APPENDIX A

GSA Formation Documentation

APPENDIX A-1

FCGMA 2015 NOI to Become GSA and Resolution 2015-01

FOX CANYON GROUNDWATER MANAGEMENT AGENCY

A STATE OF CALIFORNIA WATER AGENCY

January 26, 2015

Mark Cowin
California Department of Water Resources
PO Box 942836
Sacramento, CA 94236-0001

SUBJECT: NOTICE OF INTENT TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY FOX CANYON GROUNDWATER MANAGEMENT AGENCY

Dear Mr. Cowin:

As outlined in the California Water Code, Part 2.74, Sustainable Groundwater Management Act (Act), Section 10723 (c), the Fox Canyon Groundwater Management Agency (FCGMA) shall be deemed the exclusive Groundwater Sustainability Agency (GSA) within its boundaries with powers to comply with Act. On January 09, 2015 the FCGMA held a public hearing and passed Resolution 2015-01, Attachment 1, wherein the FCGMA elected to become the GSA for the Arroyo Santa Rosa Valley, Las Posas Valley (West, South, and East), Oxnard Forebay, Oxnard Plain and Pleasant Valley Basins within the FCGMA boundaries. Therefore, this letter shall service as the Notice of Intent for the FCGMA to assume the role as the GSA for the aforementioned basins, depicted on Attachment 2.

Per Section 10723.2 of the Act, the GSA shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. The FCGMA as enacted has a Board of Directors and operating structure that clearly represents the interests of all users and uses of groundwater and surface water within the FCGMA boundaries. The five member Board of the FCGMA is comprised as follows:

- One member shall be chosen by United Water Conservation District, the member's district or divisions must overlie at least in part the territory of the FCGMA;
- One member shall be chosen by the County of Ventura, the member's district must overlie at least in part the territory of the FCGMA;
- One member shall be chosen from the members of the city councils of the cities whose territory at least in part overlies the territory of the FCGMA;
- One member shall be chosen from the members of the governing boards of the following mutual water companies and special districts not governed by the County Board of Supervisors which are engaged in water activities and whose territory at least in part overlies the territory of the FCGMA: the Alta Mutual Water Company, the Anacapa Municipal Water District, the Berylwood Mutual Water Company, the Calleguas Municipal Water District, the Camrosa County Water District, the Del Norte Mutual Water Company, the Pleasant Valley County Water District, and the Zone Mutual Water Company; and
- The fifth member of the Board shall be chosen by the other four members from a list of at least five nominations from the Ventura County Farm Bureau and the Ventura County Agricultural Association acting jointly for a two-year term to represent agricultural interests within the territory

of the FCGMA. The fifth member shall reside and be actively and primarily engaged in agriculture within the territory of the FCGMA.

Acting as a groundwater management agency since 1983 the FCGMA has undertaken a collaborative and inclusive model to include all users and uses of groundwater as it strives to protect this valuable resource. It has enacted numerous policies and ordinances aimed at protecting the resource. A history of the FCGMA and pertinent ordinances and resolutions are available at http://fcgma.org/.

