,900.92	13,852	132	94	13,872	100	1,539	1,609	14,360
RUSSIAN RIVER											
SONOMA(WARM SPRINGS)	WRS	381,000	445.53	230,741	-229	61	210,555	110	97	1	207,978
MENDOCINO (COYOTE)	COY	122,400	748.36	87,000	-209	71	64,516	135	205	117	70,078
SACRAMENTO RIVER											
SHASTA	SHA	4,552,000	1,042.92	3,870,252	-13,956	85	3,084,934	125	9,396	2,597	2,926,205
KESWICK	KES	23,772	585.15	22,601	-76	95	22,359	101	11,091	11,059	21,732
FEATHER RIVER											
OROVILLE	ORO	3,537,577	856.78	2,900,331	-15,257	82	2,469,415	117	10,199	2,698	1,786,780
ANTELOPE	ANT	22,566	5,000.09	20,832	-53	92	19,273	108	---	---	19,457
FRENCHMAN	FRD	55,477	5,584.85	50,640	-119	91	35,377	143	---	---	48,928
LAKE DAVIS	DAV	83,000	5,772.04	72,907	-110	88	61,806	118	---	---	72,647
YUBA RIVER											
BULLARDS BAR	BUL	966,000	1,916.25	787,867	-5,091	82	709,510	111	2,934	373	691,836
ENGLEBRIGHT	ENG	70,000	522.36	66,258	1,080	95	65,398	101	---	3,132	66,187
AMERICAN RIVER											
FOLSOM	FOL	977,000	449.76	803,085	-2,348	82	657,192	122	3,760	2,684	554,002
UNION VALLEY	UNV	266,369	4,861.62	242,695	-1,865	91	202,353	120	---	---	220,764
LOON LAKE	LON	69,306	6,398.36	53,911	-74	78	55,111	98	---	---	54,122
ICE HOUSE	ICH	43,496	5,442.13	38,345	-242	88	36,771	104	---	11	32,937
NIMBUS	NAT	9,000	123.93	8,228	37	91	8,318	99	3,365	3,388	7,965
CACHE CREEK											
INDIAN VALLEY	INV	300,000	1,473.70	256,960	---	86	154,420	166	240	10	139,832
PUTAH CREEK											
BERRYESSA	BER	1,602,000	435.06	1,459,594	-1,104	91	---	---	---	---	1,311,493
STONY CREEK											
BLACK BUTTE	BLB	143,700	458.42	78,515	-994	55	60,280	130	484	14	41,507
CALAVERAS RIVER											
NEW HOGAN	NHG	317,000	672.40	170,242	-569	54	142,370	120	302	51	179,297
MOKELUMNE RIVER											
CAMANCHE	CMN	417,120	229.39	372,520	-575	89	280,603	133	850	620	356,800
PARDEE	PAR	203,795	566.32	200,844	-321	99	187,245	107	883	---	199,643
STANISLAUS RIVER											
DONNELL'S	DON	64,320	---	58,589	-632	91	48,483	121	596	---	54,342
BEARDSLEY	BRD	97,800	---	91,628	-105	94	79,668	115	668	---	60,935
TULLOCH	TUL	67,000	508.95	65,658	480	98	65,162	101	3,419	3,675	65,511
NEW MELONES	NML	2,400,000	1,060.20	2,088,923	-5,117	87	1,433,546	146	3,622	1,174	1,855,253
TUOLUMNE RIVER											
DON PEDRO	DNP	2,030,000	821.31	1,919,682	-1,368	95	1,500,805	128	3,232	726	1,650,103
HETCH HETCHY	HTH	360,000	---	356,224	---	99	310,812	115	542	---	333,322
CHERRY VALLEY	CHV	273,500	---	248,143	---	91	179,365	138	254	---	230,067
MERCED RIVER											
MC CLURE (EXCHEQUER)	EXC	1,024,600	853.49	931,897	-2,322	91	600,476	155	1,958	285	743,657
CHOWCHILLA RIVER											

WATER STORAGE												
Reservoir Name	StaID	Capacity (AF)	Elevation (FT)	Storage (AF)	Storage Change	% of Capacity	Average Storage	% of Average	Outflow (CFS)	Inflow (CFS)	Storage-Year Ago This Date	
EASTMAN (BUCHANAN)	BUC	150,000	552.27	95,236	-468	63	62,505	152	200	-21	64,368	
FRESNO RIVER												
HENSLEY (HIDDEN)	HID	90,000	509.14	48,111	-431	53	30,017	160	220	17	16,760	
SAN JOAQUIN RIVER												
MILLERTON (FRIANT)	MIL	520,500	564.37	456,106	-3,601	88	289,073	158	4,452	2,712	309,769	
SAN LUIS CREEK												
SAN LUIS	SNL	2,041,000	479.89	1,283,037	-17,425	63	938,416	137	---	---	911,255	
KINGS RIVER												
PINE FLAT	PNF	1,000,000	913.15	787,866	-7,629	79	454,000	174	6,019	2,223	363,787	
KAWEAH RIVER												
KAWEAH (TERMINUS)	TRM	185,600	645.30	63,941	-2,697	34	37,943	169	1,656	311	19,251	
TULE RIVER												
SUCCESS	SCC	82,300	635.98	49,685	-1,164	60	27,935	178	626	55	10,737	
KERN RIVER												
ISABELLA	ISB	568,000	2,576.54	283,667	-2,030	50	249,532	114	1,774	863	125,898	
TRUCKEE RIVER												
STAMPEDE	STP	226,500	5,946.76	220,104	-673	97	142,154	155	80	-5	210,430	
INDEPENDENCE LAKE	INP	17,295	6,948.53	16,969	-21	98	16,349	104	---	---	16,753	
DONNER LAKE	DNN	9,700	5,935.19	8,995	-34	93	8,523	106	---	---	8,366	
SANTA YNEZ RIVER												
CACHUMA LAKE	CCH	193,305	737.90	150,247	-104	78	158,657	95	38	17	68,802	
SOUTH COAST												
PYRAMID	PYM	180,000	2,576.62	168,126	1,279	93	160,255	105	---	---	164,687	
CASTAIC	CAS	325,000	1,501.81	295,002	-699	91	270,202	109	---	---	281,537	
LAKE PERRIS	PRR	131,452	1,583.42	116,509	-178	89	101,961	114	---	---	101,879	

AF - Acre Feet CFS - Cubic Feet per Second

Note: Reservoir Flows are daily averages.

[Back](#)

SAN JOAQUIN RIVER NEAR VERNALIS (VNS)

Elevation: 35.0' · SAN JOAQUIN R basin · Operator: USGS and DWR

Query executed Wednesday at 13:57:38

Provisional data, subject to change.
Select a sensor type for a plot of data.

DAILY DATA

DATE / TIME (PST)	M FLOW CFS
07/15/2019	3,023
07/16/2019	3,023
07/17/2019	3,559
07/18/2019	3,742
07/19/2019	3,725
07/20/2019	3,572
07/21/2019	3,227
07/22/2019	3,015
07/23/2019	3,068
07/24/2019	3,543
07/25/2019	3,664
07/26/2019	3,687
07/27/2019	3,512
07/28/2019	3,091
07/29/2019	2,736
07/30/2019	2,651
07/31/2019	3,155
08/01/2019	3,302
08/02/2019	3,402
08/03/2019	3,309
08/04/2019	2,845
08/05/2019	2,499
08/06/2019	2,528
08/07/2019	3,165
08/08/2019	3,541
08/09/2019	3,716
08/10/2019	3,668
08/11/2019	3,208
08/12/2019	2,780
08/13/2019	2,506
08/14/2019	--

Showing 1 to 31 of 31 entries

BRT and *ART* signify discharge at stage below or above available rating table
Warning! This data is preliminary and subject to revision.

[Show VNS Map](#) | [Plot all VNS Sensors](#) | [2 Month VNS Data](#) | [Real-Time VNS Data](#) | [VNS Info](#)

Enclosure 19

American Rivers/CDFW property easement at the Kisst Dairy property as included on the San Joaquin County Habitat Conservation and Open Space Plan (included as Agenda Item 4Q in the August 22, 2019 Joint Meeting of the Board of Directors for the San Joaquin Council of Governments and SJCOG Inc.

STAFF REPORT

SUBJECT: American Rivers / California Department of Fish and Wildlife Easement Holding Request

RECOMMENDED ACTION: Motion to (1) Approve the Conservation Easement Holding Request and (2) Approve the Treasurer to Negotiate the Terms of the Easement Holding with the Requesting Parties

DISCUSSION:

SUMMARY:

American Rivers, a nation-wide conservation entity for collaborative watershed and agricultural landscapes, is working with the California Department of Fish and Wildlife (CDFW) to acquire a habitat conservation on a property in San Joaquin County through the Wildlife Conservation Board (WCB) grant program. Because SJCOG, Inc. is the non-profit 501c3 administrators of the San Joaquin County Habitat Conservation and Open Space Plan (SJMSCP), American Rivers and CDFW approached SJCOG, Inc. staff as the best option for both agencies to serve as the holding entity for the acquired land. While the habitat land easement will not provide any mitigation credit for the SJMSCP, it would require the SJCOG, Inc. to take responsibility for accepting, monitor and reporting on the mitigation land to the parties for which it would be compensated.

RECOMMENDATION:

A motion to (1) approve the conservation easement holding request and (2) approve the SJCOG, Inc. Treasurer to negotiate the terms of the easement holding with the requesting parties.

FISCAL IMPACT:

If approved, SJCOG, Inc. will receive the easement through a recorded grant deed and will be provided an endowment for the future costs of land management, monitoring, and reporting. SJCOG, Inc. will establish an endowment account for this preserve in the amount of roughly **\$90,023.00** (109.55+/- acres x \$821.75 per acre for 2019 endowment amount) for these activities

BACKGROUND:

The American Rivers/CDFW property easement at the Kisst Dairy Property is being purchased with grant funds in the Old River Paradise Cut area where many existing SJMSCP easement lands exist. The easement will be a Swainson's hawk easement for active row cropland. The

property is in the Central Zone along Paradise Cut and Alder Avenue as shown in attachment 1 and 2.

The grant easement purchase will have a Preserve Management Plan (PMP) recorded with the grant deed of conservation drafted by American Rivers and CDFW with input by SJCOG, Inc. staff and ICF as land managers for the SJMSCP. The PMP will follow the overall premise of existing SJMSCP management plans for the near-by preserve to allow better management and monitoring as a Row and Field Crop Preserve.

CDFW and American Rivers have drafted a Monitoring Protocol (attachment 3) for consideration by the SJCOG, Inc. Board. The final details of the agreement, compensation, and scope will be completed through negotiations before recording and accepting.

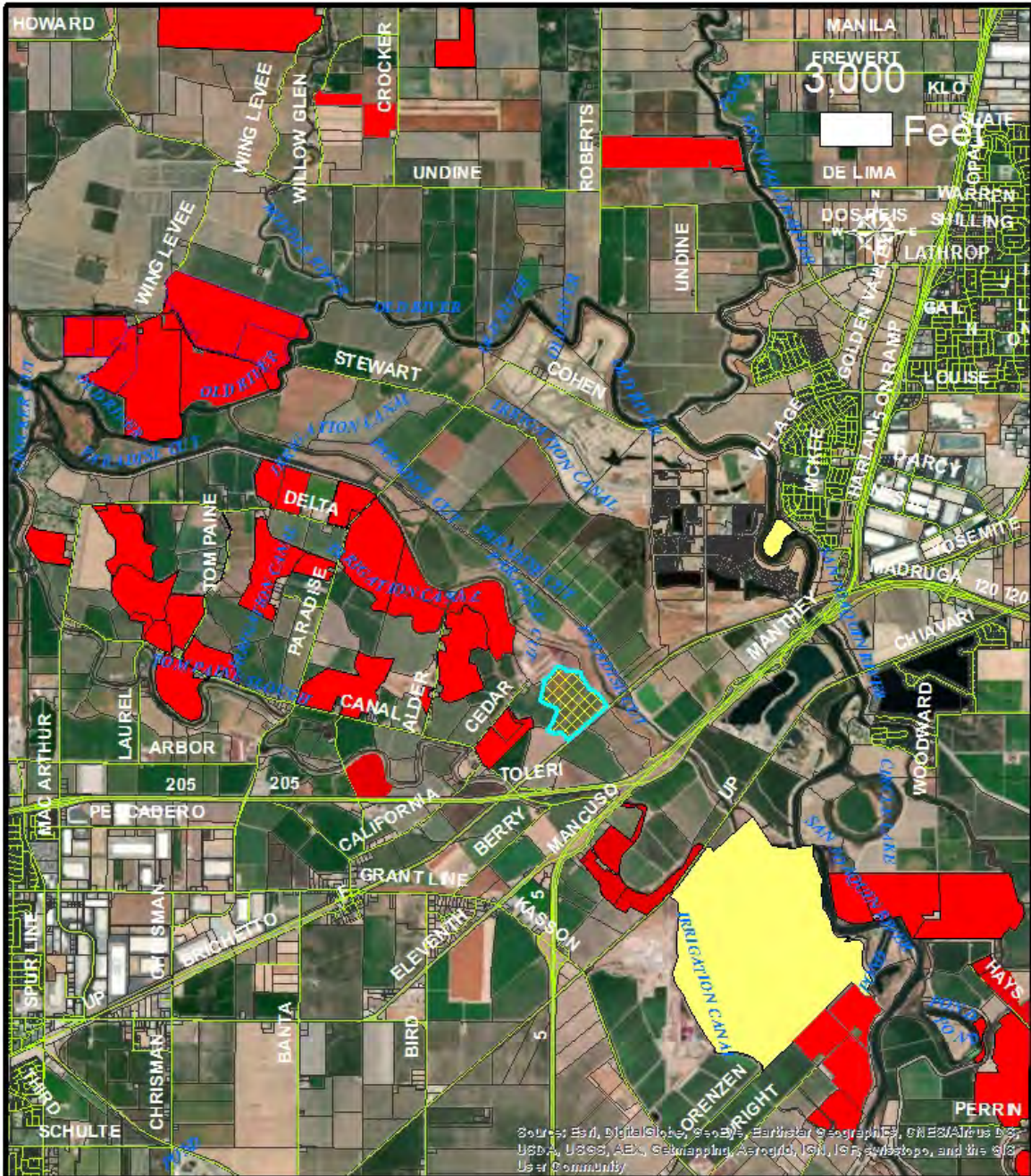
COMMITTEE ACTIONS:

- Habitat Technical Advisory Committee: Information
- SJCOG, Inc. Board – Action Required


ATTACHMENTS:

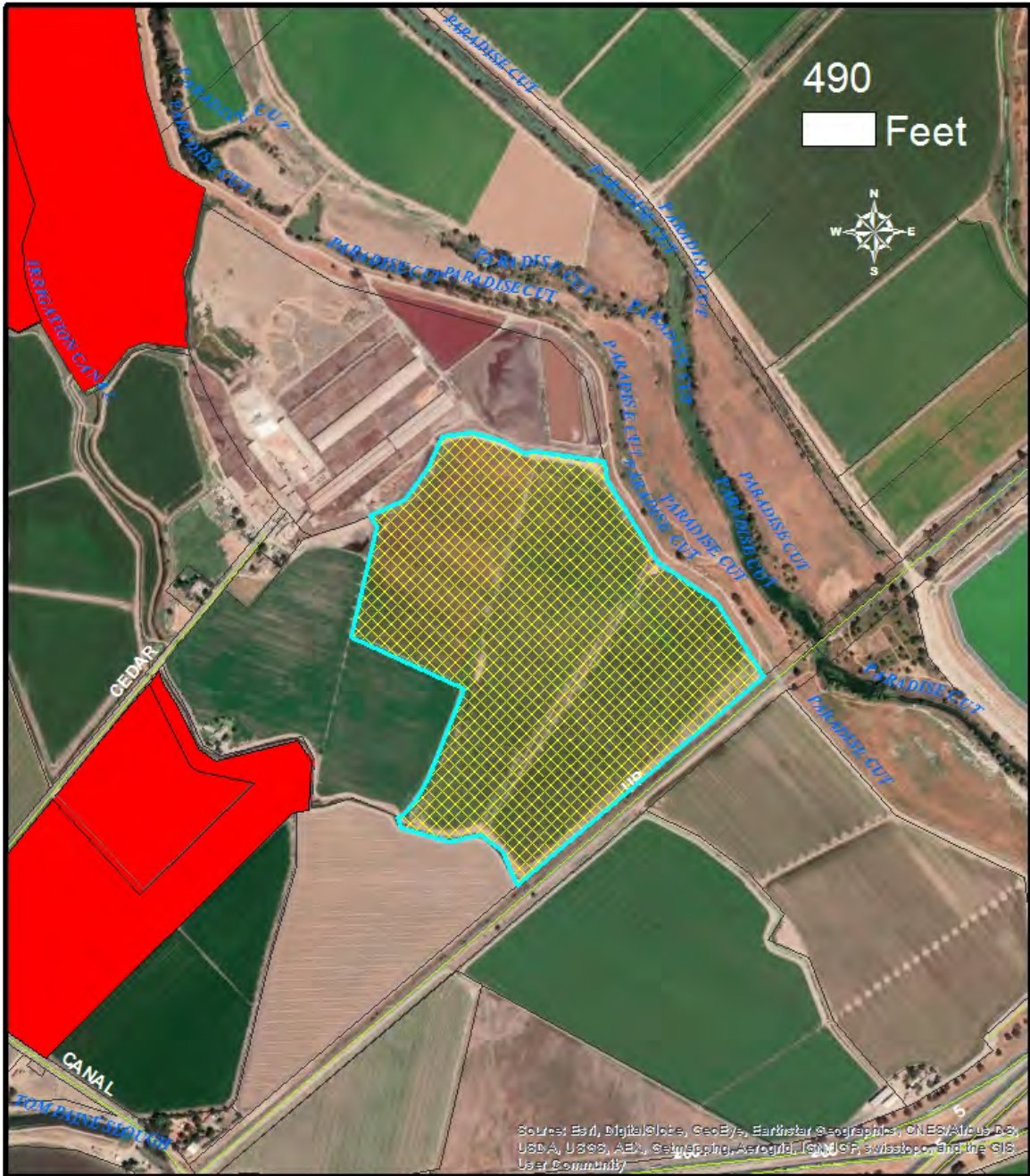
1. Overview Preserve Location Map
2. Preserve Location Map
3. Monitoring Protocol

Prepared by: Steven Mayo, Program Manager






Legend

-  AR CDFW WCB Kisst Easement
-  SJCOG_Preserves
-  Unknown/Other Easement



Legend

-  AR CDFW WCB Kisst Easement
-  SJCOG_Preserves
-  Unknown/Other Easement

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Eastern San Joaquin Subbasin GSP Public Draft						
Summary of Public Comments and Responses						
Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	Chris Thomas cthomas@thefreshwatertrust.org /northerndeltagsa@gmail.com	Northern Delta Sustainability Agency/NDGSA Associate Member Staten Island-Conservation Farms and Ranches	N/A	Public and Agency Comment Disposition/Coordination		The Groundwater Sustainability Plan ("GSP") development process could be improved with greater integration of public comments into the GSP. Specifically, there should be a disposition process for both oral and written comments. In addition, engagement and coordination with adjacent agencies/ subbasins should be clearly documented. The subbasin planning processes in our region will benefit from greater coordination, and doing so will be essential to completing successful GSPs.
2			pp. 2-56 to 2-57	2.1.10 HCM Data Gaps	Basin Setting	The draft GSP has significant and critical gaps in understanding of conditions, which contributes to inadequate modeling.
						The data gaps identified in the draft GSP include the following:
						—Water quality of principal aquifers
						—Aquifer characteristics
						—Groundwater Level Data
						—Groundwater Quality Data
						—Subsurface Conditions
						This extensive list of missing data indicates that the technical fundamentals of the subbasin's hydrologic and water quality are absent, that the ongoing lack of data collection and analysis is problematic, and calls into question the basis for establishing reliable and defensible thresholds.

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
4		3		Proposed Monitoring Well Network	Basin Setting	To rectify data gaps, a concerted program to resolve data gaps should be developed, funded and implemented. Further, these data gaps preclude the ability to track consistency with the GSP, and ultimately to ensure sustainability. furthermore, there are significant defects in the GSPs proposed monitoring approach. Sampling frequency was reduced to 2 events a year for 'representative' monitoring wells. This seems far too infrequent, given the DWR documented 'critically over-drafted' basin condition, existing cones of depression, and the limited number of monitoring wells proposed . (Discussed at July 10, 2019 GWA Board Meeting.) DWR has identified that the well sampling frequency should be based on groundwater conditions and hydrogeologic understanding. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-2-Monitoring-Networks-and-Identification-of-Data-Gaps.pdf
						The draft GSP approach in number, location and frequency of sampling of wells appears to be inconsistent with the DWR BMPs. Generally, there are too few wells, and they are spatially dispersed outside of the cone(s) of depression over a very large subbasin, and limited sampling frequency will make it difficult to track the sustainability criteria and associated thresholds, the effectiveness of the GSP, and to begin to detect impacts to Groundwater Dependent Ecosystems (GDEs).
11		h	p. 2-65	Figure 2-37		Only one large cone of depression, an area of significantly reduced water table elevation, is identified in the GSP. This singular feature differs from previous analyses in the Cosumnes and South American subbasins; and, the degree of resolution of the data presented makes it difficult to tell if there are one or more distinct cones in the central part of the subbasin, but in any case the model shows depletion along Staten Island.

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
5			pp. 2-65 to 2-66	Figure 2-37 Figure 2-38,	Groundwater Modeling	The model(s) appear to show groundwater elevation declines in the Delta, including Staten Island. These data need further investigation since that condition seems unlikely and not supported by DWR and other groundwater elevation analyses. ESJ consultants were asked to explain why there were so many apparent discontinuities from the adjacent subbasin documented depressions, and the apparent errors in reporting of groundwater elevations in the Delta. For example, there are inexplicably irregular patterns of groundwater elevations shown for the Delta. The response was that the model itself had some challenges in development and that stakeholders could ignore those results. There is apparently limited quality control in the modeling effort, and erroneous results were not identified in the draft GSP. To the extent the GSP continues to rely on this modeling, it should identify where and how the data is not considered accurate. Or, if there are significant caveats, how and where those apply.
6				Sections 3.4-9	Groundwater Dependent Ecosystems and Interconnected Surface Waters	At the July 10, 2019 GWA Board Meeting, the consultants discussed use of The Nature Conservancy-initiated GDE assessment approach, "somewhat," but that in any case that their analysis was "consistent." The approach to GDEs should be clearly disclosed in the GSP.
7				Figure 3-64 Figure 3-65		Similarly, Interconnected Surface Waters (ISW) analysis in the draft GSP shows portions the sloughs as being variously 'always losing' and 'always gaining' around the perimeter of Staten Island. Yet, these gaining sections (all at or below sea level) are further identified 'disconnected' from the groundwater system.
						When asked about this obvious error in groundwater depletion modeling below sea level for several streams and Delta sloughs, the staff response was that it appears to be a modeling calibration error. It seems unlikely that these data were reviewed before publication. If they were reviewed, it would be expected that the text of the draft GSP would explain why it was incorrect or uncertain and how that was being resolved. This discrepancy raises concerns about the quality and the reliability of the GDE and ISW analyses.

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
8					Sea Water Intrusion	<p>The draft GSP has set water quality standards for salinity intrusion that appear inconsistent with meeting environmental and agricultural beneficial uses, and protecting crops from yield losses associated with cumulative impacts of salinity.</p> <p>The GSP sets the isocontour line for reporting at 500 mg/L, ostensibly "same as Secondary Maximum Contaminant Level (SMCL) for chloride." (P. 12 July 10, 2019 GWA Board Meeting.)</p> <p>The Chloride SMCL set by the USEPA is 250 mg/L: https://www.epa.gov/dwregdev/drinking-water-regulations-and-contaminants https://www.epa.gov/sites/production/files/2018-03/documents/dwtable2018.pdf</p>
						<p>The SMCL for Total Dissolved Solids (TDS) set by the USEPA is 500 mg/L: https://www.epa.gov/sites/production/files/2019-03/documents/cfr-2011-title40-vol23-part143.pdf</p>
9			p. 3-14 p. 3-12		Drinking Water Supplies and Agricultural Uses Not Protected	<p>However, the GSP set the measurable objective at 600 mg/L for TDS and the minimum threshold for TDS at 1,000 mg/L, double the SMCL. This measurable objective is above the SMCL, and the maximum threshold is not protective of drinking water supplies and agricultural uses. By the time water quality has reached the measurable objective it is unlikely to be used for potable water, and places agriculture at risk from yield losses.</p>
10					Chloride Threshold Too High	<p>The subbasin's GSP defined minimum threshold for chloride has been set at 2,000 mg/L, well above the limits for harm for many agricultural crops. http://lawr.ucdavis.edu/cooperative-extension/irrigation/drought-tips/water-quality-guidelines-trees-and-vines https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/pnw597.pdf</p>
11			p. 3-12		TDS Threshold Too High	<p>The minimum threshold is set at 1,000 mg/L for TDS, also at or above the level of impact to agricultural most agricultural crops. https://www.usbr.gov/lc/phoenix/programs/cass/pdf/Phase1/ATechapdxTDS.pdf</p>

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
12						The monitoring triggers in the draft GSP for chloride and TDS are too high to avoid undesirable effects, and do consider leaching fractions or soil salinity accumulation rates in its assumptions that further chronic reductions in crop productivity and other negative impacts would be avoided. The analysis in the draft GSP does not appear to follow a best available science (BAS) approach. For instance, the draft GSP fails to disclose that the levels of TDS identified as acceptable are associated with levels found to have a 50% yield loss of crops.
13			p. 3-15			The trigger at 400% SMCL would clearly cause negative impacts to domestic well users drinking water quality. The threshold for chloride is impermissibly high and would cause degradation of existing water quality, and potentially institutionalize unsustainable and undesirable water quality.
14			p. 2-54	Figure 2-31	Inadequate Baseline and Monitoring	The well network and associated chloride concentrations used in the analysis do not adequately represent Delta locations or the potential for associated sea/brackish water intrusion into shallow groundwater. Significantly more wells at various depths are required to show current conditions, and to detect future impacts within the Delta.
15			p. 2-78 to 2-79	Figure 2-52 Figure 2-53		Where chloride concentrations are described, there are a disproportionate amount of observations above 250 mg/L. in the Delta. If this threshold were approved it is possible that agricultural groundwater users would not be able to use this water for crops without reductions in productivity, and that continued irrigation with this water could reduce the ability to continue farming current crops. This standard is entirely inappropriate for drinking water quality.
20			p. 3-12	Section 3.2.3.1.2		Whatever the particular standard, protection from seawater intrusion is reliant on the ability of the subbasin to detect undesirable effects. For the entire ESJ subbasin, the draft GSP provides: "Undesirable results occur during GSP implementation when more than 25 percent of representative monitoring wells (3 of 10 sites) exceed the minimum thresholds for water quality for two consecutive years and where these concentrations are the result of groundwater management activities."

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16						Given the limited number of monitoring wells over a vast area, this standard is inadequate for the detection of a groundwater impact. The standard would require the source of the exceedance to be known, and that source to be the 'result of groundwater management activities'; that there is a monitoring well in proximity, that the exceedance is detected in the twice a year sampling; that two additional wells are located in the proximity and have similar detections with similar identified causes; and, moreover that those detections happen over two years. Those conditions are obviously unlikely to ever be met; the proposed well monitoring network appears to be so dispersed to ensure that exceedances could only be met at one well at the most.
17					Conclusion	The draft GSP is lacking in available data and an adequate proposed monitoring approach. The draft GSP should be modified and updated to include reasonable, scientifically supported thresholds, better track sustainability, and meet SGMA statutory requirements. The draft GSP should also be updated to clarify where the data and the visualizations are not accurate and what process will be applied to improve them. The salinity and TDS limits are not likely to meet sustainability and could allow significant degradation of water quality if applied.
						We look forward to working with the ESJ group to ensure a complete GSP that meets all requirements and can be approved by DWR in the coming months.

August 24, 2019

Eastern San Joaquin Groundwater Authority
1810 E. Hazelton Avenue
P.O. Box 1810
Stockton, CA 95201

Submitted online via: <http://www.esjgroundwater.org/>

Re: Eastern San Joaquin Subbasin Groundwater Sustainability Plan Public Draft

Dear Basin Representatives,

The Nature Conservancy (TNC) appreciates the opportunity to comment on the Eastern San Joaquin Subbasin Groundwater Sustainability Plan Public Draft prepared by the Eastern San Joaquin Groundwater Authority under the Sustainable Groundwater Management Act (SGMA) and dated July 2019. TNC provided comments on the Eastern San Joaquin Subbasin Groundwater Sustainability Plan Draft Deliverable 1, which included portions of Chapters 1, 2, 3 and 5, on May 31, 2019. For your convenience, we have included the several attachments (discussed below) to this letter that were also provided in the previous letter.

TNC as a Stakeholder Representative for the Environment

TNC is a global, nonprofit organization dedicated to conserving the lands and waters on which all life depends. We seek to achieve our mission through science-based planning and implementation of conservation strategies. For decades, we have dedicated resources to establishing diverse partnerships and developing foundational science products for achieving positive outcomes for people and nature in California. TNC was part of a stakeholder group formed by the Water Foundation in early 2014 to develop recommendations for groundwater reform and actively worked to shape and pass SGMA.

Our reason for engaging is simple: **California's** freshwater biodiversity is highly imperiled. We have lost more than 90 percent of our native wetland and river habitats, leading to precipitous declines in native plants and the populations of animals that call these places home. These natural resources are intricately connected to **California's economy** providing direct benefits through industries such as fisheries, timber and hunting, as well as indirect benefits such as clean water supplies. SGMA must be successful for us to achieve a sustainable future, in which people and nature can thrive within Eastern San Joaquin Groundwater Authority region and California.

We believe that the success of SGMA depends on bringing the best available science to the table, engaging all stakeholders in robust dialog, providing strong incentives for beneficial outcomes and rigorous enforcement by the State of California.

Given our mission, we are particularly concerned about the inclusion of nature, as required, in GSPs. The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs.

These tools and resources are available online at GroundwaterResourceHub.org. The Nature Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Addressing Nature's Water Needs in GSPs

SGMA requires that all beneficial uses and users, including environmental users of groundwater, be considered in the development and implementation of GSPs (Water Code § 10723.2).

The GSP Regulations include specific requirements to identify and consider groundwater dependent ecosystems (23 CCR §354.16(g)) when determining whether groundwater conditions are having potential effects on beneficial uses and users. GSAs must also assess whether sustainable management criteria may cause adverse impacts to beneficial uses, which include environmental uses, such as plants and animals. In addition, monitoring networks should be designed to detect potential adverse impacts to beneficial uses due to groundwater. Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decision, and using data collected through monitoring to revise decisions in the future. Over time, GSPs should improve as data gaps are reduced and uncertainties addressed.

To help ensure that GSPs adequately address nature as required under SGMA, The Nature Conservancy has prepared a checklist (Attachment A) for GSAs and their consultants to use. The attached version of this checklist was revised in July 2019. The Nature Conservancy believes the following elements are foundational for 2020 GSP submittals. For detailed guidance on how to address the checklist items, please also see our publication, *GDEs under SGMA: Guidance for Preparing GSPs*¹.

1. Environmental Representation

SGMA requires that groundwater sustainability agencies (GSAs) consider the interests of all beneficial uses and users of groundwater. To meet this requirement, we recommend actively engaging environmental stakeholders by including environmental representation on the GSA board, technical advisory group, and/or working groups. This could include local staff from state and federal resource agencies, nonprofit organizations and other environmental interests. By engaging these stakeholders, GSAs will benefit from access to additional data and resources, as well as a more robust and inclusive GSP.

2. Basin GDE and ISW Maps

SGMA requires that groundwater dependent ecosystems (GDEs) and interconnected surface waters (ISWs) be identified in the GSP. We recommend using the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) provided online² by the Department of Water Resources (DWR) as a starting point for the GDE map. The NC Dataset was developed through a collaboration between DWR, the Department of Fish and Wildlife and TNC.

¹ GDEs under SGMA: Guidance for Preparing GSPs is available at: https://groundwaterresourcehub.org/public/uploads/pdfs/GWR_Hub_GDE_Guidance_Doc_2-1-18.pdf

² The Department of Water Resources' Natural Communities Commonly Associated with Groundwater dataset is available at: <https://gis.water.ca.gov/app/NCDatasetViewer/>

3. Potential Effects on Environmental Beneficial Users

SGMA requires that potential effects on GDEs and environmental surface water users be described when defining undesirable results. In addition to identifying GDEs in the basin, The Nature Conservancy recommends identifying beneficial users of surface water, which include environmental users. This is a critical step, as it is impossible to define “significant and unreasonable adverse impacts” without knowing *what* is being impacted. Since the Public Draft GSP includes the Freshwater Species List for the Subbasin provided in our earlier comment letter as Appendix 1-F of the Public Draft, we did not include it as an attachment to this letter. We recommend that after identifying which freshwater species exist in your basin, especially federal and state-listed species, that you contact staff at the California Department of Fish and Wildlife (CDFW), United States Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Services (NMFS) to obtain their input on the groundwater and surface water needs of the organisms on the GSA’s freshwater species list. Because effects to plants and animals are difficult and sometimes impossible to reverse, we recommend erring on the side of caution to preserve sufficient groundwater conditions to sustain GDEs and ISWs.

4. Biological and Hydrological Monitoring

If sufficient hydrological and biological data in and around GDEs is not available in time for the 2020/2022 plan, data gaps should be identified along with actions to reconcile the gaps in the monitoring network.

The Nature Conservancy has thoroughly reviewed the Eastern San Joaquin Subbasin Draft GSP. We appreciate the work that has gone into the preparation of this plan. However, we consider it to be **inadequate** under SGMA because the basis for removing the majority of the potential GDEs identified in the NC Dataset from further consideration and management as GDEs is not scientifically supported, and could lead to significant and unreasonable impacts. Based on the available data, the removed polygons should be retained and managed as potential GDEs in the plan. If further analysis were to provide substantial evidence that groundwater level declines would not result in an adverse impact to the species in these ecosystems, then consideration could be given to removing them at that time; however, no such evidence has been presented in the draft GSP.

Our specific comments related to the Eastern San Joaquin Subbasin Groundwater Sustainability Plan, Draft Deliverable 1 of the Draft GSP are provided in detail in Attachment B and are in reference to the numbered items in the revised checklist in Attachment A. Attachment C describes six best practices that GSAs and their consultants can apply when using local groundwater data to confirm a connection to groundwater for DWR’s Natural Communities Commonly Associated with Groundwater Dataset². Attachment D provides an overview of a new, free online tool that allows GSAs to assess changes in groundwater-dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data.

Thank you for fully considering our comments as you develop your GSP.

Best Regards,



Sandi Matsumoto
Associate Director, California Water Program
The Nature Conservancy

Attachment A

Considering Nature under SGMA: A Checklist

The Nature Conservancy is neither dispensing legal advice nor warranting any outcome that could result from the use of this checklist. Following this checklist does not guarantee approval of a GSP or compliance with SGMA, both of which will be determined by DWR and the State Water Resources Control Board.

Environmental User Checklist

The Nature Conservancy is neither dispensing legal advice nor warranting any outcome that could result from the use of this checklist. Following this checklist does not guarantee approval of a GSP or compliance with SGMA, both of which will be determined by DWR and the State Water Resources Control Board.

GSP Plan Element*		GDE Inclusion in GSPs: Identification and Consideration Elements	Check Box
Admin Info	2.1.5 Notice & Communication <i>23 CCR §354.10</i>	Description of the types of environmental beneficial uses of groundwater that exist within GDEs and a description of how environmental stakeholders were engaged throughout the development of the GSP.	1
Planning Framework	2.1.2 to 2.1.4 Description of Plan Area <i>23 CCR §354.8</i>	Description of jurisdictional boundaries, existing land use designations, water use management and monitoring programs; general plans and other land use plans relevant to GDEs and their relationship to the GSP.	2
		Description of instream flow requirements, threatened and endangered species habitat, critical habitat, and protected areas.	3
		Summary of process for permitting new or replacement wells for the basin, and how the process incorporates any protection of GDEs	4
Basin Setting	2.2.1 Hydrogeologic Conceptual Model <i>23 CCR §354.14</i>	Basin Bottom Boundary: Is the bottom of the basin defined as at least as deep as the deepest groundwater extractions?	5
		Principal aquifers and aquitards: Are shallow aquifers adequately described, so that interconnections with surface water and vertical groundwater gradients with other aquifers can be characterized?	6
		Basin cross sections: Do cross-sections illustrate the relationships between GDEs, surface waters and principal aquifers?	7
	2.2.2	Interconnected surface waters:	8

Current & Historical Groundwater Conditions 23 CCR §354.16	Interconnected surface water maps for the basin with gaining and losing reaches defined (included as a figure in GSP & submitted as a shapefile on SGMA portal).		9
	Estimates of current and historical surface water depletions for interconnected surface waters quantified and described by reach, season, and water year type.		10
	Basin GDE map included (as figure in text & submitted as a shapefile on SGMA Portal).		11
	If NC Dataset <i>was</i> used:	Basin GDE map denotes which polygons were kept, removed, and added from NC Dataset (Worksheet 1, can be attached in GSP section 6.0).	12
		The basin's GDE shapefile, which is submitted via the SGMA Portal, includes two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed).	13
		GDEs polygons are consolidated into larger units and named for easier identification throughout GSP.	14
	If NC Dataset <i>was not</i> used:	Description of why NC dataset was not used, and how an alternative dataset and/or mapping approach used is best available information.	15
	Description of GDEs included:		16
	Historical and current groundwater conditions and variability are described in each GDE unit.		17
	Historical and current ecological conditions and variability are described in each GDE unit.		18
	Each GDE unit has been characterized as having high, moderate, or low ecological value.		19
	Inventory of species, habitats, and protected lands for each GDE unit with ecological importance (Worksheet 2, can be attached in GSP section 6.0).		20
	2.2.3 Water Budget 23 CCR §354.18	Groundwater inputs and outputs (e.g., evapotranspiration) of native vegetation and managed wetlands are included in the basin's historical and current water budget.	21
Potential impacts to groundwater conditions due to land use changes, climate change, and population growth to GDEs and aquatic ecosystems are considered in the projected water budget.		22	
Sustainable Management Criteria	3.1 Sustainability Goal 23 CCR §354.24	Environmental stakeholders/representatives were consulted.	23
		Sustainability goal mentions GDEs or species and habitats that are of particular concern or interest.	24
		Sustainability goal mentions whether the intention is to address pre-SGMA impacts, maintain or improve conditions within GDEs or species and habitats that are of particular concern or interest.	25
	3.2 Measurable Objectives 23 CCR §354.30	Description of how GDEs were considered and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.	26
	3.3 Minimum Thresholds 23 CCR §354.28	Description of how GDEs and environmental uses of surface water were considered when setting minimum thresholds for relevant sustainability indicators:	27
Will adverse impacts to GDEs and/or aquatic ecosystems dependent on interconnected surface waters (beneficial user of surface water) be avoided with the selected minimum thresholds?		28	

		Are there any differences between the selected minimum threshold and state, federal, or local standards relevant to the species or habitats residing in GDEs or aquatic ecosystems dependent on interconnected surface waters?	29	
	3.4 Undesirable Results 23 CCR §354.26	For GDEs, hydrological data are compiled and synthesized for each GDE unit:	30	
		If hydrological data <i>are available</i> within/nearby the GDE	Hydrological datasets are plotted and provided for each GDE unit (Worksheet 3, can be attached in GSP Section 6.0).	31
			Baseline period in the hydrologic data is defined.	32
			GDE unit is classified as having high, moderate, or low susceptibility to changes in groundwater.	33
			Cause-and-effect relationships between groundwater changes and GDEs are explored.	34
		If hydrological data <i>are not available</i> within/nearby the GDE	Data gaps/insufficiencies are described.	35
			Plans to reconcile data gaps in the monitoring network are stated.	36
		For GDEs, biological data are compiled and synthesized for each GDE unit:	37	
		Biological datasets are plotted and provided for each GDE unit, and when possible provide baseline conditions for assessment of trends and variability.	38	
		Data gaps/insufficiencies are described.	39	
		Plans to reconcile data gaps in the monitoring network are stated.	40	
		Description of potential effects on GDEs, land uses and property interests:	41	
		Cause-and-effect relationships between GDE and groundwater conditions are described.	42	
		Impacts to GDEs that are considered to be "significant and unreasonable" are described.	43	
	Known hydrological thresholds or triggers (e.g., instream flow criteria, groundwater depths, water quality parameters) for significant impacts to relevant species or ecological communities are reported.	44		
Land uses include and consider recreational uses (e.g., fishing/hunting, hiking, boating).	45			
Property interests include and consider privately and publicly protected conservation lands and opens spaces, including wildlife refuges, parks, and natural preserves.	46			
Sustainable Management Criteria	3.5 Monitoring Network 23 CCR §354.34	Description of whether hydrological data are spatially and temporally sufficient to monitor groundwater conditions for each GDE unit.	47	
		Description of how hydrological data gaps and insufficiencies will be reconciled in the monitoring network.	48	
		Description of how impacts to GDEs and environmental surface water users, as detected by biological responses, will be monitored and which GDE monitoring methods will be used in conjunction with hydrologic data to evaluate cause-and-effect relationships with groundwater conditions.	49	

Projects & Mgmt Actions	4.0. Projects & Mgmt Actions to Achieve Sustainability Goal <i>23 CCR §354.44</i>	Description of how GDEs will benefit from relevant project or management actions.	50
		Description of how projects and management actions will be evaluated to assess whether adverse impacts to the GDE will be mitigated or prevented.	51

* In reference to DWR's GSP annotated outline guidance document, available at:
https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD_GSP_Outline_Final_2016-12-23.pdf

Attachment B

TNC Evaluation of the Eastern San Joaquin Subbasin Groundwater Sustainability Plan, Public Draft Complete Executive Summary and Main Report

A complete draft of the Eastern San Joaquin GSP has been provided for public review. On May 31, 2019, TNC provided comments on the Eastern San Joaquin Subbasin GSP Draft Deliverable 1, which included portions of Chapters 1, 2, 3 and 5. This attachment summarizes our comments on the complete public draft GSP dated July 2019, and includes any initial review comments from our May 31, 2019 that have not yet been addressed. Since the GSP does not follow the DWR Annotated GSP Outline, we have organized our comments below in accordance with the item numbers in the checklist included as Attachment A.

Checklist Item 1 – Notice & Communication (23 CCR §354.10).

- [Section 1.3.1 Beneficial Uses and Users in the Subbasin (pp. 1-40)] [Checklist item 1]
 - Caswell Memorial State Park is incorrectly referred to as being located outside the Eastern San Joaquin Subbasin. The following additional protected lands are located near surface waters within the Subbasin that may be interconnected with groundwater, and/or may rely at least partly on groundwater to support vegetation and sensitive natural communities. These protected lands represent potential beneficial users of groundwater: Durham Ferry State Recreational Area, a small portion (approximately 200 acres) of San Joaquin River National Wildlife Refuge, Army Corps Park, Vernalis Riparian Habitat (Public Conservation Lands), Seegers Preserve, Cabral Island Preserve, Machado Preserve, Hansen Preserve, Micke Grove Park and Zoo, Oak Grove Regional Park, Nakagawa Preserve, El Rio Farms Preserve, Lodi Lake Nature Area, Woodbridge Regional Park, Woodbridge Ecological Preserve, White Slough WA, Nuss Farms, Beck Preserve, Hilder Preserve, Staten Island Ranch, Burchel Preserve, and Ishizuka Preserve. The authors referred to the San Joaquin County General Plan documents, including background reports, for information regarding these important resources. These potential beneficial groundwater users should be described in the text on pp. 1-18 and shown in Figure 1-11. Please include a description recognizing all of the protected areas in the Subbasin and their beneficial groundwater uses.
 - Section 2.2.8 includes a geospatial analysis that removes managed wetlands from consideration as GDEs. The managed wetlands in the Subbasin should be identified in this section.

Checklist Item 2 to 4 - Description of general plans and other land use plans relevant to GDEs and their relationship to the GSP (23 CCR §354.8).

- [Section 1.2.1 Description of Plan Area (1-10 to 1-21)] Critical habitat is known to exist for protected aquatic species, such as California Tiger Salamander, Steelhead, Delta Smelt, Giant Gartersnake and California Red-Legged Frog in and around the Subbasin
(<https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77>). There are likely ongoing monitoring programs associated with critical habitat areas and the protected lands. Please include a description of these habitat areas, and associated programs and requirements pertinent to ISWs, GDEs and wetlands. Identify areas where critical habitat exists and overlaps with ISWs and GDEs.
- [Section 1.2.2 Water Resources Monitoring and Management Programs (pp. 1-21 to 1-32)] Per the GSP Regulations (23 CCR §354.34 (a) and (b)), monitoring must address trends in groundwater *and related surface conditions* (emphasis added). In order for this section to provide the appropriate context and help assure integration of GSP implementation with other ongoing regulatory programs, this section should describe the following:
 - Monitoring activities and responsibilities by State, Federal and local agencies and jurisdictions related to aquatic resources and GDEs that could be affected by groundwater withdrawals should be discussed. Section 1.2.2.6 states that there are no agencies that do monitoring specific to surface-groundwater interconnection. While this may be technically correct insofar as it relates to hydrogeologic monitoring, it ignores ongoing monitoring programs related to the state of aquatic resources and GDEs that could be affected by groundwater withdrawals, and that are a direct indicator of potential undesirable results. For example, there are likely ongoing monitoring programs associated with the protected lands listed in our comments to Section 1.3.1, and other open space or preserve areas that may be monitored by public, private or nonprofit entities. A discussion of monitoring programs related to GDEs and ISWs should be included.
 - The lack of existing hydrologic monitoring of surface-groundwater interconnection is a significant data gap as it relates to classification and management of GDEs and should be identified as such and further discussed and addressed in the appropriate subsequent sections of the GSP.
 - Monitoring activities and responsibilities related to instream flow and water quality requirements under applicable Federal Energy Regulatory Commission licenses, Biological Opinions and other regulations or programs are relevant and should be identified. Please include a discussion of water flow and quality monitoring requirements pertinent to ISWs.
- [Section 1.2.3 Land Use Elements or Topic Categories of Applicable General Plans (pp. 1-33 to 1-36 and Appendix 1-E)]
 - This section should include a discussion of General Plan goals and policies related to the protection and management of GDEs and aquatic resources that could be affected by groundwater withdrawals, rather than being limited to goals and policies directly related to groundwater resources alone. Section

1.3.1 correctly identifies environmental uses of groundwater as including "...species and habitat reliant on instream flows, as well as wetlands and GDEs," and yet Section 1.2.3 and Appendix 1-E do not identify any General Plan policies related to these resources. Section 1.2.3 should identify if there are any Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) within the Subbasin and if they are associated with critical, GDE and/or ISW habitats. Appendix 1-E should identify General Plan policies related to wetlands, riparian habitat, streams, aquatic habitat, and related threatened and endangered species. Section 1.2.3.2 should include a discussion of the relationship of GSP implementation to General Plan goals and policies related to GDEs and aquatic habitat; and also address how GSP implementation will coordinate with the goals of any HCPs or NCCPs.

- [Section 1.2.3.4 Well Permitting (pp. 1-36 to 1-38)] This section should include a discussion of the following:
 - Future well permitting must be coordinated with the GSP to assure **achievement of the Plan's sustainability goals.**
 - The State Third Appellate District recently found that Counties have a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting new wells near streams with public trust uses (ELF v. SWRCB and Siskiyou County, No. C083239). The need for well permitting programs to comply with this requirement should be stated.
 - Section 2.3.3.3 discusses potential exemptions from the Stanislaus County Groundwater Ordinance but does not mention the fact that applicants who are not exempt are required to provide substantial evidence that their proposed extraction will not result in undesirable results, including significant and unreasonable impacts to GDEs and surface waters.

Checklist Items 6 and 7 – Hydrogeologic Conceptual Model (23 CCR §354.14)

- [Section 2.1.7 Geologic Cross Sections (pp. 2-35 to 2-37)] Please clearly state whether localized perched aquifers are present in the basin. Include example near-surface cross section details that depict the conceptual understanding of shallow groundwater and stream interactions at different locations, including perched and regional aquifers.
- [Section 2.1.8.2 Definable Bottom of the Basin (p. 2-39)] The Bottom of the Basin Boundary was defined by the base of freshwater, which was mapped 45 years ago and pumping since then has very likely resulted in shift in the isohaline contouring in the basin. Defining the bottom of the Subbasin based on geochemical properties is a suitable approach for defining the base of freshwater, however, as noted on page 9 of DWR's Hydrogeologic Conceptual Model BMP (https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12-23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". Thus, groundwater extraction well depth data should also be included in the determination of the basin bottom. This will

prevent the possibility of extractors with wells deeper than the basin boundary from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary. Also, pumping saline groundwater and desalinating it will become increasingly economical under SGMA due to pumping restrictions in the basin.

- [Section 2.1.10 HCM Data Gaps (pp. 2-56 and 2-57)] The Hydrologic Conceptual Model identified several data gaps including the following for groundwater level data:
 - Depth- or zone-specific water levels to assess vertical interconnection, including zones within the Principal Aquifer. Nested monitoring wells would be helpful near surface water to show how pumping is impacting surface water flows and GDEs.
 - Additional shallow groundwater data near surface waters and NCCAGs.
 - Additional groundwater level data in the east and northwest areas of the Subbasin.
 - Additional groundwater level data near the Mokelumne River to improve quantification and understanding of subsurface flows.

Of these, the second data gap is the information that is most critical to identifying GDEs or potential GDEs and understanding their characteristics.

Checklist Items 8, 9 and 10 – Interconnected Surface Waters (23 CCR §354.16)

- [Section 2.1.4.2 Major Hydraulic Features (pp. 2-9 to 2-14)] This section should discuss (or reference the sections discussing) the following:
 - Specific ISWs, including the extent of both gaining and losing reaches.
 - In-stream flow requirements in each of the interconnected rivers/streams including the amount, time of year when the flow minimum is specified, the duration, the freshwater fish species for which it applies, associated permits that set forth the requirements, and the regulating agency setting forth the compliance requirements.
 - Areas of critical habitat that exist within rivers and streams.
- [Section 2.1.5 Geologic Formations and Stratigraphy (pp. 2-23 to 2-27)] Table 2-2 states that Holocene Stream Channel Deposits are generally not saturated except by the San Joaquin River. Based on the available data, it would be expected that the stream channel deposits associated with the other ISWs in the Subbasin would be saturated near those streams and rivers.
- [Section 2.1.9.2.2 Regional Historic Groundwater Flow and Surface Water Interaction (p. 2-49)] This section focuses on groundwater flow direction and defers further discussion of groundwater conditions to Section 2.2, which does not provide information on historical groundwater-surface water interaction. This section should include a discussion of historic groundwater-surface water interaction.
- Section 2.2.6 Interconnected Surface Water Systems (pp. 2-97 to 2-99)]
 - The determination as to whether or not a stream reach is interconnected or disconnected was made based on whether modeling conducted for the GSP

indicated that it is interconnected more than 25 percent of the time. Even if the stream is only connected 25% of the time, it is still connected, and that short period of connectivity may be during critical times for select species or provide a cooling or biogeochemical effect during a critical period. Please describe the technical basis for selecting a 25 percent interconnection threshold, and how it will adequately protect the environmental beneficial uses of surface water in potentially interconnected surface waters from significant and unreasonable impacts related to groundwater extraction.

- o Shallow groundwater monitoring data near surface waters and NCCAGs are identified as a data gap in Section 2.1.10, and the use of the Eastern San Joaquin Water Resources Model (ESJWRM) to determine the percentage of time that stream reaches are groundwater connected entails inherent uncertainty. The potential presence of shallow or perched aquifers near the rivers is not assessed or discussed in the GSP. Groundwater modeling conducted by the United States Geological Survey (USGS), DWR and others (e.g., JJ&A, 2018) has considered some river reaches shown as disconnected in Figure 2-66 (pp. 2-99) to be groundwater-connected. No data or discussion is presented regarding the potential groundwater connection of other streams associated with significant wetland and riparian resources, including Pixley Slough, Mormon Slough, Littlejohns Creek, Bear Creek, Potter Creek, Duck Creek and Lone Tree Creek. As such, there is considerable uncertainty regarding the designation of interconnected and disconnected surface water resources in Figure 2-66. The uncertainty regarding the groundwater interconnection of streams in the Subbasin should be identified as a data gap.

Checklist Items 11 through 20 – Groundwater Dependent Ecosystems (23 CCR §354.16)

- [Section 2.2.7 Groundwater-Dependent Ecosystems (p. 2-100)] This section includes the incorrect statement that SGMA does not require sustainable management criteria to be established for the management of GDEs. Section 1.3.1 of the GSP states that beneficial users of groundwater and ISWs include “environmental users of groundwater, including species and habitat reliant on instream flows, as well as wetlands and GDEs.” Undesirable results under SGMA include chronic lowering of groundwater levels resulting in significant and unreasonable depletion of supply for beneficial groundwater users, *including* GDEs. Undesirable results also include depletion of ISWs resulting in significant and unreasonable adverse impacts on beneficial users of surface water, including wetlands and GDEs. The incorrect statement that SGMA does not require the establishment of sustainable management criteria for GDEs should be removed.
- [Section 2.2.8 Methodology for GDE Identification (p. 2-100 to 2-106)] The GSP relies on the NCCAG database developed by TNC for the DWR to identify potential GDEs, and then provides a framework for removing most of these areas from further consideration. **It appears that the preliminary desktop analysis documented in the draft GSP resulted an excessive elimination of the NC dataset**

polygons mapped in the Eastern San Joaquin Subbasin. In particular, the methods used to confirm whether or not polygons in the NC Dataset are connected to groundwater in the Eastern San Joaquin Subbasin are highly flawed. We have the following comments on the proposed approach:

- The GSP takes the approach of removing NCCAGs with “access to alternate water supplies” from consideration as GDEs, and states that in order to be considered GDEs, “there must not be alternate water supplies”. Alternate water supplies are assumed to include potential sources of surface water including managed wetlands, irrigated agricultural fields, perennial surface water sources, and other unspecified sources determined by stakeholders on a case-specific basis. This approach is inappropriate and deficient for several important reasons:
 - There is no hydrologic analysis or empirical data provided as a basis for the proposed buffer zones. The hydrologic connectivity between a GDE and a nearby alternative water source is highly dependent on local conditions and can vary seasonally and by year type. In the case of managed wetlands, no consideration is given to the nature of the wetland and surrounding area, the source and frequency of inundation, the soil types, and other features that would be needed to understand the hydrologic connectivity between the wetland and the surrounding area, or even whether the wetland itself is groundwater dependent for a portion of the year. Similarly, no information is given to the topography and hydrology surrounding irrigated agricultural fields, the soil types involved, irrigation practices, whether irrigation is likely to be curtailed during dry years or during certain crop rotations, and other relevant factors. The hydrologic connectivity of perennial surface water sources cannot be assessed without specific knowledge of the water source, topography and soil conditions. In summary, the adequacy of generic buffer zones to assure GDE access to surface water is unsubstantiated.
 - No information is provided regarding the species residing in the GDEs, their sensitivity to groundwater level declines, or the extent of their reliance on groundwater vs. the proposed “alternate water supplies.”
 - There is no evidence of consultation with the regulatory agencies responsible for the protection and management of these resources in the establishment of the proposed framework. It does not appear that any habitat assessments have been conducted.
 - Ecosystems often rely both on groundwater and surface water to meet their water needs (see Best Management Practice #3 in Attachment C of this letter). The availability of “alternate water supplies” to provide some portion of a GDE’s water demand does not mean all of its water needs can be met through alternate supplies (i.e., without reliance on groundwater).
 - Groundwater pumping depletes ISWs under both gaining or losing conditions, and GDEs may rely on the interactions of surface water to meet their water requirements.