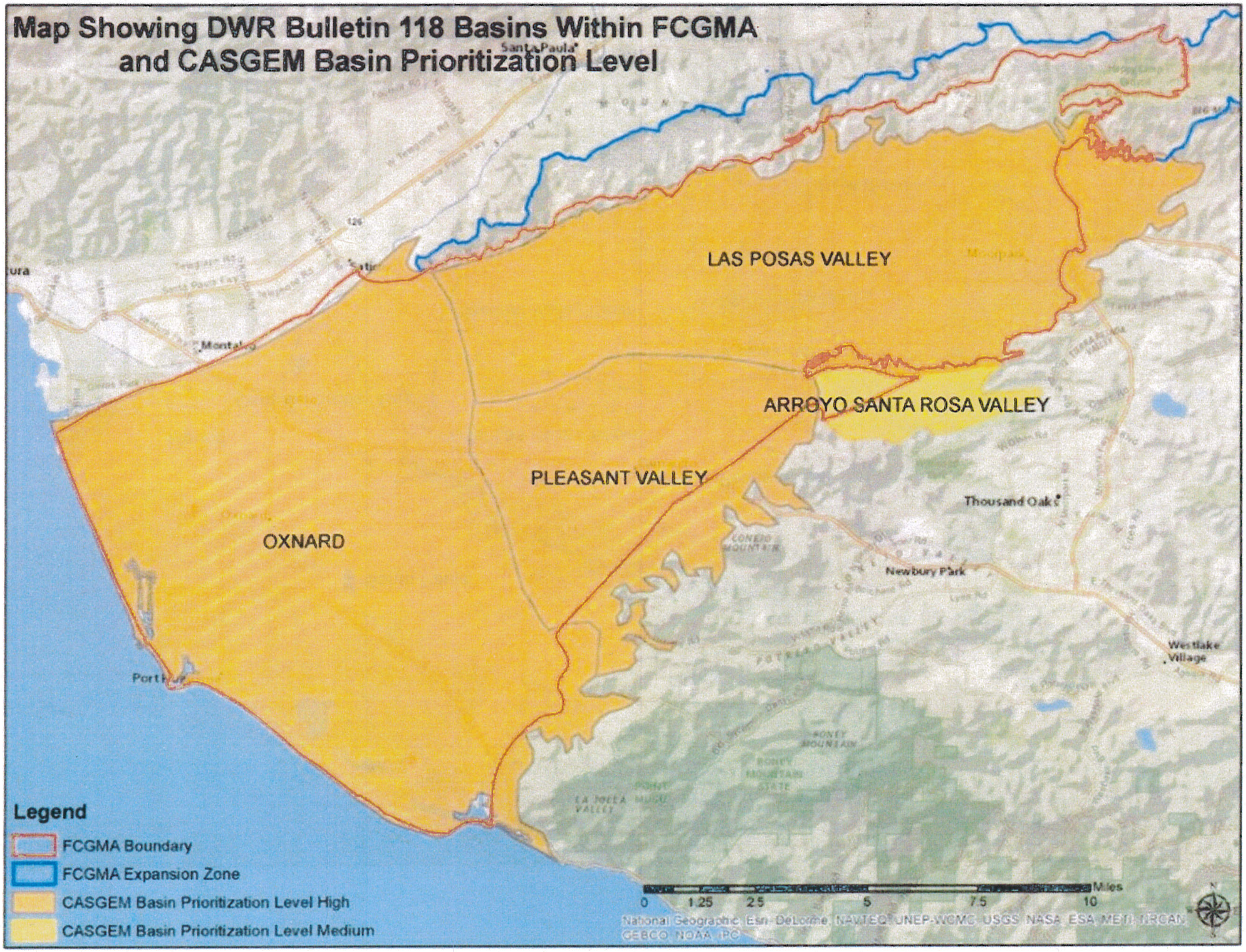
Should you require additional information or a clarification of this Notice of Intent, please contact me at (805) 654-2073.