Simply put, the approach proposes to manage GDEs without consideration to understanding the nature and needs of the resource being managed. A strictly binary approach, designating all NCCAGs as either 100 percent reliant on groundwater or 100 percent reliant on alternate water supplies is inconsistent with the available science and is not supportable. A scientific rationale for removing areas with access to assumed alternate water sources has not been provided. The deleted potential GDEs should be retained in the GSP and managed as potential GDEs. If further study and consultation with the appropriate regulatory agencies indicates that some areas would not be affected by groundwater withdrawals, consideration could be given to removing them at that time.

- We have the following additional comments regarding the potential use of buffer zones to exclude NC-Dataset polygons from further consideration as GDEs:
 - In the case of managed wetlands, the water sources used by the managed wetlands, the type of managed wetlands, the relationship of the wetlands to groundwater, and the wetland manager should be specified. In addition, these managed wetlands should be identified in Section 1.3.1.
 - Please refer to Attachment C of this letter for best practices in using groundwater data to verify whether NCCAGs are GDEs. The GSP identifies monitoring data for shallow groundwater near ISWs as a data gap. Please discuss what temporal and spatial data were **used to identify "shallow groundwater,"** and identify any data gaps.
 - A scientifically defensible rationale and data for applying the proposed buffer zones used to remove NCCAGs areas proximal to alternate water sources from consideration as GDEs has not been provided. In the absence of specific information regarding groundwater levels near these features, which is identified as a data gap in the GSP, it is possible that they are connected to a shallow groundwater table, at least seasonally. This is true of both gaining and losing reaches. Such a connection means they meet the definition of a GDE, regardless of whether the groundwater is replenished by a surface water source (see Best Management Practice #3 in Attachment C of this letter). In addition, the extent of groundwater reliance, and the ability of species to adapt to seasonal and long-term changes in hydrologic conditions, varies from species to species. We acknowledge that proximity to surface water sources and establishment of buffer zones may be an important consideration in GDE management; however, groundwater extraction can still result in drawdown near these areas, especially at the outer fringes of GDEs that are more vulnerable to drawdown. Buffer zones, if used, must be supported by actual hydrologic and habitat assessment data. If such data and assessments are not available, the areas should not be deleted from consideration and management as GDEs. The need for

supporting studies to validate the approach may be identified as a data gap and undertaken in the future.

- The “stakeholder feedback” mechanism for removal of NCCAGs from consideration as GDEs is not explained or documented in the GSP. Please provide details that support removing potential GDEs based on stakeholder feedback. Stakeholder feedback, in the absence of scientifically supportable data and/or agency consultation, may be insufficient to exclude areas from consideration as GDEs.
-
- We have the following comments about the proposed use of a 30-foot depth to water criterion to exclude NC-Dataset polygons from further consideration as GDEs:
 - SGMA defines GDEs as "ecological communities and species that depend on *groundwater emerging from aquifers or on groundwater occurring near the ground surface*". We recommend that depth to groundwater contour maps are used, where they can be reliably substantiated, to verify whether a connection to groundwater exists for polygons in the NC Dataset. This is preferable to relying on inferences based on the presence of surface water features in the Basin. However, it is important to note that where depth to water is uncertain in proximity to streams, a depth to water criterion for assessing which polygons are GDEs is inappropriate. Please refer to Appendix C of this letter for best practices for using groundwater data to verify a connection to groundwater.
 - Please provide more details on how depth to groundwater contour maps were developed:
 - Are the wells used for interpolating depth to groundwater sufficiently close (<5km) to NC Dataset polygons to reflect local conditions relevant to ecosystems?
 - Are the wells used for interpolating depth to groundwater screened within the surficial unconfined aquifer and capable of measuring the true water table?
 - Is depth to groundwater contoured using groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape? This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)³ to estimate depth-to-groundwater contours across the landscape. This will provide much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. Depth to groundwater contours developed from depth to groundwater measurements

³ USGS Digital Elevation Model data products are described at: <https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services> and can be downloaded at: <https://iewer.nationalmap.gov/basic/>

at wells assumes that the land surface is constant, which is a poor assumption to make. It is better to assume that water surface elevations are constant in between wells, and then calculate depth to groundwater using a DEM of the land surface to contour depth to groundwater.

- The 30-foot depth to water criterion used to exclude riparian areas near streams east of the San Joaquin River from further consideration as GDEs is very broadly applied and poorly supported. Based on our understanding of the regional hydrogeology, we would expect riparian vegetation and wetlands near the major surface drainages to be connected to water tables associated with the regional aquifer system from a point where the streams exit the foothill uplands westward, except in areas of significant, pumping-induced drawdown. Shallow groundwater data near streams are identified as a significant data gap, and the available groundwater level data come from wells screened at a variety of depths. The application of a 30-foot depth to water criterion is inadequately supported in light of the identified data gaps, and should not be used to exclude potential GDEs from further consideration without additional study.
- While depth to groundwater levels within 30 feet are generally accepted as being a proxy for confirming that polygons in the NC dataset are connected to groundwater, the variable needs of plant species and their dependence on seasonal and inter-annual groundwater level fluctuations should be considered when applying this criterion. The GSP cites a maximum rooting depth of 25 feet for oak trees as a basis for the 30-foot criterion, yet studies have found the roots of oaks can extend deeper than 70 feet to extract water from the capillary fringe immediately above the water table during the summer and fall, and that groundwater reserves provide a buffer to rapid changes in their hydroclimate, as long as groundwater reserves are not depleted by drought or human consumption.⁴ It is highly advised that seasonal and interannual fluctuations in the groundwater regime are taken into consideration. Utilizing groundwater data from one point in time or contoured with too few shallow monitoring wells can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Based on a study we recently submitted to *Frontiers in Environmental Science Journal*, we've observed riparian forests along the Cosumnes River to experience a range in groundwater levels between 1.5 and 75 feet over seasonal and interannual timescales. Seasonal fluctuations in the regional water table can support perched groundwater near an intermittent river that seasonally runs dry due to large seasonal fluctuations in the regional water table. While perched groundwater itself cannot directly be

⁴ Miller and others. 2009. *Groundwater Uptake by Woody Vegetation in a Semi-Arid Oak Savannah*. *Water Resources Research*. Volume 46. November.

managed due to its position in the vadose zone, the water table position within the regional aquifer (via pumping rate restrictions, restricted pumping at certain depths, restricted pumping around GDEs, well density rules) and its interactions with surface water (e.g., timing and duration) can be managed to prevent adverse impacts to ecosystems due to changes in groundwater quality and quantity under SGMA.

- Very little description is provided regarding the nature and function of the identified GDEs, their potential sensitivity to groundwater and surface water supply changes, their relative habitat value, or the current and historical groundwater conditions and variability near the GDEs. Given that monitoring of groundwater levels near ISWs has been identified as a data gap and limited resources are available to expand monitoring efforts in these areas, additional assessment would be helpful to identify and prioritize potential data gaps. We recommend that a discussion regarding the nature and characteristics of the identified GDEs be included.

Checklist Items 21 and 22 – Water Budget (23 CCR §354.18)

- [Section 2.3.5 Water Budget Estimates (pp. 2-115 to 2-133)] The following items related to GDEs, wetlands and riparian areas should be clarified or considered:
 - “Riparian intake from streams” is identified as a stream system water budget component and is defined as the portion of riparian evapotranspiration (ET) met by streamflows. Please include an explanation of the approach to determining the amount of riparian ET demand met by streamflow vs. groundwater evapotranspiration.
 - Groundwater outflow to ET does not appear to be identified as a groundwater budget component (for example see Figure 2-74, p. 2-125). In addition, the ET demand of natural vegetation does not appear to be considered in water supply and demand calculations (for example see Table 2-16, p. 2-126). Since GDEs (including wetlands, riparian vegetation, phreatophytes and other communities) are recognized as beneficial users of groundwater in the Subbasin, it is appropriate to include them in these calculations.

Checklist Items 23 and 25 – Sustainability Goal (23 CCR §354.24)

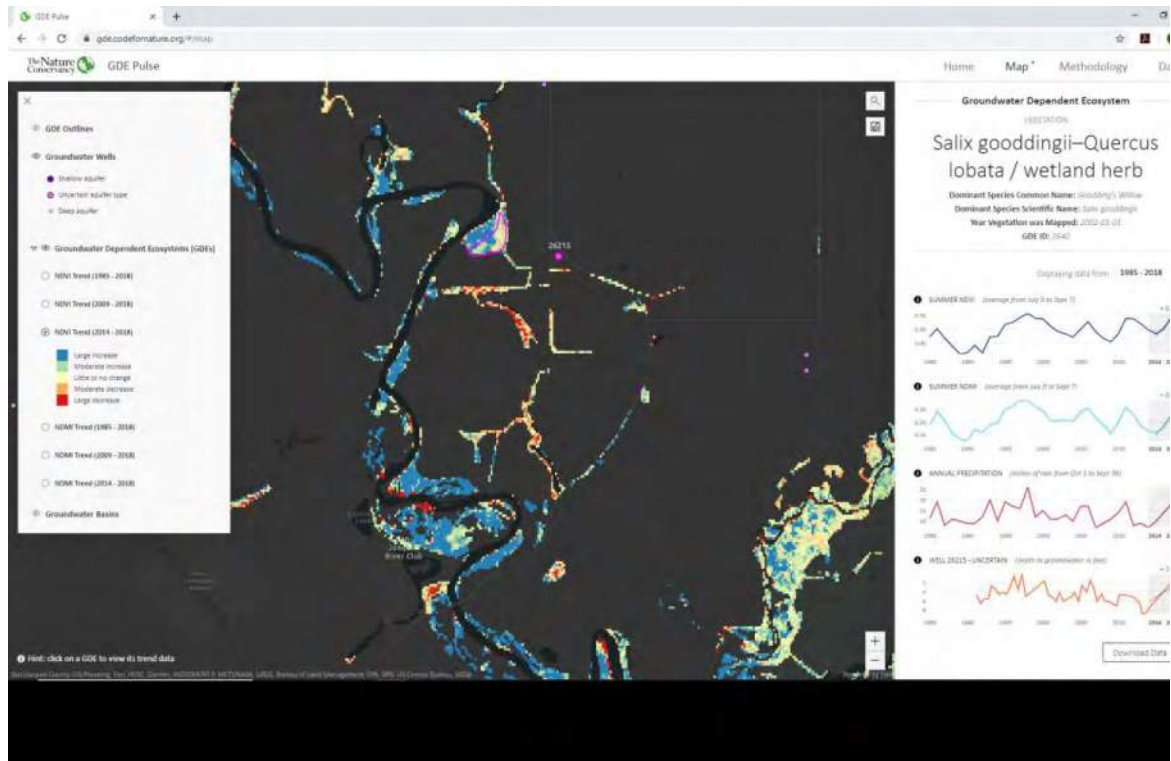
- [Section 3.1 Sustainability Goal (p. 3-1)] The Sustainability Goal is defined as being “... to maintain an economically-viable groundwater resource for the beneficial use of the people of the Eastern San Joaquin Subbasin” Since GDEs, are recognized as beneficial users of groundwater in the Subbasin, they should be mentioned in the Sustainability Goal.

Checklist Item 26 – Measurable Objectives (23 CCR §354.30) and Checklist Items 30 to 33 – Undesirable Results (23 CCR §354.26)

- [Section 3.2.1.1.1 Description of Undesirable Results (for chronic lowering of groundwater levels (p. 3-3))] This section only describes undesirable results relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline. On page 3-5 in Section 3.2.1.2, impacts to GDEs are correctly identified as an undesirable result potentially associated with chronic groundwater level decline. Please add **“potential adverse impacts to GDEs”** to the list of potential undesirable results presented in Section 3.2.1.1.1.
- [Section 3.2.3.1.1 Description of Undesirable Results (for degraded water quality (p. 3-11))] This section only describes undesirable results in terms of total dissolved solids concentrations and related impacts. The section should be modified to state that overpumping and dewatering of aquitards has been identified as a potential source of elevated arsenic concentrations above drinking water standards in San Joaquin Valley aquifers. The following is a link to a paper by Smith, Knight and Fendorf (2018) titled “Overpumping leads to California groundwater arsenic threat”: (<https://www.nature.com/articles/s41467-018-04475-3>).
- [Section 3.2.6.1.1 Description of Undesirable Results (for ISWs (p. 3-11))] This section states that undesirable results related to surface water depletion were defined and evaluated only for major streams and rivers including the Calaveras River, Dry Creek, Mokelumne River, San Joaquin River, and Stanislaus River. The section goes on to state that many of the smaller creeks and streams are solely used for the conveyance of irrigation water and these systems have not been considered in the analysis of depletions. Contrary to these statements, surface water resources in these creeks support significant recognized aquatic habitat, wetlands and riparian zones that represent potential environmental beneficial uses and users of groundwater. A number of these streams are associated with designated protected lands. The analysis for potential depletion of ISWs in Section 3.2.6 should include all beneficial users of surface water that could be affected by groundwater withdrawals, including environmental beneficial users along creeks, even if the creeks are interconnected less than 75% of the time.
- [Section 3.2.6.1.2 Identification of Undesirable Results (for ISWs (p. 3-12))] The section states that “undesirable results would occur if groundwater extractions depleted interconnected streams and there was not sufficient surface water to supply ... fish and wildlife demands.” This definition of undesirable results is overly narrow and recognizes only a limited subset of the environmental beneficial users of ISWs. A more complete definition would be that undesirable results would occur if groundwater extraction resulted in a depletion of surface water that caused significant impacts to aquatic species or wildlife, or degradation of GDEs. Please expand the definition of undesirable results to include all of the environmental beneficial uses and users of ISWs, and expand the analysis in Section 3.2.6, as appropriate.
- [Section 3.2.6.1.3 Potential Effects of Undesirable Results (for ISWs (p. 3-12))] The potential effects of undesirable results on environmental beneficial users are not described. Please expand the section to describe the potential effects of

undesirable results on all beneficial uses and users of ISWs, including environmental uses and users.

- The [GDE Pulse](#) web application developed by The Nature Conservancy provides easy access to 35 years of satellite data to view trends of vegetation metrics, groundwater depth (where available), and precipitation data. This satellite imagery can be used to observe trends for NC dataset polygons within the Subbasin. Over the past 10 years (2009-2018), some NC dataset vegetation polygons have experienced adverse impacts to vegetation growth and moisture in the western portion of the Subbasin. An example screen shot from the GDE Pulse tool is presented below. Please review these spatial patterns and, where possible, correlate them with water level trends. Any indications of adverse trends and any data gaps should be identified.



Checklist Items 27 to 29 – Minimum Thresholds (23 CCR §354.28).

- [Section 3.2.6.2 Minimum Thresholds (for ISWs (pp. 3-19 and 3-20)] The GSP proposes to use the Minimum Thresholds and Measurable Objectives associated with Chronic Decline in Groundwater Levels as a proxy for management of depletion of ISWs, and concludes that these criteria will be protective of the depletion of ISWs and prevent significant and unreasonable impacts to beneficial surface water uses and users. This conclusion is not adequately supported by data and/or consultation with the agencies that are responsible for the regulation of GDE habitats. We have the following comments:
 - The section states that current or historical issues associated with depletion of ISWs were not indicated to be significant and unreasonable based on discussions at GWA Board, Advisory Committee, and Workgroup meetings and

through input from GSA staff, and that it was therefore assumed that historical conditions are protective of beneficial uses. It does not appear that any consultation occurred with the Federal, State and local agencies responsible for management and regulation of environmental beneficial uses of ISWs, or with the private parties, agencies and NGOs involved in managing the protected lands listed in our response to Section 1.3.1. In addition, no reference is made to the review of supporting documents for General Plan Conservation or Land Use Elements, or to the review of environmental management studies and documents such as Biological Assessments, Biological Opinions, HCPs or other studies regarding the current and historical conditions of the beneficial uses being evaluated. Please provide a more thorough explanation of the basis for the assumption that current and historical groundwater level conditions are protective of beneficial uses related to ISWs. Data gaps should be acknowledged.

- o The [GDE Pulse](#) web application developed by The Nature Conservancy provides easy access to 35 years of satellite data to view trends of vegetation metrics, groundwater depth (where available), and precipitation data. This satellite imagery can be used to observe trends for NC dataset polygons within the Subbasin. Over the past 10 years (2009-2018), some NC dataset vegetation polygons have experienced adverse impacts to vegetation growth and moisture in the western portion of the Subbasin. Please review these spatial patterns and, where possible, correlate them with water level trends. Any indications of adverse trends and any data gaps should be identified.
- o The section discusses future use scenarios, associated groundwater level declines and ISW depletions on a broad level. The potential effects of these declines on environmental beneficial uses, including GDEs, are not discussed. In addition to discussion of potential adverse effects at a general level, a conclusion that significant adverse impacts are unlikely generally requires more site- and resource-specific analysis. Please include a discussion of the potential for adverse effects of surface water depletions on environmental resources, as well as a reasoned analysis of the likelihood of their occurrence under future scenarios. The lack of site-specific data to draw conclusions about specific environmental beneficial users should be recognized as a data gap.
- o Please expand the analysis of potential undesirable results to include all environmental beneficial uses and users, including those associated with more local streams and creeks.
- o The statement that an additional depletion of the surface water due to groundwater pumping of 50,000 acre-feet per year is not significant and unreasonable needs to be further analyzed. The conclusion is based on analyzing the estimated depletion as a percentage of total surface water discharge. The significance of such a depletion relative to specific beneficial uses and users will depend on its distribution throughout the surface water system. Even a modest amount of depletion may have a significant local adverse effect. The limitations of broad conclusions regarding basin-

wide surface water flow depletions should be recognized and any data gaps identified.

Checklist Items 47, 48 and 49 – Monitoring Network (23 CCR §354.34)

- [Section 4.1 Monitoring Network for Chronic Groundwater Level Decline (pp. 4-1 to 4-8) and Section 4.6 Monitoring Network for Depletion of Interconnected Surface Water (p. 4-14)] The GSP proposes to use groundwater level monitoring for chronic groundwater level decline as a surrogate for monitoring the depletion of ISWs. We have the following comments.
 - The areas identified as potential GDEs in the GSP are located near the western boundary of the Subbasin. Only one of the representative monitoring wells appears to be located near those areas (Figure 4-1 on p. 4-5). Very few of the remaining monitoring wells are located near potential ISWs and GDEs. Specific monitoring should be described to further evaluate, monitor, manage and protect areas with ISWs and GDEs.
 - Per the GSP Regulations (23 CCR §354.34 (a) and (b)), monitoring must address trends in groundwater *and related surface conditions* (emphasis added). Groundwater level monitoring alone may be insufficient to establish a linkage between groundwater extraction and potentially resulting impacts to environmental resources associated with GDEs and ISWs. The cause-effect relationship between groundwater levels and the biological responses that could result in significant and unreasonable impacts to ISWs and GDEs depends on a number of complicated factors, and this relationship is not characterized or discussed. As such, it is not possible to determine whether the proposed monitoring, minimum thresholds and measurable objectives are sufficiently protective to ensure significant and unreasonable impacts to GDEs and ISWs will be prevented. The GDE Pulse interactive mapping application provides an example of a linkage between groundwater level data and GDE health that could be used to incorporate remote sensing into an efficient and incisive monitoring program. Please provide an explanation how groundwater levels will specifically be used to assess adverse impacts to GDEs and ISWs, and identify any data gaps and how they will be addressed.
- [Section 4.7 Data Gaps (pp. 4-14 to 4-17)] Twelve new monitoring wells are proposed to measure groundwater levels and quality in critical areas where data are sparse. These include increased coverage near streams, Subbasin boundaries, and in the central area of groundwater depression. We have the following comments.
 - Locations should be prioritized near high value or sensitive resources that are vulnerable to significant and unreasonable impacts, such as near the protected lands identified in our comments on Section 1.3.1 or the GDEs identified in the Subbasin. In addition to the major streams and rivers in the subbasin, impacts to smaller creeks and wetland areas should be considered, as these may be the most vulnerable resources. Please discuss the results of a resource assessment or consultations with resource managers that demonstrates a sufficient number of wells is proposed to address data gaps near GDEs and ISWs, and that they are being sited where

they will provide the most benefit. Alternatively, please outline the process by which this will be accomplished.

- o As discussed in our comments above, please address how the need to link and correlate groundwater level declines to biological responses, and significant and adverse impacts to GDEs and ISWs will be addressed.
- o Well sites near ISWs should be selected at varying distances from streams and completed as vertically-nested clusters to capture the lateral and vertical gradients between the pumped depths in the aquifer system and the shallow groundwater aquifers that are in communication with ISWs or GDEs. There is a need to enhance monitoring of stream flow and vertical groundwater gradients by installing more stream gauges and clustered/nested wells near streams, rivers or wetlands. Ideally, co-locating stream gauges with clustered wells would enhance understanding about where ISWs exist in the basin and whether pumping is causing depletions of surface water or impacts on beneficial users of surface water and groundwater.
- o Addressing data gaps is typically iterative and it is not reasonable to expect it will be a one-time process. Please describe the process by which data gaps will be identified and addressed on an ongoing basis.
- [Section 5.3 Data Included in the Management System (pp. 5-6 to 5-8)] Table 5.3 indicates that data regarding streamflow and GDEs is not currently included in the proposed Data Management System. Per the GSP Regulations (23 CCR §354.34 (a) and (b)), monitoring must address trends in groundwater *and related surface conditions* (emphasis added). You cannot manage what you do not measure. **Please discuss which monitoring data for “related surface conditions” will be gathered and incorporated in the DMS to assess potential significant and unreasonable impacts to environmental beneficial uses and users.**
- [Section 7.3.1 Monitoring (p. 7-5)] This section lists the key components involved in implementation of the monitoring network. Groundwater levels and monitoring will occur semi-annually, but no other information is given. Section 6.3 states that “additional management activities are discussed in Chapter 7: Plan Implementation”, and would include monitoring groundwater use through use of satellite imagery. However, Chapter 7 does not discuss using imagery or any remote sensing, which is a great tool for monitoring ecosystem health of GDEs and ISWs. Please clarify the potential use of imagery as a monitoring tool, and expand it to monitoring surface indicators of ISW and GDE ecosystem health.
- [Section 7.3.2.2 Basin Conditions (pp. 7-5 and 7-6)] This section describes what current groundwater conditions and monitoring results will be included in the annual monitoring report. Please specifically address ecosystem health of GDEs and ISWs as a surface indicator to subsurface conditions. This can be done using GDE Pulse, remote sensing, imagery or other feasible methods.

Checklist Items 50 and 51 – Project and Management Actions (23 CCR §354.44)

- [Section 6.2.1 Project Identification (p. 6-1)] The Subbasin includes many GDEs and ISWs which represent beneficial uses and users of groundwater, and which include potentially sensitive resources and protected lands. Environmental resource

protection needs should be considered in establishing project priorities. In addition, consistent with existing grant and funding guidelines for SGMA-related work, priority should be given to multi-benefit projects that can address water quantity as well as providing environmental benefits or benefits to disadvantaged communities. Please include environmental benefits and multiple benefits as criteria for assessing project priorities.

- Table 6-1 (pp. 6-2 to 6-7) lists potential projects and the Measurable Objective that is expected to benefit. Only water level benefits are listed, but maintenance or recovery of groundwater levels, or construction of recharge facilities, also will have environmental benefits in many cases. From the table, it is not possible to distinguish the full range of project benefits or how the projects will be prioritized. It would be advantageous to demonstrate multiple benefits from a funding and prioritization perspective.
- [Section 6.2.4 Planned Projects (pp. 6-8 to 6-33)]
 - For the projects already identified, please consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue.
 - If ISWs will not be adequately protected by those listed, please include and describe additional management actions and projects targeted for protecting ISWs.
 - Recharge ponds, reservoirs and facilities for managed stormwater recharge can be designed to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. In some cases, such facilities have been incorporated into local HCPs, more fully recognizing the value of the habitat that they provide and the species they support. For projects that will be constructing recharge ponds, please consider identifying if there will be habitat value incorporated into the design and how the recharge ponds will be managed to benefit environmental users.
 - Specific examples of how project descriptions may be refined to incorporate environmental benefits include the following:
 - Project 21: Winery Recycled Water will recycle winery wastewater and reuse it for irrigation and in-lieu recharge, or the water will be put into ponds. Please consider identifying what proportion of water will be put into ponds for direct recharge that could also provide a benefit for wildlife and aquatic species.
 - Project 23: SSJID Stormwater Reuse will capture stormwater for reuse and recharge. Project 18: Farmington Dam Repurpose Project proposes to more than double storage in Farmington Basin for water supply. Please consider assessing ways in which these projects could also provide enhanced wildlife and aquatic species benefits.
 - For examples of case studies on how to incorporate environmental benefits into groundwater projects, please visit our website: <https://groundwaterresourcehub.org/case-studies/recharge-case-studies/>
- [Section 6.3 Management Actions (p. 6-34)] This section lists only administrative actions the GSA will undertake to implement the GSP, and does not identify the management actions to be taken if to assure SGMA compliance if monitoring data

indicate that measurable objectives or interim milestones are not being achieved. An adaptive management approach, where monitoring data are used to assess results and inform refinement of the management approach is typically specified. Please identify what management actions will be taken if monitoring data indicate that Measurable Objectives or Interim Milestones are not being achieved, or undesirable results are imminent.

Eastern San Joaquin Subbasin GSP **Public Draft**
 Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
Attachment A (see comment letter)	Sandi Matsumoto	The Nature Conservancy	N/A	N/A	N/A	Considering Nature under SGMA: A Checklist "Environmental User Checklist"
Attachment B (see comment letter)	Sandi Matsumoto	The Nature Conservancy	N/A	N/A	N/A	This attachment (also detailed below) summarizes our comments on the complete public draft GSP dated July 2019, and includes any initial review comments from our May 31, 2019 that have not yet been addressed.
1	Sandi Matsumoto	The Nature Conservancy	pp. 1-40	Section 1.3.1	N/A	Caswell Memorial State Park is incorrectly referred to as being located outside the Eastern San Joaquin Subbasin. The following additional protected lands are located near surface waters within the Subbasin that may be interconnected with groundwater, and/or may rely at least partly on groundwater to support vegetation and sensitive natural communities. These protected lands represent potential beneficial users of groundwater: Durham Ferry State Recreational Area, a small portion (approximately 200 acres) of San Joaquin River National Wildlife Refuge, Army Corps Park, Vernalis Riparian Habitat (Public Conservation Lands), Seegers Preserve, Cabral Island Preserve, Machado Preserve, Hansen Preserve, Micke Grove Park and Zoo, Oak Grove Regional Park, Nakagawa Preserve, El Rio Farms Preserve, Lodi Lake Nature Area, Woodbridge Regional Park, Woodbridge Ecological Preserve, White Slough WA, Nuss Farms, Beck Preserve, Hilder Preserve, Staten Island Ranch, Burchel Preserve, and Ishizuka Preserve. The authors referred to the San Joaquin County General Plan documents, including background reports, for information regarding these important resources. These potential beneficial groundwater users should be described in the text on pp. 1-18 and shown in Figure 1-11. Please include a description recognizing all of the protected areas in the Subbasin and their beneficial groundwater uses. Section 2.2.8 includes a geospatial analysis that removes managed wetlands from consideration as GDEs. The managed wetlands in the Subbasin should be identified in this section.
2	Sandi Matsumoto	The Nature Conservancy	pp. 1-10 to 1-21	Section 1.2.1	N/A	Critical habitat is known to exist for protected aquatic species, such as California Tiger Salamander, Steelhead, Delta Smelt, Giant Gartersnake and California Red-Legged Frog in and around the Subbasin (https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77). There are likely ongoing monitoring programs associated with critical habitat areas and the protected lands. Please include a description of these habitat areas, and associated programs and requirements pertinent to ISWs, GDEs and wetlands. Identify areas where critical habitat exists and overlaps with ISWs and GDEs.
3	Sandi Matsumoto	The Nature Conservancy	pp. 1-21 to 1-32	Section 1.2.2	N/A	Per the GSP Regulations (23 CCR §354.34 (a) and (b)), monitoring must address trends in groundwater <i>and related surface conditions</i> (emphasis added). In order for this section to provide the appropriate context and help assure integration of GSP implementation with other ongoing regulatory programs, this section should describe the following: <ul style="list-style-type: none"> o Monitoring activities and responsibilities by State, Federal and local agencies and jurisdictions related to aquatic resources and GDEs that could be affected by groundwater withdrawals should be discussed. Section 1.2.2.6 states that there are no agencies that do monitoring specific to surface-groundwater interconnection. While this may be technically correct insofar as it relates to hydrogeologic monitoring, it ignores ongoing monitoring programs related to the state of aquatic resources and GDEs that could be affected by groundwater withdrawals, and that are a direct indicator of potential undesirable results. For example, there are likely ongoing monitoring programs associated with the protected lands listed in our comments to Section 1.3.1, and other open space or preserve areas that may be monitored by public, private or nonprofit entities. A discussion of monitoring programs related to GDEs and ISWs should be included. o The lack of existing hydrologic monitoring of surface-groundwater interconnection is a significant data gap as it relates to classification and management of GDEs and should be identified as such and further discussed and addressed in the appropriate subsequent sections of the GSP. o Monitoring activities and responsibilities related to instream flow and water quality requirements under applicable Federal Energy Regulatory Commission licenses, Biological Opinions and other regulations or programs are relevant and should be identified. Please include a discussion of water flow and quality monitoring requirements pertinent to ISWs.

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4	Sandi Matsumoto	The Nature Conservancy	pp. 1-33 to 1-36 and Appendix 1-E)	Section 1.2.3	N/A	This section should include a discussion of General Plan goals and policies related to the protection and management of GDEs and aquatic resources that could be affected by groundwater withdrawals, rather than being limited to goals and policies directly related to groundwater resources alone. Section 1.3.1 correctly identifies environmental uses of groundwater as including "...species and habitat reliant on instream flows, as well as wetlands and GDEs," and yet Section 1.2.3 and Appendix 1-E do not identify any General Plan policies related to these resources. Section 1.2.3 should identify if there are any Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) within the Subbasin and if they are associated with critical, GDE and/or ISW habitats. Appendix 1-E should identify General Plan policies related to wetlands, riparian habitat, streams, aquatic habitat, and related threatened and endangered species. Section 1.2.3.2 should include a discussion of the relationship of GSP implementation to General Plan goals and policies related to GDEs and aquatic habitat; and also address how GSP implementation will coordinate with the goals of any HCPs or NCCPs.
5	Sandi Matsumoto	The Nature Conservancy	pp. 1-36 to 1-38	Section 1.2.3.4	N/A	This section should include a discussion of the following: <ul style="list-style-type: none"> o Future well permitting must be coordinated with the GSP to assure achievement of the Plan's sustainability goals. o The State Third Appellate District recently found that Counties have a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting new wells near streams with public trust uses (ELF v. SWRCB and Siskiyou County, No. C083239). The need for well permitting programs to comply with this requirement should be stated. o Section 2.3.3.3 discusses potential exemptions from the Stanislaus County Groundwater Ordinance but does not mention the fact that applicants who are not exempt are required to provide substantial evidence that their proposed extraction will not result in undesirable results, including significant and unreasonable impacts to GDEs and surface waters.
6	Sandi Matsumoto	The Nature Conservancy	pp. 2-35 to 2-37	Section 2.1.7	N/A	Please clearly state whether localized perched aquifers are present in the basin. Include example near-surface cross section details that depict the conceptual understanding of shallow groundwater and stream interactions at different locations, including perched and regional aquifers.
7	Sandi Matsumoto	The Nature Conservancy	p. 2-39	Section 2.1.8.2	N/A	The Bottom of the Basin Boundary was defined by the base of freshwater, which was mapped 45 years ago and pumping since then has very likely resulted in shift in the isohaline contouring in the basin. Defining the bottom of the Subbasin based on geochemical properties is a suitable approach for defining the base of freshwater, however, as noted on page 9 of DWR's Hydrogeologic Conceptual Model BMP (https://water.ca.gov/legacyfiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12-23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". Thus, groundwater extraction well depth data should also be included in the determination of the basin bottom. This will prevent the possibility of extractors with wells deeper than the basin boundary from claiming exemption of SGMA due to their well residing outside the vertical extent of the basin boundary. Also, pumping saline groundwater and desalinating it will become increasingly economical under SGMA due to pumping restrictions in the basin.
8	Sandi Matsumoto	The Nature Conservancy	pp. 2-56 and 2-57	Section 2.1.10	N/A	The Hydrologic Conceptual Model identified several data gaps including the following for groundwater level data: <ul style="list-style-type: none"> o Depth- or zone-specific water levels to assess vertical interconnection, including zones within the Principal Aquifer. Nested monitoring wells would be helpful near surface water to show how pumping is impacting surface water flows and GDEs. o Additional shallow groundwater data near surface waters and NCCAGs. o Additional groundwater level data in the east and northwest areas of the Subbasin. o Additional groundwater level data near the Mokelumne River to improve quantification and understanding of subsurface flows. Of these, the second data gap is the information that is most critical to identifying GDEs or potential GDEs and understanding their characteristics.
9	Sandi Matsumoto	The Nature Conservancy	pp. 2-9 to 2-14	Section 2.1.4.2	N/A	This section should discuss (or reference the sections discussing) the following: <ul style="list-style-type: none"> o Specific ISWs, including the extent of both gaining and losing reaches. o In-stream flow requirements in each of the interconnected rivers/streams including the amount, time of year when the flow minimum is specified, the duration, the freshwater fish species for which it applies, associated permits that set forth the requirements, and the regulating agency setting forth the compliance requirements. o Areas of critical habitat that exist within rivers and streams.
10	Sandi Matsumoto	The Nature Conservancy	pp. 2-23 to 2-27	Section 2.1.5	N/A	Table 2-2 states that Holocene Stream Channel Deposits are generally not saturated except by the San Joaquin River. Based on the available data, it would be expected that the stream channel deposits associated with the other ISWs in the Subbasin would be saturated near those streams and rivers.
11	Sandi Matsumoto	The Nature Conservancy	p. 2-49	Section 2.1.9.2.2	N/A	This section focuses on groundwater flow direction and defers further discussion of groundwater conditions to Section 2.2, which does not provide information on historical groundwater-surface water interaction. This section should include a discussion of historic groundwater-surface water interaction.

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12	Sandi Matsumoto	The Nature Conservancy	pp. 2-97 to 2-99	Section 2.2.6	N/A	<p>o The determination as to whether or not a stream reach is interconnected or disconnected was made based on whether modeling conducted for the GSP indicated that it is interconnected more than 25 percent of the time. Even if the stream is only connected 25% of the time, it is still connected, and that short period of connectivity may be during critical times for select species or provide a cooling or biogeochemical effect during a critical period. Please describe the technical basis for selecting a 25 percent interconnection threshold, and how it will adequately protect the environmental beneficial uses of surface water in potentially interconnected surface waters from significant and unreasonable impacts related to groundwater extraction.</p> <p>o Shallow groundwater monitoring data near surface waters and NCCAGs are identified as a data gap in Section 2.1.10, and the use of the Eastern San Joaquin Water Resources Model (ESJWRM) to determine the percentage of time that stream reaches are groundwater connected entails inherent uncertainty. The potential presence of shallow or perched aquifers near the rivers is not assessed or discussed in the GSP. Groundwater modeling conducted by the United States Geological Survey (USGS), DWR and others (e.g., JJ&A, 2018) has considered some river reaches shown as disconnected in Figure 2-66 (pp. 2-99) to be groundwater-connected. No data or discussion is presented regarding the potential groundwater connection of other streams associated with significant wetland and riparian resources, including Pixley Slough, Mormon Slough, Littlejohns Creek, Bear Creek, Potter Creek, Duck Creek and Lone Tree Creek. As such, there is considerable uncertainty regarding the designation of interconnected and disconnected surface water resources in Figure 2-66. The uncertainty regarding the groundwater interconnection of streams in the Subbasin should be identified as a data gap.</p>
13	Sandi Matsumoto	The Nature Conservancy	p. 2-100	Section 2.2.7	N/A	<p>This section includes the incorrect statement that SGMA does not require sustainable management criteria to be established for the management of GDEs. Section 1.3.1 of the GSP states that beneficial users of groundwater and ISWs include “environmental users of groundwater, including species and habitat reliant on instream flows, as well as wetlands and GDEs.” Undesirable results under SGMA include chronic lowering of groundwater levels resulting in significant and unreasonable depletion of supply for beneficial groundwater users, including GDEs. Undesirable results also include depletion of ISWs resulting in significant and unreasonable adverse impacts on beneficial users of surface water, including wetlands and GDEs. The incorrect statement that SGMA does not require the establishment of sustainable management criteria for GDEs should be removed.</p>

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14	Sandi Matsumoto	The Nature Conservancy	p. 2-100 to 2-106	Section 2.2.8	N/A	<p>The GSP relies on the NCCAG database developed by TNC for the DWR to identify potential GDEs, and then provides a framework for removing most of these areas from further consideration. It appears that the preliminary desktop analysis documented in the draft GSP resulted an excessive elimination of the NC dataset polygons mapped in the Eastern San Joaquin Subbasin. In particular, the methods used to confirm whether or not polygons in the NC Dataset are connected to groundwater in the Eastern San Joaquin Subbasin are highly flawed. We have the following comments on the proposed approach:</p> <ul style="list-style-type: none"> oThe GSP takes the approach of removing NCCAGs with “access to alternate water supplies” from consideration as GDEs, and states that in order to be considered GDEs, “there must not be alternate water supplies”. Alternate water supplies are assumed to include potential sources of surface water including managed wetlands, irrigated agricultural fields, perennial surface water sources, and other unspecified sources determined by stakeholders on a case-specific basis. This approach is inappropriate and deficient for several important reasons: <ul style="list-style-type: none"> •There is no hydrologic analysis or empirical data provided as a basis for the proposed buffer zones. The hydrologic connectivity between a GDE and a nearby alternative water source is highly dependent on local conditions and can vary seasonally and by year type. In the case of managed wetlands, no consideration is given to the nature of the wetland and surrounding area, the source and frequency of inundation, the soil types, and other features that would be needed to understand the hydrologic connectivity between the wetland and the surrounding area, or even whether the wetland itself it groundwater dependent for a portion of the year. Similarly, no information is given to the topography and hydrology surrounding irrigated agricultural fields, the soil types involved, irrigation practices, whether irrigation is likely to be curtailed during dry years or during certain crop rotations, and other relevant factors. The hydrologic connectivity of perennial surface water sources cannot be assessed without specific knowledge of the water source, topography and soil conditions. In summary, the adequacy of generic buffer zones to assure GDE access to surface water is unsubstantiated. •No information is provided regarding the species residing in the GDEs, their sensitivity to groundwater level declines, or the extent of their reliance on groundwater vs. the proposed “alternate water supplies.” •There is no evidence of consultation with the regulatory agencies responsible for the protection and management of these resources in the establishment of the proposed framework. It does not appear that any habitat assessments have been conducted. •Ecosystems often rely both on groundwater and surface water to meet their water needs (see Best Management Practice #3 in Attachment C of this letter). The availability of “alternate water supplies” to provide some portion of a GDE’s water demand does not mean all of its water needs can be met through alternate supplies (i.e., without reliance on groundwater). •Groundwater pumping depletes ISWs under both gaining or losing conditions, and GDEs may rely on the interactions of surface water to meet their water requirements. <p>Simply put, the approach proposes to manage GDEs without consideration to understanding the nature and needs of the resource being managed. A strictly binary approach, designating all NCCAGs as either 100 percent reliant on groundwater or 100 percent reliant on alternate water supplies is inconsistent with</p>
15	Sandi Matsumoto	The Nature Conservancy	pp. 2-115 to 2-133	Section 2.3.5	N/A	<p>The following items related to GDEs, wetlands and riparian areas should be clarified or considered:</p> <ul style="list-style-type: none"> o“Riparian intake from streams” is identified as a stream system water budget component and is defined as the portion of riparian evapotranspiration (ET) met by streamflows. Please include an explanation of the approach to determining the amount of riparian ET demand met by streamflow vs. groundwater evapotranspiration. oGroundwater outflow to ET does not appear to be identified as a groundwater budget component (for example see Figure 2-74, p. 2-125). In addition, the ET demand of natural vegetation does not appear to be considered in water supply and demand calculations (for example see Table 2-16, p. 2-126). Since GDEs (including wetlands, riparian vegetation, phreatophytes and other communities) are recognized as beneficial users of groundwater in the Subbasin, it is appropriate to include them in these calculations.
16	Sandi Matsumoto	The Nature Conservancy	p. 3-1	Section 3.1	N/A	<p>The Sustainability Goal is defined as being “ ... to maintain an economically-viable groundwater resource for the beneficial use of the people of the Eastern San Joaquin Subbasin” Since GDEs, are recognized as beneficial users of groundwater in the Subbasin, they should be mentioned in the Sustainability Goal.</p>
17	Sandi Matsumoto	The Nature Conservancy	p. 3-3	Section 3.2.1.1.1	N/A	<p>This section only describes undesirable results relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline. On page 3-5 in Section 3.2.1.2, impacts to GDEs are correctly identified as an undesirable result potentially associated with chronic groundwater level decline. Please add “potential adverse impacts to GDEs” to the list of potential undesirable results presented in Section 3.2.1.1.1.</p>
18	Sandi Matsumoto	The Nature Conservancy	p. 3-11	Section 3.2.3.1.1	Degraded Water Quality	<p>This section only describes undesirable results in terms of total dissolved solids concentrations and related impacts. The section should be modified to state that overpumping and dewatering of aquitards has been identified as a potential source of elevated arsenic concentrations above drinking water standards in San Joaquin Valley aquifers. The following is a link to a paper by Smith, Knight and Fendorf (2018) titled “Overpumping leads to California groundwater arsenic threat”: (https://www.nature.com/articles/s41467-018-04475-3).</p>

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19	Sandi Matsumoto	The Nature Conservancy	p. 3-11	Section 3.2.6.1.1	ISWs	This section states that undesirable results related to surface water depletion were defined and evaluated only for major streams and rivers including the Calaveras River, Dry Creek, Mokelumne River, San Joaquin River, and Stanislaus River. The section goes on to state that many of the smaller creeks and streams are solely used for the conveyance of irrigation water and these systems have not been considered in the analysis of depletions. Contrary to these statements, surface water resources in these creeks support significant recognized aquatic habitat, wetlands and riparian zones that represent potential environmental beneficial uses and users of groundwater. A number of these streams are associated with designated protected lands. The analysis for potential depletion of ISWs in Section 3.2.6 should include all beneficial users of surface water that could be affected by groundwater withdrawals, including environmental beneficial users along creeks, even if the creeks are interconnected less than 75% of the time.
20	Sandi Matsumoto	The Nature Conservancy	p. 3-12	Section 3.2.6.1.2	N/A	The section states that "undesirable results would occur if groundwater extractions depleted interconnected streams and there was not sufficient surface water to supply ... fish and wildlife demands." This definition of undesirable results is overly narrow and recognizes only a limited subset of the environmental beneficial users of ISWs. A more complete definition would be that undesirable results would occur if groundwater extraction resulted in a depletion of surface water that caused significant impacts to aquatic species or wildlife, or degradation of GDEs. Please expand the definition of undesirable results to include all of the environmental beneficial uses and users of ISWs, and expand the analysis in Section 3.2.6, as appropriate.
21	Sandi Matsumoto	The Nature Conservancy	p. 3-12	Section 3.2.6.1.3	N/A	The potential effects of undesirable results on environmental beneficial users are not described. Please expand the section to describe the potential effects of undesirable results on all beneficial uses and users of ISWs, including environmental uses and users. <ul style="list-style-type: none"> •The GDE Pulse web application developed by The Nature Conservancy provides easy access to 35 years of satellite data to view trends of vegetation metrics, groundwater depth (where available), and precipitation data. This satellite imagery can be used to observe trends for NC dataset polygons within the Subbasin. Over the past 10 years (2009-2018), some NC dataset vegetation polygons have experienced adverse impacts to vegetation growth and moisture in the western portion of the Subbasin. An example screen shot from the GDE Pulse tool is presented below. Please review these spatial patterns and, where possible, correlate them with water level trends. Any indications of adverse trends and any data gaps should be identified.

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22	Sandi Matsumoto	The Nature Conservancy	pp. 3-19 and 3-20	Section 3.2.6.2	N/A	<p>The GSP proposes to use the Minimum Thresholds and Measurable Objectives associated with Chronic Decline in Groundwater Levels as a proxy for management of depletion of ISWs, and concludes that these criteria will be protective of the depletion of ISWs and prevent significant and unreasonable impacts to beneficial surface water uses and users. This conclusion is not adequately supported by data and/or consultation with the agencies that are responsible for the regulation of GDE habitats. We have the following comments:</p> <ul style="list-style-type: none"> oThe section states that current or historical issues associated with depletion of ISWs were not indicated to be significant and unreasonable based on discussions at GWA Board, Advisory Committee, and Workgroup meetings and through input from GSA staff, and that it was therefore assumed that historical conditions are protective of beneficial uses. It does not appear that any consultation occurred with the Federal, State and local agencies responsible for management and regulation of environmental beneficial uses of ISWs, or with the private parties, agencies and NGOs involved in managing the protected lands listed in our response to Section 1.3.1. In addition, no reference is made to the review of supporting documents for General Plan Conservation or Land Use Elements, or to the review of environmental management studies and documents such as Biological Assessments, Biological Opinions, HCPs or other studies regarding the current and historical conditions of the beneficial uses being evaluated. Please provide a more thorough explanation of the basis for the assumption that current and historical groundwater level conditions are protective of beneficial uses related to ISWs. Data gaps should be acknowledged. oThe GDE Pulse web application developed by The Nature Conservancy provides easy access to 35 years of satellite data to view trends of vegetation metrics, groundwater depth (where available), and precipitation data. This satellite imagery can be used to observe trends for NC dataset polygons within the Subbasin. Over the past 10 years (2009-2018), some NC dataset vegetation polygons have experienced adverse impacts to vegetation growth and moisture in the western portion of the Subbasin. Please review these spatial patterns and, where possible, correlate them with water level trends. Any indications of adverse trends and any data gaps should be identified. oThe section discusses future use scenarios, associated groundwater level declines and ISW depletions on a broad level. The potential effects of these declines on environmental beneficial uses, including GDEs, are not discussed. In addition to discussion of potential adverse effects at a general level, a conclusion that significant adverse impacts are unlikely generally requires more site- and resource-specific analysis. Please include a discussion of the potential for adverse effects of surface water depletions on environmental resources, as well as a reasoned analysis of the likelihood of their occurrence under future scenarios. The lack of site-specific data to draw conclusions about specific environmental beneficial users should be recognized as a data gap. oPlease expand the analysis of potential undesirable results to include all environmental beneficial uses and users, including those associated with more local streams and creeks. oThe statement that an additional depletion of the surface water due to groundwater pumping of 50,000 acre-feet per year is not significant and unreasonable needs to be further analyzed. The conclusion is based on analyzing the estimated depletion as a percentage of total surface water discharge.
23	Sandi Matsumoto	The Nature Conservancy	pp. 4-1 to 4-8 and p. 4-14	Section 4.1 and Section 4.6	N/A	<p>The GSP proposes to use groundwater level monitoring for chronic groundwater level decline as a surrogate for monitoring the depletion of ISWs. We have the following comments.</p> <ul style="list-style-type: none"> oThe areas identified as potential GDEs in the GSP are located near the western boundary of the Subbasin. Only one of the representative monitoring wells appears to be located near those areas (Figure 4-1 on p. 4-5). Very few of the remaining monitoring wells are located near potential ISWs and GDEs. Specific monitoring should be described to further evaluate, monitor, manage and protect areas with ISWs and GDEs. oPer the GSP Regulations (23 CCR §354.34 (a) and (b)), monitoring must address trends in groundwater and related surface conditions (emphasis added). Groundwater level monitoring alone may be insufficient to establish a linkage between groundwater extraction and potentially resulting impacts to environmental resources associated with GDEs and ISWs. The cause-effect relationship between groundwater levels and the biological responses that could result in significant and unreasonable impacts to ISWs and GDEs depends on a number of complicated factors, and this relationship is not characterized or discussed. As such, it is not possible to determine whether the proposed monitoring, minimum thresholds and measurable objectives are sufficiently protective to ensure significant and unreasonable impacts to GDEs and ISWs will be prevented. The GDE Pulse interactive mapping application provides an example of a linkage between groundwater level data and GDE health that could be used to incorporate remote sensing into an efficient and incisive monitoring program. Please provide an explanation how groundwater levels will specifically be used to assess adverse impacts to GDEs and ISWs, and identify any data gaps and how they will be addressed.

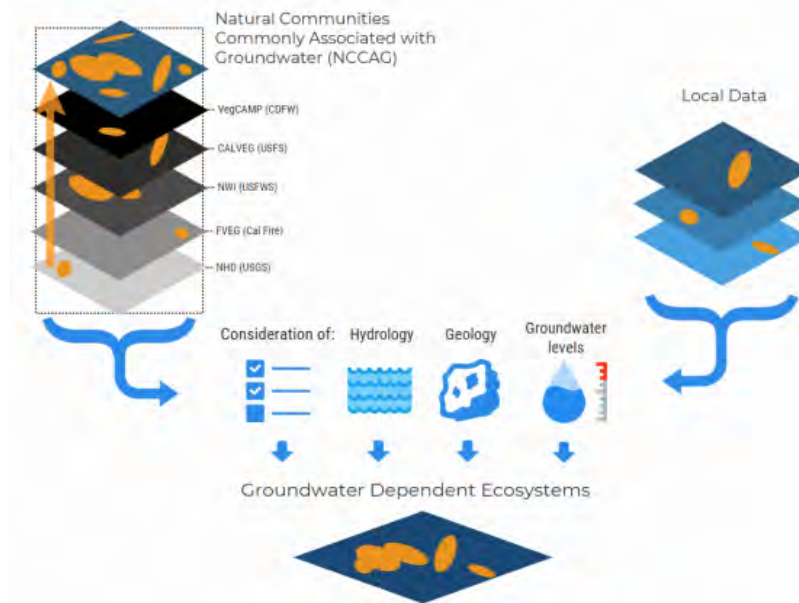
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24	Sandi Matsumoto	The Nature Conservancy	pp. 4-14 to 4-17	Section 4.7	N/A	<p>Twelve new monitoring wells are proposed to measure groundwater levels and quality in critical areas where data are sparse. These include increased coverage near streams, Subbasin boundaries, and in the central area of groundwater depression. We have the following comments.</p> <ul style="list-style-type: none"> oLocations should be prioritized near high value or sensitive resources that are vulnerable to significant and unreasonable impacts, such as near the protected lands identified in our comments on Section 1.3.1 or the GDEs identified in the Subbasin. In addition to the major streams and rivers in the subbasin, impacts to smaller creeks and wetland areas should be considered, as these may be the most vulnerable resources. Please discuss the results of a resource assessment or consultations with resource managers that demonstrates a sufficient number of wells is proposed to address data gaps near GDEs and ISWs, and that they are being sited where they will provide the most benefit. Alternatively, please outline the process by which this will be accomplished. oAs discussed in our comments above, please address how the need to link and correlate groundwater level declines to biological responses, and significant and adverse impacts to GDEs and ISWs will be addressed. oWell sites near ISWs should be selected at varying distances from streams and completed as vertically-nested clusters to capture the lateral and vertical gradients between the pumped depths in the aquifer system and the shallow groundwater aquifers that are in communication with ISWs or GDEs. There is a need to enhance monitoring of stream flow and vertical groundwater gradients by installing more stream gauges and clustered/nested wells near streams, rivers or wetlands. Ideally, co-locating stream gauges with clustered wells would enhance understanding about where ISWs exist in the basin and whether pumping is causing depletions of surface water or impacts on beneficial users of surface water and groundwater. oAddressing data gaps is typically iterative and it is not reasonable to expect it will be a one-time process. Please describe the process by which data gaps will be identified and addressed on an ongoing basis.
25	Sandi Matsumoto	The Nature Conservancy	pp. 5-6 to 5-8	Section 5.3, Table 5.3	N/A	<p>Table 5.3 indicates that data regarding streamflow and GDEs is not currently included in the proposed Data Management System. Per the GSP Regulations (23 CCR §354.34 (a) and (b)), monitoring must address trends in groundwater and related surface conditions (emphasis added). You cannot manage what you do not measure. Please discuss which monitoring data for "related surface conditions" will be gathered and incorporated in the DMS to assess potential significant and unreasonable impacts to environmental beneficial uses and users.</p>
26	Sandi Matsumoto	The Nature Conservancy	p. 7-5	Section 7.3.1	N/A	<p>This section lists the key components involved in implementation of the monitoring network. Groundwater levels and monitoring will occur semi-annually, but no other information is given. Section 6.3 states that "additional management activities are discussed in Chapter 7: Plan Implementation", and would include monitoring groundwater use through use of satellite imagery. However, Chapter 7 does not discuss using imagery or any remote sensing, which is a great tool for monitoring ecosystem health of GDEs and ISWs. Please clarify the potential use of imagery as a monitoring tool, and expand it to monitoring surface indicators of ISW and GDE ecosystem health.</p>
27	Sandi Matsumoto	The Nature Conservancy	pp. 7-5 and 7-6	Section 7.3.2.2	N/A	<p>This section describes what current groundwater conditions and monitoring results will be included in the annual monitoring report. Please specifically address ecosystem health of GDEs and ISWs as a surface indicator to subsurface conditions. This can be done using GDE Pulse, remote sensing, imagery or other feasible methods.</p>
28	Sandi Matsumoto	The Nature Conservancy	p. 6-1	Section 6.2.1	N/A	<p>The Subbasin includes many GDEs and ISWs which represent beneficial uses and users of groundwater, and which include potentially sensitive resources and protected lands. Environmental resource protection needs should be considered in establishing project priorities. In addition, consistent with existing grant and funding guidelines for SGMA-related work, priority should be given to multi-benefit projects that can address water quantity as well as providing environmental benefits or benefits to disadvantaged communities. Please include environmental benefits and multiple benefits as criteria for assessing project priorities.</p>
29	Sandi Matsumoto	The Nature Conservancy	pp. 6-2 to 6-7	Table 6.1	N/A	<p>Table 6-1 lists potential projects and the Measurable Objective that is expected to benefit. Only water level benefits are listed, but maintenance or recovery of groundwater levels, or construction of recharge facilities, also will have environmental benefits in many cases. From the table, it is not possible to distinguish the full range of project benefits or how the projects will be prioritized. It would be advantageous to demonstrate multiple benefits from a funding and prioritization perspective.</p>

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
30	Sandi Matsumoto	The Nature Conservancy	pp. 6-8 to 6-33	Section 6.2.4	N/A	<p>oFor the projects already identified, please consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue.</p> <p>oIf ISWs will not be adequately protected by those listed, please include and describe additional management actions and projects targeted for protecting ISWs.</p> <p>oRecharge ponds, reservoirs and facilities for managed stormwater recharge can be designed to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. In some cases, such facilities have been incorporated into local HCPs, more fully recognizing the value of the habitat that they provide and the species they support. For projects that will be constructing recharge ponds, please consider identifying if there will be habitat value incorporated into the design and how the recharge ponds will be managed to benefit environmental users.</p> <p>oSpecific examples of how project descriptions may be refined to incorporate environmental benefits include the following:</p> <ul style="list-style-type: none"> • Project 21: Winery Recycled Water will recycle winery wastewater and reuse it for irrigation and in-lieu recharge, or the water will be put into ponds. Please consider identifying what proportion of water will be put into ponds for direct recharge that could also provide a benefit for wildlife and aquatic species. • Project 23: SSJID Stormwater Reuse will capture stormwater for reuse and recharge. Project 18: Farmington Dam Repurpose Project proposes to more than double storage in Farmington Basin for water supply. Please consider assessing ways in which these projects could also provide enhanced wildlife and aquatic species benefits. • For examples of case studies on how to incorporate environmental benefits into groundwater projects, please visit our website: https://groundwaterresourcehub.org/case-studies/recharge-case-studies/
31	Sandi Matsumoto	The Nature Conservancy	p. 6-34	Section 6.3	N/A	<p>This section lists only administrative actions the GSA will undertake to implement the GSP, and does not identify the management actions to be taken if to assure SGMA compliance if monitoring data indicate that measurable objectives or interim milestones are not being achieved. An adaptive management approach, where monitoring data are used to assess results and inform refinement of the management approach is typically specified. Please identify what management actions will be taken if monitoring data indicate that Measurable Objectives or Interim Milestones are not being achieved, or undesirable results are imminent.</p>
Attachment C (see comment letter)	Sandi Matsumoto	The Nature Conservancy	N/A	N/A	N/A	IDENTIFYING GDEs UNDER SGMA Best Practices for using the NC Dataset
Attachment D (see comment letter)	Sandi Matsumoto	The Nature Conservancy	N/A	N/A	N/A	<p>GDE Pulse</p> <p>A new, free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data.</p>



IDENTIFYING GDEs UNDER SGMA Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online⁵ to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)⁶. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.



The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands,

⁵ NC Dataset Online Viewer: <https://gis.water.ca.gov/app/NCDataSetViewer/>

⁶ California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf>

springs, and seeps commonly associated with groundwater in California⁷. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset⁸ on the Groundwater Resource Hub⁹, a website dedicated to GDEs.

BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2a) or multiple aquifers stacked on top of each other (Figure 2b). In unconfined aquifers (Figure 2a), using the depth-to-groundwater and the rooting depth of the vegetation is a reasonable method to infer groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2d). However, it is important to consider local conditions (e.g., soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2c). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2b) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and GDEs (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should be done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer.*

⁷ For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf

⁸ "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at: <https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/>

⁹ The Groundwater Resource Hub: www.GroundwaterResourceHub.org

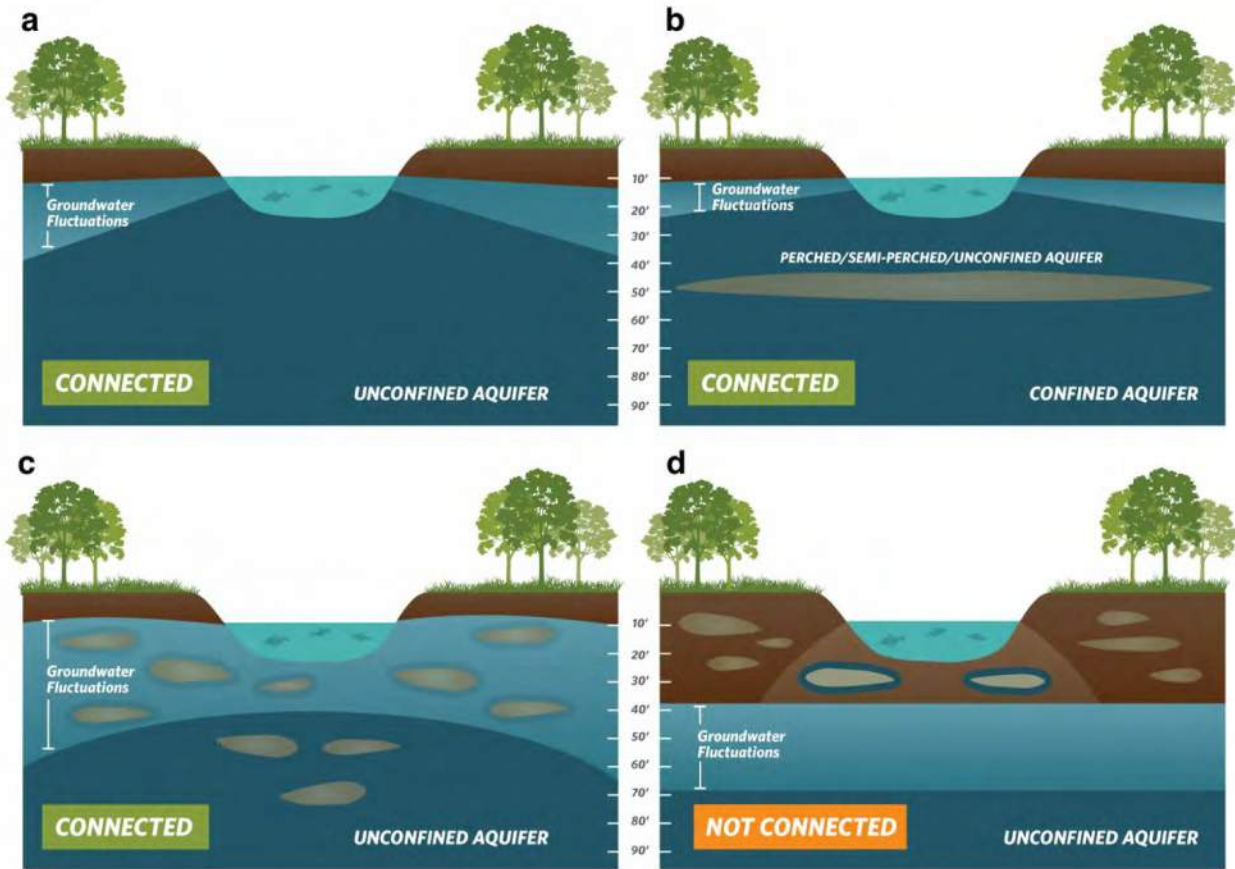


Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. (b) Depth-to-groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. Bottom: (c) Depth-to-groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. (d) Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under the surface water feature. These areas are not connected to groundwater and typically support species that do not require access to groundwater to survive.

BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets¹⁰ recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline¹¹ could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach¹² for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document⁴, one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (see Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however if these groundwater conditions are prolonged, adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet⁴ of the land surface are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer¹³. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network (see Best Practice #6).

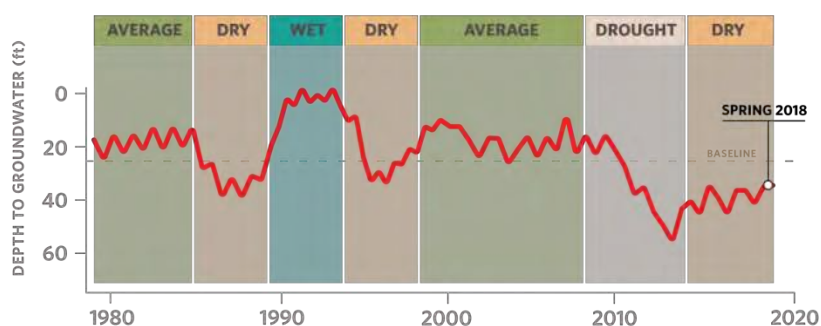


Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

¹⁰ DWR. 2016. Water Budget Best Management Practice. Available at:

https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

¹¹ Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]

¹² Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs⁴).

¹³ SGMA Data Viewer: <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer>

BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around a GDE does not preclude the possibility that it is supported by groundwater, too. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals¹⁴, which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

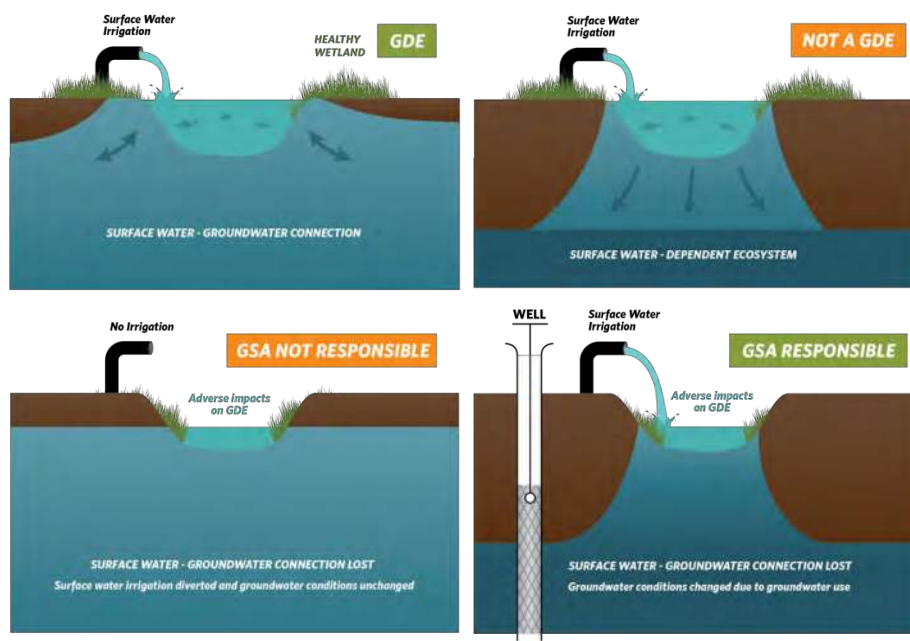


Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. (Right) Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. Bottom: (Left) An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. (Right) Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

¹⁴ For a list of environmental beneficial users of surface water by basin, visit: <https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/>

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.
- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.
- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

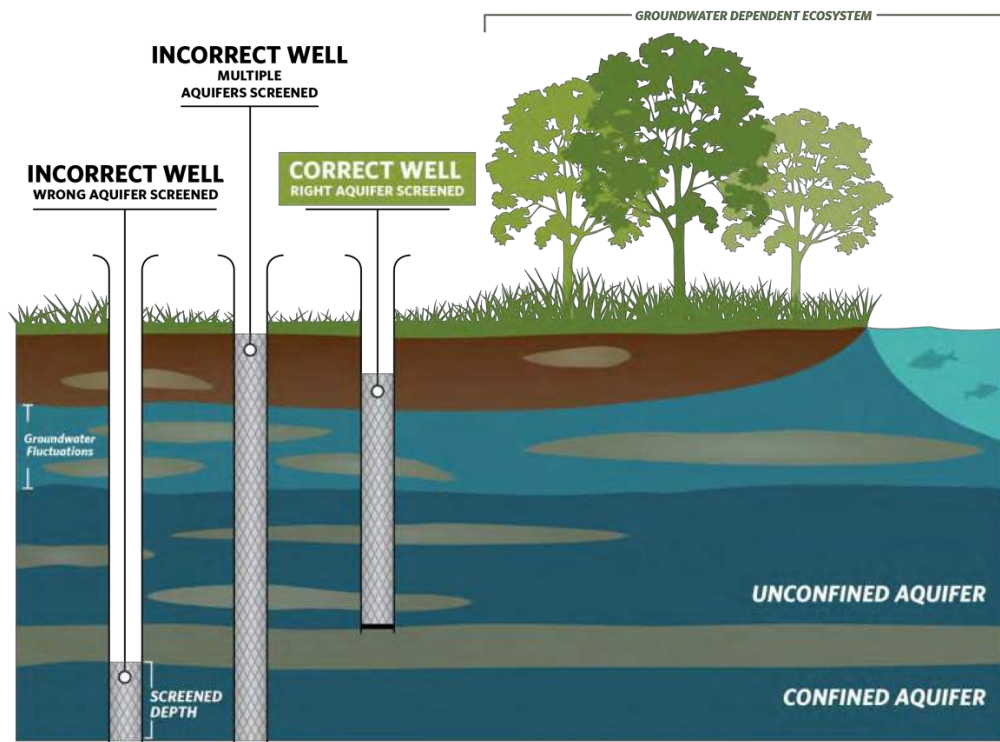


Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like stream and wetland depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6a). A more accurate approach is to interpolate groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape. This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)¹⁵ to estimate depth-to-groundwater contours across the landscape (Figure b; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found.

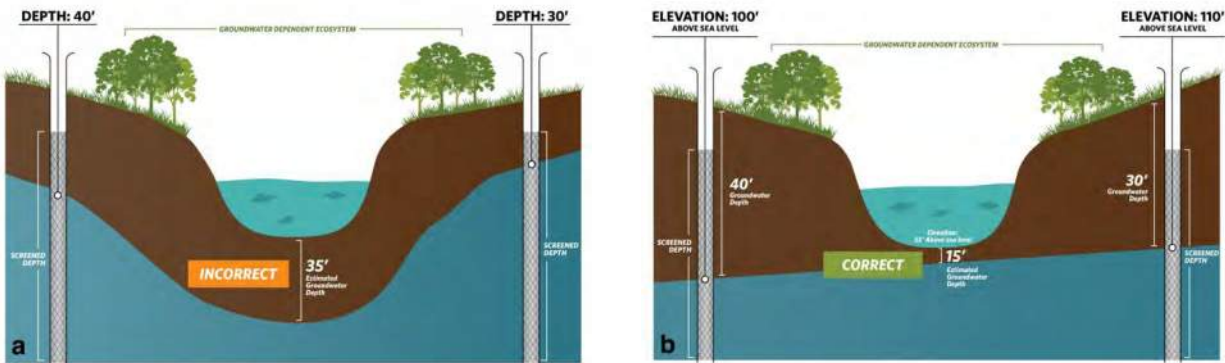


Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. (b) Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

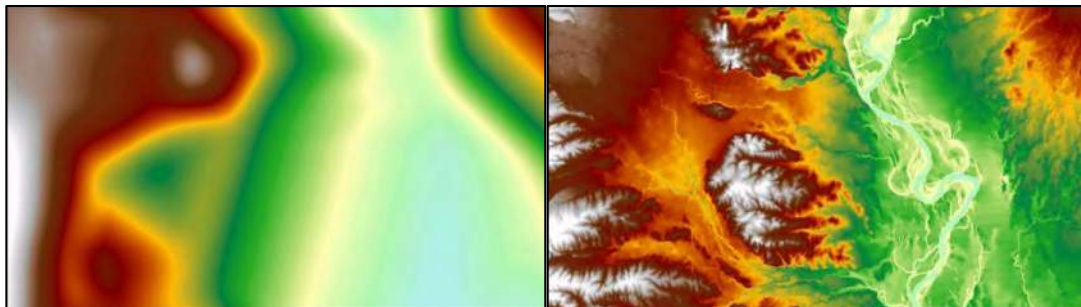


Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. (Right) Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth-to-groundwater contours. The image on the right shows a more accurate depth-to-groundwater estimate because it takes the local topography and elevation changes into account.

¹⁵ USGS Digital Elevation Model data products are described at: <https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services> and can be downloaded at: <https://iewer.nationalmap.gov/basic/>

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring programs to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network. Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

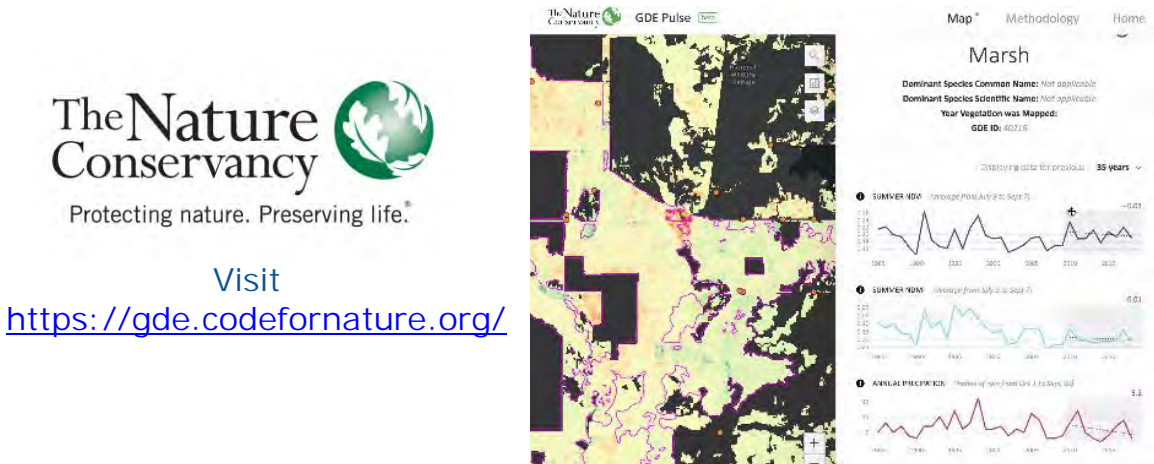
ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Attachment D

GDE Pulse

A new, free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data.



Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA’s Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset¹⁶. The following datasets are included:

Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

Annual Precipitation is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset¹⁷. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

Depth to Groundwater measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

¹⁶ The Natural Communities Commonly Associated with Groundwater Dataset is hosted on the California Department of Water Resources’ website: <https://gis.water.ca.gov/app/NCDataSetViewer/#>

¹⁷ The PRISM dataset is hosted on Oregon State University’s website: <http://www.prism.oregonstate.edu/>

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Eastern San Joaquin Subbasin GSP **Public Draft**
Summary of Public Comments and Responses

Comment #	Commenter	Commenter Organization	Page Number	Section, Figure, or Table Number	Sentence Starts with, "...	Comment
1	Joey Giordano	The Wine Group	ES-6	Figure ES-6		On Figure ES-6, I would recommend adding the total for each column/section of the bar graph below the text for each section (i.e. "Pumping under Projected Conditions XX,XXX AF". The figure has less value when you have to rely on the units on the y-axis rather than having the totals for each section explicitly marked.

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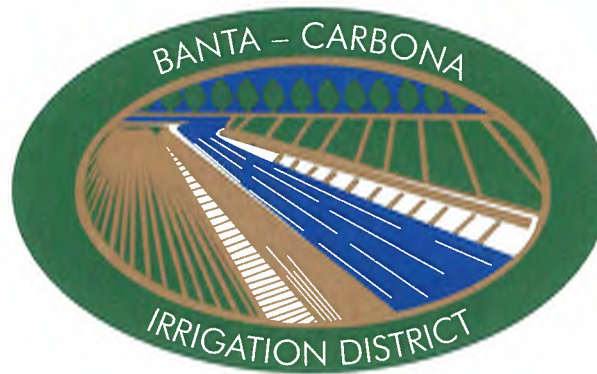
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August 21, 2019

Eastern San Joaquin Groundwater Authority
Post Office Box 1810
Stockton, CA 95201
info@esjgroundwater.org

RE: Comments on the Eastern San Joaquin Draft Groundwater Sustainability Plan (GSP)

This letter provides comments on the July 2019 Public Draft of the Eastern San Joaquin Draft Groundwater Sustainability Plan on behalf of the GSAs participating in preparation of the Tracy Subbasin Groundwater Sustainability Plan.

While interbasin coordination is not legally required under the Sustainable Groundwater Management Act, it is essential to avoid problematic disagreements after key GSP elements have already been prepared for each basin

Table 2-15 on page 2-121 of the Draft GSP indicates that the Tracy Subbasin has historically contributed 35,000 acre-feet while it is projected to increase to 41,000 acre-feet of subsurface inflow annually to the Eastern San Joaquin Groundwater Basin. These figures have not been documented or confirmed by those GSAs participating in preparation of the Tracy Subbasin Groundwater Sustainability Plan (GSP). This line should be footnoted to indicate that these figures will be further refined upon completion of the Tracy Subbasin GSP in January of 2022, and coordination of these figures with the Tracy Subbasin GSAs.

Please direct any questions to District Manager David Weisenberger at (209) 835-4670.

Very truly yours,

DAVID WEISENBERGER
General Manager

cc: Steve Bayley
Jeanne M. Zolezzi, Esq.

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APPENDIX 1-J. RESPONSE TO PUBLIC COMMENTS

Eastern San Joaquin Groundwater Sustainability Plan

Response to Comments – Master Responses

Master Response 1 -- Groundwater Dependent Ecosystems

1) Section 2.2.7 (Groundwater-Dependent Ecosystems) was revised to classify NCCAG areas that access co-occurring surface water as data gap areas requiring further refinement. Section 2.2.7.1 (Methodology for GDE Identification) was updated to better articulate the methodology used and the describe data gaps within the NCCAG dataset. A footnote was added indicating referencing the use of 2015 groundwater levels in the GDE analysis as follows: This analysis uses 2015 groundwater levels (winter, spring, summer, and fall), which may be deeper than representative levels due to drought conditions, a factor which will be considered in future GDEs analyses. Figure 2-74 was updated to show removed NCCAG areas as data gaps.

2) Language was added to Section 4.7 (Data Gaps) to identify NCCAG areas removed through the GDE analysis are data gaps ideas requiring further refinement (NCCAGs that either access co-occurring surface water or were identified as located in an area with groundwater levels deeper than 30 feet bgs). The purpose of this is to identify potential existing GDEs that may have been incorrectly eliminated through this screening process.

3) Language was added to Section 4.7 (Data Gaps) to indicate that the ESJGWA would evaluate using the GDE Pulse Tool and other tools to monitor GDEs.

4) The GSP includes the list of freshwater species provided by The Nature Conservancy as Appendix 1-G: Freshwater Species in the Eastern San Joaquin Subbasin as beneficial users of groundwater. Language was added to Section 2.2.7 (Groundwater-Dependent Ecosystems) and Section 4.7 (Data Gaps) to indicate that fish and wildlife species associated with GDEs are a data gap area.

Master Response 2 -- Interconnected Surface Water

1) The ESJGWA recognizes that depletions of interconnected surface water are a data gap area and supports the use of groundwater levels as a proxy, as this represents the best information currently available. The ESJGWA has identified a need for future study and refinement of interconnected surface water and will continue coordination efforts to better inform basin conditions.

2) Language has been added to Section 4.7 (Data Gaps) identifying interconnected surface water as a data gap area for future study and refinement. The section has also been updated to clarify and better articulate the ESJGWA's focus on installing additional monitoring wells near streams, which can be evaluated for use as representative monitoring wells in the future.

3) The GSP identifies areas in the Subbasin that the ESJGWA believes to be interconnected based on the best available information but recognizes that these areas may require additional analysis and will be updated with future model verification and validation efforts. Figures 2-71 and 2-72 were reviewed for consistency based on comments received and the section was reorganized for clarification. Language in Section 2.2.6 (Interconnected Surface Water Systems) was updated to describe gaining and losing streams as "gaining greater than 75% of the time" and "losing greater than 75% of the time" and Figure 2-72 was updated accordingly. Figure 2-71 was updated to display stream nodes gaining most of the time as interconnected and the language was updated to "interconnected greater than 75% of the time" and "interconnected less than 25% of the time." Language was added to clarify Figures 2-71 and 2-72 in the GSP are showing model results and are not intended for regulatory purposes. A footnote was added to Figures 2-71 and 2-72 stating: Analysis is based on limited data recognized to have significant gaps. Interconnected surface water is a recognized data gap in the GSP as discussed in Section 4.7. Stream nodes in areas with poor model calibration were removed from Figures 2-71 and 2-72 and text was added to clarify that this data gap will be resolved in future updates to the GSP.

4) Language was added to Section 2.2.6 (Interconnected Surface Water Systems) clarifying that the ESJWRM historical calibration model results represents the best available information for both current and historical conditions related to interconnectivity between surface water and the groundwater system as follows: This analysis was based on modeling results from the historical calibration of the ESJWRM for approximately 900 stream nodes in the Eastern San Joaquin Subbasin, which represents that best available information for current and historical conditions related to interconnected surface water systems.

5) The GSP includes the list of freshwater species provided by The Nature Conservancy as Appendix 1-G: Freshwater Species in the Eastern San Joaquin Subbasin as beneficial users of groundwater.

6) Language was added to Section 4.7 (Data Gaps) to indicate that the ESJGWA would evaluate using the GDE Pulse Tool and other tools to monitor GDEs.

7) The ESJGWA considers current minimum thresholds and measurable objectives to be protective of beneficial uses and users in the subbasin, and to be protective of existing in-stream flow requirements for fish and wildlife.

Master Response 3 -- Water Quality

1) A new subsection has been added to Section 3.2.3 (Section 3.2.3.4: Monitoring for Additional Constituents), which states that additional monitoring is needed to identify water quality conditions and trends related to additional constituents including arsenic and nitrate. This new subsection references Chapter 4 (Monitoring Networks) and describes the informational monitoring efforts that will take place as part of the broad monitoring network for water quality, and specifically, the monitoring for arsenic and for cations/anions, which includes nitrate. The subsection also references the existing regulations through existing water resources monitoring and management programs (described in Section 1.2.2). Language has been added to indicate that if existing regulations are violated, or if monitoring efforts indicate concerning trends, the ESJGWA will evaluate developing minimum thresholds and measurable objectives for additional constituents, as well as to take steps to coordinate with regulatory agencies. Additionally, language has been added stating that the ESJGWA may require GSAs that are drinking water suppliers to report to the ESJGWA if constituents of concern exceed their MCL. While these reports do not reflect the water quality of private well owners, it would provide a useful basin-wide screen to better inform basin groundwater quality.

2) Language has been added to Section 3.2.3.2 (Minimum Thresholds) referencing Section 3.2.3.4 and indicating the monitoring efforts for additional constituents, including nitrate and arsenic.

3) Language was modified in Section 3.2.3.1.1 (Description of Undesirable Results) to indicate new monitoring efforts in the Subbasin that will occur as part of the broad monitoring network for water quality and to highlight coordination efforts with existing regulatory agencies to determine if existing regulatory requirements are met. Language stating no nexus was removed and replaced with language stating that new monitoring efforts and coordination with existing regulatory agencies will allow the GSAs to determine if groundwater pumping activities are contributing to undesirable effects related to degraded water quality.

Master Response 4 -- Groundwater Storage

1) Given the existing subsurface conditions and large volume for groundwater in storage, the historical undesirable effects in the Eastern San Joaquin Subbasin groundwater have been related to accessibility, not storage volume. Thus, the issues associated with groundwater overdraft are more appropriately addressed through the Chronic Lowering of Groundwater Levels Sustainability Indicator.

2) Language was added to Section 3.2.2 (Reduction in Groundwater Storage) to better articulate the model analysis used to determine no undesirable results for Reduction in Groundwater Storage and to show how using groundwater levels as a proxy is protective as follows: An undesirable result occurs when groundwater storage volumes are insufficient to satisfy beneficial uses within the Subbasin. To identify a volume associated with undesirable results, the ESJWRM was run to estimate the volume of groundwater storage needed to meet beneficial uses. The analysis determined that groundwater demand for beneficial use occurs within the shallowest 23 MAF of the Subbasin, as this is roughly the zone corresponding to the depth at which pumping occurs and is reasonably expected to occur in the future. Based on this analysis, it is estimated that overlying pumpers have limited access equating to approximately the shallowest 23 MAF of groundwater storage in the Subbasin; therefore, an undesirable result would occur if groundwater storage levels were depleted by 23 MAF. Therefore, undesirable results would occur if groundwater storage were reduced by 23 MAF, to a total volume of 30 MAF...Minimum thresholds for groundwater levels will effectively avoid undesirable results for reduction of groundwater storage. As noted above, the amount of groundwater in storage in the Subbasin is approximately 53 MAF and the undesirable results of reducing beneficial uses would not occur until storage is reduced by 23 MAF, to a total of 30 MAF. The ESJWRM was run to estimate the reduction in groundwater storage that would occur if every representative monitoring well in the Subbasin were to operate at the minimum threshold for the chronic lowering of groundwater levels sustainability indicator. The results of this analysis showed that this scenario would result in a reduction of approximately 1.2 MAF of storage.³ Because undesirable results are anticipated to occur following a reduction of 23 MAF, the minimum thresholds for groundwater levels are protective of beneficial uses. Minimum thresholds and measurable objectives for groundwater levels can therefore be used as a proxy for reduction in groundwater storage, as groundwater levels are sufficiently protective against occurrences of significant and unreasonable reduction in groundwater storage.

3) The ESJGWA acknowledges conditions of overdraft and in response has identified projects that will recharge and/or offset up to 78,000 AFY to meet the Subbasin's sustainable yield. The groundwater storage estimate of 53 MAF is based on current groundwater conditions calculated for years 1996-2015; this estimate does not include future projects implemented as part of this GSP. Sustainable yield is defined in the GSP as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result" (per CWC §10721(w)). Sustainable yield for the Eastern San Joaquin Subbasin was calculated through development of an ESJWRM sustainable conditions scenario (model run) in which the goal was to generate a long-term (50-year) change in Subbasin groundwater storage of zero, a conservative approach, as a change in storage of greater than zero could occur without causing undesirable results.

Master Response 5 -- Projects

1) The ESJGWA acknowledges that many of the projects are in preliminary planning stages. The ESJGWA has a 20-year planning timeframe to bring the projects online, and will continue to evaluate project benefits, impacts, and costs. The ESJWRM was used to calculate basin-scale planning targets based on projected future water demands. There is uncertainty in these estimates, which will be refined in coming years through model updates and verification studies. Further, this GSP is an adaptive plan, driven by annual monitoring reports. The data in these reports, as well as individual GSA-level water budgets, will provide a means of project evaluation, and will assess potential for undesirable results. The three tiers of projects have been developed to respond to the uncertainty in planning targets and provide greater flexibility in how sustainability will be achieved. The Subbasin may need to recharge and/or offset more or less water than the estimated 78,000 AFY to reach sustainability and can pull from the highest benefit and most feasible projects to do so.

2) GSP projects have been proposed by individual GSAs and will be implemented at the GSA level. The ESJGWA's role in project implementation will be to oversee essential coordination and evaluation activities, but the ESJGWA does not have authority to direct project design, timeline, or initiation.

3) A subsection was added to GSP Chapter 6 (Projects and Management Actions) that outlines a process for management actions if the identified projects do not progress, or if monitoring activities demonstrate that the projects are not effective in achieving stated recharge and/or offset targets: Although the ESJGWA does not provide direct authority to require GSAs to implement projects, the ESJGWA will be working on GSA-level water budgets and will be requesting annual or biannual progress reports to evaluate progress. If the projects do not progress, or if monitoring efforts demonstrate that the projects are not effective in achieving stated recharge and/or offset targets, the ESJGWA will convene a working group to evaluate supply-side and demand-side management actions such as the implementation of groundwater pumping curtailments, land fallowing, etc.

4) The ESJGWA acknowledges that there are many factors that could affect the availability of surface water, and that has to be evaluated by GSAs in the implementation of projects. The process of GSAs providing biannual reports will allow for the ESJGWA to update the Plan and adjust the implementation course as needed based on conditions.

5) Language was added to the GSP referencing existing conservation management actions (including Urban Water Management Plans and Agriculture Water Management Plans). Additionally, language was added to Section 6.2.2 (Project Implementation) to emphasize the pathway toward sustainability: Projects will be administered by the GSA project proponents. GSAs may elect to implement projects individually or jointly with one or more GSAs or with the ESJGWA. As the ESJGWA develops GSA-level water budgets, the GSAs will have a better understanding of how projects will be implemented at the GSA-level and can better evaluate progress toward completion.

ESJ Public Comments Response

Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
1	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region		The Department believes the GSP does not adequately demonstrate consideration of environmental beneficial uses and users of groundwater in its sustainability management criteria nor does it adequately characterize or consider surface water-groundwater connectivity. Accordingly, the Department recommends that ESJ address these deficiencies before submitting the GSP to the Department of Water Resources (DWR).	Interconnected Surface Water	The GSP as written includes the list of freshwater species provided by The Nature Conservancy as Appendix 1-G: Freshwater Species in the Eastern San Joaquin Subbasin as beneficial users of groundwater.
2	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	1.2.1.1	Department lands are excluded from 'Summary of Jurisdictional Areas' narrative as well as from Figure 1-11, which maps other federal and state lands. a. Issue: The GSP does not identify the jurisdictional boundaries of Department-owned and -managed lands as required by 23 CCR §354.8(a)(3). b. Recommendation: Include in Figure 1-11 and the accompanying narrative White Slough Wildlife Area, Woodbridge Ecological Reserve, and Vernalis Ecological Reserve Department lands.	Plan Area	Edits made to Figure 1-11 to include White Slough Wildlife Area, Woodbridge Ecological Reserve, and Vernalis Ecological Reserve Department lands. Added text to Section 1.2.1 (Description of Plan Area) to describe these areas: The California Department of Fish and Wildlife (CDFW) owns 880 acres of man-made ditches, canals, and marshes with both grassland and riparian habitat, recognized as the White Slough Wildlife Area. The property was designated by the Fish and Game Commission in 1980 and provides recreational opportunities such as fishing, hunting, and hiking (CDFW, 2019a). CDFW also maintains the 353-acre Woodbridge Ecological Reserve to protect primarily the sandhill crane population, but also other migratory waterfowl. The sandhill crane was listed as a threatened species in 1983. Woodbridge Ecological Reserve and the greater Stockton Delta wetlands make up the largest freshwater marsh in California (CDFW, 2019b). Lastly, Vernalis Ecological Reserve is also shown in Figure 1-11. It serves as a public access area owned by CDFW for hunting and wildlife viewing (CDFW, 2019c).
3	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	2.2.6	The narrative describing the basin's interconnected surface water conditions lacks specifics and contains inconsistencies in mapped surface water-groundwater interconnectivity. a. Issue: i. The interconnected surface water conditions narrative lacks estimations of the quantity and timing of streamflow depletions as specified in 23 CCR § 354.16(f). ii. Figure 2-65 portrays modeled 'losing,' 'gaining,' and 'mixed' stream reaches, and Figure 2-66 portrays modeled 'interconnected and 'disconnected' streams. Figure 2-66 shows modeled stream reaches as 'disconnected,' whereas Figure 2-65 identifies those same reaches as switching between 'losing,' 'gaining,' and 'mixed.' Accompanying narrative suggests that streams are only mapped as 'interconnected' in Figure 2-66 when they are interconnected at least 75% of the time. This 75% threshold for displaying interconnected surface waters excludes reaches of stream that are intermittently connected to groundwater and that may depend on groundwater contributions to meet the needs of instream or riparian beneficial uses and users of interconnected surface waters. b. Recommendation: i. Identify the estimated quality and timing of streamflow depletions in the ESJ Subbasin. If this information is not available, identify an expeditious path to estimating these values. ii. Update Figure 2-66 to show all interconnected stream reaches, even if they are interconnected less than 25% of the time.	Interconnected Surface Water	See Master Response 2 - ISW.
4	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	2.2.7	GDE identification, required by 23 CCR § 354.16(g), is based on methods that risk exclusion of ecosystems that may depend on groundwater. a. Issue: Methods applied to the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset to eliminate potential GDEs are fallible. i. Depth to Groundwater: The removal of potential GDEs with a depth to groundwater greater than 30 feet during (an unspecified season) of 2015 relies on a single-point-in-time baseline hydrology. Specifically, this 2015 baseline falls several years into a historic drought when groundwater levels throughout the San Joaquin Valley were trending dramatically lower than usual due to reduced surface water availability. Exclusion of potential GDEs based on a snapshot of groundwater elevations during a historic drought is invalid; because this approach does not consider representative climate conditions or account for GDEs that can survive a finite period of time without groundwater access (Naumburg 2005), but that rely on groundwater table recovery for long term survival. ii. Adjacent to Alternate Water Supplies: The GSP notes that "to be dependent on groundwater there must not be other available water supplies" (GSP pp 2-104). This statement disregards a GDE's adaptability and opportunistic approach to accessing water in which vegetation may vary reliance on surface water and groundwater between seasons and water years. Therefore, the removal of potential GDEs that are within 50 feet of irrigated lands, 150 feet of managed wetlands, and 150 feet of perennial surface water does not consider the potential for GDEs shifting reliance between surface and groundwater. Additionally, vegetation near interconnected perennial surface waters may depend on sustained groundwater elevations to stabilize the gradient or rate of loss of surface water; meaning ecosystems near interconnected surface waters likely depend on sustainable groundwater elevations and constitute GDEs. Therefore, it is possible that any of these potential GDEs proximate to 'alternate water supplies' rely on groundwater during specific seasons or water years. b. Recommendations: i. Depth to Groundwater: Develop a hydrologically robust baseline from which to remove areas with a depth to groundwater greater than 30 feet' that relies on multiple, climatically representative years of groundwater elevation and that accounts for the inter-seasonal and inter-annual variability of GDE water demand. ii. Adjacent to Alternate Water Supplies: Reevaluate potential GDEs previously removed due to proximity to irrigated lands, managed wetlands, and perennial surface waters. Err on the side of inclusivity until there is evidence that the overlying ecosystem has no significant dependence on groundwater across seasons and water year types. Ensure that riparian GDE beneficial users of groundwater and interconnected surface water are carefully considered in the analysis of undesirable results and minimum thresholds for depletions of interconnected surface waters.	GDEs	See Master Response 1 - GDEs.
5	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	2.3.5.4	Projected water budget assumptions may risk overestimating surface water availability and sustainable yield by not relying on best available information [23 COR § 354.18(e)]. a. Issue: Projected surface water budget assumptions may risk overestimating water availability. Overestimation of water availability can result in the overallocation of both surface and groundwater water resources, unnecessarily jeopardizing environmental beneficial users. Two water budget assumptions that do not rely on best available information and that underscore current sustainable yield estimations are as follows: 1) the climate change analysis predicting a net depletion of aquifer storage is not reflected in the projected water budget or estimated sustainable yield, rather it is presented as a separate analysis; and 2) projected surface water deliveries need to be updated to reflect any new regulatory reductions of surface water deliveries such as those that may be codified in the State Water Resources Control Board Water Quality Control Plan for the Bay Delta: San Joaquin River Flows and Southern Delta Water Quality. b. Recommendation: Amend the water budget and sustainable yield: 1) apply climate change estimates to the projected water budget and scale the sustainable yield accordingly; and 2) adjust surface water delivery estimates to reflect any new regulatory compliance.	Water Budget	1) Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Due to the uncertainty around climate projections in the 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040. Therefore, the sustainable yield analysis did not include climate change. Comment noted for follow up in next round of model refinements and updates to analyses. 2) Added text to Section 2.3.5 (Water Budget Estimates) clarifying that climate change was a separate scenario: "Hydrology under climate change projections was evaluated in a separate ESJWRM scenario and results are discussed separately in Section 2.3.7.4." 3) Added text to Section 2.3.6 (Sustainable Yield Estimate) clarifying that climate change was not part of the analysis: "The sustainable conditions scenario, building off the projected conditions scenario, does not include climate change discussed in Section 2.3.7. Due to the uncertainty around DWR's climate projections for a 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040." 4) The SWRCB did adopt the water quality control plan for the Bay-Delta, which has an impact on the Subbasin and will be addressed in future updates to the GSP. Given the timeframe of the GSP being adopted, it was not possible to include the new regulations in the analysis in this GSP and they will be included in future iterations.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
6	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	3.2.1	<p>Groundwater Level and Interconnected Surface Water sustainable management criteria do not protect against undesirable results for fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.</p> <p>a. Issues:</p> <p>i. Proxy Metric: Before addressing the individual sustainability criteria for both Groundwater Levels and Depletions of Interconnected Surface Water, the Department challenges the use of groundwater elevations as a proxy metric for Depletions of Interconnected Surface Water. The GSP does not provide evidence that a "significant correlation exists between groundwater elevations" and Depletions of Interconnected Surface Water [23 OCR §354.36(b)(1)]. Instead, the GSP backs into the proxy metric by associating the proposed Groundwater Level minimum thresholds with the absence of significant and unreasonable surface water depletions, claiming that historical depletions of interconnected surface water had no associated undesirable results (GSP pp 3-19). The GSP offers few details to substantiate this claim that historical surface water depletions did not lead to undesirable results, and the GSP does not specify the modeling exercise used to determine the insignificance of historical surface water depletions. Provided the status of surface water allocations and aquatic ecosystems on rivers in the ESJ basin, the Department contests that any surface water depletions attributable to groundwater pumping are likely to be significant and unreasonable, particularly in the benchmark year of 2015 when groundwater pumping and surface water temperatures were critically high. Depleted flows in the lower San Joaquin River, many reaches of which are identified as interconnected in the GSP, contribute to increased in-river water temperatures. Groundwater extraction from interconnected aquifers contributes to depletion of instream flow (Barlow and Leake, 2012). Low flows and increased water temperatures in the lower San Joaquin River have been documented to negatively impact Chinook salmon (<i>Oncorhynchus tshawytscha</i>) and steelhead (<i>Oncorhynchus mykiss</i>) (Hallock 1970, Marston 2012). Acknowledging that fish and wildlife beneficial uses and users of groundwater likely experienced undesirable results during historical pumping regimes, especially during critically dry years, the GSP cannot rely on groundwater elevation as a proxy metric for Depletions of Interconnected Surface Water. If a significant correlation is lacking between groundwater elevations and Depletions of Interconnected Surface Water, particularly at the representative monitoring well locations used to track groundwater elevations in the ESJ Subbasin, then groundwater elevations used as a proxy for surface water depletions may misinform groundwater management activities and poorly predict instream habitat conditions for fish and wildlife species. Accordingly, the application of Groundwater Level sustainable management criteria to Depletions of Interconnected Surface Water is inappropriate, as it is not grounded in a quantifiable and site-specific understanding of surface water-groundwater connectivity as required by 23 CCR § 354.28 (c)(6)(A).</p> <p>ii. Undesirable Results: Groundwater Level 'undesirable results' and 'effects of undesirable results' do not specify impacts to environmental beneficial users such as terrestrial GDEs (GSP pp 3-3, 3-4). Additionally, the method used to identify undesirable results for Groundwater Levels (i.e., minimum threshold exceedances in groundwater elevation) is applied to the identification of undesirable results for the Depletions of Interconnected Surface Water without a reasonable justification. The indicator of undesirable results for Groundwater Levels is the measure of 25% of monitoring wells falling below their minimum thresholds for two consecutive (non-dry) years, yet the GSP does not prove a relationship between the Groundwater Level identification of undesirable results and the presence of undesirable results for Depletions of Interconnected Surface Water (see Comment #5.a.i). Effectively, the GSP does not connect identification of undesirable results for Depletions of Interconnected Surface Water to effects on interconnected surface water beneficial users per 23 CCR § 354.26 (b)(3). Finally, the GSP notes that groundwater levels that fall below the minimum threshold during hydrologically dry or critically dry years are not considered to be an indicator of undesirable results (GSP pp 3-3). This means proposed indicators of undesirable results for Groundwater Levels and Depletions of Interconnected Surface Water do not exist for dry water years. This absence of undesirable results indicators for certain water years means beneficial users of groundwater and interconnected surface water may experience significant and unreasonable effects throughout the duration of dry or critical water years before the undesirable results are 'identified' and managed. Accordingly, there is no groundwater management accountability during the most challenging of years for water resource managers and fish and wildlife beneficial users alike.</p> <p>iii. Minimum Thresholds and Measurable Objectives: Minimum thresholds and measurable objectives for Groundwater Levels, and by proxy, for Depletions of Interconnected Surface Water, are not protective of environmental beneficial uses and users of groundwater and interconnected surface water. Minimum thresholds allow for a decrease of groundwater elevation from 2015, or a comparable historic low, for all representative monitoring sites (3-7); and measurable objectives are set at historically low groundwater elevations (GSP 3-8). These sustainability criteria suggest that groundwater elevations at all representative wells in the ESJ Subbasin can continue to decrease for the next 20 years, dropping further from historically low groundwater elevations during drought years, without witnessing undesirable results. The ESJ Subbasin is characterized by DWIR as 'Critically Overdrafted,' meaning "continuation of present water management practices [in the basin] would probably result in significant adverse overdraft-related environmental, social, or economic impacts" ("Critically"). However, according to the GSP, there are no areas within the basin that are considered to have 'significant and unreasonable existing issues' (GSP pp 3-4), therefore minimum thresholds allow for continued groundwater depletions. Conceptually, there is a disconnect between the ESJ's 'Critically Overdrafted' designation and the GSP's claim that the basin has not experienced undesirable results, nor will it if groundwater levels continue to decrease. More specifically, the Department believes historical declines in terrestrial and aquatic groundwater dependent ecosystem viability, exacerbated by recent drought years, are evidence of undesirable results and further groundwater decline will undoubtedly lead to significant and unreasonable effects on fish and wildlife beneficial uses and users of groundwater and interconnected surface waters under the proposed sustainable management criteria. For example, further streamflow depletion attributable to groundwater pumping that lowers groundwater levels to meet minimum thresholds or even measurable objective may further compromise in-stream temperature targets in the lower San Joaquin River, adversely impacting in-stream species (see Comment #5.a.i). Accordingly, the Department does not believe groundwater levels above the proposed minimum thresholds and below the proposed measurable objectives (in the margin of operational flexibility) will allow the basin to achieve sustainability, particularly with respect to avoiding undesirable results for fish and wildlife beneficial uses and users of groundwater and Interconnected surface water.</p> <p>b. Recommendation:</p> <p>i. Proxy Metrics: To justify use of groundwater elevations as a proxy metric for Depletions of Interconnected Surface Water, the GSP should either specify how groundwater elevations are significantly correlated to surface water depletions; or define an expeditious path to identifying the location, quantity, and timing of surface water depletions caused by groundwater use, per 23 CCR §354.28(c)(6)(A), to better inform sustainability criteria for Depletions of Interconnected Surface Water.</p> <p>ii. Undesirable Results: Specify Groundwater Level 'undesirable results' and 'effects of undesirable results' for environmental beneficial users of groundwater and interconnected surface water. Specify undesirable result indicators for Depletions of Interconnected Surface Water that are relevant to beneficial users of surface waters. Identify undesirable results indicators for dry and critically dry water years for all sustainability indicators.</p> <p>iii. Minimum Thresholds and Measurable Objectives: Reconsider minimum thresholds and measurable objectives, accounting for undesirable results for fish and wildlife beneficial uses and users of groundwater and interconnected surface water. Design sustainable management criteria that reflect a 'Critically Overdrafted' subbasin designation by seeking to improve current groundwater conditions rather than allowing for continued aquifer depletions over the next two decades. For example, historical groundwater pumping has likely contributed to stream disconnection illustrated in figure 2-66 (GSP 2-99); resulting in depleted stream flows and reduced baseflows in ESJ Subbasin tributaries, and exacerbated high water temperatures in the lower San Joaquin River that negatively impact listed species such as the Chinook Salmon. Minimum thresholds and measurable objectives should reflect an effort to prevent further degradation to interconnected surface waters and to avoid undesirable results, rather than risk magnifying historical undesirable results through lowered groundwater elevations.</p>	Interconnected Surface Water	See Master Response 2 - ISW.

ESJ Public Comments Response

Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
7	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	3.6	The GSP wrongly abdicates responsibility for specific constituents by implying there is no nexus between specific groundwater contaminants and groundwater pumping (GSP pp 3-11). a. Issue: The GSP identifies two primary water quality constituents of concern in the ESJ Subbasin: salinity and arsenic (GSP pp 2-76). The GSP only specifies sustainability management criteria for salinity. The GSP explains that other constituents, including arsenic, are managed through other regulatory programs, and suggests that because GSAs do not have land use authority, they lack an ability to manage for such constituents as arsenic (GSP pp 3-11). Science suggests that over-pumping of aquifers can cause clay layers to compress and release dissolved arsenic, resulting in an increase of arsenic in extracted water ("Groundwater"). Thus, groundwater pumping actions can affect the presence, movement, and concentration of naturally oncoming arsenic in groundwater, potentially increasing anthropogenic and ecosystem exposure to arsenic contamination. According to SGMA statute, GSAs have the authority to establish groundwater extraction allocations, among other relevant authorities [WC § 10726.4]. Because arsenic contamination can be impacted by groundwater pumping, and because GSAs have the authority to manage groundwater pumping, the ESJGWA has a viable management lever over arsenic contamination in the ESJ Subbasin. b. Recommendation: Draft a plan to investigate the relationship between groundwater pumping and the presence, movement, and concentration of arsenic in the ESJ Subbasin and include the plan in the GSP submitted to DWR by January 2020. Develop sustainability criteria for arsenic accordingly and in partnership with existing regulatory programs by the first 5-year GSP update due in January 2025.	Groundwater Quality	See Master Response 3 -- Water Quality.
8	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	Monitoring Networks	Number and distribution of groundwater monitoring wells are insufficient for analysis. a. Issue: The current monitoring network lacks a sufficient number and representative distribution of shallow groundwater monitoring wells to monitor impacts to environmental beneficial uses and users of groundwater and interconnected surface waters [23 CCR § 354.34(2)]. Few wells are near interconnected surface waters or concentrations of] GDEs; and therefore, there are few data points on shallow groundwater level trends. These data are critical to understanding groundwater management impacts on fish and wildlife beneficial uses and users of groundwater, including GDEs and interconnected surface water habitats, that are impacted disproportionately by shallow groundwater trends. b. Recommendation: Install additional shallow groundwater monitoring wells near GDEs and interconnected surface waters, potentially pairing multiple-completion wells with streamflow gauges for improved understanding of surface water-groundwater interconnectivity.	Monitoring Network	Data gaps are discussed in Section 4.7 (Data Gaps) and include identified gaps in the monitoring and analysis of interconnected surface waters and GDEs. The GSP includes a plan for the drilling of up to 12 proposed wells to help resolve identified gaps and enhance future analysis of interconnected surface waters and GDEs. These proposed wells would all measure for both groundwater quality and groundwater levels and include 2 deep, nested wells funded under the TSS application and up to 10 shallow wells drilled by the ESJGWA. If a need for more detail is recognized, the monitoring network will be reevaluated as updates to the GSP occur. Frequency of groundwater level monitoring is cited in the Draft Monitoring Networks and Identification of Data Gaps Best Management Practice. While semi-annual monitoring is required for groundwater levels, DWR guidance recommends monthly sampling of groundwater levels for the Subbasin based on aquifer type, volume of long-term aquifer withdrawals, and recharge potential. The ESJGWA Board determined semi-annual sampling was appropriate as it will capture seasonal highs and lows and that additional monitoring would not necessarily provide additional information on trends.
9	Kevin Thomas	CA Department of Fish and Wildlife, North Central Region	6.1	Demand reduction management actions lack emphasis and specificity critical to ESJ Subbasin sustainability goal achievement. a. Issue: The GSP project and management actions focus on supply augmentation, with only three projects intended to conserve groundwater through metering and systems optimization. Though the GSP reserves the flexibility to implement demand-side management in the future (GSP pp 6-1), there are no specifics as to how the ESJGWA would implement demand management. This lack of specificity on how demand will be managed may lead to deprioritization or delayed implementation of demand management actions, which can undermine a basin's ability to achieve sustainability goals. Considering the ESJ Subbasins' current unsustainable rate of groundwater consumption and considering the cost and timing challenges associated with supply augmentation projects, a balanced portfolio approach to achieve groundwater sustainability should include demand-management strategies. b. Recommendation: Add specific measures for initiating demand reduction on an earlier timeline in the ESJ Subbasin to account for groundwater pumping lag impacts, supply-augmentation project implementation challenges, and a scaled ramping-down of groundwater use that is a necessary ingredient in San Joaquin Valley long-term groundwater sustainability. Be specific about triggers, timing, and expected outcomes of demand-management actions.	Projects and Management Actions	See Master Response 5 - Projects.
10	Bill Mattos	California Poultry Federation		CFP commends the Draft GSP for emphasizing projects to augment yield and increase recharge.	Projects and Management Actions	See Master Response 5 - Projects.
11	Tom Lippe	California Sportfishing Protection Alliance	n/a	The Plan does not satisfy GSP Rule 355.4(b)(1) because the Plan's description of the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable or supported by the best available information and best available science.	Sustainable Management Criteria	The ESJGWA has determined that the plan is supported by the best available data and science with extensive input from stakeholders, GSAs, and agencies.
12	Tom Lippe	California Sportfishing Protection Alliance	n/a	The Plan does not satisfy GSP Rule 355.4(b)(3) because the sustainable management criteria and projects and management actions identified in the plan are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Plan.	Sustainable Management Criteria	The ESJGWA has determined that the plan is supported by the best available data and science with extensive input from stakeholders, GSAs, and agencies.
13	Tom Lippe	California Sportfishing Protection Alliance	n/a	The Plan does not satisfy GSP Rule 355.4(b)(5) because the Plan does not contain or present substantial evidence to conclude that the projects and management actions identified to achieve sustainable yield are effective or feasible or not likely to prevent undesirable results or to ensure that the basin is operated within its sustainable yield.	Projects and Management Actions	See Master Response 5 - Projects.
14	Greg Kamman	California Sportfishing Protection Alliance	Section 2.1.9.2.2	Section 2.1.9.2.2 of the GSP (page 2-49) is entitled, Regional Historic Groundwater Flow and Surface Water Interaction. There is no presentation or reference to historic groundwater interaction with surface water in this section of the GSP.	Basin Setting	Added text to Section 2.1.9.2.2 (Regional Historic Groundwater Flow and Surface Water Interaction) referring to where historic groundwater-surface water interaction is discussed: Historical groundwater-surface water interaction in the context of the twenty years of the historical model (ESJWRM) is discussed in Section 2.2.6.
15	Greg Kamman	California Sportfishing Protection Alliance	Section 2.2.6	Section 354.16 of the GSP Regulations stipulates that each plan describe current and historic groundwater conditions in the basin based on the best available information. With regard to Section 2.2.6 of the GSP.(Interconnected Surface Water Systems), I would like you to be aware of a study completed by Kamman Hydrology & Engineering, Inc. in 2018 , which delineates subterranean streams and Potential Stream Depletion Areas (PSDA) along the Stanislaus River bordering the south side of the ESJGB. PSDA's are areas where groundwater pumping could potentially cause stream depletion. This report and associated maps are attached for reference and integration into Section 2.2.6 of the GSP. Access KHE's 2018 report at this link: https://www.dropbox.com/s/zzqnn6ifsbahx5p/PSDA-mapping-Tech-Memorandum_v1%2Bquads.pdf?dl=0	Basin Setting	Thank you for providing the report. Interconnected surface water was discussed at the scale of the Eastern San Joaquin Subbasin in Section 2.2.6, though the figures show more individual stream results. Comment noted for follow up and comparison as analysis of stream-aquifer interaction continues in future GSP updates.
16	Greg Kamman	California Sportfishing Protection Alliance	Section 2.2.6	Section 2.2.6 of the GSP (page 2-97 to 2-99) also introduces Figure 2-65 (attached as Exhibit A), which shows gaining streams in blue where groundwater discharges to rivers, losing streams in red where streams lose water to the groundwater system, and mixed streams (gaining or losing less than 75 percent of the time) in orange. This analysis was based on modeling results from the historical calibration of the East San Joaquin Water Resources Model (ESJWRM) for approximately 900 stream nodes in the Eastern San Joaquin Subbasin. The historical model calibration period covers the water years 1996-2015. Based on the Cumulative Departure from Mean Precipitation curve presented in Figure 2-71 (pg. 2-109 of GSP), the years 1996-2015 reflect a dry period, as there is a net decrease in approximately 17-inches of precipitation (i.e., change from +7 [1996] to -10 inches [2015] in the cumulative departure curve). This section of the GSP only presents a description of historical (and dry) interconnected surface water conditions. Section 354.16 of the California Code of Regulations (Regulations) stipulates that each Plan shall provide a description of current and historical groundwater conditions in the basin. The GSP fails to describe the current conditions of the interconnected surface water system in the basin.	Interconnected Surface Water	See Master Response 2 - ISW.