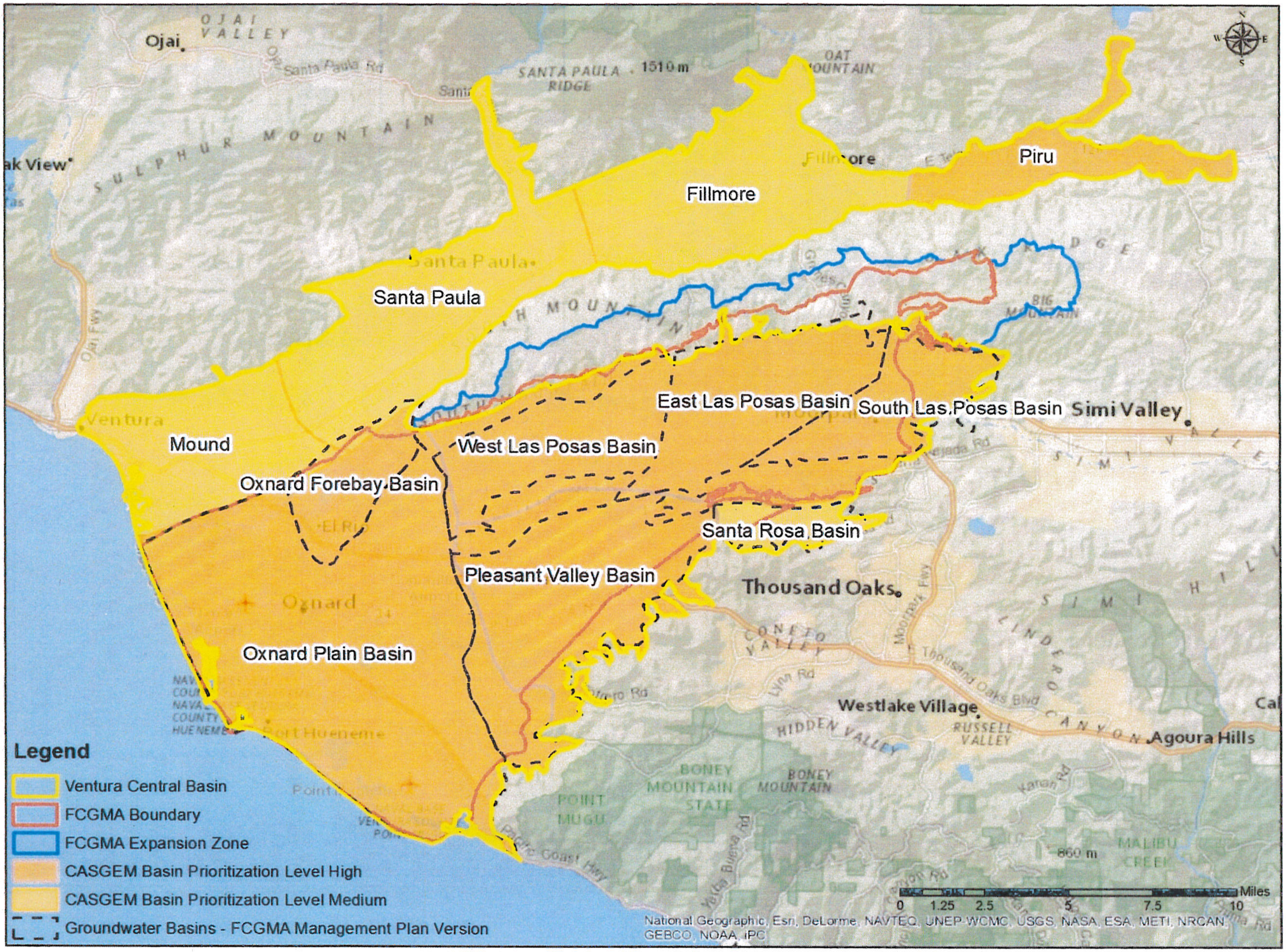
Sincerely,

Jeff Pratt, P.E.
FCGMA Executive Officer

Attachments: (1) FCGMA Resolution 2015-01
(2) FCGMA Boundary and Basins

cc: Bob Pierotti, Supervising Engineering Geologist
California Department of Water Resources
Southern Region
770 Fairmont Avenue, Suite 102
Glendale, CA 91203


Map Showing DWR Bulletin 118 Basins Within FCGMA
and CASGEM Basin Prioritization Level
LAS POSAS VALLEY
ARROYO SANTA ROSA VALLEY
PLEASANT VALLEY
OXNARD
Santa Paula
Thousand Oaks
Newbury Park
Westlake Village
Port Hue
Legend
FCGMA Boundary
FCGMA Expansion Zone
CASGEM Basin Prioritization Level High
CASGEM Basin Prioritization Level Medium
0 1.25 2.5 5 7.5 10 Miles
National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC



Piru
Fillmore
Santa Paula
Mound
East Las Posas Basin
South Las Posas Basin
West Las Posas Basin
Oxnard Forebay Basin
Santa Rosa Basin
Pleasant Valley Basin
Oxnard Plain Basin
Simi Valley
Thousand Oaks
Westlake Village
Agoura Hills
Ojai
Legend
Ventura Central Basin
FCGMA Boundary
FCGMA Expansion Zone
CASGEM Basin Prioritization Level High
CASGEM Basin Prioritization Level Medium
Groundwater Basins - FCGMA Management Plan Version
0 1.25 2.5 5 7.5 10 Miles
National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC

Resolution No. 2015-01
of the
Fox Canyon Groundwater Management Agency

A RESOLUTION ELECTING TO BE THE GROUNDWATER SUSTAINABILITY AGENCY FOR THE ARROYO SANTA ROSA VALLEY, (WEST, SOUTH, EAST) LAS POSAS VALLEY, OXNARD FOREBAY, OXNARD PLAIN, AND PLEASANT VALLEY BASINS WITHIN THE BOUNDARIES OF THE FOX CANYON GROUNDWATER MANAGEMENT AGENCY

WHEREAS, Fox Canyon Groundwater Management Agency was formed for the purpose of preserving the groundwater resources within its statutory boundaries and has such powers granted by its enabling legislation and such other powers as are reasonably implied and necessary and proper to carry out its objectives and purposes; and

WHEREAS, the Agency's statutory boundaries overlie the following groundwater basins identified and defined in the Department of Water Resources report entitled "California's Groundwater: Bulletin 118" updated in 2003: the Arroyo Santa Rosa Valley Groundwater Basin, the Las Posas Valley Groundwater Basin, the Oxnard Sub-basin of the Santa Clara River Valley Groundwater Basin, and the Pleasant Valley Groundwater Basins within the boundaries of the Fox Canyon Groundwater Management Agency; and

WHEREAS, in 2014, the Legislature added the Sustainable Groundwater Management Act to the Water Code which grants the Agency additional authority and technical and financial assistance necessary to sustainably manage groundwater; and

WHEREAS, the Act establishes the Agency as the exclusive local agency within its statutory boundaries unless it elects to opt out of being the exclusive groundwater management agency within those boundaries; and

WHEREAS, the Agency wishes to exercise the powers and authorities of a groundwater sustainability agency granted by the Act and has conducted the public hearing required under section 10723 of the Act.

NOW, THEREFORE, IT IS HEREBY PROCLAIMED AND ORDERED that:

1. Fox Canyon Groundwater Management Agency elects to be the exclusive groundwater management agency within its statutory boundaries with powers to comply with the Sustainable Groundwater Management Act;

and

2. The Executive Officer is authorized to submit to the Department of Water Resources on behalf of the Agency a notice of intent to undertake sustainable groundwater management in accordance with Part 2.74 of the Water Code.

On motion by Director Craven, and seconded by Director Kelley, the foregoing resolution was passed and adopted on January 9, 2015 by the following vote.

AYES – Chair Maulhardt, Directors Craven, Bennett, and Kelley
NOES – None
ABSTAINS – None
ABSENT – Director Borchard

By: Lynn E. Maulhardt
Lynn E. Maulhardt, Chair, Board of Directors
Fox Canyon Groundwater Management Agency

ATTEST: I hereby certify that the above is a true and correct copy of Resolution No. 2015-01.

By: Jessica Kam
Jessica Kam, Clerk of the Board

APPENDIX A-2

County of Ventura Board Minutes
June 20, 2017

BOARD MINUTES
BOARD OF SUPERVISORS, COUNTY OF VENTURA, STATE OF CALIFORNIA

SUPERVISORS STEVE BENNETT, LINDA PARKS,
KELLY LONG, PETER C. FOY AND JOHN C. ZARAGOZA
June 20, 2017 at 10:30 a.m.

Public Hearing Regarding Adoption of a Resolution to Become the Groundwater Sustainability Agency for Unmanaged Areas Within the Santa Paula and Oxnard Sub-Basins of the Santa Clara River Valley Groundwater Basin, Las Posas Valley Groundwater Basin, and the Pleasant Valley Groundwater Basin.
(Public Works Agency)

(X) All Board members are present.

(X) The Board holds a public hearing.

(X) The following person is heard: Arne Anselm.

(X) Upon motion of Supervisor Foy, seconded by Supervisor Bennett, and duly carried, the Board hereby approves recommendations as stated in the Board letter.

I hereby certify that the annexed instrument is a true and correct copy of the document which is on file in this office.
Dated: MICHAEL POWERS
6/23/17 Clerk of the Board of Supervisors
County of Ventura, State of California

By: Lori Gaines
Deputy Clerk of the Board

By: ______
Brian Palmer
Chief Deputy Clerk of the Board

Item #55
6/20/17

RESOLUTION NO. 17-088

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF VENTURA TO BECOME THE GROUNDWATER SUSTAINABILITY AGENCY FOR UNMANAGED AREAS WITHIN THE SANTA PAULA AND OXNARD SUB-BASINS OF THE SANTA CLARA RIVER VALLEY GROUNDWATER BASIN, AND THE PLEASANT VALLEY AND LAS POSAS VALLEY GROUNDWATER BASINS

WHEREAS, the California Legislature has adopted, and the Governor has signed into law,the Sustainable Groundwater Management Act of 2014 ("SGMA"), which authorizes local agencies to manage groundwater in a sustainable fashion; and

WHEREAS, SGMA provides that for all groundwater basins designated by the Department of Water Resources (DWR) as a high- or medium priority basin a local agency, or combination of agencies, must decide to become the groundwater sustainability agency or agencies (GSAs) for the entire basin to avoid state intervention; and

WHEREAS, DWR has designated the Santa Paula and Oxnard Sub-Basins of the Santa Clara River Valley Groundwater Basin, Las Posas Valley Groundwater Basin, and the Pleasant Valley Groundwater Basin (Basins) as high- or medium priority basins; and

WHEREAS, SGMA further provides that in the event there is an area within a high- or medium priority basin that is not within the management area of a GSA, the County of Ventura will be presumed to be the GSA for that area unless the County opts out of being the GSA for that area; and

WHEREAS, there are currently areas within the Basins that are not within the management area of a GSA and are considered unmanaged under SGMA; and