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17	Greg Kamman	California Sportfishing Protection Alliance	Section 2.2.6	<p>Section 2.2.6 of the GSP (Interconnected Surface Water Systems; page 2-97 to 2-99) also presents Figure 2-66 (attached as Exhibit B), which is entitled, Interconnected and Disconnected Streams. The GSP states that Stream connectivity was analyzed by comparing monthly groundwater elevations from the historical calibration of the ESJWRM to streambed elevations along the streams represented in the ESJWRM. Exhibit B shows the locations where streams are interconnected at least 75 percent of the time (shown in blue) or disconnected (shown in green). Section 351 of the Regulations defines “interconnected surface water” as surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. The GSP (pg. 2-97) states that interconnected surface waters may be either gaining or losing, wherein the surface water feature itself is either gaining water from the aquifer system or losing water to the aquifer system. Exhibit C (attached) is taken from DWR’s water budget BMP guidance document and illustrates the relationship between surface water and groundwater for gaining, losing and disconnected streams. Per this diagram, for a stream to be gaining, it must be hydraulically connected to the aquifer. In many instances, a losing stream may also be in hydraulic connection to the aquifer. Losing streams may become disconnected seasonally or during drought periods in response to a falling water table. There are inconsistencies between the results presented in Exhibits A and B where areas delineated as gaining streams are also identified as being disconnected. A good example of this is the upstream portion of the Stanislaus River located in the southeast corner of the basin. These inconsistencies should be corrected or explained. In addition, the stream connectivity presented in Exhibit B is for historic conditions – the current conditions should also be presented per Regulations.</p>	Interconnected Surface Water	See Master Response 2 - ISW.
18	Greg Kamman	California Sportfishing Protection Alliance	Sections 2.2.7, 2.2.8, and 2.2.9	<p>The GSP Regulations define “groundwater dependent ecosystem” (GDE) as ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. Section 354.16 of the Regulations stipulate that Plans identify (current and historic) GDEs within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information. As stated on page 2-100, the GSP identifies GDEs within the Subbasin based on determining the areas where vegetation is dependent on groundwater. The GSP presents a methodology where the Natural Communities Commonly Associated with Groundwater (NCCAG) database, developed by DWR, CDFW and The Nature Conservancy (TNC), is used to identify vegetation communities and wetlands that are dependent on groundwater. Figure 2-67 of the GSP (attached as Exhibit D) presents the NCCAG within the basin. The GSP then describes a methodology by which NCCAG’s with alternate water supplies are excluded from consideration as GDEs based on the following criteria: a. Depth to groundwater greater than 30 feet; b. areas within 150 feet of managed wetlands that receive supplemental water; c. areas within 50 feet of irrigated agriculture; d. areas within 150 feet of perennial surface water bodies, and e. areas removed based on stakeholder comment. The resulting areas identified as GDEs within the basin based on these criteria are shown in Figure 2-69 of the GSP (attached as Exhibit E).</p> <p>There are two major problems with the GSP’s method for delineation of GDEs. First, the GSP method only considers the presence of vegetation communities and wetlands in the determination. GSP Regulations stipulate that “species” dependent on groundwater should also be considered. Thus, the analysis should also take into consideration the presence of fish and wildlife species that rely on riparian wetlands and/or flow in rivers influenced by gaining reaches. The Nature Conservancy refers to these species as Environmental Surface Water Beneficial Users and has prepared a list of freshwater species located within each groundwater basin in California. These lists are posted at their website specifically for GSAs and others to better evaluate the impacts of groundwater management on environmental beneficial users of surface water in GSPs. This best available science should be integrated into the determination of GDEs.</p> <p>The second problem I see in the GSP methodology is the failure to acknowledge that GDEs may depend on shallow groundwater regardless of the presence of alternative water sources. For example, wetlands within or adjacent to irrigated agriculture may not rely on that irrigation for survival; if they did, we would expect to find wetlands growing in all irrigated lands. In addition, the presence and sustainability of perennial surface water in Central Valley Rivers is controlled by many factors (e.g., groundwater inflow, reservoir operations, irrigation drainage, etc.). Modeling results presented in the GSP indicate significant contributions of groundwater flow to “gaining” reaches of the Stanislaus River (see Exhibit A). The riparian and wetland vegetation bordering these gaining reaches are surely sustained to some degree by this groundwater inflow to the river and the shallow groundwater conditions that likely accompany gaining reaches. The interconnected condition is also likely influenced significantly by seasonal and long-term wet and dry cycles. However, the GSP does not quantify the relative spatial or temporal contributions of groundwater supply to riparian habitats. Instead, the GSP simply dismisses these habitats as GDE’s under the assumption that perennial flow is sustained through the summer by agricultural deliveries or tailwater. Therefore, it is my opinion that the process of elimination of GDEs as presented in the GSP is seriously flawed and does not correctly recognize or delineate GDEs in the basin.</p>	GDEs	See Master Response 1 - GDEs.
19	Greg Kamman	California Sportfishing Protection Alliance	Section 2.3.6	<p>One of the most important outcomes of the GSP is the determination of sustainable yield (sustainability goal) for the basin. Section 2.3.6 (pg. 2-133) of the GSP states that, “The sustainable conditions scenario is based on the projected conditions scenario modified by lowering groundwater production across the model domain.” This section of the GSP then provides some qualitative statements about future supplies, demands and uncertainties in water budget assumptions and numerical modeling. Although the sustainable yield of the basin is determined to be 715,000 AF/yr +/- 10 percent, and a 78,000 AF/yr reduction in groundwater use is needed to achieve sustainability, there is no detailed explanation on how these numbers were determined. Per Section 354.24 of the GSP Regulations, “The Plan shall include a description of the sustainability goal, including information from the basin setting used to establish the sustainability goal, etc.” As written, the GSP does not provide the reader with a clear and detailed explanation on how the sustainable yield figure was derived and if climate change predictions were factored into the quantification. This omission makes it impossible to review and comment on the reliability of the sustainable yield or required reduction figures for the basin under existing or future conditions. Therefore, the draft GSP should be revised to include this information and recirculated for public comment.</p>	Water Budget	<p>1) The text in 2.3.6 (Sustainable Yield Estimate) includes a description of how sustainable yield was estimated using ESJWRM. The analysis of sustainable yield involved simulations on the projected conditions scenario lowering groundwater production across the model domain to achieve a long-term change in storage of, or very close to, zero. 2) The ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040. Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Therefore, the sustainable yield analysis did not include climate change. Comment noted for follow up in next round of model refinements and updates to analyses.</p>

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20	Greg Kamman	California Sportfishing Protection Alliance	Section 6.2.3	<p>Because the Subbasin is in overdraft, the GSP has identified 23 projects to reduce overdraft conditions and meet long-term water demands and sustainability goals. There are some projects focused on conservation and reuse of reclaimed water, but the majority simply reduce local groundwater demand by providing access to surface water supplies. These projects are limited in geographic area and are intended to provide local solutions. However, from the perspective of a full basin water budget, shifting the reliance from groundwater to surface water supplies may not generate the full benefits anticipated as provided in the project descriptions. This is because diverting and reducing stream flows will lead to reductions in groundwater recharge in other areas within or beyond the basin, via reduced water available for stream infiltration or other uses of stream diversions that contribute to recharge. As required in Section 354.44 of the Regulations, the GSP does not provide a full and comprehensive quantification of demand reduction in response to project implementation – this would require deriving a basin-scale water budget accounting that incorporates project actions. This analysis would also inform the evaluation, as required under Section 355.4 of the GSP Regulations, of Plan/project feasibility and undesirable results (e.g., ecological impacts) associated with increased diversion and use of surface water supplies.</p> <p>Stated another way, I'm concerned that the GSP has not demonstrated that the Project Actions will be effective in achieving stated reductions in groundwater use and avoiding undesirable results. For example, Project 2, the SEWD Surface Water Implementation Expansion Project (SEWD), would require landowners adjacent to surface water conveyance systems (rivers or pipelines) to utilize surface water as part of the SGMA implementation. This would increase surface water usage by about 18,000 to 20,000 AF/year with in-lieu groundwater recharge benefits. This project relies on water from New Hogan Reservoir (Calaveras River water) and New Melones Reservoir (Stanislaus River water). Although the project could reduce groundwater use, there is no analysis provided on how the project would affect surface and ground water resources downstream of the two reservoirs. If this project reduced downstream flows, it could result in depleted surface water supplies, reduced groundwater recharge from the rivers as well as adverse impacts to riparian vegetation and environmental surface water beneficial users.</p> <p>Similarly, I'm concerned about the assumed feasibility of some projects achieving the desired goal. For example, the groundwater recharge Projects 11 and 12 are anticipated to each recharge 8,000 AF/yr through the construction and operation of independent 10-acre recharge ponds. This equates to recharging 800 feet of water at each pond site between December 1 and June 30th of each year or 3.78 feet daily for the 212 day period. I am skeptical about achieving this level of recharge given the uncertainties in water availability during dry years, operations that would be required to maintain ponding of sufficient depth and duration, and maintaining basin infiltration rates given the likely accumulation of fine grained material that reduces basin permeability. This example demonstrates how the GSP fails to demonstrate how these project can be accomplished in a successful manner under a variety of rainfall and runoff conditions.</p>	Projects and Management Actions	See Master Response 5 - Projects. The ESJWRM will be updated to incorporate and evaluate GSP projects in future model refinement efforts.
21		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The GSP does not currently provide clear information on how and to what extent DAC members rely on groundwater. For example: how much of the population relies on private domestic wells for drinking water? How much of the population relies on small community water systems and where are those systems located? Are those community water systems solely depending on groundwater? How many connections do the small water systems serve? This information is valuable for the reader to understand the scale of the vulnerable population dependent on groundwater for drinking water. [SEE MORE SPECIFICS IN COMMENT LETTER]	DACs	1) DAC areas are mapped in Figure 1-8 in Section 1.2.1. The density of domestic wells are mapped in Figure 1-12. 2) An appendix has been added to the GSP which documents the 432 community water systems that received hard copy outreach materials throughout the GSP development process. Section 1.3.4.4 (Stakeholder Database) was updated to list the dates that outreach materials were mailed to community water systems. An analysis was performed to map community water systems that are DAC or SDAC areas, and the results of this analysis are presented in the added appendix. The appendix lists the number of connections served by each system. 3) Section 1.3.1 (Beneficial Uses and Users in the Subbasin) was updated to include community water systems and reference the added appendix. 4) Language was added to Section 1.3.4.5 (Stakeholder Education and Outreach) indicating that many GSAs conducted local outreach within their jurisdiction, including direct mailings to parcels served as part of a small water system.
22		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Although the GSP identifies declining water quality trends for arsenic and nitrate in the basin, which meet the GSP's definition of undesirable results for water quality, no MOs or MTs are set for these constituents. The concentration of these constituents can be impacted by management actions. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	See Master Response 3 -- Water Quality.
23		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The GSP notes plans to coordinate and share data with other regulatory monitoring programs, but does not explain how this coordination will improve sustainability with respect to water quality within the basin. The GSP should identify a clear plan for addressing all groundwater constituents that are contributing to the undesirable results of degraded groundwater quality, including those for drinking water users. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	See Master Response 3 -- Water Quality.
24		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Caswell Memorial State Park is incorrectly referred to as being located outside the Eastern San Joaquin Subbasin. [SEE MORE SPECIFICS IN COMMENT LETTER]	Clarifying Edit	Caswell Memorial State Park is within the Subbasin. Section 1.2.1 (Description of Plan Area) includes text that it is the only state park within the Eastern San Joaquin Subbasin boundary.
25		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	Figure 1-11	The authors referred to the San Joaquin County General Plan documents, including background reports, for information regarding these important resources. These potential beneficial groundwater users should be described in the text on pp. 1-18 and shown in Figure 1-11. Please include a description recognizing all of the protected areas in the Subbasin and their beneficial groundwater uses. [SEE MORE SPECIFICS IN COMMENT LETTER]	Plan Area	Comment noted. This information is beyond the scope of the GSP. Consider for inclusion in future updates to the GSP.
26		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	2.2.8	Section 2.2.8 includes a geospatial analysis that removes managed wetlands from consideration as GDEs. The managed wetlands in the Subbasin should be identified in this section. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	Comment noted for potential inclusion in future update to the GSP. Figure 2-68 was updated to show removed NCCAG areas (including managed wetlands in pink) as data gaps. These identified wetlands were reviewed with local water managers to verify supplemental water deliveries.
27		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Ongoing stakeholder engagement and inclusion throughout the GSP implementation process will be crucial to ensuring that the needs of the most vulnerable beneficial users in the basin are met. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	This has been noted as a future item for consideration as the GSAs move into GSP implementation.

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28		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	Figure 1-8	The Communications plan does not specify how the DACs identified in Figure 1-8 were specifically engaged. The failure to identify small community water systems calls into question how and whether adequate outreach to DACs was conducted. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	1) An appendix has been added to the GSP which documents the 432 community water systems that received hard copy outreach materials throughout the GSP development process. Section 1.3.4.4 (Stakeholder Database) was updated to list the dates that outreach materials were mailed to community water systems. An analysis was performed to map community water systems that are DAC or SDAC areas, and the results of this analysis are presented in the added appendix. 2) Section 1.3.1 (Beneficial Uses and Users in the Subbasin) was updated to include community water systems and reference the added appendix. 3) Language was added to Section 1.3.4.5 (Stakeholder Education and Outreach) indicating that many GSAs conducted local outreach within their jurisdiction, including direct mailings to parcels served as part of a small water system.
29		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The “stakeholder feedback” mechanism for removal of NCCAGs from consideration as GDEs is not explained or documented in the GSP. Please provide details that support removing potential GDEs based on stakeholder feedback. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	Text in Section 2.2.7 (Groundwater-Dependent Ecosystems) was edited to clarify what comprised stakeholder feedback: Next, areas identified as GDEs were ground-truthed with GSA staff and Groundwater Sustainability Workgroup (Workgroup) members. Through this process, areas identified GDEs were investigated, and areas identified as known irrigated parcels such as parks were reclassified. These areas are labeled on Figure 2-74 as “Stakeholder Comment.”
30		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The GSP uses domestic well depths as a basis for determining water level MTs, but does not present the domestic well depth data in the document. A map or maps showing domestic and public supply well depths would provide more transparency. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Levels	Appendix 3-A (Supplemental Data for Groundwater Level Minimum Thresholds) shows the tabulated data for the wells in the representative monitoring network for groundwater levels. The table has been updated to include municipal well depths for Stockton, Manteca, and Lodi.
31		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The GSP identifies that information on domestic well construction including screen interval depths, are not available. However, the GSP does not identify a plan to fill this data gap, even though this information is critical to the GSA’s establishment of their water level MTs. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	Though the ESJGWA is not currently planning to collect construction information about domestic wells, any information that is shared or becomes publicly available will be reviewed for use in updates to the GSP.
32		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Providing maps of the monitoring network overlaid with location of DACs, GDEs, and any other sensitive beneficial users will allow the reader to evaluate the adequacy of the network to monitor conditions near these beneficial users. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The plan is supported by the best available data and science and meets the requirements of SGMA. The ESJGWA Board supports the inclusion of the monitoring network as presented and approved it in July 2019.
33		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The scientific rationale for removing areas with access to alternate water sources from the identified GDEs should be better explained. Specifically, the results of any supporting habitat assessments should be provided. If no habitat assessments were conducted or reviewed, this should be identified as a data gap. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	See Master Response 1 - GDEs.
34		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		In the case of managed wetlands, the water sources used by the managed wetlands, the type of managed wetlands, the relationship of the wetlands to groundwater, and the wetland manager should be specified. In addition, these managed wetlands should be identified in Section 1.3.1. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	Comment noted. The managed wetlands and surrounding areas are mapped in Figure 2-68. SGMA does not require identification of managed wetlands or further classification.
35		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The approach used to identify and exclude GDEs should be supported by actual hydrologic and habitat assessment data. If such data and assessments are not available, the need for supporting studies to validate the approach should be identified as a data gap. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	GDEs have been identified as data gap areas requiring further refinement. Section 4.7 (Data Gaps) has been updated to reflect this change and to identify plans to collection additional data in areas of shallow groundwater.
36		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Shallow groundwater data near streams are identified as a significant data gap, and the application of a 30-foot depth to water criterion in light of the identified data gaps needs to be explained and supported. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	Section 2.2.7 (Groundwater-Dependent Ecosystems) was expanded to better describe the analysis: To identify NCCAG areas that are GDEs, the analysis identified communities in areas where groundwater levels are shallower than 30 feet bgs, as these areas are thought to be reachable by the root zone of vegetation. Oak trees are considered the deepest-rooted plant in the region with a root zone of roughly 25 feet. This value is considered conservative, as this depth is unlikely to support recruitment of new oak seedlings. NCCAG-identified communities in areas with groundwater shallower than 30 feet were considered as potential GDEs. Communities in areas deeper than 30 feet were identified as data gap areas for future refinement and are labeled on Figure 2-68 as “Depth to Water > 30 ft”. These areas will be refined in future analyses to identify potential existing GDEs that may have been misclassified through this screening process. Additional information regarding plans to fill GDE-related data gaps can be found in Section 4.7.4.
37		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		We recommend that depth to groundwater contour maps are used to verify whether a connection to groundwater exists for polygons in the NC Dataset, instead of relying on inferences based on the presence of surface water features in the Basin. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	Comment noted. This GSP uses a depth to groundwater contour map to evaluate whether a connection to groundwater exists with the Natural Communities Commonly Associated with Groundwater database (collectively developed by TNC, DWR, and CDFW).
38		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		It is highly advised that seasonal and interannual fluctuations in the groundwater regime are taken into consideration in the evaluation of root zones, particularly for oak trees. Utilizing groundwater data from one point in time or contoured with too few shallow monitoring wells can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	See Master Response 1 - GDEs.
39		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		We recommend that a discussion regarding the nature and characteristics of the identified GDEs be included. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	Comment noted. Consider for inclusion in future updates to the GSP. As GDEs are a recognized data gap in the GSP, the list of identified GDEs will continue to be refined. Language was added to Section 4.7 (Data Gaps) to identify NCCAG areas removed through the GDE analysis are data gaps areas requiring further refinement. The purpose of this is to identify potential existing GDEs that may have been incorrectly eliminated through this screening process.

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40		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		It is not clear how climate change is anticipated to change the demands of domestic users and small public water systems or how these demands were accounted for in the projected water budget. [SEE MORE SPECIFICS IN COMMENT LETTER]	Climate Change	There was no specific analysis done on the impact of climate change on domestic users and small public water systems apart from the simulation of both in the climate change model scenario as a part of the broader urban classification including all cities, private domestic users, and public water systems. Climate change will continue to be evaluated with every update to the GSP. Comment noted for follow up in next round of model refinements and updates to analyses.
41		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Please include an explanation of the approach to determining the amount of riparian ET demand met by streamflow vs. groundwater evapotranspiration. [SEE MORE SPECIFICS IN COMMENT LETTER]	Water Budget	Riparian evapotranspiration is included in the water budget (part of "Refuge, Native, and Riparian Evapotranspiration" in Table 2-14) and simulated in the model. Both streamflow and groundwater can contribute to meeting riparian evapotranspiration demand and the amount of demand met by each component is estimated directly by the model. "Riparian Intake from Streams" in Tables 2-13 and 2-14 includes all surface water and groundwater contributing to riparian demand through stream-aquifer interaction. The ESJWRM model does not have the level of detail to determine how much groundwater is consumed by riparian demand.
42		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Groundwater outflow to ET does not appear to be identified as a groundwater budget component. In addition, the ET demand of natural vegetation does not appear to be considered in water supply and demand calculations. Since wetlands, GDEs and riparian vegetation are recognized as beneficial users of groundwater in the Subbasin, it is appropriate to include them in these calculations. [SEE MORE SPECIFICS IN COMMENT LETTER]	Water Budget	1) Groundwater outflow to evapotranspiration is not directly included as a water budget component and is simulated indirectly in ESJWRM through stream-aquifer interaction and seepage of pumped groundwater. 2) Wetlands, GDEs, riparian vegetation, and native (or natural) vegetation are recognized as beneficial users and are included in the water budget, though not separated out and are part of "Refuge, Native, and Riparian Evapotranspiration". There is not enough information at this time to determine how much groundwater is consumed by each of these demands. 3) This GSP recognized GDEs as a data gap in both the determination of GDEs in the Subbasin as well as the simulation of GDEs in the model. In the model, GDEs are broadly assumed to be represented as native vegetation as they are not specifically included in land use surveys. This representation removes the realistic variation of rooting depths across GDEs and we will consider the specific simulation of GDEs in future updates to the model. Comment noted for follow up in next round of model refinements and updates.
43		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The GSP clearly identifies plans to address data gaps in the monitoring network near streams, but does not clearly identify whether data gaps exist near DACs/drinking water users. A map illustrating the location of current and proposed monitoring well locations and depths relative to domestic and small public water systems wells and depths would allow the reader to assess the adequacy of the proposed network for monitoring impacts to these beneficial users. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The ESJGWA Board supports the inclusion of the monitoring network as presented and approved it in July 2019. Data gaps are discussed in Section 4.7 (Data Gaps) and include identified gaps in the monitoring and analysis of interconnected surface waters and GDEs. The GSP includes a plan for the drilling of up to 12 proposed wells to help resolve identified gaps and enhance future analysis of interconnected surface waters and GDEs. These proposed wells would all measure for both groundwater quality and groundwater levels and include 2 deep, nested wells funded under the TSS application and up to 10 shallow wells drilled by the ESJGWA. The plan meets the requirements of SGMA and does not require an additional figure at this time.
44		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Very few of the remaining monitoring wells are located near potential ISWs and GDEs. Specific monitoring of GDEs and ISWs should be described to further evaluate, monitor, manage and protect these areas. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The ESJGWA Board determined the monitoring network is consistent with SGMA regulations. If a need for more detail recognized, the monitoring network will be reevaluated as updates to the GSP occur. Data gaps are discussed in Section 4.7 (Data Gaps) and include identified gaps in the monitoring and analysis of interconnected surface waters and GDEs. The GSP includes a plan for the drilling of up to 12 proposed wells to help resolve identified gaps and enhance future analysis of interconnected surface waters and GDEs. These proposed wells would all measure for both groundwater quality and groundwater levels and include 2 deep, nested wells funded under the TSS application and up to 10 shallow wells drilled by the ESJGWA.
45		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		It is not possible to determine whether the proposed monitoring, minimum thresholds and measurable objectives are sufficiently protective to ensure significant and unreasonable impacts to GDEs and ISWs will be prevented. The GDE Pulse interactive mapping application ¹⁴ provides an example of a linkage between groundwater level data and GDE health that could be used to incorporate remote sensing into an efficient and incisive monitoring program. Please provide an explanation how groundwater levels will specifically be used to assess adverse impacts to GDEs and ISWs, and identify any data gaps and how they will be addressed. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The ESJGWA Board determined the monitoring network is consistent with SGMA regulations. If a need for more detail recognized, the monitoring network will be reevaluated as updates to the GSP occur. Data gaps are discussed in Section 4.7 (Data Gaps) and include identified gaps in the monitoring and analysis of interconnected surface waters and GDEs. The GSP includes a plan for the drilling of up to 12 proposed wells to help resolve identified gaps and enhance future analysis of interconnected surface waters and GDEs. These proposed wells would all measure for both groundwater quality and groundwater levels and include 2 deep, nested wells funded under the TSS application and up to 10 shallow wells drilled by the ESJGWA. GDE Pulse will be evaluated for use in the next round of GSP updates.
46		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Monitoring well locations should be prioritized near high value or sensitive resources (GDEs) that are vulnerable to significant and unreasonable impacts, such as near the protected lands identified in our comments on Section 1.3.1 or the GDEs identified in the Subbasin. In addition to the major streams and rivers in the subbasin, impacts to smaller creeks and wetland areas should be considered, as these may be the most vulnerable resources. Please discuss the results of a resource assessment or consultations with resource managers that demonstrates a sufficient number of wells is proposed to address data gaps near GDEs and ISWs, and that they are being sited where they will provide the most benefit. Alternatively, please outline the process by which this will be accomplished. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The ESJGWA Board determined the monitoring network is consistent with SGMA regulations. If a need for more detail recognized, the monitoring network will be reevaluated as updates to the GSP occur. Data gaps are discussed in Section 4.7 (Data Gaps) and include identified gaps in the monitoring and analysis of interconnected surface waters and GDEs. The GSP includes a plan for the drilling of up to 12 proposed wells to help resolve identified gaps and enhance future analysis of interconnected surface waters and GDEs. These proposed wells would all measure for both groundwater quality and groundwater levels and include 2 deep, nested wells funded under the TSS application and up to 10 shallow wells drilled by the ESJGWA.
47		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Please address how the need to link and correlate groundwater level declines to biological responses, and significant and adverse impacts to GDEs and ISWs will be addressed. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	The GSP considers environmental users of groundwater, including species and habitat reliant on instream flows, as well as wetlands and GDEs as beneficial uses and users. See Section 1.3.1 (Beneficial Uses and Users in the Basin). Beneficial uses and users are considered in identifying undesirable results for each of the sustainability indicators.
48		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Addressing data gaps is typically iterative and it is not reasonable to expect it will be a one-time process. Please describe the process by which data gaps will be identified and addressed on an ongoing basis. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The ESJGWA is committed to resolving the data gaps identified during the GSP development process. As discussed in Section 7.6.4 (Monitoring Network Description), a program may be developed for the GSP update to help fill new or remaining data gaps.
49		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	5.3	Section 5.3 Table 5.3 indicates that data regarding streamflow and GDEs is not currently included in the proposed Data Management System. Please discuss which monitoring data for "related surface conditions" will be gathered and incorporated in the DMS to assess potential significant and unreasonable impacts to environmental beneficial uses and users. [SEE MORE SPECIFICS IN COMMENT LETTER]	DMS	Surface water data, including streamflow and water quality, is readily and publicly available online and has not be separately added to the DMS, though the system is set up to store streamflow and many other different types of data. Streamflow and surface water gage data was used both to build and calibrate the model, as well as in various analyses for the GSP. All groundwater level monitoring data will be evaluated for analysis of groundwater-surface water interaction and other surface conditions. As GDEs are a recognized data gap in the GSP, additional data may be collected that will be considered for addition to the DMS.
50		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	7.3.1	In Section 7.3.1, please clarify the potential use of imagery as a monitoring tool, and expand it to monitoring surface indicators of ISW and GDE ecosystem health. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	While there are currently no specific plans regarding the use of imagery is a monitoring tool, any publicly available tools will be evaluated for use in updates to the GSP.
51		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	7.3.2.2	In Section 7.3.2.2, please specifically address ecosystem health of GDEs and ISWs as a surface indicator to subsurface conditions. This can be done using GDEPulse, remote sensing, imagery or other feasible methods [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	While there are currently no specific plans regarding the use of imagery is a monitoring tool, any publicly available tools will be evaluated for use in updates to the GSP.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
52		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Stakeholder input from DAC community members does not appear to have been considered in establishment of water quality URs, based on the information presented in the GSP. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	1) An appendix has been added to the GSP which documents the 432 community water systems that received hard copy outreach materials throughout the GSP development process. Section 1.3.4.4 (Stakeholder Database) was updated to list the dates that outreach materials were mailed to community water systems. An analysis was performed to map community water systems that are DAC or SDAC areas, and the results of this analysis are presented in the added appendix. 2) Section 1.3.1 (Beneficial Uses and Users in the Subbasin) was updated to include community water systems and reference the added appendix. 3) Language was added to Section 1.3.4.5 (Stakeholder Education and Outreach) indicating that many GSAs conducted local outreach within their jurisdiction, including direct mailings to parcels served as part of a small water system.
53		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Based on the presented information, domestic well uses are considered under URs and for the development of water level MOS and MTs, but DAC members are not explicitly considered. More detail and specifics regarding DAC members, including those that rely on smaller community drinking water systems, not only domestic wells, is necessary to demonstrate that these beneficial users were adequately considered. [SEE MORE SPECIFICS IN COMMENT LETTER]	Sustainable Management Criteria	Groundwater level minimum thresholds considered domestic wells in the analysis to determine the thresholds with the intent of being protective of 90% of domestic wells. In the Subbasin, 22 percent of domestic wells are located within DACs. An appendix has been added to the GSP which documents the 432 community water systems that received hard copy outreach materials throughout the GSP development process. Section 1.3.4.4 (Stakeholder Database) was updated to list the dates that outreach materials were mailed to community water systems. An analysis was performed to map community water systems that are DAC or SDAC areas, and the results of this analysis are presented in the added appendix.
54		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The incorrect statement that SGMA does not require the establishment of sustainable management criteria for GDEs should be removed. [SEE MORE SPECIFICS IN COMMENT LETTER]	Clarifying Edit	Clarified text in Section 2.2.7 (Groundwater-Dependent Ecosystems): SGMA requires the identification of GDEs. SGMA does not require that additional sustainable management criteria be established to specifically manage these areas, but rather includes GDEs as a beneficial user of water to be considered when developing other sustainable management criteria.
55		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	3.2.1.1.1	Please add "potential adverse impacts to GDEs" to the list of potential undesirable results presented in Section 3.2.1.1.1. [SEE MORE SPECIFICS IN COMMENT LETTER]	Clarifying Edit	Added text to Section 3.2.1.1.1 (Description of Undesirable Results) to list GDEs as having potential undesirable results due to the chronic lowering of groundwater: Adverse impacts to environmental uses and users, including interconnected surface waters and groundwater-dependent ecosystems (GDEs).
56		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	3.2.6	The analysis for potential depletion of ISWs in Section 3.2.6 should include all beneficial users of surface water that could be affected by groundwater withdrawals, including environmental beneficial users along creeks, even if the creeks are interconnected less than 75% of the time. [SEE MORE SPECIFICS IN COMMENT LETTER]	Interconnected Surface Water	Comment noted. The ESJGWA supports the definition of undesirable results provided in the GSP, which identifies GDEs and freshwater fish and wildlife species as beneficial users. The ESJGWA will continue to collect data to better inform connectivity conditions in the Subbasin.
57		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The definition of undesirable results for ISWs is overly narrow and recognizes only a limited subset of the environmental beneficial users of ISWs. A more complete definition would be that undesirable results would occur if groundwater extraction resulted in a depletion of surface water that caused significant impacts to aquatic species or wildlife, or degradation of wetlands, riparian habitats and GDEs. Please expand the definition of undesirable results to include all of the environmental beneficial uses and users of ISWs, and expand the analysis in Section 3.2.6, as appropriate. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	Comment noted. The ESJGWA supports the definition of undesirable results provided in the GSP, which identifies GDEs and freshwater fish and wildlife species as beneficial users. The ESJGWA will continue to collect data to better inform connectivity conditions in the Subbasin.
58		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	3.2.6.1.3	Please expand Section 3.2.6.1.3 to describe the potential effects of undesirable results on all beneficial uses and users of ISWs, including environmental uses and users. [SEE MORE SPECIFICS IN COMMENT LETTER]	Interconnected Surface Water	The ESJGWA considers the discussion in Section 3.2.6 (Depletions of Interconnected Surface Water) to be descriptive of beneficial uses and users in the subbasin, and to be protective of existing in-stream flow requirements for fish and wildlife.
59		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The likely benefits and impacts to DAC members by the proposed projects and management actions are not clearly identified in the GSP. A discussion should be added for each project or management action to clearly identify the benefits to DAC drinking water users and potential impacts to the water supply. For all potential impacts, the project/management action should include a clear plan to monitor for, prevent, and/or mitigate against such impacts. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	Comment noted. The ESJGWA has a twenty year planning timeframe to bring the projects online, and will continue to evaluate project benefits, impacts, and costs. DAC benefits and impacts will be addressed at the GSA level by the project proponents, as determined to be appropriate by the project proponents. SGMA looks at the basin-scale. Project impacts will be evaluated; it is the GSA's responsibility to meet project-level environmental regulations. CEQA compliance will be done at the GSA level.
60		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The GSP does not appear to include any plans to address impacts to domestic well users if domestic wells do go dry in the future. Based on the water level MTs, at least 10% of domestic wells would be expected to be dewatered if MT levels are reached. While the identified projects are intended to keep water levels above the MTs, no program is provided as a contingency in case 1) groundwater conditions decline before the projects are fully implemented, or 2) implementation of such projects does not have the desired effects. A plan to mitigate impacts to DAC drinking water users could include a program to replace wells, connect well users to a public water system, establishment of a tanked water program, etc. The GSP should also identify a mechanism to fund such a program. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Levels	The ESJGWA supports using the minimum thresholds, measurable objectives, and interim milestones for the chronic lowering of groundwater levels sustainability indicator as written. SGMA does not require zero impact, and the ESJGWA has determined that it is not considered significant and unreasonable for wells belonging to the shallowest 10 percent of domestic wells to be dewatered, as the wells that are likely to be dewatered are those that are 50 years or older, have reached the end of their usable life, and would need to be replaced anyway. Data collected on Stanislaus County rural domestic wells that were dewatered in years 2014-2016, showed that the average depth of wells reported as dewatered was 91 ft bgs, and that 60 percent were shallower than 100 ft bgs. Additionally, the average well age for wells reported as dewatered was 55 years, and 52 percent were older than 50 years old. There are various well impact mitigation programs in place, therefore there were no changes were made to the GSP.
61		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists	Table 6-1	From Table 6-1 it is not possible to distinguish the full range of project benefits or how the projects will be prioritized. It would be advantageous to demonstrate multiple benefits from a funding and prioritization perspective. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	Comment noted. The text in Chapter 6 (Projects and Management Actions) provides summaries of all potential SGMA projects, including expected project benefits.
62		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Potential impacts of projects and management actions on groundwater levels near surface water bodies should be evaluated as part of the GSP. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	Comment noted. The ESJGWA has a twenty year planning timeframe to bring the projects online, and will continue to evaluate project benefits, impacts, and costs. SGMA looks at the basin-scale. Project impacts will be evaluated; it is the GSA's responsibility to meet project-level environmental regulations. CEQA compliance will be done at the GSA level.
63		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The draft GSP sets the minimum thresholds (MTs) for groundwater levels at representative monitoring well sites as the shallower of either: (1) the shallower of 1992 or 2015-2016 historical groundwater levels with a buffer of 100 percent of historical range applied, or (2) the 10th percentile of total depth of domestic wells within a 3-mile radius of a representative monitoring well site. This approach to setting water level MTs and the selected representative monitoring network leaves key beneficial users in the subbasin, specifically domestic well users and in particular members of disadvantaged communities (DACs), potentially vulnerable to impacts. [SEE MORE SPECIFICS IN COMMENT LETTER, APPENDIX B: FOCUSED TECHNICAL REVIEW]	Groundwater Levels	The ESJGWA supports using the minimum thresholds, measurable objectives, and interim milestones for the chronic lowering of groundwater levels sustainability indicator as written. SGMA does not require zero impact, and the ESJGWA has determined that it is not considered significant and unreasonable for wells belonging to the shallowest 10 percent of domestic wells to be dewatered, as the wells that are likely to be dewatered are those that are 50 years or older, have reached the end of their usable life, and would need to be replaced anyway. Data collected on Stanislaus County rural domestic wells that were dewatered in years 2014-2016, showed that the average depth of wells reported as dewatered was 91 ft bgs, and that 60 percent were shallower than 100 ft bgs. Additionally, the average well age for wells reported as dewatered was 55 years, and 52 percent were older than 50 years old. There are various well impact mitigation programs in place, therefore there were no changes were made to the GSP.

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64		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The draft GSP includes limited analysis of water quality constituents and defines undesirable results (URs) for water quality relative to "impacts to the long-term viability of domestic, agricultural, municipal, environmental, or other beneficial uses over the planning and implementation horizon of this GSP" (Section 3.2.1.1). For the reasons identified below, the water quality monitoring network and analysis presented in the draft GSP does not clearly illustrate how the sustainable management criteria will be sufficient to ensure that the stated water quality UR of impacting the long-term viability of the groundwater resource, particularly for domestic water users including DACs, will be avoided. [SEE MORE SPECIFICS IN COMMENT LETTER, APPENDIX B: FOCUSED TECHNICAL REVIEW]	Groundwater Quality	See Master Response 3 -- Water Quality.
65		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The draft GSP estimates conditions using 2070 climate forecast. Based on this, the draft GSP estimates that "Under climate change conditions, the depletion in aquifer storage is expected to increase by about 68 percent to an average annual storage change of 57,000 AF/year, from 34,000 AF/year in the projected conditions scenario" (Section 2.3.7.4). However, the results of the climate change scenario modeling were not used as the basis for development of Project and Management Actions. Therefore, while climate change is evaluated in terms of future water budget conditions, the draft GSP does not actually include a substantive plan to address the increased deficit anticipated to result from climate change.	Water Budget	Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Due to the uncertainty around climate projections in the 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040. Therefore, climate change was not included in the sustainable yield analysis or the estimated amount of direct or in lieu recharge and/or reduction in pumping needed for the Subbasin to reach sustainability. Climate change will continue to be evaluated with every update to the GSP and estimates of projects and management actions will continue to evolve with refinements to the model. Comment noted for follow up in next round of model refinements and updates to analyses.
66		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The draft GSP notes that because there are no available data on local private groundwater pumping, "groundwater pumping to meet agricultural and rural residential needs is calculated by the model based on meeting remaining demands after appropriate surface water delivery is made to respective areas. Demand in areas with no access to surface water is completely met by groundwater pumping" (Section 2.3.4.2). However, based on our review of the draft GSP the model-calculated rural residential demands are not presented in the document. This water demand information should be transparently presented for the historical, current, and future water budgets so that the public can review the drinking water demand estimates for domestic users and community water systems, and make an assessment as to the appropriateness of the demands considered in the historical, current, or future water budgets.	Water Budget	Specifying urban demand at the level of rural residential demand goes above and beyond the requirements of SGMA. The current text, tables, and figures for the water budget meet the requirements of the GSP.
67		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The draft GSP notes that the future water budget demands for domestic areas outside of those covered by Urban Water Management Plans "are estimated based on rural population" and that "To estimate the urban water demand of rural domestic water areas, the average major urban area GPCD was combined with estimated rural population" (Section 3.2 of Appendix 2-1). However, the draft GSP does not present the population values associated with the rural population or a clear presentation of the results of this method. In order for the public to be able to evaluate the appropriateness of these assumptions, the applied values and resultant demands should be clearly identified in the document.	Water Budget	The model report was finalized in August 2018 and was included as an appendix in the GSP to provide an explanation of the development and calibration of the historical model. The model documentation will be updated as updates to the model are made in the future. Comment noted for follow up in next round of model refinements and updates to analyses.
68		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The proposed projects and management actions include twenty separate direct and in-lieu recharge projects. Recharge projects have the potential to mobilize contaminants, including by mobilizing surface and shallow soil contaminants through percolation, spreading existing contaminant plumes by altering the groundwater flow gradient, and mobilizing naturally occurring compounds through changes in geochemistry due to the introduction of a different water type, among other mechanisms. As recommended in the 2019 Stanford A Guide to Water Quality Requirements Under the Sustainable Groundwater Management Act, "In addition to complying with any regulatory requirements, GSAs undertaking recharge or other active management actions should consider developing a sufficient understanding of the interactions between subsurface geology, geochemistry and GSP projects in their basin. The development of sufficient monitoring networks, capable of detecting changes in groundwater quality conditions related to active management, will be critical to understanding these interactions."7 Therefore, the GSP should explicitly describe how such risks will be evaluated and monitored as a part of each identified project.	Projects and Management Actions	1) CEQA compliance will be conducted at the GSA level. Language was added to Section 2.2.4.4 (Point Sources) stating that new projects undertaken by GSAs as part of GSP implementation will evaluate contaminant plume movement in a CEQA document, and management through existing regulatory agencies was highlighted. 2) Recharge projects were preliminarily screened for the potential to contribute to the migration of a potential contaminant plume during the GSP project proposal process. Projects with the potential to contribute to the migration of a potential contaminant plume were eliminated from consideration and removed from the GSP list of projects. (See GSP Section 6.2.1 (Project Identification)).
69		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		Based on our assessment of the water levels, a significant proportion of domestic wells have the potential to be partially or fully dewatered if water levels reach the proposed MT levels. However, the draft GSP does not include or describe any plans to develop a well impact mitigation program. Such a program could include a combination of replacing impacted wells with new, deeper wells and/or connecting domestic users to a public water system. A plan to establish an emergency tanked water program, as was done in some areas of California during the last drought, may be an appropriate short-term solution, but would not be a good long-term solution for community members. Key considerations for establishing such a program should include: - A strong preference for connecting current domestic well users to a public water system, whenever possible. Public water systems have an obligation to test water quality for water served, and although the public water systems in this area typically have limited resources, they do have a greater ability to install treatment systems to address water quality impacts, recoup funds for litigated contamination such as 1,2,3-TCP, and apply for and receive grant funding for beneficial projects. Because of this, public water systems, including small community water systems, provide a more reliable drinking water source than privately-owned domestic wells. - A secure and reliable funding source and mechanism for implementation of such a mitigation program needs to be identified. While grant or emergency funding could potentially be available for such a program when needed, the availability of these funds is not certain. A more secure funding mechanism could be the establishment of a reserve fund that is paid into on an annual basis and accrues funds that would then be available as water levels drop in the future. - The implementation of a mitigation program should be triggered before wells begin to become unusable, so that funding will be available, and the necessary planning and contracting will be completed such that the necessary construction will be implemented without unnecessarily leaving community members without access to drinking water. Thus, the program should be designed to be proactive, rather than reactive. - A well mitigation program should not be established only in case of emergency. Droughts are said to be becoming more and more frequent and severe, and as such should be included as part of the long-term sustainability planning for the subbasin.	Groundwater Levels	The ESJGWA supports using the minimum thresholds, measurable objectives, and interim milestones for the chronic lowering of groundwater levels sustainability indicator as written. SGMA does not require zero impact, and the ESJGWA has determined that it is not considered significant and unreasonable for wells belonging to the shallowest 10 percent of domestic wells to be dewatered, as the wells that are likely to be dewatered are those that are 50 years or older, have reached the end of their usable life, and would need to be replaced anyway. Data collected on Stanislaus County rural domestic wells that were dewatered in years 2014-2016, showed that the average depth of wells reported as dewatered was 91 ft bgs, and that 60 percent were shallower than 100 ft bgs. Additionally, the average well age for wells reported as dewatered was 55 years, and 52 percent were older than 50 years old. There are various well impact mitigation programs in place, therefore there were no changes made to the GSP.
70		Collective Comments: TNC, Audubon California, CWA, CWF, American Rivers, Union of Concerned Scientists		The following figures are included in the joint comments document: Figure 1 - Representative Monitoring Network for GW Levels Relative to Domestic Wells, DACs, and Community Water Systems Figure 2 - Water Level MTs and Domestic Wells Figure 3 - Representative Monitoring Network for Water Quality Relative to Domestic Wells, DACs, and Community Water Systems [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	No specific comment to respond to.
71		Collective Comments: The League of Women Voters of SJ, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		Submitting public notices to the newspaper, notices of items on an isolated agenda, or a notice on a website fulfills a minimum outreach requirement for some governmental actions but not for SGMA. Groundwater sustainability plan regulations require that GSAs document in a communication section of the GSP the opportunities for public engagement and active involvement of diverse social, cultural, and economic elements of the population within the basin. These types of public notices do not encourage active involvement of diverse members of our Eastern San Joaquin Subbasin. These minimum public noticing techniques were used when the GSAs were formed and are documented on the SGMA Portal website: https://sgma.water.ca.gov/portal/gsa/all (search for GSA of interest). A single initial notification of GSP preparation was made on behalf of all the GSAs within the Eastern San Joaquin Subbasin and can be found her: https://sgma.water.ca.gov/portal/gsp/init/preview/82 . Since the initial notification dated March 16, 2018, development of the GSP has been ongoing, but consistent public outreach has not. A 2017 Department of Water Resources (DWR) grant for Facilitation and Support Services included a stakeholder identification and engagement component, but stakeholder engagement efforts trailed facilitation activities under that agreement by about six months. A situation assessment produced by consultants in December 2018, after the end of the contract period, summarized feedback from one group of stakeholders. That assessment references a separate document with recommendations for adjustment to the stakeholder process, but the separate document is not available online.	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.

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72		Collective Comments: The League of Women Voters of SJC, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		Public outreach has not been well-coordinated or effective because of the nature of GSAs formed in this Subbasin, because of assumptions underlying SGMA outreach guidelines, and because technical issues and funding challenges have not been widely discussed nor presented in language that will engage those impacted. Agencies in the Eastern San Joaquin Subbasin formed GSAs primarily to protect their autonomy, not necessarily because they were considering the effect of the GSP on the users they serve or residents within the GSA Boundaries. Some GSAs have names that would not be recognized even by water users that they serve. Examples include the Eastside GSA (Calaveras County Water District, Rock Creek Water District, and Stanislaus County), and South San Joaquin GSA (South San Joaquin Irrigation District). Nevertheless, SGMA assigns GSAs outreach responsibilities. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.
73		Collective Comments: The League of Women Voters of SJC, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		Outreach summaries produced and distributed by the GSP consultant team do not provide useful information because they allow for reporting on only certain kinds of outreach, and because even GSAs that perform outreach are not always reporting it. According to the ESJGA GSA Outreach Activities summary (Appendix A), some GSAs have reported no outreach activities at all. This may indicate that no outreach activity occurred or that GSA staff is unwilling or unable to report GSA outreach activities, or that the summary provides data only on electronic outreach. A major theme raised by a member of the ESJ Groundwater Advisory Committee at its June 12, 2019 meeting is that there must be balance between autonomy and accountability. This documentation of SGMA-required outreach activities to encourage active involvement suggests that perhaps too much autonomy has been applied without clearly needed accountability. Also, not all agencies that want autonomy have the capacity or resources to do the required outreach for which they may be held accountable. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.
74		Collective Comments: The League of Women Voters of SJC, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		Focusing outreach requirements on individual GSAs has created a situation in which it appears that no outreach has been done to an important and impacted category of users: people on domestic wells. ...Those individuals, who are likely very vulnerable to impacts of the GSP, are not being directly noticed. Of most concern are the residents with wells less than 200 feet below ground surface... With the exception of San Joaquin County GSA No.1, GSAs in this Subbasin are either public agencies or a private agency (San Joaquin County GSA No.2 – Calwater) created to provide surface and/or groundwater. These GSAs therefore have some kind of constituency or customer base. People on domestic wells are not part of that base, and responsibility for SGMA outreach to them has not been addressed. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.
75		Collective Comments: The League of Women Voters of SJC, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		Recommendations - GSAs in the Eastern San Joaquin Subbasin should increase outreach by print with informational inserts in utility bills, property tax bills, and any other regular correspondence that is sent to households. Notices of the plan commenting period should be posted at each GSA headquarters, along with information about where to find GSA specific information. - Principal and sub-contract consultants who are developing the GSP can develop posters that can be widely distributed, and can provide flyers to the Agricultural Commissioner’s Office, Environmental Health Department, and Community Development Department within Calaveras, San Joaquin, and Stanislaus Counties. - The Eastern San Joaquin Groundwater Authority (ESJGA) website, esjgroundwater.org, should provide GSA website addresses where stakeholders can find GSA and ESJGA level information, GSA contact email addresses, telephone numbers, and GSA staff contact names. Currently only mailing addresses are available for contacting GSAs. A number of non-governmental organizations (NGOs) representatives including the Sierra Club, League of Woman Voters, and Catholic Charities requested back in November 2018 that this information be updated, but that has not been done. - The ESJGA website should provide information about how people can determine the GSA jurisdiction within which they live. - Email inquiries to “Contact Us” on the ESJGA website currently go through a San Joaquin County government subcontractor, who redirects them. Responses to email inquiries, tabulating, and documenting of contacts and responses, should be included on regular outreach summaries. - GSAs a fee to provide funding for an outreach coordinator to perform tasks that GSAs do not have the staff or expertise to perform. - As recommended by the Facilitation and Support Services consultants, a stakeholder or advisory board should be convened when the GSP is submitted, to review and inform implementation.	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.
76		Collective Comments: The League of Women Voters of SJC, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		Each GSA should provide a written explanation of why the outreach they have done so far is adequate to meet the intent of SGMA outreach, and if it has not been adequate, what strategies each GSA proposes for doing adequate outreach during implementation of the plan. This information should be included in the GSP.	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.
77		Collective Comments: The League of Women Voters of SJC, EJCW, Sierra Club Delta-Sierra Group, Puentes, Restore the Delta		A preliminary list of GSP implementation elements includes a task called “Public Outreach and Website Maintenance.” Providing for public outreach and website maintenance only at the level of the Eastern San Joaquin Groundwater Authority website will not be adequate to cover the outreach obligations of all the GSAs.	Outreach	Outreach efforts conducted as part of GSP development are described in Chapter 1.3 (Notice and Communication). Outreach efforts done by the ESJGWA have gone above and beyond the requirements of SGMA. However, the ESJGWA recognizes there is always room for improvement. The ESJGWA has appointed an Ad Hoc Committee for the purposes of refining implementation and funding next steps. The Ad Hoc Committee has met weekly to bi-weekly since July 2019. Recommendations on outreach efforts moving forward are being identified by the Ad Hoc Committee for ESJGWA action. The Ad Hoc Committee has reviewed the suggestions put forth in this letter and have identified these future actions for consideration moving forward.
78	John Fio jfio@ekiconsult.com 650-292-9110	EKI on behalf of Cosumnes Subbasin GSA Working Group	1.2.3.3 Land Use Plans Outside the Plan Area	The section heading indicates it will discuss land use plans outside the ESJ Subbasin, but no specific land use planning information is provided for the adjacent Cosumnes Subbasin aside from referencing the existence of the City of Galt General Plan (2009).	Plan Area	As the surrounding groundwater subbasins are not designated as critically overdrafted, their GSPs are on a slower timeline. ESJ Subbasin will continue to coordinate with Cosumnes Subbasin and other neighboring subbasins on land use planning in the two subbasins as their GSP work progresses. Text added to 1.2.3.3 discussing continued coordination with neighboring subbasins: Ongoing coordination with neighboring groundwater subbasins will include updates on major land use planning that may impact the groundwater system.
79	Linda Dorn dornl@saccounty.net 916-874-1085	Sacramento County Groundwater Sustainability Agency (GSA) - Cosumnes Subbasin	1.2.3.4 Well Permitting	As an adjacent basin please add Sacramento County well permitting. For well standards visit: http://www.emd.saccounty.net/EC/Pages/Wells.aspx	Well Permitting	A new subsection has been added to the GSP under section 1.2.3.4 (Well Permitting) to add Sacramento well permitting information in response to this comment.
80	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	1.3.5 Inter-basin Coordination	Only provides date of inter-basin meeting. No explanation of topics discussed or outcome from effort.	Clarifying Edit	Comment noted. As the surrounding subbasins are on a slower timeline than the Subbasin, inter-basin coordination is just beginning and the description in the text is indicative of discussions so far.
81	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	2.1.9 Principal Aquifer	The northern boundary of the ESJ Subbasin is shared with the Cosumnes Subbasin, however, there seems to be very little information described in writing about subsurface conditions and groundwater flow conditions at that boundary. This appears to be a deficit in the HCM.	Basin Setting	The ESJGWA determined that the HCM meets the requirements of the Water Code. Subsurface conditions are discussed for the entire Subbasin. Groundwater flow is discussed broadly in Section 2.1.9.2.2 (Regional Historical Groundwater Flow and Surface Water Interaction) with more discussion and figures in Section 2.2.1.2 (Current Groundwater Elevations).