WHEREAS, SGMA requires the County to provide notification to DWR of the County's decision to become a GSA for any unmanaged area within a high- or medium priority basin on or before June 30, 2017;

WHEREAS, the Board of Supervisors of the County has determined it to be in the County's best interest and in the public interest for the County to act as the GSA for any areas within the Basins that are unmanaged as of June 30, 2017; and

WHEREAS, adoption of this resolution does not constitute a "project" under California Environmental Quality Act Guidelines Section 15378(b)(5), including organization and administrative activities of government, because there would be no direct or indirect physical change in the environment.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of the County of Ventura as follows:

1. The County of Ventura shall become the groundwater sustainability agency for areas within the Santa Paula and Oxnard Sub-Basins of the Santa Clara River Valley Groundwater Basin, the Las Posas Valley Groundwater Basin, and the Pleasant Valley Groundwater Basin that are unmanaged as of June 30, 2017;

2. The Director of the Public Works Agency is authorized to: (a) notify the Department of Water Resources (DWR) of the action taken by this resolution and to develop and file with DWR the information required to be submitted as part of the notification, (b) withdraw or modify the County's notification to DWR to fulfill the purposes of this resolution and (c) take such further actions as are necessary to carry out the intent of this resolution.

Upon a motion of Board Member Foy, seconded by Board Member Bennett, and duly carried, the Board hereby approves and adopts this resolution on the 20 day of June, 2017.

Chair, Board of Supervisors
County of Ventura

ATTEST:

MICHAEL POWERS, Clerk of the
Board of Supervisors, County of Ventura
State of California

By: ______________________
Deputy Clerk of the Board

APPENDIX A-3

CWD Resolution No. 17-11

CAMROSA WATER DISTRICT
BUILDING WATER SELF-RELIANCE

Resolution No: 17-11

A Resolution of the Board of Directors
of Camrosa Water District

Declaring Camrosa Water District's Intent to Act as the Groundwater Sustainability Agency for the Portions of the Pleasant Valley Basin, Oxnard Subbasin of the Santa Clara River Valley Basin, and the Las Posas Basin Outside the Boundaries of the Fox Canyon Groundwater Management Agency and Within the Camrosa Service Area

Whereas, on September 16, 2014, Governor Jerry Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739, known collectively as the Sustainable Groundwater Management Act (SGMA); and,

Whereas, the SGMA went into effect on January 1, 2015; and,

Whereas, the SGMA requires all high- and medium-priority groundwater basins, as designated by the California Department of Water Resources (DWR), to be managed by a Groundwater Sustainability Agency (GSA); and,

Whereas, the Pleasant Valley Basin, the Oxnard Subbasin of the Santa Clara River Valley Basin, and the Las Posas Basin, as defined by DWR's California's Groundwater Bulletin 118, have been characterized by DWR as high-priority basins; and,

Whereas, the majority of said basins are under the jurisdiction of the Fox Canyon Groundwater Management Agency (FCGMA) and Section 10723 (c) of Senate Bill 1168 defines the FCGMA as the exclusive local agency within its respective statutory boundaries with the power to comply with the SGMA; and,

Whereas, Section 10723.2 of Senate Bill 1168 requires that GSAs consider the interests of all beneficial uses and users of groundwater; and

Whereas, the SGMA requires that the GSA notify the Department of Water Resources of its intent to undertake sustainable groundwater management within thirty days of its election; and

Whereas, the SGMA requires that the GSA develop and implement a groundwater sustainability plan, according to guidelines to be developed forthwith by DWR;

Now, Therefore, Be It Resolved by the Camrosa Water District Board of Directors that Camrosa will act as the Groundwater Sustainability Agency for the portions of the Pleasant Valley Basin, the Oxnard Subbasin of the Santa Clara River Valley Basin, and the Las Posas Basin outside the boundaries of the Fox Canyon Groundwater Management Agency and within the Camrosa Service area; and

Be It Further Resolved that the Board of Directors of Camrosa Water District will act as the governing board of the newly created GSAs; and

Be It Further Resolved that, abiding by Section 10727 (b) (3) of Senate Bill 1168, Camrosa will develop a coordination agreement with the FCGMA to ensure that the groundwater sustainability plans covering the entirety of the three basins are coordinated; and

Be It Further Resolved the Camrosa Water District will notify DWR of its intent to sustainably manage the portions of the Pleasant Valley Basin, the Oxnard Subbasin of the Santa Clara River Valley Basin, and the Las Posas Basin outside the boundaries of the FCGMA within thirty days of the date this resolution is signed; and

Be It Further Resolved that such notification shall include the service area boundaries of the portions of the three basins that Camrosa intends to manage, a copy of this resolution, a list of interested parties developed pursuant to Section 10723.2 of Senate Bill 1168 and described above, and an explanation of how their interests will be considered in the development and operation of the groundwater sustainability agency and the development and implementation of the agency's sustainability plan.

Adopted, Signed and Approved this 8th day of June, 2017.

Eugene F. West, President	(ATTEST) Tony L. Stafford, Secretary
Board of Directors	Board of Directors
Camrosa Water District	**Camrosa Water District**

APPENDIX A-4

Allocation System Ordinance

AN ORDINANCE TO ESTABLISH AN ALLOCATION SYSTEM FOR THE OXNARD AND PLEASANT VALLEY GROUNDWATER BASINS

ARTICLE 1. FINDINGS

1.1. The Pleasant Valley Groundwater Basin and Oxnard Groundwater Subbasin (collectively, "the Basins") are located within Fox Canyon Groundwater Management Agency ("Agency") and have been designated by the California Department of Water Resources as high priority groundwater basins that are subject to critical conditions of overdraft.

1.2. The Agency is required under the Sustainable Groundwater Management Act ("SGMA") to manage the Basins under a groundwater sustainability plan by January 31, 2020.

1.3. The groundwater sustainability plan must include an estimate of the sustainable yield for the Basins.

1.4. Based on current projections, the sustainable yield of the Basins will be less than recent average annual groundwater extractions from the Basins.

1.5. The 10-year period prior to January 1, 2015, the date SGMA became effective, includes a complete climate cycle and is representative of annual average precipitation, groundwater extractions from the Basins and deliveries of surface water from the Santa Clara River through United Water Conservation District's Pleasant Valley Pipeline and Pumping Trough Pipeline in lieu of groundwater extractions from the Basins. During the 10-year period, these in lieu deliveries averaged 15,600 acre-feet annually and consisted of surface water that otherwise would have been used for groundwater recharge.

1.6. During the 10-year period prior to January 1, 2015, the Conejo Creek Project supplied an average of 4,978 acre-feet of surface water annually to Pleasant Valley County Water District for agricultural use which otherwise could have been supplied by pumping groundwater from the Basins. During that period, there was a corresponding decrease in groundwater use within Pleasant Valley's service area.

1.7. The adoption of this ordinance is a necessary step in the transition from the Agency's current groundwater management programs to sustainable groundwater management under SGMA. As part of that transition, the Agency intends to move from a wellhead-based to a land-based allocation system; however, implementation of that change is not feasible until such time as the Agency has developed sufficient parcel-based water-use data to allow for effective regulation of extractions on that basis.

1.8. The measures set forth in this ordinance are necessary to improve and protect the quantity and quality of groundwater supplies within the Basins.

1.9. This ordinance is exempt from the California Environmental Quality Act (CEQA) pursuant to Water Code section 10728.6 and CEQA Guidelines sections 15061(b)(3), 15307 and 15308.

1.10. The extraction allocations established under this ordinance are consistent with the land use elements of the applicable general plans to the extent that there is sufficient sustainable yield in the Basins to serve the land use designations therein.

ARTICLE 2. PURPOSE

The purpose of this ordinance is to facilitate adoption and implementation of the groundwater sustainability plan and to ensure that the Basins are operated within their sustainable yields. It is not the purpose of this ordinance to determine or alter water right entitlements, including those which may be asserted pursuant to California Water Code sections 1005.1, 1005.2 or 1005.4.

ARTICLE 3. PERIODIC REVIEW PROCEDURE

The Board will periodically review the effectiveness of this ordinance toward meeting its purpose. This review shall occur at least once every five years. If necessary, this ordinance will be amended to ensure that the sustainability goals of the groundwater sustainability plans are met.

ARTICLE 4. DEFINITIONS

4.1 "Agency" shall mean the Fox Canyon Groundwater Management Agency.

4.2 "Agricultural Operator" shall mean an owner or operator of an extraction facility used to produce groundwater for use on lands in the production of plant crops or livestock for market and uses incidental thereto.

4.3 "Assessor's Parcel Map" shall mean an official map designating parcels by Assessor's Parcel Number.

4.4 "Assessor's Parcel Number" shall mean the number assigned to a parcel by the County of Ventura for purposes of identification.

4.5 "Base Period" shall mean calendar years 2005 through 2014.

4.6 "Base-Period Conejo Creek Deliveries" shall mean the average annual amount of Conejo Creek Water Deliveries during the base period.

4.7 "Base-Period Extraction" shall mean the average annual groundwater extraction based on reported extractions during the base period, excluding any extractions that incurred surcharges.