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
82	Linda Dorn	Sacramento County Groundwater Sustainability Agency (GSA) - Cosumnes Subbasin	2.1.10 HCM Data Gaps	Sacramento County GSA is adjacent to the northwest data gap area and we encourage coordination with Sacramento County GSA for filling this data gap.	Current Groundwater Conditions	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
83	Linda Dorn	Sacramento County Groundwater Sustainability Agency (GSA) - Cosumnes Subbasin	2.2.1.1 Historical Groundwater Elevations	Amador County Groundwater Sustainability Authority may have information to help fill this data gap in the northeast corner of the subbasin. https://amadorwater.org/tag/amador-county-groundwater-management-authority/	Basin Setting	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
84	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	Figure 2-38	It would be helpful for neighboring basins if the groundwater elevation map displayed data points and posted values, especially at the basin boundaries where the contours help assess cross boundary flows.	Mechanics - Graphics	The ESJGWA will continue to coordinate with neighboring subbasins as they develop their plans and establish sustainable management criteria, such that no subbasin is preventing another from achieving sustainability.
85	Linda Dorn	Sacramento County Groundwater Sustainability Agency (GSA) - Cosumnes Subbasin	2.3.1 Water Budget Background Information	Since the Eastern San Joaquin subbasins water budget relies on adjacent subbasins inflow, the water budget inflow information for the Cosumnes subbasin maybe different than what has been calculated. A sentence should be added that reflects how the water budget will handle discrepancies between adjacent subbasins water budgets .	Water Budget	As the Cosumnes Subbasin is not designated as a critically overdrafted, groundwater basin, their GSP is on a slower timeline so analysis was not available for direct comparison during initial inter-basin coordination discussions. ESJ Subbasin will continue to coordinate with Cosumnes Subbasin on boundary flows across Dry Creek as well as sustainable management criteria developed in the two subbasins as their GSP work progresses.
86	Linda Dorn	Sacramento County Groundwater Sustainability Agency (GSA) - Cosumnes Subbasin	2.3.4.1 Assumptions Used in the Historical Water Budget	Sacramento County flood gauge information may provide data on flows in Dry Creek that would be more accurate than extracting Dry Creek flow from CalSIMII. Please see the website below for more information on flow for Dry Creek. https://www.sacfflood.org/level.php?view=253d63a6-69ea-4c28-bd90-539059aa5fd8&view_group=99a123be-5de5-3678-7140-d7bb445af1b3&group=7c53d59d-d00d-707c-d514-fc1327f3c4e9 Also Amador County produced a 2006 Dry Creek Watershed Management Plan (attached) that is attached to the e-mail submitting these comments. Amador County has additional information on Cosumnes River flows too.	Basin Setting	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
87	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	Table 2-15	Historical conditions indicate that, on average, net groundwater flow is from the Cosumnes Subbasin into the ESJ Subbasin at a rate of 14,000 acre-feet per year (AF/year). However, inflows from the Cosumnes Subbasin to the ESJ Subbasin increase to 23,000 AF/yr under current conditions (more than 60%) and will be 19,000 AF/yr under projected conditions (more than 30%). These changes in cross-boundary flows are potentially significant, and groundwater level monitoring and protective SMCs are needed near the subbasin boundary to ensure that: (1) undesirable results do not occur across the shared subbasin boundary , and (2) these projected increased levels of inflow to the ESJ subbasin from the Cosumnes Subbasin do not impact the ability of the Cosumnes Subbasin to achieve sustainability.	Water Budget	As the Cosumnes Subbasin is not designated as a critically overdrafted, groundwater basin, their GSP is on a slower timeline so analysis was not available for direct comparison during initial inter-basin coordination discussions. ESJ Subbasin will continue to coordinate with Cosumnes Subbasin on boundary flows across Dry Creek as well as sustainable management criteria developed in the two subbasins as their GSP work progresses.
88	Linda Dorn	Sacramento County Groundwater Sustainability Agency (GSA) - Cosumnes Subbasin	2.3.6 Sustainable Yield Estimate	Assuming groundwater pumping under sustainable conditions will not create changes in groundwater inflow from neighboring basins should include a caveat referencing future GSPs of the neighboring basins will help determine if pumping under sustainable conditions will affect inflows at the basin boundaries.	Water Budget	As the neighboring subbasins are not designated as critically overdrafted groundwater basins, their GSPs are on a later timeline so analyses were not available for direct comparison during initial inter-basin coordination discussions. ESJ Subbasin will continue to coordinate with neighboring subbasins on boundary flows as well as sustainable management criteria as GSP work progresses. The ESJGWA will continue to coordinate with neighboring subbasins as they develop their plans and establish sustainable management criteria, such that no subbasin is preventing another from achieving sustainability.
89	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	2.3.6 Sustainable Yield Estimate	The projected water budget shows greater outflows than inflows, resulting in an average annual deficit in groundwater storage of 34,000 AF/year in the ESJ Subbasin. To achieve sustainability, approximately 78,000 AF/year of direct or in lieu groundwater recharge and/or reduction in agricultural and urban groundwater pumping is reportedly needed in the ESJ Subbasin. However, there is no explanation or discussion for how and where these reductions will be achieved. Moreover, the lack of certainty in implementing projects and/or management actions to achieve sustainability create uncertainty in their potential effects on the Cosumnes Subbasin.	Water Budget	See Master Response 5 - Projects.
90	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	2.3.7.4 Eastern San Joaquin Water Budget Under Climate Change	Tabulated water budget results like those in Table 2-15 need to be included for the climate change scenario results.	Climate Change	The current text, tables, and figures for climate change meet the requirements of the GSP. Future updates to the GSP may include more detailed analysis of climate change scenario results.
91	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	3.2.1.2 Minimum Thresholds	The Minimum Thresholds(MT) for groundwater levels protect against Undesirable Results in the ESJ Subbasin and were specified for 19 wells based on minimum water levels measured in 1992 or 2015-2016, whichever are lowest, plus an operational buffer. These groundwater level MTs are utilized as proxy for groundwater storage, subsidence, and interconnected surface water sustainability indicators for the ESJ Subbasin. The MTs for the ESJ Subbasin should also ensure that they are not creating changes in groundwater inflow that could impede sustainability plans and implementation in the Cosumnes Subbasin. This includes groundwater level monitoring near the subbasin boundary and projected changes under historical, current, projected, and climate change.	Monitoring Network	As the Cosumnes Subbasin is not designated as a critically overdrafted, groundwater basin, their GSP is on a slower timeline so analysis was not available for direct comparison during initial inter-basin coordination discussions. As described in Section 4.7 (Data Gaps) and shown in Figure 4-3, additional groundwater monitoring wells are planned for more groundwater monitoring along the boundary with Cosumnes Subbasin to support future GSP updates. ESJ Subbasin will continue to coordinate with Cosumnes Subbasin on boundary flows across Dry Creek as well as sustainable management criteria developed in the two subbasins as their GSP work progresses.
92	John Fio	EKI on behalf of Cosumnes Subbasin GSA Working Group	3.2.6 Depletion of Interconnected Surface Water	"Depletion of Interconnected Surface Water" states that depletions are considered an Undesirable Result (UR) if the depletions significantly and unreasonably reduce surface water flow or levels and adversely impact beneficial uses of the surface water within the ESJ Subbasin. However, the contribution of these reductions to the cumulative depletion in downstream flows and potential impacts to Cosumnes Subbasin recharge should also be considered, given the important nature of this boundary condition.	Interconnected Surface Water	See Master Response 2 - ISW.
93	Rodney Frickerfricke@geiconsultants.com 916-341-9138	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.2.1.1	Sacramento Solano Subbasin (Bulletin 118 Basin Number 5-021.66)	Mechanics - Text	Comment addressed in text.
94	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		..., while eastern western portions of San Joaquin County and City of Stockton, and western portions of Calaveras and much of Stanislaus County ies, lie in neighboring subbasins.	Mechanics - Text	Edited text in Section 1.2.1.1: The cities of Lodi, Escalon, Manteca, and Ripon are contained entirely within the Subbasin, while western portions of San Joaquin County and the City of Stockton, and eastern portions of Calaveras and Stanislaus counties, lie in neighboring subbasins or outside of groundwater subbasins altogether.
95	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Well Density	Statement is out of context. Paragraph is talking about density of supply wells and the DWR criteria is not applicable to locations chosen by well owners. Monitoring wells are subject to the DWR criteria, which is a different topic.	Mechanics - Text	Edited text in Section 1.2.1.1 to remove sentence related to monitoring well density.
96	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 1-12 to -14	The download of data for these maps should have included data tables, including number of wells per section, depths, and other information. How were these data addressed in the GSP?	Mechanics - Graphics	Comment noted. This information is beyond the scope of the GSP. Data used in the figures can be obtained through DWR's Well Completion Report Map Application.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
97	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.2.2 Water Resources Monitoring and Management Programs	Online System for Well Completion Reports (OSWCR) seems to be oriented to licensed well drillers but has a link to: Well Completion Report Map Application which provides links to PDFs. In addition, the SGMA Data Viewer application provides links to PDFs of well completion reports.	Clarifying Edit	Comment noted. OSWCR is DWR's database of well completion reports. DWR's SGMA data viewer uses records from OSWCR to display wells with downloadable completion report PDFs.
98	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.2.2.4 Land Subsidence Monitoring	The paragraph should acknowledge that DWR (2014) listed the Eastern San Joaquin Subbasin as having a medium to high potential for subsidence due to long-term declining groundwater levels. (Summary of Recent, Historical, and Estimated Potential for Future Land Subsidence in California)	Subsidence	Comment noted. Continued lowering of groundwater levels may cause subsidence, though there are no historical records of impacts in the Subbasin.
99	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.2.2.4 Land Subsidence Monitoring	The paragraph starts with a USGS heading, which only applies to the subsequent paragraph. The paragraph refers to Plate Boundary Observatory (PBO) GPS stations, which are operated by UNAVCO, and refers to station (P781), which was removed from the program in 2014. The text does not acknowledge other PBO stations in the vicinity of the subbasin, including P256 – Brentwood, P257 – Tracy, P273 – Lodi, P274 – Elk Grove, P275 – Galt, and P309 – Linden. The USGS study area may have utilized the PBO stations but the study addressed much of the San Joaquin Valley further south.	Subsidence	1) The ESJGWA supports the use of existing monitoring stations and InSAR data currently referenced in the GSP for the evaluation of subsidence, and believe the conditions of the subbasin do warrant the creation of new subsidence stations at this time. The GSP has been updated to reference the UNAVCO continuous GPS stations in Section 1.2.2.4 (Land Subsidence Monitoring): Reporting since 2004, the UNAVCO (formerly University Navigation Satellite Timing and Ranging or NAVSTAR Consortium) Plate Boundary Observatory network consists of a network of about 1,100 continuous global positioning system (CGPS) and meteorology stations in the western United States to measure deformation resulting from the constant motion of the Pacific and North American tectonic plates in the western United States. Stations located within the Subbasin contain data from at least 2006 to current and include station P309 located east of Linden and station P273 located west of Lodi. Other stations are also available in nearby Subbasins. Subsidence analyses have also been conducted using satellite-based methods over limited time periods, as described below. 2) The paragraph under the USGS heading referring to the nonoperational station P781 was deleted with the expansion of the description of the UNAVCO data.
100	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.2.2.4 Land Subsidence Monitoring	The NASA JPL processed dataset spans from May Spring of 2015 to April Summer of 2017 (CA, DWR, 2019).	Subsidence	Comment noted. Multiple sources refer to the NASA JPL dataset spanning Spring 2015 to Summer 2017.
101	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.3.1 Beneficial Uses and Users in the Basin	Text says "... approximately 1,000 unique domestic, public, and production wells in the Subbasin." but Figure 2-4 shows 6,800 GAMA sites and DWR (2014) says 19,176 wells total.	Clarifying Edit	The total number of production wells in the Subbasin is not known. Edited Section 1.3.1 (Beneficial Uses and Users in the Basin) to delete sentence mentioning 1,000 wells.
102	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	1.3.5 Inter-basin Coordination	To date, there has been at least one meeting between representatives of the GWA and the neighboring basins of Cosumnes, Modesto, Subbasin and Tracy Subbasins to initiate this process.	Clarifying Edit	Edited text in Section 1.3.5 (Inter-basin Coordination): To date, there have been initial meetings between representatives of the ESJGWA and the neighboring subbasins to initiate this process.
103	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.2 Regional Geologic and Structural Setting	The Sierra Nevada Mountain Range, east of the Central Valley, is comprised of pre-Tertiary igneous and metamorphic continental rocks.	Clarifying Edit	Edited text in Section 2.1.2 (Regional Geologic and Structural Setting): The Sierra Nevada Mountain Range, east of the Central Valley, consists of pre-Tertiary igneous and metamorphic continental rocks.
104	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.3 Geologic History	Middle to late Tertiary would be more like 23 to 60 or 65 million years	Clarifying Edit	Text is correct. The middle to late tertiary period is closer in time to now than the earlier portion of the tertiary period, so the ~3-30 million years ago in the text is correct.
105	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.4.2 Major Hydraulic Features	Acre-feet per day and cubic feet per second are flow rates, not volumes	Clarifying Edit	Edited text in Section 2.1.4.2 (Major Hydraulic Features) on Page 2-12 from "volumes" to "flows".
106	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.5 Geologic Formation and Stratigraphy	Generally, eastside formation material originates as from continental deposits from the Sierra Nevada and westside formation material originates as from the continental deposits from the Coastal Ranges (marine).	Clarifying Edit	Edited text in Section 2.1.5 (Geologic Formations and Stratigraphy).
107	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-16 Geologic Map	The Tulare Formation is listed in the legend but is not present on the map. The Sacramento Regional Geology Map (RGM) does not include the Tulare Formation in its Explanation and the dark orange shading on the San Francisco-San Jose RGM is labeled Tvs for the Valley Springs Formation. The Tulare Formation originates from the Coast Range and would not crop out within the ESJ Subbasin.	Mechanics - Graphics	The Tulare Formation was taken out of the legend. This is confirmed by both of the RGMs the commenter cited.
108	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-2 Generalized Stratigraphic Column	See comment above. The explanation summary for the San Francisco-San Jose RGM shows that the Tulare Formation is older than the Turlock Lake Formation. The Geologic Map Explanation indicates the upper Tulare Formation and lower Turlock Lake Formation could be interbedded at depth within the center of the Central Valley.	Clarifying Edit	According to the San Francisco-San Jose RGM, the Tulare Fm is generally older than the Turlock Lake Fm and likely interbedded in the San Joaquin Valley, as the commenter noted. The Rock Characteristics and Environment column describes the continental basinal equivalent formations from recent to Plio-Pleistocene. These descriptions can be revised and clarified in future iterations of the GSP.
109	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.5.1.2 Lone Formation	The Lone Formation is an important source of both sand and clay but these products are separate. "Kaolinite sand" is not possibly since kaolinite is a clay mineral and not durable enough to be sand.	Clarifying Edit	Deleted sentence in Section 2.1.5.1.2 (Lone Formation) referring to lone sand.
110	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.5.1.5 Laguna Formation	Which studies suggest that the Pliocene-Pleistocene Tulare Formation (younger) could be part of the middle Pliocene Laguna Formation (older) or occur between the Laguna Formation and the Miocene-early Pliocene Mehrten Formation (older still)?	Clarifying Edit	Removed in response to comment.
111	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.5.1.6 Turlock Lake Formation	According to the USGS (Faunt, 2009), "... the western San Joaquin Valley generally is finer-grained and is underlain by the Corcoran Clay Member of the Tulare Formation (hereafter referred to as the Corcoran Clay)." and "This confining unit is a stratigraphic unit, the Corcoran Clay Member of the Tulare Formation (referred to in this report as the Corcoran Clay." Bold added for emphasis. A search of the report (Faunt, 2009) did not find any reference to the Turlock Lake Formation.	Clarifying Edit	Faunt 2009 is not cited in Chapter 2 in reference to the Turlock Lake Formation.
112	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-18: Base of Fresh Groundwater Elevation Contours and Stockton Fault	Only a single sentence for the figure. Additional text should be added to explain the significance of the information.	Basin Setting	Added text to reference other sections for discussion of base of fresh water: This feature also influences the location, depth, and thickness of the "base of the fresh water", as shown below in Figure 2 18. The base of fresh water is discussed further in Sections 2.1.7 and 2.1.8.2.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
113	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-20: Hydrogeologic Cross-sections A-A' and B-B'	- Cross sections are too small, even printed on 11 x 17" paper, as the well labels are not legible. Scale of 0.36 to 0.45 inch per 1000 feet is not reasonable. The Stockton Fault is not depicted or located on Sections D-D' and E-E'. - Page 2-38, first paragraph refers to "well screen interval (shown in red)." but the interval is not shown and likely could not be seen due to the small size of the cross section. Cross sections don't show the three zones within the principal aquifer, except by association with the formations. Model Section D-D' is equivalent to GSP Section C-C' and D-D' shows the Corcoran Clay. - The Corcoran Clay is shown on southern end (7 miles) of Section E-E' but not at the southern end of Section D-D'. According to DWR (1981/2008), the top of the Corcoran Clay cannot be delineated to the east of Highway 99 at Manteca, but Section E-E' is located further east of Highway 99 and would not encounter the clay until several miles further south of the subbasin boundary. Moreover, the depth to the top might be 200 feet on the west side of Manteca, south of Highway 120, which is within the southernmost alignment of Section D-D'. - The presence of the Corcoran Clay appears to be more related to the DWR model of the Central Valley than to well logs.	Basin Setting	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin, and the number of cross-sections already exceeds SGMA requirements. Additionally, the well logs for wells shown in the cross-sections are public for detailed review. The representation of Corcoran Clay cross-sections is based on previous work from DWR and is consistent with the latest released version of C2VSim. The image resolution was increased to help with zooming in on small areas.
114	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-21: Hydrogeologic Cross-sections C-C' and D-D'	- Cross sections are too small, even printed on 11 x 17" paper, as the well labels are not legible. Scale of 0.36 to 0.45 inch per 1000 feet is not reasonable. The Stockton Fault is not depicted or located on Sections D-D' and E-E'. - Page 2-38, first paragraph refers to "well screen interval (shown in red)." but the interval is not shown and likely could not be seen due to the small size of the cross section. Cross sections don't show the three zones within the principal aquifer, except by association with the formations. Model Section D-D' is equivalent to GSP Section C-C' and D-D' shows the Corcoran Clay. - The Corcoran Clay is shown on southern end (7 miles) of Section E-E' but not at the southern end of Section D-D'. According to DWR (1981/2008), the top of the Corcoran Clay cannot be delineated to the east of Highway 99 at Manteca, but Section E-E' is located further east of Highway 99 and would not encounter the clay until several miles further south of the subbasin boundary. Moreover, the depth to the top might be 200 feet on the west side of Manteca, south of Highway 120, which is within the southernmost alignment of Section D-D'. - The presence of the Corcoran Clay appears to be more related to the DWR model of the Central Valley than to well logs.	Basin Setting	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin, and the number of cross-sections already exceeds SGMA requirements. Additionally, the well logs for wells shown in the cross-sections are public for detailed review. The representation of Corcoran Clay cross-sections is based on previous work from DWR and is consistent with the latest released version of C2VSim. The image resolution was increased to help with zooming in on small areas.
115	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-22: Hydrogeologic Cross-section E-E'	- Cross sections are too small, even printed on 11 x 17" paper, as the well labels are not legible. Scale of 0.36 to 0.45 inch per 1000 feet is not reasonable. The Stockton Fault is not depicted or located on Sections D-D' and E-E'. - Page 2-38, first paragraph refers to "well screen interval (shown in red)." but the interval is not shown and likely could not be seen due to the small size of the cross section. Cross sections don't show the three zones within the principal aquifer, except by association with the formations. Model Section D-D' is equivalent to GSP Section C-C' and D-D' shows the Corcoran Clay. - The Corcoran Clay is shown on southern end (7 miles) of Section E-E' but not at the southern end of Section D-D'. According to DWR (1981/2008), the top of the Corcoran Clay cannot be delineated to the east of Highway 99 at Manteca, but Section E-E' is located further east of Highway 99 and would not encounter the clay until several miles further south of the subbasin boundary. Moreover, the depth to the top might be 200 feet on the west side of Manteca, south of Highway 120, which is within the southernmost alignment of Section D-D'. - The presence of the Corcoran Clay appears to be more related to the DWR model of the Central Valley than to well logs.	Basin Setting	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin, and the number of cross-sections already exceeds SGMA requirements. Additionally, the well logs for wells shown in the cross-sections are public for detailed review. The representation of Corcoran Clay cross-sections is based on previous work from DWR and is consistent with the latest released version of C2VSim. The image resolution was increased to help with zooming in on small areas.
116	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-20: Hydrogeologic Cross-section B-B'	The eastern side of the sections show 1,500 feet and nearly 2,100 feet, respectively, of sedimentary formations without presenting an explanation. Section A-A' shows these formations thinning eastward on top of bedrock. Sections B-B' and C-C' suggest a substantial aquifer further east and the model sections show similar conditions. This thick eastern boundary is not discussed in the text and will produce a high-end bias for the estimate of groundwater storage which could lead to the false sense of sustainability.	Basin Setting	The current model thickness is consistent with the DWR's C2VSim model and is an area for enhancement in model refinements. New monitoring wells shown in Figure 4-3 will help refine the model thickness through new information about the aquifer on the eastern side of the Subbasin. Comment noted for follow up in next round of model refinements and updates.
117	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-21: Hydrogeologic Cross-section C-C'	The eastern side of the sections show 1,500 feet and nearly 2,100 feet, respectively, of sedimentary formations without presenting an explanation. Section A-A' shows these formations thinning eastward on top of bedrock. Sections B-B' and C-C' suggest a substantial aquifer further east and the model sections show similar conditions. This thick eastern boundary is not discussed in the text and will produce a high-end bias for the estimate of groundwater storage which could lead to the false sense of sustainability.	Basin Setting	The current model thickness is consistent with the DWR's C2VSim model and is an area for enhancement in model refinements. New monitoring wells shown in Figure 4-3 will help refine the model thickness through new information about the aquifer on the eastern side of the Subbasin. Comment noted for follow up in next round of model refinements and updates.
118	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.1 Zones within Principal Aquifer	What about the stratigraphy of the Shallow and Intermediate Zones? Why are is the stratigraphy of the deeper than Deep Zone referenced when few wells are deeper than 500 feet?	Basin Setting	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin.
119	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.1.1 Shallow Zone	For the 11 x 17" print, that's 0.01 to 0.12 inches, and 0.01 inches at 0.06 to 0.07 inches below the land surface, and is not shown on the sections. What about a bullet for hydraulic conductivity values for each zone to match the other aquifer parameters?	Clarifying Edit	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin. The image resolution of the cross-sections was increased to help with zooming in on small areas.
120	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.1.3 Deep Zone	For the 11 x 17" print, that's 0.01 to 0.12 inches, and 0.01 inches at 0.06 to 0.07 inches below the land surface, and is not shown on the sections. What about a bullet for hydraulic conductivity values for each zone to match the other aquifer parameters?	Clarifying Edit	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin. The image resolution of the cross-sections was increased to help with zooming in on small areas.
121	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.1.4 Limited Aquitards	See comments above. Text on page 2-29 says Corcoran Clay is associated with the Laguna Formation and/or occurs between the Laguna and Mehrten Formations. As shown on Section E-E', the top of Corcoran Clay is ~140 feet and the thickness is ~70 feet at the basin boundary.	Clarifying Edit	Comment noted. Discussion in Section 2.1.9.1.4 is discussing the northern portion of the Corcoran Clay in general (not specific to the Subbasin), while Cross-Section E-E' only shows one small area of the Subbasin.
122	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.1.4 Limited Aquitards	For the 11 x 17" print, that's 0.004 to 0.06 inches	Clarifying Edit	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin. The image resolution of the cross-sections was increased to help with zooming in on small areas.
123	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.2 Aquifer Characteristics and Groundwater Quality	Camanche Reservoir is located at the northeastern corner of the subbasin and Oakdale is located at the southeastern corner, ~30 miles apart.	Clarifying Edit	Edited text in Section 2.1.9.2 (Aquifer Characteristics and Groundwater Quality): The thickest sand and gravel sequences ranged from 500 to 700 feet near the Stanislaus River, south of Woodward Reservoir and northeast of Oakdale.
124	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.2.1 Aquifer Parameters and Production Zone Well Capacities	Production Zone is new subdivision to the Principal Aquifer. How does it relate to the Shallow, Intermediate and Deep Zones?	Clarifying Edit	The production zone is not a new subdivision of the principal aquifer. As described in Section 2.1.9 (Principal Aquifer): The Eastern San Joaquin Subbasin HCM has one principal aquifer that provides water for domestic, irrigation, and municipal water supply and that is composed of three water production zones. These three water production zones are the Shallow, Intermediate, and Deep Zones.
125	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		Page 2-42 said "Storage coefficients up to 17 percent" for the shallow zone, which should have referred to the specific yield.	Clarifying Edit	Edited text in Section 2.1.9.1.1 (Shallow Zone) to change storage coefficients to specific yield.
126	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-4 Wells within Water-Bearing Zones	Why was Intermediate and Deep Zones combined?	Clarifying Edit	Intermediate and deep zones were combined in Table 2-4 due to trends in the data. Consider for further definition in future updates to the GSP.
127	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.9.2.3.1 Geologic Formation Water Quality	The oxidation of pyrite and other sulfide minerals would produce sulfuric acid which would manifest as a lower pH.	Clarifying Edit	Comment noted.

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128	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		What type of conditions since redox is an abbreviation for reduced versus oxidized conditions - oxygen absent versus oxygen present?	Clarifying Edit	Comment noted. Source (Izbicki et al., 2008) indicates arsenic release in the absence of oxygen.
129	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		The focus of this paragraph is odd. The atmosphere is comprised of 78% nitrogen and the soils and underlying rock in the upland watersheds appears to absorb and store nitrogen. The real important issue is the occurrence of nitrate in the subbasin. How much nitrate occurs in the Mokelumne River (and other rivers) as that surface water enters the subbasin? Why is nitrate omitted from the list of anions in the next paragraph? Why wasn't a box-and-whisker diagram prepared for nitrate to show its variations between 2005 and 2017?	Basin Setting	Comment noted. Additional data on nitrate in the Subbasin is included in Section 2.2.4.2 (Nitrate). Nitrate was left off the list of water quality parameters in Section 2.1.9.2.3.1 (Geologic Formation Water Quality) as it is covered by separate monitoring and regulation programs.
130	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.1.10 HCM Data Gaps	Water quality of three zones in principal aquifers	Clarifying Edit	Edited text in Section 2.1.10 (HCM Data Gaps): Water quality of three zones in principal aquifer.
131	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Groundwater Level Data	Additional groundwater level data near major creeks and rivers such as the Mokelumne River to improve quantification and understanding of subsurface flows between subbasins and for surface water-groundwater interactions	Clarifying Edit	Edited text in Section 2.1.10 (HCM Data Gaps): Additional groundwater level data near major creeks and rivers to improve quantification and understanding of subsurface flows between groundwater subbasins and surface water-groundwater interaction.
132	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Subsurface Conditions	Why east side of basin, which is bedrock in the foothills of the Sierra Nevada mountains? More attention is needed along the boundary with the Cosumnes and South American Subbasins to the north.	Clarifying Edit	Comment noted. The eastern area, though largely bedrock, lacks monitoring wells, as discussed in Chapter 4 (Monitoring Network), and data.
133	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-34: Hydrographs of Selected Wells	SGMA requires the same datum and scaling for hydrographs (to the extent possible). The 10 hydrographs use different horizontal and vertical scales. The horizontal scales varied from starting years between 1950 and 1973 and the ending years between 2014 and 2017 which produced a span of 43 to 67 years. The span of the vertical scales varied between 18 and 180 years. What are the depths of these 10 wells? What zones do these wells represent? Why weren't wells 04N08E06C002 and 04N05E10K001 identified as representative monitoring wells, given their proximal location to the northern boundary of the subbasin?	Mechanics - Graphics	Comment noted for consideration in updates to the GSP. It is beyond the scope of the GSP to include this information.
134	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-35: Groundwater Elevations 1940-2018, (a) Box-and Whisker Plot with Precipitation	Difficult plot due to overlapping lines. Change to scale of the second vertical axis to shift the precipitation line above the box-and-whiskers. Average annual precipitation line is not provided, as stated in third note. What about showing the water year type?	Mechanics - Graphics	Comment noted. Scales on the plot were updated. Water year types and annual total precipitation can be found in Figure 2-71.
135	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.2.1.2 Current Groundwater Elevations	Why are 2016 data omitted from current conditions? Historical data are 1996 to 2015. Current data are only 2017?	Clarifying Edit	Groundwater level data represented the latest complete records available at the time of the analysis for the GSP. The DMS will ensure that data is kept up-to-date for future analyses and updates to the GSP.
136	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.2.1.2.1 Vertical Gradients	Vertical gradients only show potential for groundwater flow. An aquitard would prevent that vertical flow.	Clarifying Edit	Comment noted. Aquitards would prevent vertical flow, but are not common in Eastern San Joaquin Subbasin.
137	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.2.1.2.1 Vertical Gradients	Vertical gradients only show potential for groundwater flow. An aquitard would prevent that vertical flow.	Clarifying Edit	Comment noted. Aquitards would prevent vertical flow, but are not common in Eastern San Joaquin Subbasin.
138	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figures 2-40 to 2-49: Nested Well Hydrographs	SGMA requires the same datum and scaling for hydrographs (to the extent possible). The 10 hydrographs use different horizontal and vertical scales. Use of the scales would allow the magnitude of the gradients to be evident between locations and allow comparison of the record of data.	Mechanics - Graphics	Scales on the hydrographs were standardized for consistency.
139	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.2.2 Groundwater Storage	Figure 2-50 is not effective at showing anything - just a big blue rectangle with a slightly irregularly top '-0.91 / 53 *100 = -1.7% Reduction in storage really only began in 2008 when the value became negative and stay negative thereafter. The average change in storage would be -0.11 MAF/yr for that 8-year period.	Mechanics - Graphics	The figure has been developed to show the impact of groundwater extraction on overall amount of fresh groundwater in storage. The potential for undesirable results associated with groundwater accessibility are addressed through the Chronic Lowering of Groundwater Levels Sustainability Indicator.
140	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-5: Summary of Chloride Data by Decade	The table shows that minimum, average, and median values are all less than 250 mg/L. How do the depth intervals relate to the zones in the principal aquifer?	Clarifying Edit	Comment noted. Table 2-5 shows chloride measurements by decade, but has no component related specifically to well depth.
141	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-6: Summary of Chloride Data by Depth (1940s-2010s)	The table shows that minimum, average, and median values are all less than 250 mg/L. How do the depth intervals relate to the zones in the principal aquifer?	Clarifying Edit	Comment noted. Table 2-5 shows chloride measurements by well depth, with depths ranging from 0 to over 500 feet deep. These wells may be from any of the principal aquifer zones, depending where in the Subbasin they are located. From Figure 2-54, as most of the wells with depth data are in the City of Stockton area, the wells are likely in the intermediate or deep zones according to cross-section B-B' in Figure 2-20.
142	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Chloride data	Table 2.6 shows that 3,566 samples out of a total of 6,931 samples lack depth data but these data are not limited to only concentrations greater than 250 mg/L. The no-depth well group does have the highest range but the 100-foot well group has a much higher median value, a higher minimum, and a comparable average relative to the no-depth well group.	Clarifying Edit	Comment noted. Consider for analysis in future updates to the GSP.
143	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.2.4.1.2 Total Dissolved Solids	According to the USGS (Hem, 1985), "Organic matter, if present, may be partly volatile, but it is not completely removed unless the residue is strongly ignited."	Clarifying Edit	Comment noted. Consider for analysis in future updates to the GSP.

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144	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-57: Maximum TDS Concentrations in Shallow Wells 2015-2018	Figure explanation says shallow wells are less than 200 feet but Table 2.7 show depth ranges of 0-100', 100-250', 250-500', and >500', which is not consistent. How do the depth intervals relate to the zones in the principal aquifer?	Clarifying Edit	Figure 2-57 shows TDS concentrations in shallow wells (wells shallower than 200 feet), while Figure 2-58 shows concentrations in deep wells (wells deeper than 200 feet). Table 2-7 is the tabulated data behind the two figures (2-57 and 2-58). The well depths are likely in the shallow or intermediate zones of the principal aquifer, based on the depths presented in cross-section C-C' in Figure 2-21.
145	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-58: Maximum TDS Concentrations in Deep Wells 2015-2018	Figure explanation says deep wells are greater than 200 feet. What about intermediate wells?	Mechanics - Graphics	The analysis only differentiates between deep wells (greater than 200 feet) and shallow wells (less than 200 feet).
146	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-10: MCLs for Common Petroleum Hydrocarbons and MTBE	Why are the units for xylene mg/L when the other organics are ug/L? The change seems disingenuous.	Clarifying Edit	Confirmed MCLs in California Regulations Related to Drinking Water from the SWRCB. Units in table are correct.
147	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-11: MCLs for Common Synthetic Organic Constituents	TCE may have been used early in the dry cleaning industry but dry cleaners seem to be the dominant source for PCE plumes.	Clarifying Edit	Edited sources for PCE in Table 2-11 (MCLs for Common Synthetic Organic Constituents): Used as a solvent in manufacturing facilities, dry cleaners, printing shops, and auto repair facilities.
148	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-67: Natural Communities Commonly Associated with Groundwater (NCCAG)	Dark subbasin boundary line obscures the color-coded lines	Mechanics - Graphics	Changed the order of the layering so that the subbasin boundary does not obscure the NCCAG indications.
149	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.3.3 Use of the ESJWRM and Associated Data in Water Budget Development	Historical Water Budget was established for 20 years (WY 1996 to 2015). Projected Water Budget was produced for the implementation period, starting in 2020, based on a 50-year previous hydrology (1969 to 2018). Why is Current Water Budget based on a 50-year period (1969 to 2018) when SGMA requires the use of "the most recent hydrology, water supply, water demand, and land use information."? I'm thinking a Current Water Budget would be for 2016 and 2017 (maybe 2018) to be consistent with Section 2.2.1.2 - Current Groundwater Elevations.	Water Budget	The current text, tables, and figures for the water budget meet the requirements of the GSP. As described in Section 2.3.4.2 (Assumptions Used in the Current Water Budget), the current conditions scenario uses current estimates of water demand and supplies along with 50 years of historical hydrology to see the long-term impact of current demand and supply on the Subbasin.
150	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-12: Summary of Water Budget Assumptions (Historical, Current, and Projected Periods)	Hydrologic Years: 50-year period for Current Water Budget is not consistent with SGMA requirement. All other entries say current and refer to recent information - no the past 50 years. Note 3 refers to "pre-drought level (assumed water year 2013)". WY 2013 was a critical WY.	Water Budget	1) The current text, tables, and figures for the water budget meet the requirements of the GSP. As described in Section 2.3.4.2 (Assumptions Used in the Current Water Budget), the current conditions scenario uses current estimates of water demand and supplies along with 50 years of historical hydrology to see the long-term impact of current demand and supply on the Subbasin. 2) Even though water year 2013 was designated a critical water year in terms of hydrology, the drought regulations had not largely impacted urban water users yet, so 2013 urban demand (per capita water use) was assumed to represent normal/pre-drought urban demand conditions.
151	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.3.4.2 Assumptions Used in the Current Water Budget	The 50-year period is not consistent with SGMA requirement.	Water Budget	The current text, tables, and figures for the water budget meet the requirements of the GSP. As described in Section 2.3.4.2 (Assumptions Used in the Current Water Budget), the current conditions scenario uses current estimates of water demand and supplies along with 50 years of historical hydrology to see the long-term impact of current demand and supply on the Subbasin.
152	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.3.5 Water Budget Estimates	Riparian intake from streams is evapotranspiration outflow from the stream system. How can it also be an inflow?	Clarifying Edit	The stream water budget is a balance on water in streams and the land surface water budget is a balance on water used on lands. Water comes from the stream system to meet the riparian demand occurring in the land surface system, so is an outflow from the stream system and an inflow to the land surface system.
153	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-15: Average Annual Water Budget – Groundwater System	The proportions of water in the budgets don't vary more than a few percentage point which is likely due to the long-term overlapping periods of data. See previous comments on the use of a 50-year period for current conditions. Totals for main categories of inflow and outflow don't match table totals (due to rounding [?]). Tables 2-13 and 2-14 may exhibit similar discrepancies.	Water Budget	Added a footnote to Tables 2-13 to 2-17 clarifying that: Summations in table may not match the numbers in the table. This is due to the rounding of model results.
154	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figures 2-72 to 2-80	Magnitude of average annual volumes would be more easily perceived if the vertical scale was the same for each plot.	Mechanics - Graphics	Scales have been changed to be consistent within scenarios for each of the stream, land surface, and groundwater system figures.
155	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 2-16: Average Annual Values for Key Components of Historical Water Budget by Year Type	How can the average of three AN years be less than one BN year? Is math correct?	Mechanics - Graphics	Footnote on Table 2-16 addresses this comment: There was only one below normal year in the historical calibration, so averages are just based on model results for that single water year. Since there wasn't any more below normal years to use in the average, results the below normal water year type do not follow expected trends.
156	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.3.5.4 Projected Water Budget Estimates	Section needs a figure for projected groundwater budget similar to the historical conditions of 1996 to 2015 (Figure 2-51) and for climate change (Figure 2-102). What about groundwater budget information for WYs 2016, 2017, and 2018?	Water Budget	The current text, tables, and figures for the water budget meet the requirements of the GSP. The current version of the model includes data through water year 2015 (September 2015). Future refinements to the model will include data updates to include 2016 through 2018.
157	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.3.6 Sustainable Yield Estimate	This statement actually implies that groundwater levels will decline until 2045 (2020 + 25 = 2045), which would not be consistent with SGMA's prohibition of "chronic lowering of groundwater levels" which would continue to cause groundwater to flow from the adjacent subbasins and limit their ability to achieve sustainable management, unless ESJ successfully implements all of their projects and management actions.	Clarifying Edit	25 years was edited to 20 years in the text in Section 2.3.6 (Sustainable Yield Estimate).

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158	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		Does this 50-year average approach really support operations within this sustainable yield within the 20-year planning and implementation horizon? The sustainable yield would appear to range from 643,000 AF/yr to 715,000 AF/yr to 787,000 AF/yr. Table 2-17 says the 50-year total groundwater supply is 801,000 AF/yr, which is 86,000 AF/yr greater than the sustainable yield. Text on page 2-148 also refers to 801,000 AF/yr as private groundwater production.	Water Budget	The sustainable yield scenario of the ESJWRM tests if a simulated demand reduction is sustainable over 50 years of varying hydrologic data. The 20-year implementation period was included to allow for changes to occur in the Subbasin before 2040 and for groundwater levels to continue to drop. The text in Section 2.3.6 (Sustainable Yield Estimate) was edited to clarify that demand reductions slowly ramp up over the 20-year period. In order to account for the challenges of implementing the GSP, this Plan assumes future operations include a ramping up of demand reduction actions (e.g., projects that reduce groundwater pumping or increase recharge) for a 20-year period and groundwater levels will continue to decline until 2040.
159	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		Does this 50-year average approach really support operations within this sustainable yield within the 20-year planning and implementation horizon? The sustainable yield would appear to range from 643,000 AF/yr to 715,000 AF/yr to 787,000 AF/yr. Table 2-17 says the 50-year total groundwater supply is 801,000 AF/yr, which is 86,000 AF/yr greater than the sustainable yield. Text on page 2-148 also refers to 801,000 AF/yr as private groundwater production.	Water Budget	The sustainable yield scenario of the ESJWRM tests if a simulated demand reduction is sustainable over 50 years of varying hydrologic data. The 20-year implementation period was included to allow for changes to occur in the Subbasin before 2040 and for groundwater levels to continue to drop. The text in Section 2.3.6 (Sustainable Yield Estimate) was edited to clarify that demand reductions slowly ramp up over the 20-year period. In order to account for the challenges of implementing the GSP, this Plan assumes future operations include a ramping up of demand reduction actions (e.g., projects that reduce groundwater pumping or increase recharge) for a 20-year period and groundwater levels will continue to decline until 2040.
160	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-82: Dry Creek Hydrograph	Why is a 54-year period (1964 to 2018) used in the projection when the previous text referred to a 50-year period (1696 to 2018)? Shouldn't the time scale be 2020 to 2070 or Year 1 to 50, beginning in 2020? Same questions for Figures 2-84, 2-86, 2-88, and 2-90.	Climate Change	Edits made to Figures 2-82, 2-84, 2-86, 2-88, and 2-90 so time scale shows the 50-year period of the simulation period.
161	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.3.7.4 Eastern San Joaquin Water Budget Under Climate Change	Does municipal groundwater pumping increase to total?	Climate Change	In the climate change scenario, groundwater pumping to meet agricultural and residential needs is calculated by the model based on meeting remaining demands after appropriate surface water delivery is made to respective areas. Demand in areas with no access to surface water is completely met by groundwater pumping. Pumping occurring within city limits may need to increase to meet the urban demands not met through surface water.
162	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 2-102: Groundwater Budget – Climate Change Scenario	Cumulative change in groundwater storage continues to decline for the 50-year period which is not consistent with the SGMA prohibition of reduction in groundwater storage.	Climate Change	Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Due to the uncertainty around climate projections in the 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield and a zero change in storage in the GSP implementation time period beginning in 2040. Climate change will continue to be evaluated with every update to the GSP and estimates of projects and management actions will continue to evolve with refinements to the model. Comment noted for follow up in next round of model refinements and updates to analyses.
163	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 3-2: Location of Representative Monitoring Wells for Groundwater Levels	Groundwater along the northern boundary are monitored by two shallow CASGEM wells (Wells 04N07E20H003 and 04N05E24J003) that are 3.3 to 4.2 miles south of the Cosumnes Subbasin. These wells are located ~8 miles apart along the 26-mile E-W subbasin boundary (excludes 4-mile N-S boundary with Amador County). Additional monitoring wells should be installed along the boundary to cover the entire length, including deeper wells, to better define cross boundary flow, vertical gradients, and the surface water-groundwater interaction.	Monitoring Network	As described in Section 4.7 (Data Gaps) and shown in Figure 4-3, additional groundwater monitoring wells are planned for the Subbasin to fill recognized data gaps. Two of these wells are adjacent to Dry Creek and will provide data relevant to stream-aquifer interaction, as well as subsurface flows across the groundwater subbasin boundary shared with Cosumnes Subbasin. One of the wells, a deep nested well, was included in the TSS funding application and is located along the boundary shared with Cosumnes Subbasin (about midway along the portion of Dry Creek bordering the Subbasin). The second well along Dry Creek is shallow and will be funded by the ESJGWA. Additional information will be provided by wells installed and maintained along the boundary by the GSAs within the Cosumnes Subbasin, which will also be incorporated into future GSP updates. The text in Section 4.7 (Data Gaps) was updated to reflect additional details about the proposed new monitoring wells and locations of the TSS wells.
164	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 3-1: Minimum Thresholds for Chronic Lowering of Groundwater Levels	The MT for well 04N07E20H003 was confirmed at -81.7 feet MSL by the GSP methodology, but the MT (-31.2 feet MSL) for well 04N05E24J003 was found to be lower by 1.4 feet or -29.8 feet MSL. Appendix 3-A shows a 25-foot buffer compared to the 23.6-foot buffer derived from the difference between the highest and lowest values. The MOs were confirmed for the two wells (Table 3-2). Use of these management criteria will further reduce groundwater levels and storage along the northern boundary of the subbasin and cause groundwater from the Cosumnes Subbasin to flow into the ESJ Subbasin due to this generous management criteria. Recent groundwater levels (Mar/Apr-19) are 13 and 17 feet above their respective MOs and 58 and 41 feet above their respective MTs (Wells 04N07E20H003 and 04N05E24J003). Use of this criteria will allow the further lowering of groundwater levels and the reduction in storage, which will cause additional groundwater flow from the Cosumnes Subbasin, especially during a long-term period of drought. Note that the method for establishing the MT buffer is somewhat different for each well, which adds a bias to values. For well 04N07E20H003, the buffer was based on the difference between the highest groundwater level (WL), which occurred during Mar-84 (during an above normal [AN] WY, following the wettest WY on record and a wetter AN WY), and the lowest WL during Oct-16. For well 04N05E24J004, the highest and lowest WLs occurred during Mar-97 and Oct-15, respectively. The historical water budget period was established for 1996 to 2015, so the highest and lowest WLs should be restricted to that period (See attached Figures 1 & 2). In addition, Appendix 3-B provides hydrographs with MT and MO lines for a date range beginning in 1990. This uniform criteria should be applied to all representative WL monitoring wells.	Groundwater Levels	1) This response assumes the commenter to have confirmed the minimum threshold and measurable objective for well 04N07E20H003. For well 04N05E24J003, the commenter notes the measurable objective is confirmed correct, but the minimum threshold is not. It is assumed the commenter is referring to well 04N05E24J004 because well 04N05E24J003 is not used. The discrepancy noted in the comment is in the source of data from which the calculations are made. Local San Joaquin County well data was used to calculate the buffer and a minimum threshold of -31.2 ft MSL for 04N05E24J004. The measurable objective of -6.2 ft MSL was calculated from CASGEM data for well 04N05E24J004. Where available, CASGEM data was consistently used to calculate measurable objectives and local agency data was consistently used to determine the historical range buffer, as the local datasets typically had a longer monitoring record. 2) The ESJGWA supports using the minimum thresholds, measurable objectives, and interim milestones for the chronic lowering of groundwater levels sustainability indicator as written. The current approach was developed recognizing that the aquifer is heterogeneous, and the criteria as written accounts for the varying responses to hydrology that occur in different locations across the Subbasin. The intent of adding a buffer of 100 percent of the historical range to the historical drought low is to reflect this varying hydrology, as areas far from surface water will respond/fluctuate differently than areas close to surface water. It is recognized that the monitoring wells have different periods of record. The methodology uses available data from 1990 to 2019 to set these criteria. 3) In evaluating flow gradient changes between subbasins, the ESJGWA's focus is on long-term change in groundwater elevation, rather than temporary fluctuation in periods of drought. The ESJGWA will continue to coordinate with neighboring subbasins as they develop their plans and establish sustainable management criteria, such that no subbasin is preventing another from achieving sustainability. Because neighboring subbasins are largely on the 2022 timeline for GSP development, it is too speculative at this time to determine how inter-basin flows will be affected.
165	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 3-3: Interim Milestones for Chronic Lowering of Groundwater Levels	Current groundwater levels (WL) are set at values for Fall 2015. For well 04N05E24J004, the "current" WL, MO, and all interim milestones are -6.2 feet MSL. The WL declined further in fall 2016 to -4.2 feet MSL and then varied from 6.3 feet MSL in fall 2017 and 3.3 feet MSL in fall 2018. For well 04N07E20H003, the "current" WL was -35.5 feet MSL, just above the MO of -36.7 feet MSL, and the first two interim milestones equal -35.5 feet MSL ("current WL") and the third milestone allowed a WL decline to -36.1 feet MSL. The WLs declined during the fall 2016 to -36.7 feet MSL (MO) and then rose thereafter to -32.8 feet MSL during fall 2017 and -31.4 feet MSL during fall 2018.	Groundwater Levels	Correct, the current groundwater levels are set at values for Fall 2015 for almost all wells. This is noted in a footnote in Table 3-3. The four wells using an average groundwater level for current are indicated with "****".
166	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	3.2.2 Reduction in Groundwater Storage	DWR has classified the ESJ Subbasin as overdrafted. The text does not provide a direct rebuttal to this classification or address the contributions of groundwater from the adjacent subbasins which should be an undesirable result of overpumping.	Groundwater Storage	See Master Response 4 - GW Storage.
167	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		The text does not address the contributions of groundwater from the adjacent subbasins which should be an undesirable result of overpumping. How much groundwater would move into the ESJ Subbasin from adjacent subbasins if the storage were reduced by 1.2 MAF to down to 30 MAF?	Groundwater Storage	See Master Response 4 - GW Storage.
168	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 3-4: Interim Milestones for Degraded Water Quality	The measurable objective for TDS is 600 mg/L - the recommended secondary MCL plus a 100-mg/L buffer. TDS currently ranges from 280 to 510 mg/L (average: 370 mg/L) at the 10 representative monitoring wells. The interim milestones allow incremental increases of TDS over the 20-year period, ranging from 5 to 29 percent (average: 15%), where lower-TDS wells have greater increments and higher-TDS wells have lower increments. This approach appears to encourage the degradation of water quality as an objective.	Groundwater Quality	The measurable objective is close to the SMCL of 500 mg/L and significantly below the upper limit SMCL of 1000 mg/L and is considered protective of beneficial uses. Having measurable objectives somewhat above current conditions provides the GSAs with flexibility through the implementation horizon, while being protective of drinking water and agricultural water supplies.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
169	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	3.2.5 Land Subsidence	The text fails to acknowledge the continuous GPS station (P309 - Linden) in the subbasin and the 5 other stations in adjacent subbasins, which be used to interpolate subsidence within the subbasin. Additional GSP stations could be installed in the subbasin.	Subsidence	The ESJGWA supports the use of existing monitoring stations and InSAR data currently referenced in the GSP for the evaluation of subsidence, and believe the conditions of the subbasin do warrant the creation of new subsidence stations at this time. The GSP has been updated to reference the UNAVCO continuous GPS stations in Section 1.2.2.4 (Land Subsidence Monitoring): UNAVCO's Plate Boundary Observatory Program – Reporting since 2004, the UNAVCO (formerly University Navigation Satellite Timing and Ranging or NAVSTAR Consortium) Plate Boundary Observatory network consists of a network of about 1,100 continuous global positioning system (CGPS) and meteorology stations in the western United States to measure deformation resulting from the constant motion of the Pacific and North American tectonic plates in the western United States. Stations located within the Subbasin contain data from at least 2006 to current and include station P309 located east of Linden and station P273 located west of Lodi. Other stations are also available in nearby Subbasins. GSP subsidence analyses have been conducted using satellite-based methods over limited time periods, as described below.
170	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	4.3 MONITORING NETWORKS FOR DEGRADED WATER QUALITY	Anions should include nitrate as well as bicarbonate & carbonate, chloride, and sulfate.	Clarifying Edit	Comment noted. Water quality monitoring will test for a variety of contaminants.
171	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	4.3.5 Spatial Density of Groundwater Quality Monitoring Wells	Make appropriate revision in Section 8, page 8-6	Clarifying Edit	Edited References to delete 2010b (2016b is the correct reference to the monitoring network BMP), make formerly 2010c references into 2010b, and edit references in Section 4.3.5 (Spatial Density of Groundwater Quality Monitoring Wells) to 2016b.
172	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	6.2.1 Project Identification	Project is affordable and coste-effective (highest lowest unit cost per volume water savings)	Mechanics - Text	Comment addressed in text.
173	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	6.3 MANAGEMENT ACTIONS	All of these activities are required by SGMA so they aren't really management actions (reduced pumping, following, ...) as intended by SGMA	Plan Implementation	The ESJGWA treats management actions as generally administrative, locally implemented actions that the GSAs could take that affect groundwater sustainability. Language was added to the GSP (Section 6.3 Management Actions) referencing existing conservation management actions occurring in the Subbasin (including Urban Water Management Plans and Agriculture Water Management Plans). More information on management actions will be added if the ESJGWA determines pumping reductions or others are needed to achieve sustainability in the Subbasin.
174	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Table 7-2: Costs to GSAs and GSP Implementation Costs	\$0.8M to \$2.0M is quite excessive, as if the GSP will be done over. Annual reports will provide a significant foundation for the 5-year evaluation and the cost might be only \$200K to \$300K - hopefully a lot less. Other costs should be reviewed closely to ensure reasonableness.	Plan Implementation	The cost estimates for implementation actions are conservative planning-level estimates that will be refined once additional specifics have been determined. The ESJ ESJGWA Plan Implementation Ad-Hoc Committee has been convened for this purpose and is meeting on an approximately weekly basis to actively identify next steps and form recommendations that will allow for refinement in GSP implementation cost estimates.
175	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	7.6 DEVELOPING 5-YEAR EVALUATION REPORTS	\$0.8M to \$2.0M is quite excessive, as if the GSP will be done over. Annual reports will provide a significant foundation for the 5-year evaluation and the cost might be only \$200K to \$300K - hopefully a lot less. Other costs should be reviewed closely to ensure reasonableness.	Plan Implementation	The cost estimates for implementation actions are conservative planning-level estimates that will be refined once additional specifics have been determined. The ESJ ESJGWA Plan Implementation Ad-Hoc Committee has been convened for this purpose and is meeting on an approximately weekly basis to actively identify next steps and form recommendations that will allow for refinement in GSP implementation cost estimates.
176	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	7.3.1 Monitoring	Won't the field crew and their equipment be used for sampling (\$57K to \$60K) and sampling costs are really laboratory costs (\$24K to \$30K)? Will CASGEM continue to exist after full implementation of SGMA?	Plan Implementation	Section 7.3.1 (Monitoring) has been updated to change the line item previous identified "Sampling costs" to "Laboratory costs". The form that the future CASGEM program will take after SGMA implementation is unknown at this time.
177	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	7.6.3 Reconsideration of GSP Elements	Why waste resources on a new index when a 118-year index is already available for the San Joaquin Valley? (Sacramento Valley index is 113 years long and is mostly consistent with the San Joaquin Valley index.)	Clarifying Edit	The San Joaquin Valley index is not based only on data local to the Subbasin. The ESJGWA Board will evaluate available indices' methodologies and determine whether or not to develop a new water year index.
178	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	ES-5. EXISTING GROUNDWATER CONDITIONS	California has three secondary maximum contaminant level (SMCL) standards for TDS, all based on aesthetic considerations such as taste and odor, not public health concerns. These are 500 mg/L (recommended limit), 1,000 mg/L (upper limit), and 1,500 2,500 mg/L (short-term limit).	Clarifying Edit	Edited Section ES-5 (Existing Groundwater Conditions) to correct the short-term SMCL for TDS and clarify the text: These are 500 mg/L (recommended limit), 1,000 mg/L (upper limit), and 1,500 mg/L (short-term limit).
179	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	ES-5. EXISTING GROUNDWATER CONDITIONS	Replace with: Surface waters can be hydraulically interconnected to the groundwater system, where the baseflow is derived from the aquifer (gaining stream) or the stream can lose surface water to the aquifer. If the water table beneath the stream goes down excessively as a result of groundwater pumping, the stream may disconnect from the underlying aquifer.	Clarifying Edit	Edited text in Section ES-5 (Existing Groundwater Conditions): Surface waters can be hydraulically interconnected with the groundwater system, where the stream baseflow is either derived from the aquifer (gaining stream) or recharged to the aquifer (losing stream). If the water table beneath the stream lowers as a result of groundwater pumping, the stream may disconnect entirely from the underlying aquifer. Major river systems in the Subbasin are highly managed to meet instream flow requirements for fisheries, water quality standards, and water rights of users downstream.
180	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	ES-10. PROJECTS AND MANAGEMENT ACTIONS	All of these activities are required by SGMA so they aren't really management actions (reduced pumping, following, ...) as intended by SGMA	Plan Implementation	The ESJGWA treats management actions as generally administrative, locally implemented actions that the GSAs could take that affect groundwater sustainability. Language was added to the GSP (Section 6.3 Management Actions) referencing existing conservation management actions occurring in the Subbasin (including Urban Water Management Plans and Agriculture Water Management Plans). More information on management actions will be added if the ESJGWA determines pumping reductions or others are needed to achieve sustainability in the Subbasin.
181	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	ES-12. FUNDING	Some costs need a closer look, especially the 5-year updates.	Plan Implementation	The cost estimates for implementation actions are conservative planning-level estimates that will be refined once additional specifics have been determined. The ESJGWA Plan Implementation Ad-Hoc Committee has been convened for this purpose and is meeting on an approximately weekly basis to actively identify next steps and form recommendations that will allow for refinement in GSP implementation cost estimates.
182	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Cross Section B-B'	Elevation scale is shown to vary from 2500' to 0' [msl]. The correct elevation range should be 900' msl, based on Figure 22, to a deep negative elevation.	Mechanics - Graphics	The level of detail in the GSP is appropriate for a conceptual model of the Subbasin. The image resolution of the cross-sections was increased to help with zooming in on small areas.
183	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figures 29a to 29f: Cross Sections	The upper limits of the elevation scale vary from 1800' to 3000'. The correct elevation range should be 900' msl, based on Figure 22, to a deep negative elevation.	Mechanics - Graphics	Comment noted. The model report was finalized in August 2018 and was included as an appendix in the GSP to provide an explanation of the development and calibration of the historical model. The model documentation will be updated as updates to the model are made in the future.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
184	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figures 29a: Cross Section	Section A-A' is located somewhat north of GSP Section A-A'. The GSP section shows the sedimentary formations thinning eastward on top of bedrock. Whereas, the model section shows over 1000 feet of sediments along the eastern boundary of the model. This extra thickness in the model provides additional groundwater storage which could contribute to a false sense of sustainability.	Model Uncertainties	Sustainability is measured through field monitoring and comparison with minimum thresholds, allowing for identification of sustainable conditions. The current model thickness is consistent with the DWR's C2VSim model and is an area for enhancement in model refinements. New monitoring wells shown in Figure 4-3 in Section 4.71 (Plan to Fill Data Gaps) will help refine the model thickness through new information about the aquifer on the eastern side of the Subbasin. Comment noted for follow up in next round of model refinements and updates.
185	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	2.9 Model Layering	Layer 1 thickness ranges from 34 to 966 feet and Layer 2 thickness ranges from 50 to 540 feet. Layer 1 is thickest within the north-central and along the eastern boundary, and the latter condition seems unusual and is not explained by the report. Layer 2 is thickest within the south-central area and this condition seems reasonable.	Clarifying Edit	Comment noted. The model report was finalized in August 2018 and was included as an appendix in the GSP to provide an explanation of the development and calibration of the historical model. The model documentation will be updated as updates to the model are made in the future.
186	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	Figure 23: Layer 1 Thickness & Figure 24: Layer 2 Thickness	The thickness of Layer 1 is divided into five categories but the range of the first and last categories are significantly different from the middle 3 categories. The span of the first category is 196 feet and the last category is 520 feet, compared to the 60-foot spans of the middle categories. For comparison, the thickness of Layer 2 is divided into six categories with spans between 60 and 90 feet (average: 73 feet). These large differences within Layer 1 contribute to the uncertainty in the model output.	Clarifying Edit	Comment noted. The model report was finalized in August 2018 and was included as an appendix in the GSP to provide an explanation of the development and calibration of the historical model. The model documentation will be updated as updates to the model are made in the future.
187	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	3.3.2 Groundwater Pumping	City of Galt is located along the northern boundary of the subbasin and produces groundwater for its customers. The model should acknowledge and include the City's groundwater production.	Clarifying Edit	Comment noted. The model report was finalized in August 2018 and was included as an appendix in the GSP to provide an explanation of the development and calibration of the historical model. The model documentation will be updated as updates to the model are made in the future.
188	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin	4.7 Final Calibration Parameters	Why does the Corcoran Clay vertical K values apply to Layers 3 and 4 when the aquitard is situated between Layers 1 and 2?	Clarifying Edit	Comment noted. The model report was finalized in August 2018 and was included as an appendix in the GSP to provide an explanation of the development and calibration of the historical model. The model documentation will be updated as updates to the model are made in the future.
189	Rodney Fricke	GEI on behalf of Sacramento County GSA - Cosumnes Subbasin		The GWA Board adopted a preliminary schedule for project implementation. Project implementation is scheduled to begin in 2020, with full sustainability implementation by 2040.	Mechanics - Text	Comment noted. Sentence is discussing that full project implementation will be by 2040 (also when sustainability will be achieved).
190	Grace Su	EBMUD	2.1.1.1	The text says that a large number of wells do not have construction depth or screen interval information. Were only the wells with construction information used to prepare the GW elevation contour maps for each principal aquifer?	Clarifying Edit	Comment noted. It is unclear what maps the commenter is referring to. The contour maps in Chapter 2 (Basin Setting) only relate to groundwater elevation information, which was available at wells even if construction information was not available.
191	Grace Su	EBMUD	2.1.4.2	Please modify the discharge values from Camanche Reservoir discussed in the third and fourth sentence of this paragraph. Releases from the Camanche Reservoir could be as low as 100 cfs during critically dry years and up to 5,000 cfs during the wet season. Since the Camanche Dam was completed in 1964, the maximum daily release from the Camanche Reservoir has not exceeded 5,000 cfs. The Mokelumne River flows recorded below Camanche Dam prior to 1964 are not representative of flows observed after the dam was built.	Clarifying Edit	Edited text in Section 2.1.4.2 (Major Hydraulic Features) to correct maximum and minimum Camanche Reservoir releases: Flow in the Mokelumne River below the Camanche Reservoir varies seasonally and is dependent on discharges from the on-stream reservoir, from less than 200 AF/day during the dry season to 9,900 AF/day during the wet season. These flows correlate to discharges from as low as 100 to no more than 5,000 cfs collected by the USGS below the Camanche Dam.
192	Grace Su	EBMUD	2.1.9.2.1	What is the basis for the statement that the horizontal hydraulic conductivity values in the model are considered low? If the conductivities are higher, what implications would that have on the results?	Clarifying Edit	Higher hydraulic conductivities in ESJWRM would have significant impact on the movement of groundwater in the Subbasin. Hydraulic conductivities will be further evaluated as the model is updated in the future. Edited text in Section 2.1.9.2.1 (Aquifer Parameters and Production Zone Well Capacities) to remove portion of sentence with the comment that horizontal hydraulic conductivity in the model is considered low.
193	Grace Su	EBMUD	6.2.5.3	Please change "will" to "may" in this sentence: The longer term project may use the same concept...	Mechanics - Text	Comment addressed in text.
194	Grace Su	EBMUD	6.2.5.3	EBMUD is requesting that this sentence be removed as it does not accurately reflect the terms of the existing Agreement.	Clarifying Edit	Comment addressed in text.
195	Grace Su	EBMUD	7.4.1	EBMUD would like to be informed as the Mokelumne River Loss Study Project moves forward and is interested in being a participant and in providing technical input.	Projects and Management Actions	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
196	Jane Wagner-Tyack	Communication Consultant	Introduction, Paragraph 2	"Is comprised of" misrepresents the meaning of "comprise." Preferable: "The GWA is composed of 15 Groundwater Sustainability Agencies" or "The GWA comprises 15 Groundwater Sustainability Agencies." The same is true for the other two uses of "comprise" in this paragraph.	Mechanics - Text	Comment addressed in text.
197	Jane Wagner-Tyack	Communication Consultant	Introduction, Paragraph 2	SGMA wanted to see an advisory group that included a wide range of stakeholders. This was not supposed to be just outreach to stakeholders to tell them what was being decided. Maybe you want to mention at the end of this paragraph that "Some input from the Sustainability Workgroup (described below) has also been incorporated into the GSP."	Outreach	Added to ES-3 (Outreach Efforts): from the Workgroup was presented to the ESJGWA Board and has also been incorporated into the GSP.
198	Jane Wagner-Tyack	Communication Consultant	ES-2	Bulletin 118 and updated--Do you mean "as" updated?	Mechanics - Text	Comment addressed in text.
199	Jane Wagner-Tyack	Communication Consultant	ES-3	Please delete "all" in the first sentence. The stakeholder engagement strategy is far from inclusive. Also, mention that this is a 24-member Workgroup.	Clarifying Edit	Edits made. Groundwater Sustainability Workgroup is 23 members.
200	Jane Wagner-Tyack	Communication Consultant	ES-4	On the third line, please insert "the" before "San Joaquin River."	Mechanics - Text	Comment addressed in text.
201	Jane Wagner-Tyack	Communication Consultant	ES-5	The last sentence in this paragraph seems unnecessarily vague. What effects has the Sacramento-San Joaquin Delta (note correct name for the Delta) had on groundwater levels in the Subbasin? What surface water has been imported for in-lieu use?	Clarifying Edit	Edited text in ES-5 (Existing Groundwater Conditions): The western and southern portions of the Subbasin have experienced less change in groundwater levels, in part due to the minimal groundwater pumping in the Delta area to the west and the import of surface water for agricultural and urban uses.
202	Jane Wagner-Tyack	Communication Consultant	ES-5	"Concerns" and "maximum" misspelled.	Mechanics - Text	Comment addressed in text.
203	Jane Wagner-Tyack	Communication Consultant	ES-5	In the last sentence, "have not been able to be tied"--SOMEONE's analysis has not tied elevated concentrations of other constituents to groundwater management activities. I think the water quality argument will be vulnerable here, and it would be best to mention from the beginning whatever data or prior analysis you have to support this assertion.	Groundwater Quality	Language was added to ES-5: Existing Groundwater Conditions stating: The GSP establishes ongoing monitoring of salinity, arsenic, nitrate, and a number of other common water quality constituents to fill data gaps and identify potential trends of concern.
204	Jane Wagner-Tyack	Communication Consultant	ES-5	Need to correct spelling of "volume" and "concern" in the last sentence of the paragraph.	Mechanics - Text	Comment addressed in text.
205	Jane Wagner-Tyack	Communication Consultant	ES-5	The Delta is properly referred to as "the Sacramento-San Joaquin Delta." (Do a search of this for the whole document.) Also, third line, "alternations to," do you mean "alterations to"?	Mechanics - Text	Comment addressed in text.
206	Jane Wagner-Tyack	Communication Consultant	ES-6	The prior bulleted list is preceded by a statement with a colon. The bulleted item here isn't part of a list. This statement could be made part of the paragraph.	Mechanics - Text	Comment addressed in text.
207	Jane Wagner-Tyack	Communication Consultant	ES-7	Reading that the annual groundwater overdraft is projected to increase to approximately 57,000 AF/year with climate change is likely to send the reader back to find out what the current overdraft is, but I don't see that number above, only a statement that the Subbasin has been overdraft for many years. For comparison purposes, provide an average or range of current overdraft. Also, briefly, what is it about climate change that will lead to greater overdraft?	Clarifying Edit	Edited text in ES-7 (Water Budgets) to clarify climate change analysis: The projected Subbasin water budget was also evaluated under climate change conditions, which simulate higher demand requiring increased groundwater pumping despite more precipitation and streamflows. The climate change scenario used for the analysis was the 2070 central tendency climate change scenario prescribed by DWR. The overdraft modeled under climate change conditions is simulated to increase above projected conditions without climate change.
208	Jane Wagner-Tyack	Communication Consultant	ES-8, next to Figure ES-6	Line 5, delete "from" before "participating GSA." It isn't necessary.	Mechanics - Text	Comment addressed in text.
209	Jane Wagner-Tyack	Communication Consultant	Figure ES-6	This map needs a legend for what kinds of wells the different shapes represent.	Mechanics - Graphics	Figure represents total pumping by all types of wells. Comment addressed in text.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
210	Jane Wagner-Tyack	Communication Consultant	ES-9	After the link, you might tell the reader to use the Guest login.	Clarifying Edit	Comment noted. There is a "Guest Login" button at the DMS link.
211	Jane Wagner-Tyack	Communication Consultant	ES-10	"modification of levels of pumping reduction" is confusing. You could just say, "These additional evaluations may lead to pumping modifications associated with the attainment of reliability."	Mechanics - Text	Comment addressed in text.
212	Jane Wagner-Tyack	Communication Consultant	ES-10	Delete "several," which suggests a small number.	Mechanics - Text	Comment addressed in text.
213	Jane Wagner-Tyack	Communication Consultant	ES-10	"The initial set of projects WAS reviewed" or "The projects WERE reviewed"	Mechanics - Text	Comment addressed in text.
214	Jane Wagner-Tyack	Communication Consultant	ES-10	"Planned projects are anticipated to provide enough water to offset the projected 2040 supply imbalance of _____ AFY."	Mechanics - Text	Comment addressed in text.
215	Jane Wagner-Tyack	Communication Consultant	ES-12	It isn't clear how the two bulleted points ("Developing" and "Evaluation") relate to the paragraph that introduces them. Also, "Evaluating" would be the correct parallel to "Developing."	Clarifying Edit	Deleted bulleted points as not relevant to the surrounding text.
216	Jane Wagner-Tyack	Communication Consultant	1.1.1	Introduce the earlier GBA here to distinguish it from the GSA. There was initial confusion; also, the GBA was responsible for much of the prior planning effort, and you will reference it at 1.1.4.3. "... fits in with these prior planning efforts, including the Eastern San Joaquin Groundwater Basin Authority (GBA), building on existing local management..."	Clarifying Edit	Comment noted.
217	Jane Wagner-Tyack	Communication Consultant	1.1.4	Change 15 to 16 for number of GSAs and add back in Woodbridge Irrigation District (WID).	Mechanics - Text	Comment addressed in text.
218	Jane Wagner-Tyack	Communication Consultant		In the second sentence, the references to "currently" and "in 2010" in the same sentence are confusing. "The District provides water and wastewater service to approximately 3,200 residents (as of 2010) in the unincorporated..."	Mechanics - Text	Comment addressed in text.
219	Jane Wagner-Tyack	Communication Consultant		"to meet domestic and industrial needs in the City"--which City? Both the City of Escalon and the City of Tracy are named in this sentence.	Clarifying Edit	Edited text in Section 1.1.4.3 (Description of Participating Agencies): The City of Escalon is selling its allotment of treated water to the City of Tracy but intends to construct a pipeline to convey SSJID water to meet domestic and industrial needs in the City of Escalon (SSJID, 2015b).
220	Jane Wagner-Tyack	Communication Consultant		Delete "with" before "overlaps." "The SEWD GSA covers 101,000 acres of the District"--meaning unclear. Is this 101,000 acres that are not part of another GSA? Insert "is" between "and" and "provided" at the end of the third line. Last line--"...two efforts preceding the current GWA that focused..."	Mechanics - Text	Edits made to text to clarify SEWD acreage.
221	Jane Wagner-Tyack	Communication Consultant		Add back Woodbridge Irrigation District.	Mechanics - Text	Comment addressed in text.
222	Jane Wagner-Tyack	Communication Consultant		I believe that Thornton should be added as an unincorporated community.	Mechanics - Text	Comment addressed in text.
223	Jane Wagner-Tyack	Communication Consultant	1.2.1.1	"...within the region that includes the Eastern San Joaquin Subbasin." (Only one of these state parks is actually in the Subbasin.)	Mechanics - Text	Comment addressed in text.
224	Jane Wagner-Tyack	Communication Consultant	1.2.2.1.5	On the first reference to the ESJWRM, write out "Eastern San Joaquin Water Resources Model" so that the reader doesn't have to refer to the list of acronyms. This is a fairly important model not mentioned earlier.	Mechanics - Text	Comment addressed in text.
225	Jane Wagner-Tyack	Communication Consultant	1.2.2.7.4	"with sufficient accuracy"--sufficient for what? This is extremely vague. If you can without misrepresentation, stop this point after "customers". Otherwise, clarify.	Clarifying Edit	Language of "with sufficient accuracy" came from California Water Code §10608.48(b). Edited text in Section 1.2.2.7.4 (Agricultural Water Management Plans) to clarify: Measure the volume of water delivered to customers with sufficient accuracy to comply with requirements of the California Water Code (CWC).
226	Jane Wagner-Tyack	Communication Consultant	1.2.2.8	No pipelines? At the top of the next page, we learn that OID has over time replaced unlined laterals with PVC pipelines.	Clarifying Edit	Edited text in Section 1.2.2.8 (Canal Diversions and Seepage): All of the major irrigation districts utilize a combination of natural watercourses, canals, and pipelines to distribute surface water diversions to their customers.
227	Jane Wagner-Tyack	Communication Consultant	1.2.2.8	"105 miles are inconsistent"--meaning unclear. Please clarify.	Clarifying Edit	Edited text in Section 1.2.2.8 (Canal Diversions and Seepage): While the entire lateral system historically consisted of open, unlined ditches, 100 miles of the laterals have been converted to pipelines; 105 miles are open, concrete-lined ditches; and the rest remain unlined.
228	Jane Wagner-Tyack	Communication Consultant	1.2.2.9	"...for a total recharge volume of about 65,000 AF since the inception of the project."	Mechanics - Text	Comment addressed in text.
229	Jane Wagner-Tyack	Communication Consultant	1.2.3.1.1	Sources are provided for all the other plan information in this section. What is the source of information for the San Joaquin County General Plan? Would it be appropriate to move "(SJC, 2016b)" to the end of this sections as "(San Joaquin County, 2016b)"? And what does "b" refer to?	Mechanics - Text	Moved reference to San Joaquin County General Plan (SJC, 2016b) to end of section as commenter suggested.
230	Jane Wagner-Tyack	Communication Consultant	1.2.3.1.8	"may have to abandon a large number of wells as sources of potable water due to contamination,..."--What kind of contamination? This is relevant to the Water Quality Sustainability Indicator.	Groundwater Quality	Language was added to indicate that this is a result of localized contamination.
231	Jane Wagner-Tyack	Communication Consultant	1.3.5	This sentence says that there has been "at least one meeting". The next sentence refers to "these meetings." These statements need to be consistent.	Mechanics - Text	Edits made to text to clarify inter-basin coordination meetings.
232	Jane Wagner-Tyack	Communication Consultant	1.1.4	End of 7th line, change "comprised" to "consisting."	Mechanics - Text	Comment addressed in text.
233	Jane Wagner-Tyack	Communication Consultant	"	Delete. This sentence is redundant.	Mechanics - Text	Comment addressed in text.
234	Jane Wagner-Tyack	Communication Consultant	1.1.4.2	Change "15" to "16" and change "have" to "has"--"Each...has a voice...and has appointed". Correct parallelism of bulleted list: Approving budgets, Proposing guidance, Adopting rules, Approving any contracts, Reporting to, Approving and implementing a GSP. For second bulleted list, Recommending for both bullets.	Mechanics - Text	Comment addressed in text.
235	Jane Wagner-Tyack	Communication Consultant	1.1.4.3	Add (CDWA) after the agency name to conform to the style for the other agencies.	Mechanics - Text	Comment addressed in text.
236	Jane Wagner-Tyack	Communication Consultant		Delete "comprised of"--"Eastside San Joaquin GSA is a partnership..."	Mechanics - Text	Comment addressed in text.
237	Jane Wagner-Tyack	Communication Consultant		Second to last line, insert "the" before "Calaveras River".	Mechanics - Text	Comment addressed in text.
238	Jane Wagner-Tyack	Communication Consultant		First line, substitute "and" for "that"--"and extends..."	Mechanics - Text	Comment addressed in text.
239	Jane Wagner-Tyack	Communication Consultant		Change "is comprised of" to "consists of" or "comprises." For a correct usage of "comprise," see the OID description directly above this entry.	Mechanics - Text	Comment addressed in text.
240	Jane Wagner-Tyack	Communication Consultant		"Almost 7,000 acres of San Joaquin County plus Cal Water are combined in San Joaquin County No. 2 GSA."	Mechanics - Text	Comment addressed in text.
241	Jane Wagner-Tyack	Communication Consultant		Substitute "encompass" (as in the SDWA description) for "is comprised of." "Comprise" is not the most accurate word to use in the first bulleted paragraph below. Better: "The cities of Manteca, Ripon, and Escalon account for approximately 20,000 acres of the District area."	Mechanics - Text	Comment addressed in text.
242	Jane Wagner-Tyack	Communication Consultant		Substitute "on" for "to"--"Exercise the powers conferred on GSAs by SGMA."	Mechanics - Text	Comment addressed in text.
243	Jane Wagner-Tyack	Communication Consultant	1.2.2	For consistency: add (DWR) after Department of Water Resources; insert Water Data Library before (WDL), add (CV-SALTS) after Central Valley Salinity Alternatives for Long-Term Sustainability. Also, for Dairy CARES--Cares is apparently not an acronym. The correct term is Dairy Cares.	Mechanics - Text	Comment addressed in text.
244	Jane Wagner-Tyack	Communication Consultant	1.2.2.2.3	Remove the "s" from "creates." The subject/verb agreement is "differences...create".	Mechanics - Text	Comment addressed in text.
245	Jane Wagner-Tyack	Communication Consultant	1.2.2.2.6	Change "off" to "on"--"was developed based on a detailed water quality analysis..."	Mechanics - Text	Comment addressed in text.
246	Jane Wagner-Tyack	Communication Consultant	1.2.2.8	Substitute "the entire lateral system historically consisted of open, unlined ditches"	Mechanics - Text	Comment addressed in text.
247	Jane Wagner-Tyack	Communication Consultant	1.2.2.8	Second paragraph on the page, 3rd line, substitute "estimated" for "considered."	Mechanics - Text	Comment addressed in text.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
248	Jane Wagner-Tyack	Communication Consultant	1.2.2.9	Delete the second "Figure 1-16" in the first sentence, at the end.	Mechanics - Text	Comment addressed in text.
249	Jane Wagner-Tyack	Communication Consultant	1.2.2.9	Add " has"---"Since 2003, SEWD has operated..."	Mechanics - Text	Comment addressed in text.
250	Jane Wagner-Tyack	Communication Consultant	1.2.3.1.1	Change this to "Stakeholder input informed..."	Mechanics - Text	Comment addressed in text.
251	Jane Wagner-Tyack	Communication Consultant	1.2.3.1.5	Insert "input from"---"...the 1991 General Plan was informed by input from community members..."	Mechanics - Text	Comment addressed in text.
252	Jane Wagner-Tyack	Communication Consultant	1.2.3.1.5	Dangling modifier--the General Plan is not the primary source of water supply. But also, groundwater is no longer the primary source of water supply for Lodi, which now gets about 50% of its water most of the time from surface supplies through an agreement with WID. Delete the phrase "As the primary source of water supply for the City of Lodi" and begin the sentence with "The General Plan..."	Mechanics - Text	Comment addressed in text.
253	Jane Wagner-Tyack	Communication Consultant	1.3.1	Delete "of" after "hold."	Mechanics - Text	Comment addressed in text.
254	Jane Wagner-Tyack	Communication Consultant	1.3.4.2	Delete "relied" and insert "the Workgroup"---"...to promote stakeholder input and relied upon the Workgroup when developing..."	Mechanics - Text	Comment addressed in text.
255	Jane Wagner-Tyack	Communication Consultant	1.3.4.2	Delete "and"---"members from a variety of organizations who represent one or more..."	Mechanics - Text	Comment addressed in text.
256	Jane Wagner-Tyack	Communication Consultant	1.3.4.3	Two sentences have been telescoped here. Change to "detailing a stakeholder engagement strategy developed to achieve..."	Mechanics - Text	Comment addressed in text.
257	Jane Wagner-Tyack	Communication Consultant	1.3.4.4	There were no prior GWA engagement efforts (because there was no prior GWA). For "GWA", substitute "Eastern San Joaquin Subbasin engagement efforts..."	Mechanics - Text	Comment addressed in text.
258	Jane Wagner-Tyack	Communication Consultant	1.3.4.5	Delete the apostrophe in "Manufacturers." They don't use it. The name style in Table 1-4 is correct.	Mechanics - Text	Comment addressed in text.
259	Jane Wagner-Tyack	Communication Consultant	2.1.4.3	"...restricted to metamorphic or pre-Tertiary sedimentary material and that, whereas..." Something is missing here; "that" doesn't make sense in this context.	Clarifying Edit	Removed "that, whereas" from sentence in Section 2.1.4.3: These soils tend to be darker and heavier than the Stanislaus and Mokelumne River fan soils likely due to the source area being restricted to metamorphic or pre-Tertiary sedimentary material and the Mokelumne and Stanislaus Rivers received large contributions from a granitic source (CA DWR 1967).
260	Jane Wagner-Tyack	Communication Consultant	2.1.4.3	"Pre-Modesto formations" are mentioned here, but I didn't see those defined earlier, and the Geologic Time Scale in Figure 2-5 appears not to be designed to include them. They are referenced again in Section 2.1.4.5.1. "During the Pleistocene Epoch when the Modesto and Riverbank formations were deposited..." Can you provide a second Time Scale showing more detail for the Pleistocene?	Basin Setting	The pre-Modesto formation is earlier in the Pliocene era, as seen in Table 2-2. The geologic time scale in Figure 2-5 is sufficient for the purposes of the discussion in the GSP.
261	Jane Wagner-Tyack	Communication Consultant	2.1.5	This paragraph refers the reader to Figure 2-15 and also refers to "the Central Valley geomorphic province and the granitic Sierra Nevada Geomorphic province." However, neither of these provinces is identified in Figure 2-15. Also, it would be helpful to have Figure 2-15 on the same page as this discussion.	Mechanics - Graphics	Comment addressed in text.
262	Jane Wagner-Tyack	Communication Consultant	2.1.5	The sentence refers to the Mehrten and Laguna formations, but these have not been introduced earlier, so the reader has no context in which to place them. As with the Pre-Modesto and Riverbank formations mentioned in 2.1.4.3 and 2.1.4.5.1, a geologic time scale should be provided.	Clarifying Edit	A geologic time scale is included as Figure 2-5. A stratigraphic column is included that associates the time scale with the names and characteristics of each formation, as Table 2-2. Figure 2-5 and Table 2-2 are introduced in Section 2.1.2.
263	Jane Wagner-Tyack	Communication Consultant	Table 2-2	This footnote says that "Figure 2-5 contains time scales corresponding to formations." It does not. As noted above, the time scale needs more detail for local formations for the Tertiary and Quaternary periods.	Mechanics - Text	Comment noted. The level of detail in Figure 2-5, along with the text descriptions of the formations is sufficient.
264	Jane Wagner-Tyack	Communication Consultant	Table 2-2	The table says that the Eocene is "Unimportant to fresh water basin except as possible contaminant source." Is saline water the only contaminant, or are there other possible contaminants? Any mention of contaminants is likely to be a red flag relative to groundwater quality discussions.	Clarifying Edit	Removed in response to comment.
265	Jane Wagner-Tyack	Communication Consultant	2.1.5.1.1 and 2.1.5.1.2	Again, if a figure like 2-5 is going to be provided, it should include all the formations referenced in the text.	Mechanics - Graphics	This figure is a geologic timescale meant to serve as a reference for the reader. Only those time periods relevant to the formations in the subbasin are referenced in the text.
266	Jane Wagner-Tyack	Communication Consultant	2.1.5.1.3	It appears that these local formations are spatial rather than (or in addition to) temporal. Figure 2-16 is intended to show these formations, but it is VERY hard to read, with excessive grid detail that doesn't appear to be relevant to showing the major formations.	Mechanics - Graphics	This figure is a geologic map that is georeferenced from the references noted at the bottom. The figure was reimported into the document at a higher resolution.
267	Jane Wagner-Tyack	Communication Consultant	2.1.5.1.4	Need different visuals for all formations listed under 2.1.5.1	Mechanics - Graphics	Comment noted for consideration in updates to the GSP. It is beyond the scope of the GSP required by SGMA.
268	Jane Wagner-Tyack	Communication Consultant	2.1.6	This sentence concludes with "for the east side of the Great Valley." "Great Valley" is not a term that has been used in this document previously, and it is not a commonly used term in this state. In fact, it isn't clear what it means. Does it refer to California's Central Valley? To the San Joaquin Valley?	Clarifying Edit	Term was clarified in the text.
269	Jane Wagner-Tyack	Communication Consultant	2.1.7	This sentence, at the top of page 2-38, says that water wells and oil and gas wells are "indicated by an asterisk on the cross-sections." The asterisks are completely illegible. In fact, the cross-sections are impossible to read.	Mechanics - Graphics	Figures were reimported at a higher resolution.
270	Jane Wagner-Tyack	Communication Consultant	2.1.7	The sentence at the bottom of the second paragraph on page 2-38 says, "The analysis inferred formation contracts in place where this data was limited..." Can you explain what "formation contracts" are? Or do you mean that the formation contracts (decreases in size)?	Clarifying Edit	This comment points out a typo in the text as written. Comment addressed in text.
271	Jane Wagner-Tyack	Communication Consultant	2.1.9.1.4	The sentence refers to the condition of the Corcoran Clay "as depicted on Figure 2-22", but it is very hard to discern anything in Figure 2-22.	Mechanics - Graphics	This figure was reimported into the document at a higher resolution. Cross-sections were developed to represent the basin scale and not intended to provide specific information on individual well level stratigraphy.
272	Jane Wagner-Tyack	Communication Consultant	Table 2-3	Since there is no list of definitions, define "Aquifer Field" in the text or in a footnote to this table.	Mechanics - Text	Edited heading for Table 2-3 to remove reference to aquifer field.
273	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	"The natural geochemical effects on water quality result to mobilize the elemental makeup of sediments"--meaning unclear. Please rephrase to clarify.	Mechanics - Text	Edited text to clarify: The natural geochemical effects on water quality release the elemental makeup of sediments (i.e., metals and other ions).
274	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	This sentence sounds awkward and unnecessarily legalistic, and it doesn't clearly apply to the rest of the section. That is, it isn't clear that the two lists that follow are intended to summarize the general water quality of principal aquifers; that seems to be covered in the next sections. Can you say this? "General water quality of principal aquifers is summarized in the following sections, as required by 23 CCR"	Mechanics - Text	Comment addressed in text.
275	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	The sentence says that nitrate (should be lower case) "is well understood as a result of fertilizer application". Actually, nitrate is well understood as a result of studies of the consequences of its agricultural use in fertilizer application. The following sentence says that "Naturally occurring nitrogen must also be discussed to have a complete understanding of the natural conditions" in the Subbasin. A better transition: "Nitrogen also occurs naturally in the Eastern San Joaquin Subbasin. Extensive work..."	Mechanics - Text	Comment addressed in text.
276	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.2	Suggested rewrite for easier reading: "Evaluating the historical trends of these parameters is not straightforward. GAMA records include some groundwater quality results for the Eastern San Joaquin Subbasin going back to the 1940s. However, a thorough analysis requires a large amount of data on all the major cations and anions mentioned above. A large number of measurements of this kind were taken from 2005 to 2017, as shown in Figure 2-27. Data from 2018 are not included because at the time of writing, that data was incomplete."	Mechanics - Text	Comment addressed in text.
277	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.2	Delete "a better idea" and just say "an idea," since there is not actually any other idea for "better" to refer to.	Mechanics - Text	Comment addressed in text.
278	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.2	Regarding the Trilinear Diagrams, is it customary to present these without a legend for the symbols?	Mechanics - Graphics	Comment addressed in text.
279	Jane Wagner-Tyack	Communication Consultant	2	"e" in "The" should not be boldfaced.	Mechanics - Text	Comment addressed in text.
280	Jane Wagner-Tyack	Communication Consultant	2.1.2	Delete "is comprised of" and substitute "consists of".	Mechanics - Text	Comment addressed in text.
281	Jane Wagner-Tyack	Communication Consultant	2.1.2	Add "s" to "source" for correct subject/verb agreement, and add "the" before Sierra Nevada"--"The material sources...are the Coastal Ranges and the Sierra Nevada..."	Mechanics - Text	Comment addressed in text.
282	Jane Wagner-Tyack	Communication Consultant	2.1.3	Changes "vary" to "varies" for correct subject/verb agreement--"The origin...varies in geologic time..."	Mechanics - Text	Comment addressed in text.
283	Jane Wagner-Tyack	Communication Consultant	2.1.4.1	Change "and" to "to"--"Ground surface elevations vary...from almost 1,000 feet...to around sea level..."	Mechanics - Text	Comment addressed in text.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
284	Jane Wagner-Tyack	Communication Consultant	2.1.4.2	Add "the" before both "Stanislaus River" and "Mokelumne River".	Mechanics - Text	Comment addressed in text.
285	Jane Wagner-Tyack	Communication Consultant	2.1.4.2	Delete "the" before "10 watersheds".	Mechanics - Text	Comment addressed in text.
286	Jane Wagner-Tyack	Communication Consultant	2.1.4.3	Change "Figure 3-9" to "Figure 2-9".	Mechanics - Text	Comment addressed in text.
287	Jane Wagner-Tyack	Communication Consultant	2.1.4.4	Add "the" before "Stanislaus River".	Mechanics - Text	Comment addressed in text.
288	Jane Wagner-Tyack	Communication Consultant	2.1.5	Lower case "f" in "Mehrlen and Laguna formations" and "Riverbank and Modesto formations."	Mechanics - Text	Comment addressed in text.
289	Jane Wagner-Tyack	Communication Consultant	2.1.5.1.6	Substitute "consists" for "as consisting."	Mechanics - Text	Comment addressed in text.
290	Jane Wagner-Tyack	Communication Consultant	Figure 2-18	Add "Water" to title--"Base of Fresh Water Elevation Contours and Stockton Fault"	Mechanics - Text	Comment addressed in text.
291	Jane Wagner-Tyack	Communication Consultant	2.1.9	First bullet--"Shallow Zone that consists of" (replace "is comprised of"); Second bullet--"Intermediate Zone that consists of" (replace "is comprised of"). The third bullet is already correct.	Mechanics - Text	Comment addressed in text.
292	Jane Wagner-Tyack	Communication Consultant	2.1.9.1	Insert "of" after "depth" in each case--"Depth of discrete layers..."	Mechanics - Text	Comment addressed in text.
293	Jane Wagner-Tyack	Communication Consultant	2.1.9.1.1	Insert "and" after "geologic formations"--"...are present west of the older geologic formations and extend across..."	Mechanics - Text	Comment addressed in text.
294	Jane Wagner-Tyack	Communication Consultant	2.1.9.1.1	"gpd/ft"--gallons per day per foot? "gpd" is not on the list of acronyms.	Mechanics - Text	Comment addressed in text.
295	Jane Wagner-Tyack	Communication Consultant	2.1.9.1.4	Substitute "have" for "has"--"...thickest sequences...and overbank fines...have been observed."	Mechanics - Text	Comment addressed in text.
296	Jane Wagner-Tyack	Communication Consultant	2.1.9.2	Change "Recognition of" to "Recognizing" so that this bullet point reads like a sentence, as the others to.	Mechanics - Text	Comment addressed in text.
297	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.1	Replace "comprised of" with "encompassing."	Mechanics - Text	Comment addressed in text.
298	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.1	Change "are" to "is"--"The distribution...is provided..."	Mechanics - Text	Comment addressed in text.
299	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	Replace "which encompasses" with "which includes." In the next sentence, change "is" to "are" for correct subject/verb agreement--"natural geochemical effects" is the subject of this clause.	Mechanics - Text	Comment addressed in text.
300	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	Delete "also" between "rocks" and "have". There is no other condition to which this clearly refers.	Mechanics - Text	Comment addressed in text.
301	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	"...is characterized by Metzger and others in a 2012 study, Test Drilling..."	Mechanics - Text	Comment addressed in text.
302	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	Insert "is" between "and" and "hazardous"--"...is naturally occurring..and is hazardous..."	Mechanics - Text	Comment addressed in text.
303	Jane Wagner-Tyack	Communication Consultant	2.1.9.2.3.1	Write out San Joaquin County instead of using SJC. (It is nice not to expect the reader to refer to the acronym list for everything.)	Mechanics - Text	Comment addressed in text.
304	Jane Wagner-Tyack	Communication Consultant	2.1.10	"actions" should be plural--"...a significant impact on how projects and management actions in one part of the basin..."	Mechanics - Text	Comment addressed in text.
305	Jane Wagner-Tyack	Communication Consultant	2.2.3	This section misrepresents the situation in the Delta by suggesting that barriers have been installed to prevent seawater intrusion. No barriers prevent the inland movement of seawater into the Delta; it does occur, and managing it is an ongoing challenge. If you need a reference, I can provide one. Correction: "While the Delta ecosystem evolved with a natural salinity cycle that brought brackish tidal water in from San Francisco Bay, levees installed to allow development of agriculture, followed by development and operation of the Central Valley Project and the State Water Project, have altered the inward movement of seawater through the Delta. Current management practices endeavor to maintain freshwater flows through a combination of hydraulic and physical barriers, and alterations to existing channels." Change "alternations" to "alterations of existing channels". I don't see the Water Education Foundation listed under References. Also, in the last sentence in this paragraph, delete "sources" and change "are" to "is"--"...salinity in the Subbasin is due to other factors..."	Clarifying Edit	Edited text in Section 2.2.3 (Seawater Intrusion) to remove reference to barriers in the Delta preventing seawater intrusion and based on other commenter suggestions: While the Delta ecosystem evolved with a natural salinity cycle that brought brackish tidal water in from the San Francisco Bay, levees installed to allow development of agriculture, followed by development and operation of the Central Valley Project and the State Water Project, have altered the inward movement of seawater through the Delta. Current management practices endeavor to maintain freshwater flows through a combination of hydraulic and physical barriers and alterations to existing channels (Water Education Foundation). Portions of the Subbasin do, however, experience water quality issues related to salinity, which are addressed under the water quality section (Section 2.2.4.1). As described in Section 2.2.4.1, salinity in the Subbasin is due to other factors and are not the result of seawater intrusion. Citation for Water Education Foundation reference added in the text.
306	Jane Wagner-Tyack	Communication Consultant	2.2.4.1.1	The sentence says that additional measurements above 250 mg/L are scattered throughout SJC (I would just write out San Joaquin County), but the figure does not show any measurements outside the Subbasin.	Mechanics - Text	To be consistent with the extent of data shown Figure 2-52, deleted portion of sentence mentioning measurements in the remainder of San Joaquin County.
307	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.1	This sentence says that groundwater monitoring and evaluation has resulted in removal of contaminant sources and implementation of remedial activities. That isn't something that just monitoring can do. When groundwater monitoring and evaluation identified point source locations for contamination, the City of Lodi initiated remedial activities.	Mechanics - Text	Edited text to clarify meaning: Since the discovery of these plumes in the 1980s, groundwater monitoring and evaluation at point source locations has led to the implementation of remedial activities such as the installation of groundwater extraction and remedial systems, implementation of a Salinity Reduction Plan, and mandated WDRs (RWQCB, 2012).
308	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.1	This entire section appears to contradict the claim in 2.2.4.4 that point source contamination has not been found to be related to groundwater management activities in the Subbasin. Broadly, for ALL similar statements (for example at 2.2.4.2 and 2.2.4.3), there needs to be a clear explanation of what "related to groundwater management activities" actually means.	Groundwater Quality	See Master Response 3 - WQ.
309	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.2	This sentence says that sites are doing investigation and remediation. The same statement is made in 2.2.4.4.3 and 2.2.4.4.4. What is meant by sites? WHO is doing the investigation and remediation? Is this the responsibility of site owners? The RWQCB? Please name an agent or agents for these activities.	Clarifying Edit	Sites include individual areas with active, potential, or past contamination issues found in the RWQCB's GeoTracker or DTSC's EnviroStor databases. The responsible party for the site is usually the owner or operator who may be responsible for cleanup of the site. More information is available online regarding GeoTracker and EnviroStor
310	Jane Wagner-Tyack	Communication Consultant	2.2.1.1	Replace "with" with "that have"--"10 wells that have periods...and that are relatively..."	Mechanics - Text	Comment addressed in text.
311	Jane Wagner-Tyack	Communication Consultant	Figure 2-35	Delete comma after "line".	Mechanics - Text	Comment addressed in text.
312	Jane Wagner-Tyack	Communication Consultant	2.2.1.2	Substitute "to" for "and" in this clause--"...the lateral gradient ranges from approximately 21 ft/mi...to 16 ft/mi..." A range is always "from x...to y" (or "is between x and y").	Mechanics - Text	Comment addressed in text.
313	Jane Wagner-Tyack	Communication Consultant	2.2.4	Constituents "are related to..." or "relate to..."	Mechanics - Text	Comment addressed in text.
314	Jane Wagner-Tyack	Communication Consultant	2.2.4.1	IMPORTANT: There is no San Joaquin Delta, at least not in California. The San Joaquin River and the Sacramento River meet to form the Sacramento-San Joaquin Delta. That is the correct name. I recommend doing Find for the whole GSP document to be sure that all of these uses of the name are correct.	Mechanics - Text	Comment addressed in text.
315	Jane Wagner-Tyack	Communication Consultant	2.2.4.1	"Emplace" means to put into position. Suggested revision: "Evaporation of groundwater in discharge areas introduces naturally occurring soluble salts into Sacramento-San Joaquin Delta sediments."	Mechanics - Text	Comment addressed in text.
316	Jane Wagner-Tyack	Communication Consultant	2.2.4.1	Comma after second "aquifer"--"This results in a saline aquifer underlying the freshwater aquifer, and well pumping can result..."	Mechanics - Text	Comment addressed in text.
317	Jane Wagner-Tyack	Communication Consultant	2.2.4.1.1	Change "have" to "has" in the last line--"...the number of measurements...has decreased..." (It is the number, not the measurements, that has decreased.)	Mechanics - Text	Comment addressed in text.
318	Jane Wagner-Tyack	Communication Consultant	2.2.4.2	Write out "San Joaquin County" here, since it is part of the name of the Coalition. Otherwise, it sounds like SJC and the Delta Water Quality Coalition are two separate entities.	Mechanics - Text	Comment addressed in text.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
319	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.1	Delete "and" after "closure" and insert a comma--"...now has regulatory closure, with cleanup moving..."	Mechanics - Text	Comment addressed in text.
320	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.2	Substitute "At" for "Of"--"At these sites, petroleum hydrocarbon constituents..."	Mechanics - Text	Comment addressed in text.
321	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.3	Substitute "At" for "Of"--"At these sites, pesticides..."	Mechanics - Text	Comment addressed in text.
322	Jane Wagner-Tyack	Communication Consultant	2.2.4.4.4	Substitute "At" for "Of"--"At these sites, the most common constituents..."	Mechanics - Text	Comment addressed in text.
323	Jane Wagner-Tyack	Communication Consultant	2.2.5	Revise this sentence as follows: "There are no historical records of significant and unreasonable impacts from subsidence in the Eastern San Joaquin Subbasin."	Mechanics - Text	Comment addressed in text.
324	Jane Wagner-Tyack	Communication Consultant	2.2.8	Revise this sentence as follows: "A working group consisting of DWR, California Department of Fish and Wildlife (CDFW), and the Nature Conservancy (TNC) developed the NCCAG database by reviewing publicly available state and federal agency datasets..."	Mechanics - Text	Comment addressed in text.
325	Jane Wagner-Tyack	Communication Consultant	2.2.8	Typo: Should be "The Plan identifies GDEs as NCCAG-identified areas that meet all of the criteria below."	Mechanics - Text	Comment addressed in text.
326	Jane Wagner-Tyack	Communication Consultant	2.2.8	Comma needed after "region" to prevent misreading, plus "s" on "plant"--"Oak trees are considered the deepest-rooted plants in the region, with a root zone..."	Mechanics - Text	Comment addressed in text.
327	Jane Wagner-Tyack	Communication Consultant	2.2.8	Add "to be"--"...are assumed to be unable to access...and to be dependent on..."	Mechanics - Text	Comment addressed in text.
328	Jane Wagner-Tyack	Communication Consultant	2.3.1	The relationship between these two ideas is not causal but coordinate. Revision: "This process is new and has been developed under time constraints; the water budget assumptions will be refined in the future..."	Mechanics - Text	Comment addressed in text.
329	Jane Wagner-Tyack	Communication Consultant	2.3.4.2	"Therefore, groundwater pumping to meet agricultural and rural residential needs is calculated by the model based on meeting remaining demands after appropriate surface water delivery is made to respective areas." Please explain what is meant by "appropriate surface water delivery" and which areas are "respective" (and of what they are respective).	Clarifying Edit	Edited text in 2.3.4.2 and 2.3.4.2: Therefore, groundwater pumping to meet agricultural and rural residential needs is calculated by the model based on meeting remaining demands after surface water deliveries are made.
330	Jane Wagner-Tyack	Communication Consultant	2.3.5	Do you want to add "including urban runoff" to the third bullet? Urban runoff is discussed in detail in Footnote 5 of Table 2-13.	Clarifying Edit	Runoff to the stream system is only due to precipitation. The note in Table 2-13 focuses on urban areas, they are the largest contributor to runoff as there is more rainwater runoff from paved areas as opposed to areas with soil. Clarified this in note 5 on Table 2-13.
331	Jane Wagner-Tyack	Communication Consultant	Table 2-13	To begin with, please put the table and the footnotes on facing pages. The Hydrologic Period row should show parallel information: For Historical: Water Years 1996-2015 (20-Year Period); for Current: Water Years 1969-2018 (50-Year Period); for Projected, Water Years 1969-2018 (50-Year Period). Without this information, it is hard to fairly evaluate the table in general and Footnote 1 in particular. In Footnote 5, "The historical calibration, with both less precipitation and smaller urban areas..."--since this represents a yearly average, explain why there is less precipitation. Finally, if surface water is diverted from one part of the Subbasin and delivered to another part of the Subbasin, does that show up somewhere here? Does that warrant a footnote?	Mechanics - Graphics	1) Edited hydrologic period rows as suggested by commenter. 2) Clarified note 5 in Table 2-13 to describe why the historical simulation has less average rainfall: The historical calibration, with both less precipitation (due to more dry years than wet in the 20-year period) and smaller urban areas, has a corresponding smaller runoff. 3) For a subbasin-wide water budget, there is no distinction in where surface water is diverted from versus delivered to. For the purposes of the stream system balance, the only concern is how much surface water was taken off of streams within the Subbasin.
332	Jane Wagner-Tyack	Communication Consultant	Table 2-14	Same comments as for Table 2-13 with respect to headings and footnotes.	Mechanics - Graphics	Edited hydrologic period rows as suggested by commenter.
333	Jane Wagner-Tyack	Communication Consultant	Table 2-15	Same comments as for Table 2-13 with respect to headings and footnotes. Also, footnote 1 says that differences in scenarios are related partly to "differences in the infiltration parameters related to land use." This need to be explained. Also, please provide a footnote explaining why no South American Subbasin outflows are shown.	Mechanics - Graphics	1) Edited hydrologic period rows as suggested by commenter. 2) Clarified description of deep percolation in note 1 in Table 2-15: Deep percolation is the amount of infiltrated water ultimately reaching the groundwater aquifer. The source of the water may be from precipitation, as well as either applied surface water or groundwater used for agricultural or urban and industrial purposes. Differences between scenarios are related to differences between these sources of water and differences in urban versus agricultural land use totals. 3) Added note 8 to Table 2-13 and note 11 to Table 2-15: Values smaller than 500 AF/year are represented by a dash (-).
334	Jane Wagner-Tyack	Communication Consultant	Table 2-15	Footnote 4 refers to MAR projects. I'm pretty sure those weren't mentioned earlier in the document. Section 2.3.4.3 would be a logical place to do that.	Mechanics - Text	A section was added to Chapter 6 to discuss Flood-MAR.
335	Jane Wagner-Tyack	Communication Consultant	Figure 2-72	Labels on the bar graph should correspond to the discussion in the text above the graph. Thus, the right-hand bar, for Inflow (and these are actually Surface Water Inflows), would show "Upstream Reservoir Releases" or "Reservoir Releases" rather than "Stream Inflows" for the green section (the source of the majority of inflows). The orange section of the bar would be "Runoff of Precipitation." The yellow section would be "Return Flow of Applied Water." Another color needs to be used for "Stream Gains from Groundwater," as this is MUCH too dark to read. For the Outflow bar, the gray section should be labeled "Downstream Outflows," or better, "San Joaquin River and Mokelumne River Outflows," as in Figure 2-78. The light blue section is "Stream Seepage to Groundwater." Where are "Surface Water Diversions"?	Mechanics - Graphics	Dark colors were made lighter. Labeling is consistent with DWR's Water Budget Best Management Practice.
336	Jane Wagner-Tyack	Communication Consultant	2.3.5.1, 2.3.5.2, 2.3.5.4	(Should 2.3.5.4 actually be 2.3.5.3?) For ALL the water budget figures, I encourage using a scale for Average Annual Volume that is the same for all hydrologic periods and all systems. This will be inconvenient in terms of document spacing, but it will convey much more clearly the water budget situation across scenarios and will improve the credibility of the document. It is not usually the intention to mislead with this kind of graphic presentation, but that is frequently the effect.	Mechanics - Graphics	Scales have been changed to be consistent within scenarios for each of the stream, land surface, and groundwater system figures.
337	Jane Wagner-Tyack	Communication Consultant	Figure 2-73	Inflow categories in the bar graph correspond to the descriptions in the text except that "Total" is not necessary for either Surface or Groundwater Supply. The dark blue background, both here and in subsequent Land Surface System figures, makes the text too hard to read and should be lightened. For Outflow, the orange area should be "Surface Runoff of Precipitation," and the yellow area should be "Return Flow of Applied Water."	Mechanics - Graphics	Dark background was made lighter. Labeling is consistent with DWR's Water Budget Best Management Practice.
338	Jane Wagner-Tyack	Communication Consultant	Figure 2-74	Inflow categories in the bar graph correspond to descriptions, except that "Change in Groundwater Storage" is misleading. This is actually a deficit and should be identified that way, and a number could be put on it in the text, which just says "...the inflows do not meet the entire groundwater demand." The amount of the deficit is listed in the text for the current average (on page 2-129) and for the projected average (on page 2-132). Alternatively, you could omit that category from the bar graph and show that the Inflow bar is actually lower than the outflow bar. This would be an honest representation of the situation. Tucking the gray bar in the middle appears deceptive. For the Outflow bar, the orange section should be "subsurface Outflow to Neighboring Basins."	Mechanics - Graphics	The description of "change in groundwater storage" is consistent with DWR's Water Budget Best Management Practice.
339	Jane Wagner-Tyack	Communication Consultant	Figure 2-75	See Comment #9 for Figure 2-72. Labels should be consistent between text and graph and across graphs. Also, keep Inflow discussion first, as in the prior discussion and to align with the fact that Inflows are shown in the left-hand bar. This will mean deleting "These" from the beginning of the paragraph directly above.	Mechanics - Graphics	Labeling is consistent with DWR's Water Budget Best Management Practice.
340	Jane Wagner-Tyack	Communication Consultant	Figure 2-77	Again, don't bury "Change in Groundwater Storage" in the middle. Call it a deficit, and show it at the top of the bar. It is already identified in the text as 48,000 AF/year. Also, in the text, refer to groundwater use as "Groundwater pumping," as is done in the bar graph and also in the discussion on page 2-124. Using the word "production" looks like an attempt to disguise what is actually going on.	Mechanics - Graphics	The description of "change in groundwater storage" is consistent with DWR's Water Budget Best Management Practice.
341	Jane Wagner-Tyack	Communication Consultant	Figure 2-78	As in Figure 2-72, the Inflow categories are "Reservoir Releases," "Runoff of Precipitation," "Return Flow of Applied Water", and "Stream Gains From Groundwater." Outflow categories are "San Joaquin River and Mokelumne River Outflows," "Stream Seepage to Groundwater", and "Riparian Intake from Streams." But again, surface water diversions are missing from the Outflow bar. The text mentions distribution to local growers of 370,000 AF/year. What about urban diversions?	Mechanics - Graphics	Labeling is consistent with DWR's Water Budget Best Management Practice.
342	Jane Wagner-Tyack	Communication Consultant	Figure 2-79	See Comment #11 on Figure 2-73 for both Figure 2-76 and Figure 2-79.	Mechanics - Graphics	Dark background was made lighter. Labeling is consistent with DWR's Water Budget Best Management Practice.
343	Jane Wagner-Tyack	Communication Consultant	Figure 2-80 and accompanying text	Again, don't bury "Change in Groundwater Storage" in the middle, and do call it a Deficit. In the text, (first paragraph) use "groundwater pumping" instead of "groundwater production."	Mechanics - Graphics	The description of "change in groundwater storage" is consistent with DWR's Water Budget Best Management Practice.
344	Jane Wagner-Tyack	Communication Consultant	Table 2-17	Where do the numbers for the last row, "Change in Groundwater Storage" come from? They don't appear to arise from anything else in the table, where everything is in balance. Should that row be separated from the rest of the table?	Clarifying Edit	The change in groundwater storage is the difference between groundwater system inflows and outflows. It is a separate category and necessary to balance the groundwater water budget. In Table 2-17, added heading above row for "Change in Groundwater Storage" specifying a separate section for "Inflows Minus Outflows".
345	Jane Wagner-Tyack	Communication Consultant	2.3.7.2	"...to ensure the resolution would be reasonable..."--What is meant by "resolution" in this context?	Clarifying Edit	Replaced "resolution" with "results" in text in Section 2.3.7.2 (DWR Guidance).
346	Jane Wagner-Tyack	Communication Consultant	Figure 2-100	This title is misleading. Climate change will not produce more groundwater. The title should be "Simulated Changes in Groundwater Pumping due to Climate Change." Delete "production" from the Note.	Mechanics - Text	Comment addressed in text.
347	Jane Wagner-Tyack	Communication Consultant	Table 2-12	"Future evapotranspiration rates are assumed to remain the same as historical." Do you want to add any qualifying statement here about climate change?	Clarifying Edit	Added text to note 2 of Table 2-12: For the current and projected water budgets, future evapotranspiration rates are assumed to remain the same as historical. The impact of climate change on evapotranspiration is evaluated separately in Section 2.3.7.