4.8 "Base-Period PTP Deliveries" shall mean the average annual amount of PTP deliveries during the base period as reported to the Agency by United.

4.9 "Base-Period PV Deliveries" shall mean the average annual amount of PV deliveries during the base period as reported to the Agency by United.

4.10 "Basins" shall mean the Pleasant Valley Groundwater Basin and the Oxnard Groundwater Subbasin.

4.11 "Board" shall mean the Board of Directors of the Agency.

4.12 "Conejo Creek Project" shall mean the Conejo Creek Diversion structure and appurtenances owned and operated by Camrosa Water District through which recycled water discharged from the Hill Canyon Wastewater Treatment Plant is diverted from Conejo Creek for delivery to Camrosa Water District and Pleasant Valley.

4.13 "Conejo Creek Water Deliveries" shall mean deliveries of water to Pleasant Valley from the Conejo Creek Project.

4.14 "Executive Officer" shall mean the individual appointed by the Board to administer Agency functions or his/her designee.

4.15 "Extraction Allocation" shall mean the amount of groundwater that may be obtained from an extraction facility during a given water year before a surcharge is imposed.

4.16 "Extraction Facility" shall mean any device or method (e.g. water well) for extraction of groundwater within the Basin.

4.17 "Groundwater Sustainability Plan" shall mean the plan or plans, and any amendment thereof, developed and adopted by the Agency for the Basins in accordance with SGMA.

4.18 "Management Area" shall mean an area within the Basins for which the groundwater sustainability plan may identify different minimum thresholds, measurable objectives, monitoring or projects and management actions in accordance with regulations adopted pursuant to chapter 10 of SGMA.

4.19 "Municipal and Industrial Operator" shall mean an owner or operator that supplied groundwater for domestic, industrial, commercial or other non-agricultural use.

4.20 "Municipal and Industrial (M&I) Use" shall mean any use other than agricultural irrigation.

4.21 "Mutual Water Company" shall mean a corporation organized for, or engaged in the business of, selling, distributing, supplying, or delivering water to its stockholders and members at cost for irrigation purposes or for M&I use.

4.22 "O-H Pipeline" means the water distribution system operated by United that supplies groundwater to contractors under the O-H Pipeline Agreement.

4.23 "O-H Pipeline Agreement" means the Water Supply Agreement for Delivery of Water Through the Oxnard/Hueneme Pipeline dated July 1, 1996, and any amendment thereto.

4.24 "Operator" shall mean a person operating an extraction facility. The owner of an extraction facility shall be conclusively presumed to be the operator unless a satisfactory showing is made to the Agency that the extraction facility actually is operated by some other person.

4.25 "Owner" shall mean a person owning an extraction facility or an interest in an extraction facility other than a lien to secure the payment of a debt or other obligation and shall include any mutual water company and incorporated ownership.

4.26 "Parcel" shall mean a lot or parcel shown on an Assessor's Parcel Map with an assigned Assessor's Parcel Number.

4.27 "Person" shall mean any state or local governmental agency, private corporation, firm, partnership, individual, group of individuals, or, to the extent authorized by law, any federal agency.

4.28 "Pleasant Valley" shall mean Pleasant Valley County Water District.

4.29 "Pleasant Valley's Service Area" shall mean all lands shown on the map of the boundaries of Pleasant Valley on file with the Ventura Local Agency Formation Commission.

4.30 "PTP Deliveries" shall mean deliveries of surface water from the Santa Clara River through United's Pumping Trough Pipeline.

4.31 "PV Deliveries" shall mean deliveries of surface water from the Santa Clara River through United's Pleasant Valley Pipeline.

4.32 "Sustainable Groundwater Management Act" or "SGMA" shall mean Part 2.74 of Division 6 of the California Water Code, sections 10720 et seq.

4.33 "Sustainable Yield" shall mean the maximum quantity of water that can be withdrawn annually from the Basins as provided in the groundwater sustainability plan.

4.34 "United" shall mean United Water Conservation District.

4.35 "Water Market" shall mean a program which, by ordinance, allows the transfer of extraction allocations through a market administered by or on behalf of the Agency.

4.36 "Water Purveyor" shall mean a mutual water company, special district, or municipality that supplies groundwater to others for agricultural or municipal and industrial use.

4.37 "Water Year" shall mean the period from October 1 of one calendar year through September 30 of the following calendar year.