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348	Jane Wagner-Tyack	Communication Consultant	Table 2-12	Note that there's an error here for Reference source not found.	Mechanics - Text	Removed unlinked reference from text.
349	Jane Wagner-Tyack	Communication Consultant	2.3.4.1	Change "was" to "were"---"flow estimates...were used..."	Mechanics - Text	Comment addressed in text.
350	Jane Wagner-Tyack	Communication Consultant	2.3.4.1	To be consistent, write out all district names, or don't write out any of them. Also, "including" implies that not all entities are listed. If they are all listed, delete "including" and use a colon after "Subbasin." If you include acronyms after names (which is actually a good idea), put them in parentheses rather than brackets. Brackets are correctly used in the section above for parenthetical references within parentheses.	Mechanics - Text	Comment addressed in text.
351	Jane Wagner-Tyack	Communication Consultant	2.3.4.3	Change "was" to "were"---"projections...were estimated..." (The noun with which a verb grammatically agrees is frequently not the closest noun.)	Mechanics - Text	Comment addressed in text.
352	Jane Wagner-Tyack	Communication Consultant	2.3.5	Fourth bullet, add "the" between "to" and "stream".	Mechanics - Text	Comment addressed in text.
353	Jane Wagner-Tyack	Communication Consultant	2.3.5	"are provided herein" sounds stiff and formal, which is not the tone of the document overall. Suggestion: "...scenarios are provided below, with results summarized in Table 2-13 and Table 2-15."	Mechanics - Text	Comment addressed in text.
354	Jane Wagner-Tyack	Communication Consultant	2.3.5.1	"...the water budget presented in Table 2-12..." Table 2-12 is a summary of water budget assumptions. It doesn't appear to be a water budget. Also, delete "of" between "estimates" and "contributions"---"the water budget...not only quantifies...but also estimates..."	Mechanics - Text	Comment addressed in text.
355	Jane Wagner-Tyack	Communication Consultant	2.3.5.1	Delete "formerly" from this sentence. It is already clear that previous efforts have given a different estimate.	Mechanics - Text	Comment addressed in text.
356	Jane Wagner-Tyack	Communication Consultant	2.3.5.1	NSJCGBA is not on the list of acronyms, and I am not aware of such an entity. Does this refer to a groundwater management plan by the Eastern San Joaquin County Groundwater Basin Authority? ESJCGBA should be on the list of acronyms, as well as GBA.	Mechanics - Text	NSJCGBA stands for Northeastern San Joaquin County Groundwater Banking Authority, which is a previous groundwater management effort.
357	Jane Wagner-Tyack	Communication Consultant	2.3.5.1	Sentence is awkward. Suggested revision: "The timing of these changes was often independent of hydrologic conditions..."	Mechanics - Text	Comment addressed in text.
358	Jane Wagner-Tyack	Communication Consultant	Table 2-16	Footnote 6: Substitute "are" for "is"---"Differences...are more related..."	Mechanics - Text	Comment addressed in text.
359	Jane Wagner-Tyack	Communication Consultant	Table 2-16	Footnote 3: Revise: "...averaging of the resulting agricultural demand is less a function of water year type than of the time in the simulation when that water year fell."	Mechanics - Text	Comment addressed in text.
360	Jane Wagner-Tyack	Communication Consultant	2.3.5.2	Substitute "consist of" for "are comprised of."	Mechanics - Text	Comment addressed in text.
361	Jane Wagner-Tyack	Communication Consultant	2.3.5.4	(This section should probably be 2.3.5.3.) Change "meets" to "meet" and delete the second "more of"---"there is more precipitation and surface water to meet the water demand..."	Mechanics - Text	Comment addressed in text.
362	Jane Wagner-Tyack	Communication Consultant	2.3.5.4	Insert a comma between "averages" and "and"---"to calculate meaningful averages, and the supplies and demands are..."	Mechanics - Text	Comment addressed in text.
363	Jane Wagner-Tyack	Communication Consultant	2.3.6	Delete "use of"---"a range of assumptions (from high-end estimates to low-end estimates)..."	Mechanics - Text	Comment addressed in text.
364	Jane Wagner-Tyack	Communication Consultant	Table 2-18	"Reference ET"---Use "Eto" as provided in the list of acronyms.	Mechanics - Text	Comment addressed in text.
365	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.1	HUC is not on the list of acronyms. Write out "Hydrologic Unit Code" here or include that in the acronyms.	Mechanics - Text	Comment addressed in text.
366	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.1.1	WY is not on the list of acronyms. Write out "Water Year" here or include that in the acronyms.	Mechanics - Text	Comment addressed in text.
367	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.1.1	This sentence is hard to read, but I think what is meant is "...the projected condition scenario and the with-climate-change scenario." Add the hyphens.	Mechanics - Text	Comment addressed in text.
368	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.1.2	Should be "Streamflows" (plural) to agree with "and those derived using..."	Mechanics - Text	Comment addressed in text.
369	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.2	Insert "are" between "and" and "spatially"---"are available on a monthly time step and are spatially defined..."	Mechanics - Text	Comment addressed in text.
370	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.2.1	Words appear to be missing. "...were assumed to have a monthly precipitation..."	Mechanics - Text	Comment addressed in text.
371	Jane Wagner-Tyack	Communication Consultant	2.3.7.3.2.2	Change "are" to "is"---"Refinement...is shown..."	Mechanics - Text	Comment addressed in text.
372	Jane Wagner-Tyack	Communication Consultant	3.1	Define "planning and implementation horizon."	Clarifying Edit	Added text to Section 3.1 (Sustainability Goal) to define the planning and implementation horizon: The planning and implementation horizon includes a 20-year implementation period until 2040 where sustainability is achieved and a 50-year planning period where pumping is maintained within the sustainable yield.
373	Jane Wagner-Tyack	Communication Consultant	3.1	Define "implementation period."	Clarifying Edit	Added text to Section 3.1 (Sustainability Goal) to define the planning and implementation horizon: The planning and implementation horizon includes a 20-year implementation period until 2040 where sustainability is achieved and a 50-year planning period where pumping is maintained within the sustainable yield.
374	Jane Wagner-Tyack	Communication Consultant	3.2.2.1.2	Avoid using the passive voice to disguise a source of responsibility. WHO has estimated groundwater demand, and HOW? This information is central to the case we are making.	Mechanics - Text	Comment addressed through edits to text in response to another comment.
375	Jane Wagner-Tyack	Communication Consultant	3.2.3.1.1	"...so a nexus must be present between groundwater conditions and groundwater pumping activities." In plain English, what does this mean?	Clarifying Edit	Language was modified in Section 3.2.3.1.1 (Description of Undesirable Results (Degraded Water Quality) to indicate new monitoring efforts in the Subbasin that will occur as part of the Broad monitoring network for Water Quality) and to highlight coordination efforts with existing regulatory agencies to determine if existing regulatory requirements are met. Language stating no nexus was removed and replaced with language stating that new monitoring efforts and coordination with existing regulatory agencies will allow the GSAs to determine if groundwater pumping activities are contributing to undesirable effects related to degraded water quality.
376	Jane Wagner-Tyack	Communication Consultant	3.2.3.1.2	"...and where these concentrations are the result of groundwater management activities." What kind of activities? How will we know?	Clarifying Edit	The ESJGWA supports the sustainable management criteria for degraded water quality. Groundwater management activities refer to non-natural sources of salinity, such as irrigation return water or movement of groundwater if due to groundwater pumping.
377	Jane Wagner-Tyack	Communication Consultant	3.2.6.2	To avoid obscurity associated with use of the passive voice: "In discussions of interconnected surface water, the GWA Board, Advisory Committee, Workgroup members, and GSA staff did not indicate significant and unreasonable depletions, either currently or historically. Based on this input, this GSP assumes that historical conditions are protective of beneficial uses..." I suggest adding "however" at the beginning of the last sentence: "However, if groundwater levels were to fall lower than historical levels..." Regarding "qualified below", where? In the next paragraph?	Mechanics - Text	Comment addressed in text.
378	Jane Wagner-Tyack	Communication Consultant	4.1.1	It is worth providing some representative dates for historical data available in this Subbasin, especially since it is noted later that CASGEM data goes back to 2009. Let's not miss any opportunity to note that groundwater conditions have been monitored in this Subbasin for quite a long time.	Clarifying Edit	1) Comment noted. Groundwater level data discussed in Chapter 2 (Basin Setting). 2) Removed "since 2009" from Section 4.1.2 (Broad Monitoring Network for Groundwater Levels) as it was misleading and indicated that CASGEM only included measurements more recent than 2009: Of the 107 wells in the broad monitoring network, 76 wells included are wells used in CASGEM, a monitoring program that has tracked seasonal long-term groundwater elevation trends in the Subbasin.
379	Jane Wagner-Tyack	Communication Consultant	4.3.1	"Wells with historically "low" TDS concentrations..." What does this mean? Why is "low" in quotation marks? Quotations marks are sometimes used this way when the writer wants to put distance between the implied meaning and the actual situation. That would be unwise in this case.	Clarifying Edit	Removed quotes around "low" in Section 4.3.1 (Representative Monitoring Network for Groundwater Quality).
380	Jane Wagner-Tyack	Communication Consultant	4.3.1 and 4.3.4	Section 4.3.1 lists the City of Lodi as one of the agencies monitoring and managing wells for groundwater quality, but the City of Lodi is not shown in Table 4-5. The text should explain why not. Meanwhile, City of Lodi is listed in Table 4-7, but there is a footnote that TDS has not been regularly monitored at White Slough sites. Should this footnoted information appear in Section 4.3.1 as well?	Mechanics - Text	Comment noted. City of Lodi is not mentioned in Section 4.3.1 and is not included in Table 4-5. The City of Lodi has wells in the broad monitoring network for groundwater quality, discussed in Section 4.3.2.
381	Jane Wagner-Tyack	Communication Consultant	4.7.1	Do you mean "guide for selection of wells" rather than "guide for collection of wells"?	Mechanics - Text	Comment addressed in text.
382	Jane Wagner-Tyack	Communication Consultant	Section 3 Introduction	Delete "meetings" after "Workgroup".	Mechanics - Text	Comment addressed in text.

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383	Jane Wagner-Tyack	Communication Consultant	3.2.1.1.1	Delete "of" after "Reduction".	Mechanics - Text	Comment addressed in text.
384	Jane Wagner-Tyack	Communication Consultant	3.2.1.1.3	Sentence is awkward and hard to read. Revision: "Undesirable results due to future chronic lowering of groundwater levels could result from the following: insufficient pumping offset/reduction in the basin that results in localized or basin-wide groundwater level lowering; or delays in implementation of GSP programs or projects due to increased demand or regulatory, permitting, or funding obstacles."	Mechanics - Text	Comment addressed in text.
385	Jane Wagner-Tyack	Communication Consultant	3.2.1.2	Substitute "showed" for "evidenced."	Mechanics - Text	Comment addressed in text.
386	Jane Wagner-Tyack	Communication Consultant	3.2.1.2	"...dewatering of domestic wells is a potential undesirable result that could be used to confirm the adequacy..."	Mechanics - Text	Comment addressed in text.
387	Jane Wagner-Tyack	Communication Consultant	3.2.1.2	"...to account for the fact that domestic wells may have been drilled..."	Mechanics - Text	Comment addressed in text.
388	Jane Wagner-Tyack	Communication Consultant	3.2.1.3	"...the difference between the minimum threshold and the measurable objective."	Mechanics - Text	Comment addressed in text.
389	Jane Wagner-Tyack	Communication Consultant	3.2.2.1.4	Make this all one sentence--no period after "years", and separate with semi-colons--"...effects could include running out of fresh groundwater to access in drought years; increased cost of access; reduction in beneficial uses, such as domestic supply; and changes to agriculture."	Mechanics - Text	Comment addressed in text.
390	Jane Wagner-Tyack	Communication Consultant	3.2.2.3	This refers the reader to Section 3.2.5.3, but that section just sends the reader somewhere else. It should probably refer to Section 3.2.1.3, where measurable objectives and interim milestones for lowering of groundwater levels are discussed. Also, insert "as" between "milestones" and "for".	Mechanics - Text	Comment addressed in text.
391	Jane Wagner-Tyack	Communication Consultant	3.2.3.1.4	Add "s" after "effect" and insert a comma and "which" after "supplies"--"...the effects would potentially include...to access alternate supplies, which can be unaffordable..."	Mechanics - Text	Comment addressed in text.
392	Jane Wagner-Tyack	Communication Consultant	3.2.3.1.4	Add "or" after "practices"--"...changes in irrigation practices or crops grown..."	Mechanics - Text	Comment addressed in text.
393	Jane Wagner-Tyack	Communication Consultant	3.2.3.3	Delete "are" after "uses" in the last line--"...will protect landscape uses against impacts..."	Mechanics - Text	Comment addressed in text.
394	Jane Wagner-Tyack	Communication Consultant	3.2.4.1.1	Use the correct name for the Delta: "the Sacramento-San Joaquin Delta".	Mechanics - Text	Comment addressed in text.
395	Jane Wagner-Tyack	Communication Consultant	3.2.4.1.3	Use the correct name for the Delta: "the Sacramento-San Joaquin Delta".	Mechanics - Text	Comment addressed in text.
396	Jane Wagner-Tyack	Communication Consultant	3.2.4.1.4	Add "or" after "practices"--"...changes in irrigation practices or crops grown..."	Mechanics - Text	Comment addressed in text.
397	Jane Wagner-Tyack	Communication Consultant	3.2.5.2	Add "in the Eastern San Joaquin Subbasin"--"...declines in groundwater levels in the Eastern San Joaquin Subbasin have not resulted..."	Mechanics - Text	Comment addressed in text.
398	Jane Wagner-Tyack	Communication Consultant	3.2.5.3	The last line refers the reader to Section 2.2, Current and Historical Groundwater Conditions. It should probably refer to Section 3.2.1.3.	Mechanics - Text	Comment addressed in text.
399	Jane Wagner-Tyack	Communication Consultant	3.2.6.1.2	Add "in" to clarify parallelism, and use semicolons to make this sentence easier to follow--"...if depletions resulted in the release of stored surface water...; in the decrease of acreage...; in the reduction in availability...; or in the elimination..."	Mechanics - Text	Comment addressed in text.
400	Jane Wagner-Tyack	Communication Consultant	3.2.6.1.4	Correct parallelism: "...insufficient surface water would be available to support diversions for agricultural or urban uses or to support regulatory environmental requirements."	Mechanics - Text	Comment addressed in text.
401	Jane Wagner-Tyack	Communication Consultant	3.2.6.1.4	Substitute "pumping" for "production" and correct the parallelism: "This could result in increased groundwater pumping, changes in irrigation practices and crops grown, and adverse effects to property values and the regional economy."	Mechanics - Text	Comment addressed in text.
402	Jane Wagner-Tyack	Communication Consultant	4.1.1	Add "the" between "in" and "production"--"...represent overall conditions in the production zone..."	Mechanics - Text	Comment addressed in text.
403	Jane Wagner-Tyack	Communication Consultant	4.1.1	Substitute "insight into" for "insightful information about"--"...may provide insight into groundwater dynamics..."	Mechanics - Text	Comment addressed in text.
404	Jane Wagner-Tyack	Communication Consultant	4.1.2	Correct the parallelism of the numbered items: "1. They use an existing data source...2. They provide reliable...3. They are in many cases new, having been constructed..." Also correct the parallelism for the second numbered list, on page 4-4, by making the first item a sentence, as the others are: "1. They use an existing data source and have a historical data record;"	Mechanics - Text	Comment addressed in text.
405	Jane Wagner-Tyack	Communication Consultant	4.1.2	Make this two sentences: "...San Joaquin County's Flag City wells). These will be monitored..."	Mechanics - Text	Comment addressed in text.
406	Jane Wagner-Tyack	Communication Consultant	4.1.3	Correct agreement: "using a CASGEM-approved ... method..." or "using CASGEM-approved...methods..."	Mechanics - Text	Comment addressed in text.
407	Jane Wagner-Tyack	Communication Consultant	4.1.3	Add an "s" to "include"--"...measurement equipment...includes..."	Mechanics - Text	Comment addressed in text.
408	Jane Wagner-Tyack	Communication Consultant	4.1.5	Change "were" to "was" for correct subject/verb agreement: "...spatial location...was based..."	Mechanics - Text	Comment addressed in text.
409	Jane Wagner-Tyack	Communication Consultant	4.3	Change "are" to "is"--"the representative monitoring network is used..."	Mechanics - Text	Comment addressed in text.
410	Jane Wagner-Tyack	Communication Consultant	4.3.1	Add comma, and "they" in the second sentence: "These wells are equipped...consistent measurements, and they represent..."	Mechanics - Text	Comment addressed in text.
411	Jane Wagner-Tyack	Communication Consultant	4.3.5	Revision: "The representative monitoring network consists of a total of 10 monitoring wells, a density of 0.8 wells per 100 square miles."	Mechanics - Text	Comment addressed in text.
412	Jane Wagner-Tyack	Communication Consultant	4.3.5	Add "s" to "meet"--"The total number...meets DWR's recommendations..."	Mechanics - Text	Comment addressed in text.
413	Jane Wagner-Tyack	Communication Consultant	4.7	Insert "a" between "present" and "limitation"--"...wells present a limitation..."	Mechanics - Text	Comment addressed in text.
414	Jane Wagner-Tyack	Communication Consultant	6.1	Correct spelling of "offset" to "offset."	Mechanics - Text	Comment addressed in text.
415	Jane Wagner-Tyack	Communication Consultant	6.2.1	Third bullet: correct spelling to "cost-effective."	Mechanics - Text	Comment addressed in text.
416	Jane Wagner-Tyack	Communication Consultant	6.2.3	For correct subject/verb agreement, change "were" to "was"--"The initial set...was reviewed..." Next sentence, change "are" to "is"--"A final list...is included..."	Mechanics - Text	Comment addressed in text.
417	Jane Wagner-Tyack	Communication Consultant		PLEASE PROVIDE A MAP SHOWING THE LOCATIONS OF THE PROJECTS.	Projects and Management Actions	A map of project locations has been added to Section 6.1.2 (Projects).
418	Jane Wagner-Tyack	Communication Consultant	Table 6-1	Suggest footnoting the annual cost of Project 4 to explain why it is so much higher than the others. (Mostly annual cost of water purchase.)	Mechanics - Text	Description in text in Section 6.2.4.4 for Project 4 clarifies the estimated costs for this project.
419	Jane Wagner-Tyack	Communication Consultant	Table 6-1	For Project 11, Current Status, change "partied" to "parties."	Mechanics - Text	Comment addressed in text.
420	Jane Wagner-Tyack	Communication Consultant	Various	In most of the project descriptions that follow, subject/verb agreement needs to be corrected in one of these ways: "The estimated cost for this project includes..." or "The estimated costs for this project include..."	Mechanics - Text	Comment addressed in text.
421	Jane Wagner-Tyack	Communication Consultant	6.2.4.3	"Installation" is the subject of the sentence. Everything between that and the verb is part of a modifying phrase. So the verb must be "is", not "are"--"Installation...is in the planning stage."	Mechanics - Text	Comment addressed in text.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
422	Jane Wagner-Tyack	Communication Consultant	6.2.4.4	Suggest inserting "reduced" before "availability" to better reflect the meaning of the sentence--"The reduced availability...would be the only potential cause for a reduction in SWFT production."	Mechanics - Text	Comment addressed in text.
423	Jane Wagner-Tyack	Communication Consultant	6.2.4.5	Insert "been" between "has" and "completed"--"...project has been completed..."	Mechanics - Text	Comment addressed in text.
424	Jane Wagner-Tyack	Communication Consultant	6.2.4.5	Insert "been" between "has" and "completed"--"...project has been completed..."	Mechanics - Text	Comment addressed in text.
425	Jane Wagner-Tyack	Communication Consultant	6.2.4.5	Insert "been"--"Construction for this project has been completed" (or "is complete").	Mechanics - Text	Comment addressed in text.
426	Jane Wagner-Tyack	Communication Consultant	6.2.4.6	Change "has" to "have"--"until 7 years...have elapsed."	Mechanics - Text	Comment addressed in text.
427	Jane Wagner-Tyack	Communication Consultant	6.2.4.6	Delete "s" on "on permits", or delete "a."	Mechanics - Text	Comment addressed in text.
428	Jane Wagner-Tyack	Communication Consultant	6.2.4.7	Delete "at"--"Design for this project is 60 percent complete..."	Mechanics - Text	Comment addressed in text.
429	Jane Wagner-Tyack	Communication Consultant	Various	For most of the Time-Table statements that follow, insert "was" before "initiated" or substitute "began."	Mechanics - Text	Comment addressed in text.
430	Jane Wagner-Tyack	Communication Consultant	6.2.4.8	Substitute "overlie" for "overly. Insert "subject to" between "and" and "historical"--"...dependent on groundwater and subject to historical overdraft..."	Mechanics - Text	Comment addressed in text.
431	Jane Wagner-Tyack	Communication Consultant	6.2.4.8	For "implemented," substitute "done," or say that a review "may be required."	Mechanics - Text	Comment addressed in text.
432	Jane Wagner-Tyack	Communication Consultant	6.2.4.8	Last line, insert hyphen between "as" and "needed"--"...on an as-needed basis..."	Mechanics - Text	Comment addressed in text.
433	Jane Wagner-Tyack	Communication Consultant	6.2.5.1	Correct punctuation: "The contract project is long-term; however, water availability..."	Mechanics - Text	Comment addressed in text.
434	Jane Wagner-Tyack	Communication Consultant	6.2.5.1	Add "the" between "with" and "landowner."	Mechanics - Text	Comment addressed in text.
435	Jane Wagner-Tyack	Communication Consultant	6.2.5.3	Change "withdraw" to "withdrawal" and change the second "pumping" to "pumped"--"NSJWCD will control the withdrawal of the banked water...and then conveying the pumped groundwater...."	Mechanics - Text	Comment addressed in text.
436	Jane Wagner-Tyack	Communication Consultant	Figure 4-3	Praise up front: Some of the graphics in this document are very good, and could serve as a model for others that are not so good. Figure 4-3 is sharp, and the colors and shapes can be adequately differentiated. It is worth bearing in mind that fairly or not, every unclear graphic is likely to be perceived as intentionally deceptive.	Mechanics - Graphics	Comment noted. No edits made to text.
437	Jane Wagner-Tyack	Communication Consultant	Figure 1-3	Colors, especially in the legend, are hard to distinguish, and of course Woodbridge Irrigation District will need to be added back. Also, not every area has a corresponding number. Would broadening the color scale from blue/green help?	Mechanics - Graphics	Woodbridge Irrigation District was added back into the figure. All areas have corresponding numbers. Blue/Green color scale is intentional to accommodate for color blindness.
438	Jane Wagner-Tyack	Communication Consultant	Figure 1-4	Legend and logo are fuzzy. Sacrifice the second frame?	Mechanics - Graphics	This figure was reimported into the document at a higher resolution.
439	Jane Wagner-Tyack	Communication Consultant	Figure 1-5	Colors for East Contra Costa and Tracy subbasins are hard to differentiate, and Tracy and Cosumnes are too similar. 1-5 symbol is fuzzy.	Mechanics - Graphics	Darkened the borders around neighboring groundwater subbasins. Reimported the map at a higher resolution.
440	Jane Wagner-Tyack	Communication Consultant	Figure 1-7	County boundaries are not adequately distinguishable from other lines. Sacrifice the second frame?	Mechanics - Graphics	Reimported at higher resolution. As there is no inset map, it is unclear which second frame is being referred to in the comment.
441	Jane Wagner-Tyack	Communication Consultant	Figure 1-8	Fuzzy. Also, the colors make it hard to distinguish SDACs from DACs at this scale. Make it bigger if possible.	Mechanics - Graphics	Added darkened outlines to the DAC and SDAC polygons. Reimported into document at higher resolution.
442	Jane Wagner-Tyack	Communication Consultant	Figure 1-9	Sacrifice the second frame to gain a little size? The map on the facing page doesn't have it. Here and afterward, favor a slightly larger map over a second frame for the figure.	Mechanics - Graphics	This map does not have a second frame. Unclear what this comment is referring to.
443	Jane Wagner-Tyack	Communication Consultant	Figure 1-10	Numbers for roads and highways are fuzzy.	Mechanics - Graphics	This figure was reimported into the document at a higher resolution.
444	Jane Wagner-Tyack	Communication Consultant	Figure 1-11	Fuzzy. Also, Lakes and Waterways are too similar in color to Carnegie SVRA, even though the latter has a border.	Mechanics - Graphics	This figure was reimported into the document at a higher resolution.
445	Jane Wagner-Tyack	Communication Consultant	Figure 2-3	Highway symbols could be sharper. Landscape orientation is good.	Mechanics - Graphics	This figure was reimported into the document at a higher resolution.
446	Jane Wagner-Tyack	Communication Consultant	Figure 2-6	Really nice.	Mechanics - Graphics	Comment noted. No edits made to text.
447	Jane Wagner-Tyack	Communication Consultant	Figure 2-7	Identify Bear Creek, as in Figure 1-5.	Mechanics - Graphics	Bear Creek was labeled like in Figure 1-5.
448	Jane Wagner-Tyack	Communication Consultant	Figure 2-8	Some colors are too similar for adjacent watersheds, and blue is always problematic if it is also used for Lakes and Waterways.	Mechanics - Graphics	Colors that were similar were changed in adjacent watersheds.
449	Jane Wagner-Tyack	Communication Consultant	Figure 2-9	Too small; it is very difficult to read city names. Given general layout issues on this and the following page, there probably isn't much that can be done about this.	Mechanics - Graphics	Comment noted. No edits made to text.
450	Jane Wagner-Tyack	Communication Consultant	Figure 2-10	A bit fuzzy. Especially since there is room, show this with a landscape orientation.	Mechanics - Graphics	This figure was reimported into the document at a higher resolution.
451	Jane Wagner-Tyack	Communication Consultant	Figure 2-11	A lot of place and feature names on this map are virtually illegible, and the legend is too small. Figure 2-12 is only slightly better. Maybe nothing can be done about this.	Mechanics - Graphics	Comment noted for consideration in updates to the GSP. This figure cannot be edited to improve legibility.
452	Jane Wagner-Tyack	Communication Consultant	Figure 2-13	Fuzzy.	Mechanics - Graphics	This figure was reimported into the document at a higher resolution.
453	Jane Wagner-Tyack	Communication Consultant	Figure 2-16	The underlying grid distracts from the formations this figure is intended to show, which are hard to distinguish at best. Some colors in the legend are too similar--how is Valley Springs distinguished from Tulare? The letters on the color blocks are illegible, and they are important because they are referred to in the Table that follows. Road and highway designations on the map are fuzzy. Why is the word "Flood" floating on the right in Calaveras County?	Mechanics - Graphics	Removed unnecessary labels. Reimported into document at a higher resolution. The geology map is georeferenced from the original source and cannot be edited.
454	Jane Wagner-Tyack	Communication Consultant	Figure 2-17	It looks like most of the map units shown in the legend are not features of this subbasin, so maybe this could be simplified by including only those that are. Letters on the color blocks are illegible. It is hard to tell where the Stockton Arch is. Part of the name of "Bear" on the right is missing. Would it be possible to lay the map unit colors and detail over a map with less fuzzy place-name detail and just major roads and water features?	Mechanics - Graphics	Comment noted. This map is georeferenced from its original source and cannot be edited.
455	Jane Wagner-Tyack	Communication Consultant	Figures 2-20 to 2-22	Most of the detail in these cross-sections is completely illegible. Of course most readers will not care about the individual well identifiers, but if this information is important enough to include in the GSP (and it is referred to several times in the text--for example, some of these well identifiers apparently have asterisks), then it is important enough to be legible. Using the full page instead of allowing large margins might help a bit, as would putting each cross-section on its own page. Could the legends go underneath instead of beside the cross-sections?	Mechanics - Graphics	Figures reimported at a higher resolution into the document.
456	Jane Wagner-Tyack	Communication Consultant	Figures 2-23 and 2-24	Well depth colors are indistinguishable, and identifiers could be sharper. Bigger might be better. Landscape orientation would help.	Mechanics - Graphics	Changed well depth color ramp to be more distinguishable and increased size of symbol. Also changed color ramp of the aquifer elevations so that symbols are easier to distinguish.
457	Jane Wagner-Tyack	Communication Consultant	Figure 2-26	There is certainly room here for a landscape orientation, which has just been used for Figure 2-25.	Mechanics - Graphics	If there is no issue with reading the map, the orientation of the map was not changed.

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458	Jane Wagner-Tyack	Communication Consultant	Figure 2-27	Should definitely be shown in landscape. There is room.	Mechanics - Graphics	Figure placed in landscape.
459	Jane Wagner-Tyack	Communication Consultant	Figure 2-28	Why no legend? Is everyone supposed to know what these symbols represent?	Mechanics - Graphics	Clarifying text was added to Section 2.1.9.2.3.2 (Ion Composition).
460	Jane Wagner-Tyack	Communication Consultant	Figure 2-31	Different chloride concentrations are impossible to distinguish. I'm working from a hard copy, and just to be sure that I wasn't quibbling about something that would be visible in a different medium, I downloaded this figure and expanded it to fill my desktop computer screen. I still can't tell the difference in concentrations. Don't use a graded color scale?	Mechanics - Graphics	The color ramp of the concentrations was changed and the size of the points was increased for clarity.
461	Jane Wagner-Tyack	Communication Consultant	Figure 2-32	See comments for Figure 2-31. There is room for landscape orientation for both these figures, but that alone won't solve the problem.	Mechanics - Graphics	The color ramp of the concentrations was changed and the size of the points was increased for clarity.
462	Jane Wagner-Tyack	Communication Consultant	Figure 2-34	This figure is remarkably legible, given the detail it has to convey. The legend is nice and sharp.	Mechanics - Graphics	Comment noted. No edits made to text.
463	Jane Wagner-Tyack	Communication Consultant	Figures 2-37 and 2-38	Use landscape orientation. Maybe we'll be lucky and they will end up on facing pages.	Mechanics - Graphics	If there is no issue with reading the map, the orientation of the map was not changed.
464	Jane Wagner-Tyack	Communication Consultant	Figure 2-39	Correct name of Swenson Gold Course well. It is Swenson Golf Course. Landscape?	Mechanics - Graphics	Spelling error fixed.
465	Jane Wagner-Tyack	Communication Consultant	Figure 2-50	This figure is misleading in an important way. The subbasin has a large enough change in groundwater elevation that DWR has put us in the critical overdraft category, but all that shows here is a faintly wavy line at the top of the graph. A separate graph showing everything above 50 MAF at a different scale would more honestly illustrate the situation.	Mechanics - Graphics	The figure has been developed to show the impact of groundwater extraction on overall amount of fresh groundwater in storage. The potential for undesirable results associated with groundwater accessibility are addressed through the Chronic Lowering of Groundwater Levels Sustainability Indicator.
466	Jane Wagner-Tyack	Communication Consultant	Figure 2-51	In the legend, green and blue, and brown and pink, are too difficult to distinguish, although they work OK in the chart itself. Make the boxes bigger? Landscape orient this figure?	Mechanics - Graphics	Figure placed in landscape.
467	Jane Wagner-Tyack	Communication Consultant	Figures 2-52 and 2-53	Landscape for both?	Mechanics - Graphics	Placed in landscape. Reimported Figure 2-53 at a higher resolution.
468	Jane Wagner-Tyack	Communication Consultant	Figure 2-54	Yellow hard to see, orange impossible, especially if it is in a city. Landscape?	Mechanics - Graphics	Changed color ramp in the figure to be more visible. Also enlarged the size of the points.
469	Jane Wagner-Tyack	Communication Consultant	Figures 2-55 through 2-58	Symbols for different levels of maximum TDS are indistinguishable. (Figure 2-58 is slightly sharper than the others.) Compare to Figure 4-3. Landscape?	Mechanics - Graphics	These 4 figures were reimported into the document at a higher resolution to help distinguish between the different levels.
470	Jane Wagner-Tyack	Communication Consultant	Figure 2-64	Road identifiers are REALLY fuzzy, and county names and other features are almost illegible. Numbers in the legend are fuzzy. Is this partly the result of merging the regular subbasin map with InSAR data?	Mechanics - Graphics	This figure was reimported into the document at a higher resolution to help distinguish between the different levels.
471	Jane Wagner-Tyack	Communication Consultant	Figures 2-65 and 2-66	Landscape?	Mechanics - Graphics	Figures were reimported at a higher resolution.
472	Jane Wagner-Tyack	Communication Consultant	Figures 2-67, 2-68, and 2-69	Yellow is too hard to see. Figure 2-68 is also fuzzier than the other two.	Mechanics - Graphics	The two figures with yellow indicating Vegetative areas were changed to orange (2-67 and 2-69). Figure 2-68 was reimported into the document at a higher resolution.
473	Jane Wagner-Tyack	Communication Consultant	Figure 2-101	This figure warrants its own page, with larger boxes to make the colors in the legend distinguishable. Add labels on the right side of the graph above and below the middle line for Demand and Supply, and split the legend identifiers accordingly to help the reader match them to the colors on the graph.	Mechanics - Graphics	Figure was placed on its own page and made larger in response to this comment.
474	Jane Wagner-Tyack	Communication Consultant	Figure 2-102	Again, the colors in the legend are hard to differentiate, although they work reasonably well in the graph itself.	Mechanics - Graphics	Put this figure on its own page and made the page landscape.
475	Jane Wagner-Tyack	Communication Consultant	Figure 3-2	Colors for Select Unincorporated Communities and Cities are too hard to differentiate.	Mechanics - Graphics	Select Unincorporated Communities was in the legend in error.
476	Jane Wagner-Tyack	Communication Consultant	Figures 4-1 and 4-2	Fuzzy. Compare to Figure 4-3.	Mechanics - Graphics	Figures were reimported at a higher resolution.
477	Jane Wagner-Tyack	Communication Consultant	Figure 2-18	In earlier comments, I suggested adding "Water" to the title between "Fresh" and "Elevation." If you do that, add "Water" in the legend also.	Mechanics - Graphics	Comment addressed in figure.
478	Jane Wagner-Tyack	Communication Consultant		The case for setting minimum thresholds only for salinity based on the fact that other constituents of concern are managed through existing management and regulatory programs is not persuasively supported in the GSP. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	See Master Response 3 -- Water Quality.
479	Jane Wagner-Tyack	Communication Consultant		Prefer the active voice to the passive voice to make clear who is responsible for the content of assertions. [SEE MORE SPECIFICS IN COMMENT LETTER]	Clarifying Edit	Edits made throughout GSP to remove passive voice.
480	Jane Wagner-Tyack	Communication Consultant		Include more information about public water systems. [SEE MORE SPECIFICS IN COMMENT LETTER]	Basin Setting	1) An appendix has been added to the GSP which documents the 432 community water systems that received hard copy outreach materials throughout the GSP development process. Section 1.3.4.4 (Stakeholder Database) was updated to list the dates that outreach materials were mailed to community water systems. An analysis was performed to map community water systems that are DAC or SDAC areas, and the results of this analysis are presented in the added appendix. 2) Section 1.3.1 (Beneficial Uses and Users in the Subbasin) was updated to include community water systems and reference the added appendix.
481	Jane Wagner-Tyack	Communication Consultant		Propose a Subbasin-wide well permitting standard that will address sustainability goals, or provide a justification for not doing so. [SEE MORE SPECIFICS IN COMMENT LETTER]	Well Permitting	Well permitting requirements for San Joaquin, Calaveras, and Stanislaus counties are identified in Section 1.2.3.4 (Well Permitting) of the GSP. An additional subsection has been added to include Sacramento County well permitting requirements. GSAs do not have well permitting authority, unless as authorized by the respective county. SGMA does not provide a GSA with the authority to issue or regulate permits for the construction, modification, or abandonment of groundwater wells, but maintains the authority for well permitting activities with the county. (Water Code, § 10726.4(b).) A GSA may request the county provide the GSA with notice of any permit applications (10726.4(b)) and a GSA may impose spacing requirements on new well construction (10726.4(a)(1)). The ESJGWA will continue to coordinate with its member GSAs that are well permitting agencies. Language has been added to Section 4.7.1 (Plan to Fill Data Gaps) referencing applicable Calaveras County, Stanislaus County, and San Joaquin County monitoring well drilling standards.
482	Jane Wagner-Tyack	Communication Consultant		Nitrates: 2.2.4.2 says, "increased nitrate concentrations have not been found to be related to groundwater management activities in the Subbasin." This statement does not define "groundwater management activities" and does not identify those responsible for the finding of no relationship. Meanwhile, other evidence appears to contradict the assertions. Prior to the assertion above, in the same paragraph, is the statement that "recent nitrate measurements above the MCL correspond to the overall historical trends and highlight areas with elevated Nitrate concentrations in more recent years." What is the evidence that these elevated concentrations are unrelated to groundwater management? The superficial treatment of dairies in the GSP is notable given the fact that milk was San Joaquin County's second top commodity in 2017. This is relevant to the discussion of nitrates as well as point source contamination (see below). Dairies are confined animal feeding operations (CAFOs), and CAFOs are linked to nitrates in water. Was any effort made to track nitrate relative to dairy operations? [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	See Master Response 3 -- Water Quality.

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Comment #	Commenter	Commenter Organization	Section, Figure, or Table Number	Comment	Category	Response to Comment
483	Jane Wagner-Tyack	Communication Consultant		Arsenic: 2.2.4.3 says, "Increased arsenic concentrations have not been found to be related to groundwater management activities in the Subbasin." Again, the statement does not define "groundwater management activities" and does not identify those responsible for the finding of no relationship. Meanwhile, 4.3 says "Arsenic will be monitored for information purposes and to track trends in arsenic concentrations. The Groundwater Sustainability Plan (GSP) does not include sustainability goals, measurable objectives, or minimum thresholds for arsenic." Why does the GWA plan to monitor arsenic if it is unrelated to groundwater management? Is it likely that goals, objectives, and minimum thresholds will be set later on the basis of monitoring? The rationale for not setting minimum thresholds for arsenic, nitrogen, and sulfate (at 3.2.3.1.1 Description of Undesirable Results) is that "these constituents are managed through existing management and regulatory programs within the Subbasin." For example, the GSP mentions monitoring through the Central Valley Regional Water Quality Control Board Waste Discharge Requirement (WDR) Dairy program. The GWA will rely on "coordination with existing agencies" to ensure that regulations are being met. "Additionally, SGMA does not give GSAs land use authority, so a nexus must be present between groundwater conditions and groundwater pumping activities." We need to explain what "nexus" refers to in this context. Also, how will the GSA coordinate with existing agencies? [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	See Master Response 3 -- Water Quality.
484	Jane Wagner-Tyack	Communication Consultant		Point Sources: As with nitrate and arsenic, the GSP provides no convincing support for the statement at 2.2.4.4 that "Point source contamination has not been found to be related to groundwater management activities in the Subbasin." In fact, there is considerable evidence to the contrary. Section 1.2.2.2.4, Division of Drinking Water, says, "DDW data was used in the development of this GSP to identify point-source contamination areas." However, the use of that data appears to have been restricted in the GSP, which notes (2.2.4.4) that "point sources include leaking underground storage tanks, landfills, historical dry cleaners, and others" (emphasis added). CAFOs are point sources under NPDES regulations. Figure 2-62 accompanying the point source discussion shows only Active Investigation and Remediation Sites, not all point-source contamination areas, and the discussion focuses on fuel sites. The claim that "Point source contamination has not been found to be related to groundwater management activities in the Subbasin" is clearly contradicted by 2.2.4.4.1, which discusses plumes that have been publicized. (It would be better not to introduce this section with the word "publicized," which suggests that the plumes are included in the GSP primarily because people already know about them.)	Groundwater Quality	Language was added to Section 2.2.4.4 (Point Sources) stating that new projects undertaken by GSAs as part of GSP implementation will evaluate contaminant plume movement in a CEQA document, and management through existing regulatory agencies was highlighted. The sentence: "Point source contamination has not been found to be related to groundwater management activities in the Subbasin" was deleted. The description of plumes as "publicized" was retained, as this language was developed in coordination with City of Lodi representatives to best reflect water quality conditions in the GSA.
485	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	2.3	Differences in demand largely drive the amount of groundwater pumped, and sustainability cannot be met if the largest outflow of the water budget, groundwater pumping, is estimated solely based on consumptive use methodology as closure to the groundwater water balance. If this information is available, it should be used. [SEE MORE SPECIFICS IN COMMENT LETTER]	Water Budget	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
486	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	2.3	A water budget should also be developed to address reasonably foreseeable drought conditions.	Water Budget	All of the model scenarios include a broad range of different hydrologic years, discussed in 2.3.2 (Identification of Hydrologic Periods). Several major drought events were included as part of the 50-year hydrologic period from water year 1969 through 2018 and in the historical simulation period from water year 1996 through 2015. Tables 2-16 and 2-17 summarize some of the water budget components (including precipitation) by San Joaquin River Index water year type for the historical and projected conditions model simulations.
487	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	Figures 2-37 and 2-38	In contrast to the draft GSP's analysis presenting the groundwater water budget as relatively in balance, the GSP also acknowledges the large groundwater depression in the central portion of the Subbasin (GSP Figures 3-37 and 3-38). Long-term trends from 10 wells distributed across the Subbasin with periods of record greater than 40 years show that groundwater elevations have declined over time throughout most of the Subbasin. The average groundwater decline was quantified as -0.5 ft/yr for the period 1996-2015. However, due to the fact that this analysis only includes two wells near the cone of depression, the investigation should be expanded to focus on additional wells located within the sphere of influence of the problem area. However, due to the fact that this analysis only includes two wells near the cone of depression, the investigation should be expanded to focus on additional wells located within the sphere of influence of the problem area. [SEE MORE SPECIFICS IN COMMENT LETTER]	Basin Setting	The two wells near the cone of depression are from Figure 2-34, which shows hydrographs from select representative wells distributed across the Subbasin. These wells are just a small subset of those used to create Figures 3-37 and 3-38, which show the groundwater elevations in First Quarter 2017 and Fourth Quarter 2017, respectively. These maps were created using groundwater elevations from all available wells with data for those time periods.
488	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	Figure 2-39	This is also true for the Vertical Gradient analysis provided in draft GSP Section 3.4.1.2.1, which lacks any wells located in the southern portion of the Subbasin (GSP Figure 3-39). Groundwater conditions in additional wells should be depicted in the GSP and monitored in order to track the occurrence of undesirable groundwater effects. Additional wells would also assist in tracking the benefits of recharge [SEE MORE SPECIFICS IN COMMENT LETTER]	Basin Setting	Figure 2-39 shows the current multiple completion wells in the Subbasin. The vertical gradient analysis lacks wells in the southern portion of the Subbasin because there weren't nested wells in that area with sufficient historical data. If a need for more nested and/or clustered monitoring wells is recognized, the monitoring network will be reevaluated as updates to the GSP occur.
489	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	Figures 2-37 and 2-38	Furthermore, draft GSP Figures 3-37 and 3-38 lack districts and landmarks, making it difficult to interpret the location and detail of the groundwater depression, including the overlying water agencies. In addition, indicating groundwater levels below ground surface (BGS), rather than above mean sea level (MSL) would be helpful to better understand groundwater conditions.	Mechanics - Graphics	City boundaries and labels were added to address the comment. Redoing the analysis for DTW in addition to GWE is beyond the scope required in the GSP.
490	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	Multiple	The draft ESJ GSP unduly minimizes Subbasin challenges related to groundwater storage and overdraft... Thus, while DWR has listed the ESJ Subbasin as critically overdrafted, the ESJ GSP appears to claim that the Subbasin has a nearly balanced water budget and there are minimal problems with groundwater overdraft. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Storage	See Master Response 4 - GW Storage.
491	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	2.3	The ESJ Draft GSP also quotes a series of different groundwater overdraft values, leading to unnecessary confusion regarding conditions in the Subbasin. The Annual Water Budget in Table 2-15 is averaged over the entire basin, with a change in groundwater storage of 41,000 AF/year (1996-2015), 48,000 AF/year (past 50 years) and 34,000 AF/year (future 50 years). However, under DWR's intermediate climate change scenario, the annual groundwater overdraft will increase to 57,000 AF/year, from the previous estimate of 34,000 AF/year. Without climate change, the GSP Executive Summary states that, to reach sustainability, the basin must offset and/or recharge approximately 78,000 AF/year [SEE MORE SPECIFICS IN COMMENT LETTER]	Water Budget	The multiple overdraft values are for the different modeling scenarios required by SGMA regulations. The ESJGWA supports the description of the Subbasin water budget in the GSP.
492	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	2.3.7	The ESJ Draft GSP should acknowledge the reality of climate change scenarios prescribed by DWR, and highlight the fact that the estimated groundwater pumping offsets and/or recharge of 78,000 AF/year is a conservative estimate that may in reality be closer to 101,000 AF/year (calculated by increasing the change in groundwater storage from 34,000 AF/year (projected conditions for 50-year period) to 57,000 AF/year (climate change scenario).	Climate Change	Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Due to the uncertainty around climate projections in the 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040. Therefore, climate change was not included in the sustainable yield analysis or the estimated amount of direct or in lieu recharge and/or reduction in pumping needed for the Subbasin to reach sustainability. Climate change will continue to be evaluated with every update to the GSP and estimates of projects and management actions will continue to evolve with refinements to the model. Comment noted for follow up in next round of model refinements and updates to analyses.
493	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	6.2.4.8	The ESJ GSP should expand Project 8 to include additional water transfers within the Subbasin for recharge. The ESJ GSP should expand Project 8 to include additional water transfers within the Subbasin for recharge. In addition, Project 8 should not be limited to transfers solely from OID and SSJID to the SEWD and CSJWCD service areas. Instead, all lands subject to declining groundwater levels (GSP Figures 3-37 and 3-38) and with at least Moderately Good recharge potential (GSP, Figure 2-14) should be included. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	See Master Response 5 - Projects.
494	Laura Folglia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	6.2	The GSP should also promote smaller recharge projects whereby water users may divert surplus surface water supplies for recharge on their own lands. This could be accomplished, for instance, by the creation of a program within the GSP that landowners could join if specified criteria are met. Creation of such a program would assist smaller recharge projects with completion of complex permitting and review requirements. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	1) GSP projects have been proposed by individual GSAs and will be implemented at the GSA level. Although the ESJGWA does not have authority to direct project design or implementation, the ESJGWA's role will be to oversee essential project coordination by identifying where projects would be beneficial, synthesize how GSAs are doing projects, and make sure that GSA projects are getting the Subbasin to sustainability. 2) Flood-Managed Aquifer Recharge (Flood-MAR) opportunities will be considered through ongoing coordination with existing agencies. Flood-MAR is an integrated and voluntary resource management strategy that uses flood water resulting from, or in anticipation of, rainfall or snow melt for managed aquifer recharge (MAR) on agricultural lands and working landscapes, including but not limited to refuges, floodplains, and flood bypasses. Flood-MAR can be implemented at multiple scales, from individual landowners diverting flood water with existing infrastructure, to using extensive detention/recharge areas and modernizing flood management infrastructure/operations (Source: https://water.ca.gov/Programs/All-Programs/Flood-MAR). 3) See also: Master Response 5 - Projects.

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495	Laura Folgia, Katrina Arredondo, Olin Applegate	Larry Walker Associates	6.2	The efficacy of these projects in their potential to recharge the aquifer should be analyzed using a model scenario with the GSP Eastern San Joaquin Water Resources Model (ESJWRM).	Projects and Management Actions	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
496	David Simpson	NSJWCD	NA	Woodbridge ID and recharge projects within the District need to be included in the Final GSP.	Projects and Management Actions	Woodbridge Irrigation District (WID) was part of the ESJGWA when projects were solicited, and WID did not propose any GSP projects at that time. WID's existing projects are captured in the Water Budget.
497	David Simpson	NSJWCD	NA	The GSP should contain a statement of concern relating to SWRCB plans to reduce flows available for use by 40-60%. The GSP references climate change yet a far greater threat to sustainability in the basin is the reallocation of surface water flows currently being undertaken by the SWRCB. The Draft GSP assumes constant or increased availability of surface water yet the SWRCB has threatened to take 40-60% of the currently available flow in several key rivers. With reduced availability of surface water for existing uses and groundwater recharge, there is little to no hope of achieving groundwater sustainability without massive new infrastructure, draconian pumping restriction and increased regulation.	Plan Implementation	1) The ESJGWA acknowledges that there are many factors that could affect the availability of surface water and that has to be evaluated by GSAs in the implementation of projects. The process of providing annual reports to DWR and of GSAs self-reporting to the ESJGWA will allow the ESJGWA to update the Plan and adjust the implementation course as needed based on conditions. The GSP allows project implementation to be updated as needed, and it is currently too speculative to say what the impact will be from the proposed SWRCB regulation, as the SWRCB has not yet determined how the regulation will be implemented. 2) A data gaps and uncertainties subsection was added to Chapter 7 (Plan Implementation): The ESJGWA acknowledges that there are many factors that could affect the availability of surface water, including the SWRCB plans to reduce flows available for use by 40-60% as part of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Update). Such regulations will need to be evaluated by GSAs in the implementation of projects. The process of GSAs providing biannual reports will allow for the ESJGWA to update the Plan and adjust the implementation course as needed based on conditions. The GSP allows project implementation to be updated as needed, and it is currently too speculative to say what the impact will be from the Bay-Delta Plan Update regulation, as the SWRCB has not yet determined how the regulation will be implemented.
498	David Simpson	NSJWCD	Potential Projects	Lakso should be spelled Lakso. Manasero should be spelled Manassero.	Clarifying Edit	Comment addressed in text.
499	Barbara Barrigan-Parrilla	Restore the Delta		Restore the Delta observes in Table 2-17 (p. 2-133) of the Draft GSP Chapter 2 finds that in wet years groundwater storage is projected to increase by an annual average of 52 TAF; 23 TAF in above normal years; and decrease by 7 TAF in below normal years, 44 TAF in dry years, and 39 TAF in critically dry years. Overall, over the 50-year planning horizon of the Draft GSP, groundwater storage in the Subbasin is projected to decrease an average of 34 TAF. Over 50 years, this is a cumulative loss of stored freshwater of about 1.7 MAF. This is a much smaller amount than other groundwater sustainability agencies are contemplating elsewhere in California, but it still represents a cumulative loss to storage in our Subbasin. This is about 3.2 percent of the total subsurface freshwater storage of 53 MAF cited elsewhere in the Draft GSP.	Groundwater Storage	See Master Response 4 - GW Storage.
500	Barbara Barrigan-Parrilla	Restore the Delta		If neighboring subbasins do less to recharge their underground supplies hypothetically it would mean that the GWA would have to do more, and vice-versa, to avoid undesirable results. Restore the Delta urges the GWA to recognize this interrelationship more explicitly and to adopt a policy of encouraging neighbors to do their fair share of net recharge (combining "additional recharge or pumping reduction") activities as they implement their GSPs.	Plan Implementation	As neighboring plans are developed, the ESJGWA will be reviewing and providing input. The ESJGWA will review and will provide comment on neighboring Subbasins' GSPs if their plans adversely affect our ability to achieve sustainability.
501	Barbara Barrigan-Parrilla	Restore the Delta		We recommend also that the Final GSP incorporate reviews of what neighboring GSAs and their GSPs are contemplating in this regard so that readers of the GWA's GSP understand what this "neighborhood baseline" consists of when it comes to assessing undesirable results indicators and evaluating the success or failure of neighbors' implementation projects.	Interbasin Coordination	As the neighboring groundwater subbasins are not designated as critically overdrafted, their GSPs are on a later timeline, so analyses are not available for direct comparison. The ESJGWA will continue to coordinate with neighboring basins as more information is available.
502	Barbara Barrigan-Parrilla	Restore the Delta		Restore the Delta is by and large disappointed with the Draft GSP's climate change analysis. The Draft GSP provides no broad overview of what effects climate change is likely to have on Subbasin groundwater resources. There is not even a summary of the California Fourth Climate Change Assessment commentary on what effects are expected in California as we step-by-step enter that climate future. Instead, the Draft GSP presents only a turgid, technical description of its use of DWR climate-change models and the results of those models. This should have been limited to an appendix, and the results simply summarized in the Draft GSP. Instead, the modeling results are presented with little context. The state has presented a comprehensive, region-by-region analysis of climate change effects, and the Draft GSP needs to apply it—both to educate the Subbasin publics (including disadvantaged communities) and to place DWR-based climate change analytic results in context. As drafted, the climate change analysis has been done; GSA staff can check the box for providing a minimally adequate GSP to the state. The water users of the Subbasin deserve more, however. They deserve a Final GSP that tells them what the analysis means for the future of Subbasin groundwater resources and communities, and how it plays out relative to each of the sustainability indicators the Draft GSP puts forward.	Climate Change	The ESJGWA has noted the resource provided and has determined that it is not necessary to include a summary of the California Fourth Climate Change Assessment. The climate change analysis meets the requirements of the GSP. Climate change will continue to be evaluated with every update to the GSP.
503	Barbara Barrigan-Parrilla	Restore the Delta	Figure 2-37 and 2-38	When compared with the groundwater elevation maps that show the cones of depression (Figures 2-37 and 2-38), it is evident that the cones of depression are located directly beneath the Calaveras River and Mormon Slough, which are losing streams—their flows are now disconnected from the groundwater system, as shown in Figure 2-66 (p. 2-99). There also appears to be a portion of a cone of depression beneath Dry Creek near to the Mokelumne River as well, though this is not labeled with the same color as the cone of depression in the Eastern San Joaquin basin. This means that there is great potential for saltwater intrusion, which the draft GSP gently acknowledges. Net subsurface flow is from the west to the east. But the draft GSP is silent about the ecological consequences of having losing streams spanning the groundwater basin. [SEE MORE SPECIFICS IN COMMENT LETTER]	Interconnected Surface Water	Comment noted. As stated in the GSP, seawater intrusion is not present in the Subbasin and is not anticipated to occur; however, minimum thresholds and measurable objectives have been established to be protective in the event that sea level rise ever does occur. The ecological consequences of losing streams is the Subbasin requires further study. Groundwater provides benefits to gaining streams through additional baseflow and through influences on water chemistry and temperature.
504	Barbara Barrigan-Parrilla	Restore the Delta	Figure 1-8	Disadvantaged communities are forced to live with existing disadvantaged streams—losing streams. The Draft GSP appears to do little to rectify these existing undesirable conditions—undesirable at least from the standpoint of the disadvantaged communities forced to live without healthy riverine ecosystems and recreational and angling beneficial uses of them in their midst.	Projects and Management Actions	The ESJGWA acknowledges conditions of overdraft and in response has identified projects that will recharge and/or offset up to 78,000 AFY to meet the Subbasin's sustainable yield. As groundwater levels stabilize, the gradient pulling water from losing streams will decrease when compared to conditions without such actions. The ESJGWA has not identified losing streams as a significant and unreasonable negative impact. See Master Response 2 - ISW.
505	Barbara Barrigan-Parrilla	Restore the Delta		This particular indicator lacks any recognition of the differential impact of falling groundwater elevations on disadvantaged communities relative to other groundwater pumpers like cities and agricultural enterprises. While the plan identifies disadvantaged communities (which we note above), it does not correlate explicitly the degree to which disadvantaged communities in the Subbasin are predominantly reliant on municipal/public or private water systems, or whether they are predominantly reliant on private wells. The Draft GSP provides no policies or program recommendations and needs that would address the question: if these conditions develop where disadvantaged residents lose their pumped groundwater supplies, what steps will the GWA take to mitigate such events and recover the utility of their public/private systems or wells? The Draft GSP would, it appears, wait until impacts on disadvantaged and other communities occur before any actions to prevent such occurrences would be taken. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	The ESJGWA supports using the minimum thresholds, measurable objectives, and interim milestones for the chronic lowering of groundwater levels sustainability indicator as written. SGMA does not require zero impact, and the ESJGWA has determined that it is not considered significant and unreasonable for wells belonging to the shallowest 10 percent of domestic wells to be dewatered, as the wells that are likely to be dewatered are those that are 50 years or older, have reached the end of their usable life, and would need to be replaced anyway. Data collected on Stanislaus County rural domestic wells that were dewatered in years 2014-2016, showed that the average depth of wells reported as dewatered was 91 ft bgs, and that 60 percent were shallower than 100 ft bgs. Additionally, the average well age for wells reported as dewatered was 55 years, and 52 percent were older than 50 years old. There are various well impact mitigation programs in place, therefore there were no changes were made to the GSP.
506	Barbara Barrigan-Parrilla	Restore the Delta		The Draft GSP recognizes just "increase in pumping costs due to greater lift" as an undesirable result relating to lowered groundwater elevations. The Draft GSP fails to provide any cost threshold beyond which point the GWA would presumably act on this triggered indicator. What level of cost increase is reasonable due to greater lift needs? Do public and private well systems need to be treated differently from a cost standpoint than single private wells? Will increased costs for wells operated by members of disadvantaged communities be treated the same or differently than other systems? Restore the Delta recommends that they should be treated differently so that ability to pay is taken into account. Just as important, what remedial action does the GWA commit to in order to stem impacts to disadvantaged community groundwater users when pumping costs rise? In short, whose groundwater pumping costs are going to be the GWA's yardstick for determining undesirable results, and what actions will the GWA commit to in redressing undesirable results? [SEE MORE SPECIFICS IN COMMENT LETTER]	Plan Implementation	Given the high number of variables involved, a cost threshold for was not developed for increases in pumping costs due to greater lift as part of the Chronic Lowering of Groundwater Levels sustainability indicator undesirable result. The ESJGWA will continue to coordinate with its GSA members that are well permitting agencies.
507	Barbara Barrigan-Parrilla	Restore the Delta		For the lowering of groundwater elevation and reduction in groundwater storage indicators, the definitions in the Draft GSP are too vague about which beneficial uses have to be affected by the undesirable result. There needs to be more clear specification of undesirable results in relation to specific beneficial uses. If the GWA means "all beneficial uses" for these indicators, then state "all beneficial uses." As worded, these indicators give the GWA license to pick favored beneficial uses over others.	Groundwater Levels	1) Language was added to Section 3.2.1.1.1 (Chronic Lowering of Groundwater Levels, Description of Undesirable Results) referencing GSP Section 1.3.1 (Beneficial Uses and Users in the Subbasin). A bullet was added to identify impacts to environmental uses and users, including interconnected surface waters and GDEs, as a potential undesirable result identified by stakeholders during GSP development. Additionally, language was added to Section 3.2.1.1.4 (Chronic Lowering of Groundwater Levels, Potential Effects of Undesirable Results) to identify potential effects of undesirable results related to GDEs as a data gap. Text was added to reference the new shallow monitoring program in Section 4.7 (Plan to Fill Data Gaps) as a plan to obtain additional information. 2) Language was added to Section 3.2.2.1.1 (Reduction in Groundwater Storage, Description of Undesirable Results) referencing GSP Section 1.3.1 (Beneficial Uses and Users in the Subbasin).

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508	Barbara Barrigan-Parrilla	Restore the Delta		The Draft GSP confidently states that “there is a large volume (approximately 53 million acre-feet [MAF] of freshwater in storage” in the Subbasin, and there appears to be very little fluctuation historically in this volume on a percentage basis. The Draft GSP states that “it is roughly estimated that groundwater demand for beneficial use occurs within the top 23 MAF of the Subbasin.” (p. 3-10) No geographic description of where this 23 MAF occurs is provided. The “threshold” for undesirable result in the Draft GSP on the storage indicator then becomes “when storage is insufficient to satisfy beneficial uses within the Subbasin. Therefore, undesirable results would occur if groundwater storage were reduced to less than 30 MAF.” (Ibid.) Here the Draft GSP fails to connect the already existing undesirable results noted above with this level of groundwater storage in the Subbasin (that is, the cone of depression with the presence of losing streams immediately overlying them, for example, and their occurrence immediately beneath and down-gradient of disadvantaged communities in the Subbasin). The Draft GSP takes current groundwater storage at 53 MAF as an acceptable baseline when it actually represents a storage level that is undesirable given existing surface and subsurface conditions. Restore the Delta urges the GWA to rethink, redefine, and redraft this particular indicator discussion so that existing undesirable conditions can experience recovery and restoration to sustainable conditions as the GSP planning and implementation horizon plays out.	Groundwater Storage	See Master Response 4 - GW Storage. The cone of depression is evaluated and discussed in the Section 2.2 (Current and Historical Groundwater Conditions) of the GSP. Groundwater storage is evaluated at a subbasin scale.
509	Barbara Barrigan-Parrilla	Restore the Delta		We ask a similar question as above of the GWA: if a toxic plume suddenly spikes at three or more of the ten water quality monitoring wells, is the Draft GSP to be interpreted as meaning that the GWA would wait up to two years before taking any kind of action to protect public health and safety and address the contamination? Why does this indicator even have a time/duration threshold before enabling the GWA to identify, prevent, or mitigate an undesirable result? As with the cost discussion, what actions does the GWA commit to in order to stem the breaching of the minimum water quality thresholds it has put forward? Would it really allow saltwater intrusion, for example, to proceed for two years before acting to push back the isohaline toward the Delta? That would cost a lot more in water injections and scarce dollars, for example, than if authority for action contained in the Draft GSP allowed more prompt assessment and prevention of saltwater intrusion. [SEE MORE SPECIFICS IN COMMENT LETTER]	Sustainable Management Criteria	Sustainable management criteria and the choosing of minimum thresholds are meant to be representative of not only one point in time, but of long-term conditions in the Subbasin. By looking at two consecutive years, rather than a single year, we can remove short-term/outlier measurements and determine if conditions are reflective of longer-term trends. Furthermore, the nature of the definition of undesirable results do not preclude early action if deemed warranted by the GSAs.
510	Barbara Barrigan-Parrilla	Restore the Delta		The remaining three indicators in the Draft GSP address sea water intrusion, land subsidence, and depletion of interconnected surface water. Restore the Delta feels that these three indicators in the Draft GSP would all benefit from similar critical review and treatment (including redefinition to include existing undesirable baseline conditions) that we have outlined above for the first three indicators; indeed, our specific comments on reconnecting losing streams to groundwater systems apply to Section 3.2.6 on depletion of interconnected surface water, including our comments about the relationships of disadvantaged communities to these natural hydrologic systems.	Sustainable Management Criteria	The ESJGWA supports the sustainable management criteria as written. The purpose of the criteria is to identify what is significant and unreasonable with a focus on long-term conditions in the Subbasin. The GSAs of the ESJGWA can decide to take action at any point when established thresholds are violated.
511	Mary Elizabeth	Sierra Club, Delta-Sierra Group	7.2	There was a much more robust discussion about funding the development of the GSP than for implementing the GSP. Table 1 below provides a summary of the GSA’s areas and composition, both factors with groundwater extraction volumes should be considered when determining GSP implementation contributions. [SEE MORE SPECIFICS IN COMMENT LETTER]	Plan Implementation	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
512	Mary Elizabeth	Sierra Club, Delta-Sierra Group	7.5	Whether or not coordination between the 15 GSAs continues during implementation will be in large part determined by what this Ad Hoc Committee reports to the GWA for their consideration. It is expected that this report will be made available either in September 2019 GWA agenda materials or at the September 2019 GWA meeting. In either case long after comments on the draft GSP are due in August 2019. The postponing of these important governance and funding discussions creates a situation of urgency which will likely preclude widespread public outreach and consideration of beneficial users’ comments. The deficiencies related to individual GSA water budgets casts serious doubts about how funding allocations will be made so that basin-wide monitoring and implementation activities are accomplished. A frequent comment has been, why should we fund someone else’s misuse and lack of planning when we have been funding efficiency improvements all along. [SEE MORE SPECIFICS IN COMMENT LETTER]	Plan Implementation	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
513	Mary Elizabeth	Sierra Club, Delta-Sierra Group	n/a	Early on Stakeholder Workgroup members expressed frustration that specific technical information was not available for review in advance of meetings; that during meetings new information was made available on PowerPoint slides only; that meetings were rushed because there was an emphasis on presenting information rather than engaging in meaningful dialogue that could be communicated to the GWA. [SEE MORE SPECIFICS IN COMMENT LETTER]	Plan Implementation	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
514	Mary Elizabeth	Sierra Club, Delta-Sierra Group	1.2.3.4	The GSP Wellhead protection areas and recharge areas Section 1.2.3.4, addresses wellhead protection programs in San Joaquin County, Calaveras County, and Stanislaus County. The discussion regarding wellhead protection areas seemed to be restricted to annular seals on wells which do prevent surficial contamination from entering the aquifer. No analysis was offered as to the variation of well construction standards and location requirements that might relate to wellhead protection areas. [SEE MORE SPECIFICS IN COMMENT LETTER]	Basin Setting	Section 1.2.4 (Additional GSP Elements) provides GSAs an opportunity to discuss additional Plan areas, including wellhead protection areas and well construction policies. The ESJGWA identified these topics as relevant and important to the Subbasin as addressed in Section 1.2.3.4 (Well Permitting). Analysis on variation of well construction standards and location requirements relating to wellhead protection areas can be considered in future updates to the GSP.
515	Mary Elizabeth	Sierra Club, Delta-Sierra Group	n/a	Despite the fact that GSAs are able require water management devices on non-de minimis water wells no metering of wells of any size was proposed in the draft GSP... The Delta-Sierra Group recommends that the largest non-de minimis extraction wells be metered with an annual reporting requirement. [SEE MORE SPECIFICS IN COMMENT LETTER]	Plan Implementation	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
516	Mary Elizabeth	Sierra Club, Delta-Sierra Group	2.1.4.5.3	A generalized map was provided of potential recharge areas as shown below, but a map identifying existing recharge areas that substantially contribute to the replenishment of the groundwater basin was not found in the draft GSP... SGMA requires that a map identifying existing and potential recharge, and specifically identifying the existing recharge areas that substantially contribute to the replenishment of the groundwater basin. [SEE MORE SPECIFICS IN COMMENT LETTER]	Basin Setting	A map of existing groundwater recharge areas is presented in Figure 2-13 and a map of potential groundwater recharge areas is presented in Figure 2-14. Added to text to Section 2.1.4.5.1 (Description of Recharge Areas) clarifying that higher percolation indicates more recharge and referencing the existing conjunctive use programs (including direct recharge) described in Section 1.2.2.9: The higher percolation areas are those that substantially contribute to the replenishment and recharge of the Subbasin. Section 1.2.2.9 includes text and a figure (Figure 1-16) of existing conjunctive use programs, including current direct recharge occurring in the Subbasin.
517	Mary Elizabeth	Sierra Club, Delta-Sierra Group	3.2.6	The GSP noted in section 3.2.6 Depletion of Interconnected Surface Water that “quantification of depletions is relatively challenging and requires significant data on both groundwater levels near streams and stage information supported by groundwater modeling. “Without restricting the installation of wells within areas of influence that intersect surface waterways, further depletion of interconnected surface waters will continue. [SEE MORE SPECIFICS IN COMMENT LETTER]	Well Permitting	Well permitting requirements for San Joaquin, Calaveras, and Stanislaus counties are identified in Section 1.2.3.4 (Well Permitting) of the GSP. An additional subsection has been added to include Sacramento County well permitting requirements. GSAs do not have well permitting authority, unless as authorized by the respective county. SGMA does not provide a GSA with the authority to issue or regulate permits for the construction, modification, or abandonment of groundwater wells, but maintains the authority for well permitting activities with the county. (Water Code, § 10726.4(b).) A GSA may request the county provide the GSA with notice of any permit applications (10726.4(b)) and a GSA may impose spacing requirements on new well construction (10726.4(a)(1)). The ESJGWA will continue to coordinate with its member GSAs that are well permitting agencies. Language has been added to Section 4.7.1 (Plan to Fill Data Gaps) referencing applicable Calaveras County, Stanislaus County, and San Joaquin County monitoring well drilling standards.
518	Mary Elizabeth	Sierra Club, Delta-Sierra Group	3.2.1	The draft GSP uses groundwater level minimum thresholds as a proxy for the depletion of interconnected surface water sustainability indicator. As such, the minimum thresholds for the interconnected surface water sustainability indicator are the same as the minimum thresholds for the chronic lowering of groundwater levels sustainability indicator. The use of the existing representative groundwater level monitoring wells is inadequate to assess whether or not surface waters are depleted by groundwater extraction wells near surface waterways. [SEE MORE SPECIFICS IN COMMENT LETTER]	Interconnected Surface Water	See Master Response 2 - ISW.
519	Mary Elizabeth	Sierra Club, Delta-Sierra Group	2.2.7	The significant reduction of GDEs as compared to the NCCAG database was related to co-occurrence of surface water sources including irrigation canals. The Delta-Sierra Group objected in February 2019 to the disqualification of local ecosystems as GDEs if sources other than groundwater are available... As no sustainable management criteria are required for GDEs, the Delta-Sierra Group recommends that a less restrictive method be used if reductions to the NCCAG are desired, and that the Nature Conservancy and California Department of Fish and Wildlife be consulted. [SEE MORE SPECIFICS IN COMMENT LETTER]	GDEs	See Master Response 1 - GDEs.
520	Mary Elizabeth	Sierra Club, Delta-Sierra Group	2.2.4	The Eastern San Joaquin Subbasin groundwater quality is negatively impacted by contaminants not currently proposed for monitoring or inclusion in the Data Management System. Nitrate contamination is a significant problem in agricultural areas related to the handling of wastes and applications of fertilizers. [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	See Master Response 3 -- Water Quality.

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521	Mary Elizabeth	Sierra Club, Delta-Sierra Group	n/a	An important part of the initial steps of implementation will be to have several workshops for beneficial users that are interested in accessing the database and creating reports or accessing pre-made report formats. Probably those staff that will be inputting data will also require training. Ideally, as work continues with the database, methods to incorporate contaminant data stored by the State of California in various databases can be explored. Another possibility is that GSAs exercise their powers and authorities to require that other groundwater management data be included in an expanded database. Fees could be charged of those with reportable results to submit to the database. The fees could offset time required by staff to input the data. Perhaps, San Joaquin Environmental Health could administer the database because they already have access to small water system monitoring data under permit. Those using groundwater and those making important planning decisions would benefit from a centralized location for groundwater quality. [SEE MORE SPECIFICS IN COMMENT LETTER]	DMS	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
522	Mary Elizabeth	Sierra Club, Delta-Sierra Group	n/a	Staff involved with the California Statewide Groundwater Elevation Monitoring (CASGEM) well monitoring suggested that conditions could exist that more frequent monitoring may be necessary to capture valid seasonal fluctuations. Consideration should be given to the sampling of representative groundwater level compliance wells quarterly, a reduction of the DWR monthly monitoring suggestion. Semi-annual monitoring may miss transient changes in response to unseasonable conditions. Understanding these transient changes may help refine the conceptual model. [SEE MORE SPECIFICS IN COMMENT LETTER]	Monitoring Network	The ESJGWA Board determined semi-annual sampling was appropriate as it will capture seasonal highs and lows. If a need for more frequent monitoring is recognized, the monitoring frequency will be reevaluated as updates to the GSP occur.
523	Mary Elizabeth	Sierra Club, Delta-Sierra Group	n/a	The August 2018 Model Report included a reference to an April 25, 2018 Eastern San Joaquin Water Resources Model IDC Workshop that was not noticed or advertised despite stakeholder collaboration being the first topic discussed. Going forward as the model is refined under contract, the Delta-Sierra Group suggests that model refinement include multiple opportunities for interested parties that are stakeholders to become more familiar with the model. [SEE MORE SPECIFICS IN COMMENT LETTER]	Model Refinements	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
524	Mary Elizabeth	Sierra Club, Delta-Sierra Group	2.3	This statement is confusing especially given the description of the model results under climate change, as it is unclear which number is being referred to: "This number is larger than the estimated annual overdraft of the projected conditions scenario due to the integrated nature of the groundwater subbasin." [SEE MORE SPECIFICS IN COMMENT LETTER]	Water Budget	1) Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Due to the uncertainty around climate projections in the 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040. Therefore, climate change was not included in the sustainable yield analysis or the estimated amount of direct or in lieu recharge and/or reduction in pumping needed for the Subbasin to reach sustainability. Comment noted for follow up in next round of model refinements and updates to analyses. 2) Added text to Section 2.3.6 (Sustainable Yield Estimate) clarifying which numbers are being discussed: This number (78,000 AF/year) is larger than the estimated annual overdraft of the projected conditions scenario (34,000 AF/year) due to the integrated nature of a groundwater subbasin.
525	Mary Elizabeth	Sierra Club, Delta-Sierra Group	2.3	Under the intermediate climate change scenario prescribed by DWR, the depletion in aquifer storage is expected to increase by about 68 percent to an average annual storage change of 57,000 AF/year, from 34,000 AF/year in the projected conditions scenario. If the 68 percent is applied to 78,000 AF/year, deficient an additional 53,000 AF/year will be needed and the planned projects projected to achieve sustainability included in the GSP will be insufficient. [SEE MORE SPECIFICS IN COMMENT LETTER]	Projects and Management Actions	Consistent with regulations, the 2070 climate change sensitivity analysis on the projected conditions scenario was used to better understand trends and inform planning. Due to the uncertainty around climate projections in the 2070 timeframe, the ESJGWA Board determined the projected conditions scenario was most appropriate for analyzing sustainable yield in the GSP implementation time period beginning in 2040. Therefore, climate change was not included in the sustainable yield analysis or the estimated amount of direct or in lieu recharge and/or reduction in pumping needed for the Subbasin to reach sustainability. Climate change will continue to be evaluated with every update to the GSP and estimates of projects and management actions will continue to evolve with refinements to the model. Comment noted for follow up in next round of model refinements and updates to analyses.
526	Mary Elizabeth	Sierra Club, Delta-Sierra Group	n/a	As of 8.25.19, the Notice of Intent to Adopt GSP was not forwarded to the ESJ interested parties list although interested parties were directed to the esjgroundwater.org website for meeting information and public hearing dates. The Notice of Intent to Adopt GSP did include email addresses of GSA representatives in addition to mailing addresses and FAX numbers. [SEE MORE SPECIFICS IN COMMENT LETTER]	Outreach	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
527	Brandon Nakagawa	SSJGSA	1.1.1	Add Ag Water Management Plans and General Plans to the list.	Mechanics - Text	Comment addressed in text.
528	Brandon Nakagawa	SSJGSA	1.1.4	Suggest mentioning that Lathrop signed on to the JPA then voluntarily withdrew citing the Basin Boundary modification approved by DWR.	Clarifying Edit	Text added to Section 1.1.4 (Agency Information).
529	Brandon Nakagawa	SSJGSA	1.1.4	Suggest referencing Memorandum of Agreement between Cal Water and County	Clarifying Edit	Comment noted. Consider for inclusion in future updates to the GSP.
530	Brandon Nakagawa	SSJGSA	1.1.4	WID reinstatement as a GSA	Mechanics - Text	Comment addressed in text.
531	Brandon Nakagawa	SSJGSA	Throughout	Replace GWA with ESJGWA	Mechanics - Text	Comment addressed in text.
532	Brandon Nakagawa	SSJGSA	1.1.4.2	Should also reference the JPA document posted to www.esjgroundwater.org	Clarifying Edit	Comment noted. Future is ESJGWA is currently unknown. Consider for future updates to the GSP.
533	Brandon Nakagawa	SSJGSA	1.1.4.3	Escalon is contracted to receive treated surface water from SSJID but has yet to install infrastructure to connect to the system.	Clarifying Edit	Edited text for SSJID in Section 1.1.4.3 (Description of Participating Agencies): SSJID in 2005 began the delivery of up to 32,000 AF/year currently (and up to 43,000 AF/year in Phase II) of treated surface water from Woodward Reservoir to the cities of Manteca, Lathrop, and Tracy for the SCWSP with Escalon to receive water in the future (Eastern San Joaquin County GBA, 2014).
534	Brandon Nakagawa	SSJGSA	1.1.4.4	Sentence should read: The ESJGWA's JPA calls out the following powers granted to GSA's by SGMA.	Mechanics - Text	Comment addressed in text.
535	Brandon Nakagawa	SSJGSA	Figure 1-4	Include DWR Subbasin Basin Numbers for San Joaquin Basin and 5-22.01	Mechanics - Text	Comment noted. DWR subbasin numbers already included in the text in Section 1.2.1.1 (Summary of Jurisdictional Areas and Other Features).
536	Brandon Nakagawa	SSJGSA	Figure 1-5	Include DWR Subbasin Basin Numbers for San Joaquin Basin and all adjacent basins.	Clarifying Edit	Comment noted. DWR subbasin numbers already included in the text in Section 1.2.1.1 (Summary of Jurisdictional Areas and Other Features).
537	Brandon Nakagawa	SSJGSA	Figure 1-6	Sac Co. and San Joaquin Co/ shades are too similar.	Clarifying Edit	Edited county colors in figure.
538	Brandon Nakagawa	SSJGSA	Figure 1-10	Call out USDA CropScape 2015 as Data source.	Clarifying Edit	Comment noted. USDA CropScape 2015 discussed in text in Section 1.2.1.1 (Summary of Jurisdictional Areas and Other Features): In the 2015 CropScape dataset, fruit and nut trees comprised 37 percent, and vineyards comprised 24 percent, of the irrigated crops in the Subbasin. Alfalfa and irrigated pasture were the next most dominant crop type, comprising 11 percent of irrigated crops in the Subbasin (USDA, 2015).
539	Brandon Nakagawa	SSJGSA	Figures 1-11 and 1-12	Call out DWR WDL as data source.	Clarifying Edit	Comment noted. DWR's WDL discussed in text in Section 1.2.1.1 (Summary of Jurisdictional Areas and Other Features).
540	Brandon Nakagawa	SSJGSA	1.2.2.1.1	Might want to call out that the Board of Supervisors of San Joaquin County also act as the Board of Supervisors of the SJCFWCD. The SJCFWCD also staffs the SJCFWCD.	Clarifying Edit	Comment noted. Consider for inclusion in future updates to the GSP.
541	Brandon Nakagawa	SSJGSA	1.2.2.1.1	Technically, the SJCFWCD should be called out, not SJC.	Mechanics - Text	Comment noted. Change heading for Section 1.2.2.1.2 to San Joaquin County Flood Control and Water Conservation District and edited text to reflect the change.
542	Brandon Nakagawa	SSJGSA	1.2.2.1.5	Not a Technical Review Committee. Participants possessed technical expertise sch as staff and consultants representing many of the GSAs forming the ESJGWA.	Clarifying Edit	Comment noted. Edited text in Section 1.2.2.1.5 (Data Received Directly from GSAs) to remove mention of the GBA's Technical Review Committee.
543	Brandon Nakagawa	SSJGSA	1.2.2.8	replace "PVC" with "buried"	Mechanics - Text	Comment addressed in text.
544	Brandon Nakagawa	SSJGSA	1.2.3.1.8	Checking with Ripon on GP description	Clarifying Edit	Comment noted.
545	Brandon Nakagawa	SSJGSA	1.2.3.4.1	Confirm and insert that Municipal codes prohibit private supply wells.	Clarifying Edit	Comment noted. Consider for inclusion in future updates to the GSP.
546	Brandon Nakagawa	SSJGSA	1.2.4	The GP Update is complete so the opportunity to comment is actually through the discretionary approval process which includes CEQA, Planning Commission, appeals, etc.	Clarifying Edit	As the 2016 San Joaquin County General Plan update is complete, deleted the sentence from Section 1.2.4 (Additional GSP Elements) discussing it as an opportunity to comment on land use planning.
547	Brandon Nakagawa	SSJGSA	1.3.1	Delete "of"	Mechanics - Text	Comment addressed in text.

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548	Brandon Nakagawa	SSJGSA	1.3.4.3	Suggested Edit: and/or their preferred mode of communication	Mechanics - Text	Comment addressed in text.
549	Brandon Nakagawa	SSJGSA	2.2.1.1	Consistency: SJCFWCWD is the CASEGEM Entity and the SJC Public Work staffs the SJCFWCWD which is a separate legal entity.	Mechanics - Text	Edited text for consistency: SJC's monitoring well data comes from the San Joaquin County Flood Control and Water Conservation District (SJCFWCWD).
550	Brandon Nakagawa	SSJGSA	Figure 2-6	Suggest deleting figure 2-4 and reference on page 2-4.	Mechanics - Graphics	Comment noted. This figure provides the number of chloride measurements at GAMA Monitoring Sites.
551	Brandon Nakagawa	SSJGSA	Table 2-1	Suggest clarifying the numbers as the drainage area or sub-watershed area vs. watershed area. There may be some confusion as to watershed area vs sub-watershed area .	Clarifying Edit	Comment noted. Text considered clear enough in the distinction between watershed areas and the larger Subbasin.
552	Brandon Nakagawa	SSJGSA	Figure 2-8	Same comment above.	Clarifying Edit	Comment noted. Text considered clear enough in the distinction between watershed areas and the larger Subbasin.
553	Brandon Nakagawa	SSJGSA	2.1.4.3	"MWD" should be "MWH"	Mechanics - Text	Comment addressed in text.
554	Brandon Nakagawa	SSJGSA	2.2.1.2	Suggest describing measurements as Spring and Fall rather than by quarter.	Mechanics - Text	Edited text: Current groundwater elevation conditions, for the purposes of this Plan, have been characterized as First Quarter 2017 (recent seasonal high, measured in Spring 2017) and Fourth Quarter 2017 (recent seasonal low, measured in Fall 2017) groundwater elevation measurements.
555	Brandon Nakagawa	SSJGSA	2.2.9	See attached spreadsheet of polygons that have been investigated by staff and determined to be non-GDE's. The attached spreadsheet lists the reason for the determination.	Mechanics - Graphics	Commenter indicated that comment was addressed in other changes made to GDE section.
556	Brandon Nakagawa	SSJGSA	Table 2-12	See Table note 5: Reference error	Mechanics - Text	Removed unlinked reference from text.
557	Brandon Nakagawa	SSJGSA	2.3.4.3	Suggest referencing IDC in Model Report.	Clarifying Edit	Add references to Sections 2.3.4.2 and 2.3.4.3 to the model report for more detail of ESJWRM private groundwater pumping estimation: Additional details on the estimation of private groundwater pumping in ESJWRM can be found in the published model report (Appendix 2-A).
558	Brandon Nakagawa	SSJGSA	2.3.5.1	Replace with "The ESJGWA selected"	Mechanics - Text	Comment addressed in text.
559	Brandon Nakagawa	SSJGSA	2.3.5.1	Replace "...potential significant effects..." with "... a calculated increase..."	Mechanics - Text	Comment addressed in text.
560	Brandon Nakagawa	SSJGSA	2.3.5.1	Replace "...may be due to a shift to..." with "... are the result of converting from groundwater use to surface water supplies..."	Mechanics - Text	Comment addressed in text.
561	Brandon Nakagawa	SSJGSA	Table 2-16	Replace 2nd sentence in footnote 3 with : As agricultural land use continually evolves through changes in crop types and urbanization over the historical calibration, averaging of the resulting agricultural demand is less a function of water year type and rather dependent more on when in the simulation that year type fell.	Mechanics - Text	Comment addressed in text.
562	Brandon Nakagawa	SSJGSA	Table 2-16	Replace footnote 4 with: "Urban demands in the Historic Water Budget are reported values from cited sources. Averaging urban demands by year type may not explicitly depict urban growth patterns during the historical model period"	Mechanics - Text	Comment addressed in text.
563	Brandon Nakagawa	SSJGSA	2.3.5.2	Replace "basin" with "Subbasin"	Mechanics - Text	Comment addressed in text.
564	Brandon Nakagawa	SSJGSA	2.3.5.2	Ad to beginning of sentence: The analysis fixes the land use to current conditions and is based on...	Mechanics - Text	Comment addressed in text.
565	Brandon Nakagawa	SSJGSA	2.3.5.2	Replace "The almost" with "Approximately"	Mechanics - Text	Comment addressed in text.
566	Brandon Nakagawa	SSJGSA	2.3.5.2	I'm not sure what this sentence means if you've defined the current condition as 2014 land use and 2015 population	Mechanics - Text	Edited text to clarify: The current conditions scenario simulates 50 years of hydrology with conditions approximately reflective of current Subbasin management and activities.
567	Brandon Nakagawa	SSJGSA	2.3.5.4	Replace two sentences with: An important assumption made in the project water balance analysis that due to projected urban growth, agricultural acreage is expected to decrease by approximately 40,000 acres. While there is agricultural growth anticipated in the eastern areas of the Subbasin and potential conversion of existing agricultural land to permanent irrigated crops, no reliable projections were available to include in the simulation; therefore, no additional agricultural land growth was added to the projected conditions scenario.	Mechanics - Text	Comment addressed in text.
568	Brandon Nakagawa	SSJGSA	2.3.6	Replace "be impacted" with "vary due to a number of proposed management actions resulting in increased groundwater levels...". Impacted only sounds negative.	Mechanics - Text	Comment addressed in text.
569	Brandon Nakagawa	SSJGSA	2.3.7.1	an analysis was performed for the Subbasin evaluating the projected water budget with and ...	Mechanics - Text	Comment addressed in text.
570	Brandon Nakagawa	SSJGSA	3.2.1.2	Delete "scenarios"	Mechanics - Text	Comment addressed in text.
571	Brandon Nakagawa	SSJGSA	3.2.1.2	Suggested re-write: Previously adopted groundwater-related panning documents were reviewed including the ... These documents provided a starting point for setting minimum thresholds.	Mechanics - Text	Comment addressed in text.
572	Brandon Nakagawa	SSJGSA	3.2.1.2	The reference to Fall 1992 actually was developed as part of the 2007 IRWMP and was used as the basis for comparison in a subsequent Programmatic EIR..	Mechanics - Text	Comment noted. Though Fall 1992 was initially identified in the 2007 IRWMP as having the lowest elevations in the subbasin at that time, it was used again in the more recent 2014 IRWMP update.
573	Brandon Nakagawa	SSJGSA	3.2.1.2	Proposed re-write: The GWA Board determined that dewatering of domestic wells may be a potential undesirable result that and could potentially be used to confirm the adequacy of the minimum threshold methodology.	Mechanics - Text	Comment addressed in text.
574	Brandon Nakagawa	SSJGSA	3.2.1.2	Suggest replacing with: A radius of 3 miles around each representative monitoring well was used to identify the 10th percentile domestic well construction depth. For representative monitoring well 03N07E21L003, a 2-mile radius was used due to variations in groundwater levels due to its proximity to the Mokelumne River. The 3-mile radii (including the 2-mile radius of monitoring well 03N07E21L003) of each representative monitoring well, includes an average of 400 domestic wells each capturing approximately 76 percent of the domestic wells in the OSWCR dataset.	Mechanics - Text	Comment addressed in text.
575	Brandon Nakagawa	SSJGSA	3.2.1.2	Consider re-write: Domestic well data obtained from the OSCWR dataset is sparsely populated with information on total casing depth, screening intervals, and the age of the well. The 10th percentile well depth was chosen due to the uncertainty in the database and to account for domestic wells that may have been drilled to a very shallow depth prior to the current well drilling standards enforced by local jurisdictions and/or have reached the end of their lifecycle. The 10th percentile domestic well depth for groundwater levels is protective of 90 percent of the domestic wells in the OSCWR dataset and is used as the minimum threshold for determining if a decline in groundwater levels is significant and unreasonable under SGMA.	Mechanics - Text	Comment addressed in text.
576	Brandon Nakagawa	SSJGSA	3.2.1.2	Consider adding the OSCWR domestic well depth dataset to the Appendix.	Clarifying Edit	Comment noted. Consider for inclusion in future updates to the GSP.
577	Brandon Nakagawa	SSJGSA	3.2.2.1.1	Delete: "The undesirable result related to reduction in groundwater storage is defined in SGMA as: Significant and unreasonable reduction in groundwater storage."	Mechanics - Text	Comment addressed in text.
578	Brandon Nakagawa	SSJGSA	3.2.2.1.1	Consider replacing with "The ESJGWA has determined that an undesirable result for the reduction of groundwater storage is experienced if sustained groundwater storage volumes are too low to satisfy beneficial uses within the Subbasin over the planning and implementation horizon of this GSP."	Mechanics - Text	Comment addressed in text.
579	Brandon Nakagawa	SSJGSA	3.2.2.1.2	It is estimated that overlying pumpers have limited access equating to approximately the shallowest 23 MAF of groundwater storage in the Subbasin; therefore an undesirable result would occur if groundwater storage levels were depleted by 23 MAF.	Groundwater Storage	Language updated in the GSP to indicate 23MAF reduction as definition of undesirable result for the Reduction in Groundwater Storage sustainability indicator, rather than the subbasin having reached 30MAF remaining.

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580	Brandon Nakagawa	SSJGSA	3.2.2.1.3	Suggested edit: Depletion of 23 MAF within the SGMA panning horizon of 2040 is highly unlikely. There would need to be an event of a catastrophic nature or prolonged and exaggerated increases in the mining of groundwater, extreme and severe drought, or other major changes in groundwater management over time could to cause a depletion of groundwater storage to a significant and unreasonable level.	Mechanics - Text	Comment addressed in text.
581	Brandon Nakagawa	SSJGSA	3.2.2.1.4	Suggest adding degradation of produced water quality from groundwater sources	Clarifying Edit	Edited text in Section 3.2.2.1.4 (Potential Effects of Undesirable Results): If groundwater levels were to reach levels causing significant and unreasonable undesirable results, effects could include degradation of produced water quality from groundwater sources; running out of fresh groundwater to access in drought years; increased cost of access; and reduction in beneficial uses, such as domestic supply and changes to agriculture.
582	Brandon Nakagawa	SSJGSA	3.2.2.2	Suggest replacing "... until storage reached 30 MAF..." with "...until storage was depleted by 23 MAF..."	Mechanics - Text	Comment addressed in text.
583	Brandon Nakagawa	SSJGSA	3.2.3.1.1	"cities" should be Cities and add SJCFWCD	Mechanics - Text	Comment noted. No edits made to text.
584	Brandon Nakagawa	SSJGSA	3.2.3.1.2	Give examples of groundwater or water management activities that causes groundwater quality degradation.	Clarifying Edit	The ESJGWA supports the sustainable management criteria for degraded water quality. Groundwater management activities refer to non-natural sources of salinity, such as irrigation return water or movement of groundwater if due to groundwater pumping.
585	Brandon Nakagawa	SSJGSA	3.2.3.1.3	Suggest adding that increases in salinity only occurred in parts of the Subbasin	Clarifying Edit	Edited text in Section 3.2.3.1.3 (Potential Causes of Undesirable Results) to indicate that salinity is only a concern in part of the Subbasin: Within the Subbasin, there are localized concerns related to salinity along with three primary sources of salinity, as discussed in Section 2.2.4 of this GSP.
586	Brandon Nakagawa	SSJGSA	3.2.3.1.4	Replace first part of first sentence with: The potential effects of degraded groundwater quality would include:	Mechanics - Text	Comment addressed in text.
587	Brandon Nakagawa	SSJGSA	3.2.3.2	Suggested edits: A minimum threshold of 1,000 mg/L was selected based on stakeholder concerns for drinking water and agricultural beneficial uses. The minimum threshold selected by the GWA Board was also informed by stakeholder input. There was a meeting held in Fall 2018 with GSA representatives from San Joaquin County, City of Lodi, City of Manteca, City of Stockton, and Cal Water and an additional meeting with agribusiness members of the Stakeholder Workgroup.	Mechanics - Text	Comment addressed in text.
588	Brandon Nakagawa	SSJGSA	3.2.5.1.4	Replace unrecoverable with irrecoverable	Mechanics - Text	Comment addressed in text.
589	Brandon Nakagawa	SSJGSA	3.2.6.1.2	Proposed re-write: An undesirable result will have been deemed to occur if depletions resulted in an impact to a senior water right holder such as if the release of stored surface water occurred in higher frequency and volume to meet fish and wildlife requirements or a decrease in the amount of supply available for a senior water right holder including riparian diverters, or a potential reduction in acreage of groundwater dependent ecosystems.	Mechanics - Text	Comment addressed in text.
590	Brandon Nakagawa	SSJGSA	4.	Replace "GWA" with "ESJGWA"	Mechanics - Text	Comment addressed in text.
591	Brandon Nakagawa	SSJGSA	4.1.2	Suggested edit: Of the 107 wells in the broad monitoring network, 76 wells included are wells used in CASGEM...	Mechanics - Text	Comment addressed in text.
592	Brandon Nakagawa	SSJGSA	4.3.3	SJC also has a monitoring protocol and safety manual which could be referenced in the GSP and also update at a later date possibly to include data handling and database management..	Monitoring Network	Comment noted. The current monitoring protocols meet the requirements of SGMA.
593	Brandon Nakagawa	SSJGSA	4.7.3	Suggest reiterating the monitoring frequency for all well categories. Quarterly for representative wells for levels; semi-annually for broad network for levels, and both representative and broad network for water quality.	Clarifying Edit	Comment noted. Consider for inclusion in future updates to the GSP.
594	Brandon Nakagawa	SSJGSA	4.7.1	Reference also Calaveras, Stanislaus and San Joaquin Counties applicable monitoring well drilling standards.	Well Permitting	Language has been added to Section 4.7.1 (Plan to Fill Data Gaps) referencing applicable Calaveras County, Stanislaus County, and San Joaquin County monitoring well drilling standards.
595	Brandon Nakagawa	SSJGSA	5.	Replace "GWA" with "ESJGWA"	Mechanics - Text	Comment addressed in text.
596	Brandon Nakagawa	SSJGSA	Table 5-4	San Joaquin County should be San Joaquin County Flood Control and Water Conservation District	Mechanics - Text	Comment addressed in text.
597	Brandon Nakagawa	SSJGSA	6.	Replace "GWA" with "ESJGWA"	Mechanics - Text	Comment addressed in text.
598	Brandon Nakagawa	SSJGSA	6.2.6.5	The project is called the Division 9 Project	Mechanics - Text	Comment noted.
599	Brandon Nakagawa	SSJGSA	Table 6-2	Table needs an update of upcoming Important Dates	Clarifying Edit	Updated Table 6-2 with more recent dates for the various funding mechanisms.
600	Brandon Nakagawa	SSJGSA	7.	Replace "GWA" with "ESJGWA"	Mechanics - Text	Comment addressed in text.
601	Brandon Nakagawa	SSJGSA	Table 7-2	Some costs appear low. Discussions are ongoing as to governance, costs, and accountability measures. Costs should be re-estimated higher to avoid sticker shock later during implementation.	Projects and Management Actions	The cost estimates for implementation actions are conservative planning-level estimates that will be refined once additional specifics have been determined. The ESJ ESJGWA Plan Implementation Ad-Hoc Committee has been convened for this purpose and is meeting on an approximately weekly basis to actively identify next steps and form recommendations that will allow for refinement in GSP implementation cost estimates.
602	Brandon Nakagawa	SSJGSA	7.4.1	Suggest lumping the study in with Model Refinements in section 7.4.2. Also suggest study could be expanded to include other rivers.	Projects and Management Actions	The Mokelumne River Loss Project description text has been moved to Chapter 6 (Projects and Management Actions) based on direction from the ESJGWA Board provided at the September 11, 2019 Board meeting. At this time, no projects have been proposed to study other rivers in the Subbasin. However, further model refinement efforts will verify and validate model calibration at points across the subbasin.
603	Brandon Nakagawa	SSJGSA	7.9	GSP Implementation funding lacks specifics. The ESJGWA Board may wish to bolster and affirm the funding commitment in the resolution when adopting/affirming the GSP.	Plan Implementation	The cost estimates for implementation actions are conservative planning-level estimates that will be refined once additional specifics have been determined. The ESJ ESJGWA Plan Implementation Ad-Hoc Committee has been convened for this purpose and is meeting on an approximately weekly basis to actively identify next steps and form recommendations that will allow for refinement in GSP implementation cost estimates.
604	Stockton East Water District	Stockton East Water District GSA	Section 1.2.2.4	This sentence does not make sense. Suggest revision to: "There has been no documented subsidence reported within the Eastern San Joaquin Subbasin."	Mechanics - Text	Comment addressed through edits to text in response to another comment.
605	Stockton East Water District	Stockton East Water District GSA	Section 1.2.3.4.1	A more accurate statement would be "San Joaquin County has established water well standards for new wells that define property line setbacks . . . ETC." as these requirements apply only to new wells.	Mechanics - Text	Comment addressed in text.
606	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.1	This is not entirely accurate, streamflows entering the subbasin do induce regulated releases from respective reservoirs, but also include inflow from unregulated streams downstream of regulating reservoirs. This should be noted.	Clarifying Edit	Deleted sentence in Section 2.3.4.1 (Assumptions Used in the Historical Water Budget) to remove confusion and clarified text: Upstream reservoirs regulating streamflows into the Subbasin include Pardee and Camanche on the Mokelumne River; New Hogan on the Calaveras River; and New Melones, Tulloch, and Goodwin on the Stanislaus River. As reservoir releases are regulated, no changes to the historical operations of the reservoirs are assumed.
607	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.1	Stockton East Water District should be included in the list of districts with riparian diversions off major streams.	Clarifying Edit	Data from C2VSim for Calaveras River riparian diversions includes those diversions going to SEWD.
608	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.1	Data on private pumping is available from Stockton East Water District, was provided to the consultant, and is more accurate than that calculated by the consumptive use methodology.	Water Budget	Comment noted for follow up in next round of model refinements. Added text to Section 2.3.4.1 to clarify that private groundwater pumping was estimated the same way across the subbasin for consistency: Data on private pumping was not available on a consistent basis across the model, so private pumping was estimated as that which would be required to meet agricultural and rural residential water needs as calculated by the ESJWRM model based on consumptive use methodology (Refer to the ESJWRM documentation for details).

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609	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.2	The cited stream flow data does not include inflow into the Calaveras River below New Hogan Dam, including Cosgrove Creek and others. Similarly, the data list does not include flow for other nonregulated reservoirs in the watershed.	Water Budget	Streams simulated directly in ESJWRM include Dry Creek, Mokelumne River, Calaveras River, Stanislaus River, and San Joaquin River. All other stream flows, including tributaries to these streams, are estimated in the model. If any of these tributaries have long-term flow data available, they may be considered for direct simulation in future updates to the model.
610	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.2	Stockton East Water District should be included in the list of districts with riparian diversions off major streams.	Clarifying Edit	Data from C2VSim for Calaveras River riparian diversions includes those diversions going to SEWD.
611	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.2	Data on private pumping is available from Stockton East Water District, was provided to the consultant, and is more accurate than that calculated by the consumptive use methodology.	Water Budget	Comment noted for follow up in next round of model refinements. Added text to Section 2.3.4.2 to clarify that private groundwater pumping was estimated the same way across the subbasin for consistency: As private groundwater pumping was estimated by ESJWRM in the historical calibration, there is no local estimate of current private groundwater pumping available on a consistent basis across the model.
612	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.3	Stockton East Water District should be included in the list of districts with riparian diversions off major streams.	Clarifying Edit	Data from C2VSim for Calaveras River riparian diversions includes those diversions going to SEWD.
613	Stockton East Water District	Stockton East Water District GSA	Section 2.3.4.3	Data on private pumping is available from Stockton East Water District, was provided to the consultant, and is more accurate than that calculated by the consumptive use methodology.	Water Budget	Comment noted for follow up in next round of model refinements. Added text to Section 2.3.4.2 to clarify that private groundwater pumping was estimated the same way across the subbasin for consistency: As private groundwater pumping was estimated by ESJWRM in the historical calibration, there is no local estimate of projected private groundwater pumping available on a consistent basis across the model.
614	Stockton East Water District	Stockton East Water District GSA	Section 6.2.4.2	More accurately, these are existing surface water entitlements under contract.	Clarifying Edit	Comment noted.
615	Stockton East Water District	Stockton East Water District GSA	Section 6.2.4.6	Grammatical correction - the word "a" should be deleted before the word "streambed."	Mechanics - Text	Comment addressed in text.
616	Stockton East Water District	Stockton East Water District GSA	Section 7.9	The sentence should be rewritten to state: "Prior to implementing any fee or assessment program, the GSAs would complete a rate assessment study or other analysis if required by consistent with the regulatory requirements."	Clarifying Edit	Edited text in Section 7.9 (GSP Implementation Funding): Prior to implementing any fee or assessment program, the GSAs would complete a rate assessment study or other analysis if required by the regulatory requirements.
617	Stockton East Water District	Stockton East Water District GSA	Table 7-4	In the first and third boxes under "Certainty" the Proposition 218 process should be qualified with "if applicable."	Clarifying Edit	Comment addressed in text.
618	Martin Harris	Terra Land Group, LLC		Any water sustainability plan to be considered must take into consideration that many farmers are abandoning lower-priced crops like alfalfa and silage corn to seek higher-priced food crops that may be less tolerant to the salinity levels typical of recycled water (See Project 19/Manteca Recycled Water Project as described on pages 6-28 and 6-29 of the GSP) [SEE MORE SPECIFICS IN COMMENT LETTER]	Groundwater Quality	The ESJGWA considers minimum thresholds and measurable objectives for groundwater quality to be protective of agricultural uses. During GSP development, GSAs provided anticipated future crop type information for assessment with a general consensus that uncertainty in market demands is too high to consider future crop types into land use estimates. Language was added in Section 3.2.3.2 (Degraded Water Quality Minimum Thresholds) to include information on salinity tolerances of Subbasin crops.
619	Martin Harris	Terra Land Group, LLC		Open canals currently being utilized in the sandy area of the sub-basin must be properly managed and maintained to offset the potential effects of sedimentation and erosion. [SEE MORE SPECIFICS IN COMMENT LETTER]	Flood Risk	This has been noted as a future item for consideration as the GSAs move into GSP implementation.
620	Martin Harris	Terra Land Group, LLC		TLG believes that channel flow deficiencies and back-water effects in and along the South Delta need to be fully considered and mitigated as part of any GSP to be considered. [SEE MORE SPECIFICS IN COMMENT LETTER]	Flood Risk	There are several ongoing efforts in the Subbasin for stormwater and flood work, including through regional flood control agencies as well as planning and implementation activities. The San Joaquin Area Flood Control Agency (SJAFA) covers San Joaquin County with the exception of a few select city areas and aims to address flood protection in the area it covers. Projects SJAFA has worked on include flood walls, levees, detention basins, and other flood control improvements. SB 985 (Water Code section 10563, subdivision (c)(1)), requires a Storm Water Resource Plan as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. SWRPs are intended to develop multiple benefit projects for upcoming funding opportunities. SWRP projects can include benefits such as improved storm drainage, reduced impervious surfaces, flood protection, etc. Areas in the Subbasin have developed stormwater management plans and programs, including the City of Stockton and City of Manteca.
621	Martin Harris	Terra Land Group, LLC		The uncertainties as detailed on pages 2-134 and 2-151 of the GSP appear to be especially important when considering Section 6.2.6.6 of the GSP describes project #23 (SSJID Storm Water Reuse) which may find it difficult to drain any and all potential storm water drainage flows to be created along and through the South San Joaquin Irrigation District ("SSJID") distribution system to the San Joaquin River via the French Camp Outlet Canal. (See page 6-32 of the GSP). TLG also believes that SSJID drainage into the San Joaquin River may also prove problematic at other San Joaquin River outlet locations currently being considered. [SEE MORE SPECIFICS IN COMMENT LETTER]	Flood Risk	There are several ongoing efforts in the Subbasin for stormwater and flood work, including through regional flood control agencies as well as planning and implementation activities. The San Joaquin Area Flood Control Agency (SJAFA) covers San Joaquin County with the exception of a few select city areas and aims to address flood protection in the area it covers. Projects SJAFA has worked on include flood walls, levees, detention basins, and other flood control improvements. SB 985 (Water Code section 10563, subdivision (c)(1)), requires a Storm Water Resource Plan as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. SWRPs are intended to develop multiple benefit projects for upcoming funding opportunities. SWRP projects can include benefits such as improved storm drainage, reduced impervious surfaces, flood protection, etc. Areas in the Subbasin have developed stormwater management plans and programs, including the City of Stockton and City of Manteca.
622	Martin Harris	Terra Land Group, LLC		What drainage and backwater effects may be created in conjunction with GSP Projects #19, 22, and 23? ... TLG believes that this can only be accomplished by putting an end to the continuing delays and immediately performing a full and comprehensive environmental review. This should be performed in conjunction with an updated general plan and related environmental justice element that fully considers and mitigates for the growing storm water, waste water, potable water, irrigation water, transportation, and transit needs affecting the areas in and along the South Delta. [SEE MORE SPECIFICS IN COMMENT LETTER]	Flood Risk	There are several ongoing efforts in the Subbasin for stormwater and flood work, including through regional flood control agencies as well as planning and implementation activities. The San Joaquin Area Flood Control Agency (SJAFA) covers San Joaquin County with the exception of a few select city areas and aims to address flood protection in the area it covers. Projects SJAFA has worked on include flood walls, levees, detention basins, and other flood control improvements. SB 985 (Water Code section 10563, subdivision (c)(1)), requires a Storm Water Resource Plan as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. SWRPs are intended to develop multiple benefit projects for upcoming funding opportunities. SWRP projects can include benefits such as improved storm drainage, reduced impervious surfaces, flood protection, etc. Areas in the Subbasin have developed stormwater management plans and programs, including the City of Stockton and City of Manteca.
623	Martin Harris	Terra Land Group, LLC		How will what appears to be a very real potential for unresolved and continuing sedimentation and climate change issues in and along the South Delta be considered and allowed for in the final Mossdale Tract Drainage Plan? [SEE MORE SPECIFICS IN COMMENT LETTER]	Flood Risk	There are several ongoing efforts in the Subbasin for stormwater and flood work, including through regional flood control agencies as well as planning and implementation activities. The San Joaquin Area Flood Control Agency (SJAFA) covers San Joaquin County with the exception of a few select city areas and aims to address flood protection in the area it covers. Projects SJAFA has worked on include flood walls, levees, detention basins, and other flood control improvements. SB 985 (Water Code section 10563, subdivision (c)(1)), requires a Storm Water Resource Plan as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. SWRPs are intended to develop multiple benefit projects for upcoming funding opportunities. SWRP projects can include benefits such as improved storm drainage, reduced impervious surfaces, flood protection, etc. Areas in the Subbasin have developed stormwater management plans and programs, including the City of Stockton and City of Manteca.
624	Martin Harris	Terra Land Group, LLC		How can local, regional, state, and federal authorities work closer together to create an updated water plan that provides water deliveries at the local, regional, and state level while protecting the urban and rural areas along the South Delta from any increases to flood water, storm water, waste water, and other hydrology-related impacts that may be created? [SEE MORE SPECIFICS IN COMMENT LETTER]	Flood Risk	There are several ongoing efforts in the Subbasin for stormwater and flood work, including through regional flood control agencies as well as planning and implementation activities. The San Joaquin Area Flood Control Agency (SJAFA) covers San Joaquin County with the exception of a few select city areas and aims to address flood protection in the area it covers. Projects SJAFA has worked on include flood walls, levees, detention basins, and other flood control improvements. SB 985 (Water Code section 10563, subdivision (c)(1)), requires a Storm Water Resource Plan as a condition of receiving funds for storm water and dry weather runoff capture projects from any bond approved by voters after January 2014. SWRPs are intended to develop multiple benefit projects for upcoming funding opportunities. SWRP projects can include benefits such as improved storm drainage, reduced impervious surfaces, flood protection, etc. Areas in the Subbasin have developed stormwater management plans and programs, including the City of Stockton and City of Manteca.