ARTICLE 5. GENERAL PROVISIONS

5.1 Notwithstanding any other Agency ordinance provision to the contrary, including article 2 of Emergency Ordinance E, the Executive Officer shall establish an operator's extraction allocation for each extraction facility located within the Basins as set forth herein. The alternative extraction allocations authorized under section 5.6 of the Agency Ordinance Code shall not be available to an operator for extracting groundwater from the Basins. Except as expressly provided herein, the provisions governing extraction allocations set forth in section 5.2 of the Agency Ordinance Code shall apply to groundwater extractions from the Basins.

5.2 Except as provided in section 5.5, an extraction allocation established under this ordinance is assigned to an extraction facility. An operator with more than one extraction facility in the same groundwater basin may combine the extraction allocations for the individual facilities. If the groundwater sustainability plan creates one or more management areas within the Basins, the Board may limit the ability to combine extraction allocations assigned to extraction facilities in different management areas. Limitations on combining extraction facilities in different management areas shall be set forth in a Resolution adopted by the Board based on a determination that the limitation is necessary in order to implement the groundwater sustainability plan.

5.3 All extractions in excess of an allocation established by this ordinance shall be subject to extraction surcharges in the same manner as provided in the Agency Ordinance Code for extractions that exceed the historical and/or baseline allocation.

5.4 Extraction allocations may be transferred or temporarily assigned only as provided in article 9 of this ordinance.

5.5 The extraction allocation assigned to extraction facilities operated by United to supply water through the O-H Pipeline is "held in trust [by United] for Any or All Contractors" as a "Suballocation" as those terms are defined in the O-H Pipeline Agreement. Upon termination of or withdrawal of any party from the O-H Pipeline Agreement, the distribution of the extraction allocation assigned to the O-H Pipeline extraction facilities shall be decided by mutual agreement of United and the affected parties or as determined by a court. Notwithstanding any such agreement or court determination or the O-H Pipeline Agreement, the extraction allocation assigned to the O-H Pipeline extraction facilities shall be subject to all applicable Agency rules and regulations for the use and adjustment of extraction allocations, including chapter 5 of the Agency Ordinance Code, and to any allocation reductions implemented in accordance with article 10 of this ordinance.

5.6 In the event of a local, State, or Federal declaration of emergency with the potential to affect water supplies within the Agency, at the next scheduled meeting, the Board will consider whether to allow an operator to request an adjustment of the extraction allocation as a result of the emergency. The information required in support of the request will be set forth in a Resolution adopted by the Board.

ARTICLE 6. INITIAL ALLOCATIONS

6.1 Until such time as the reductions described in article 10 are implemented and except as otherwise provided in this article, an operator's extraction allocation shall be the base-period extraction as reported to the Agency pursuant to chapter 2 of the Agency Ordinance Code. The extraction allocation established under this section is called "base-period allocation."

6.1.1 In recognition of the use of surface water from the Conejo Creek Project and the corresponding reduction in total agricultural extractions within Pleasant Valley's service area during the base period, Pleasant Valley's base-period allocation shall be increased in an amount equal to base-period Conejo Creek water deliveries, subject to the adjustment described in subsection 6.1.1.1.

6.1.1.1 Pleasant Valley shall include in the Semi-Annual Extraction Statement required under section 2.3 of the Agency Ordinance Code a report on the use of Conejo Creek water during the reporting year. In each year in which Pleasant Valley receives Conejo Creek water deliveries, its base-period allocation for that year shall be reduced in an amount equal to the Conejo Creek water deliveries during the year.

6.1.1.2 The Board may transfer a portion of the allocation established under subsection 6.1.1 from Pleasant Valley to an operator of an extraction facility located within Pleasant Valley's service area upon a showing that the operator reduced extractions during the base period as a result of taking deliveries from Pleasant Valley. The transfer will avoid a windfall allocation that may otherwise result under subsection 6.1.1 of this ordinance and shall be subject to the procedures set forth in subsection 5.3.9 of the Agency Ordinance Code.

6.2 In order to encourage the coordinated use of groundwater from the Basins and surface water supplies from the Santa Clara River while eliminating overdraft and maintaining the sustainability goals established under SGMA, Pleasant Valley and United may increase groundwater use in years when these surface water supplies are less than normal, provided that a corresponding reduction in extractions occurs in years when surface water supplies from the Santa Clara River are more abundant. The coordinated use of these water supplies shall be implemented through adjustments to the extraction allocation as provided in this section. This extraction allocation flexibility is called "Santa Clara River Water Flex Allocation."

6.2.1 Santa Clara River Water Flex Allocation

6.2.1.1 In any year in which the volume of surface water available for PV deliveries is less than base-period PV deliveries, Pleasant Valley's base-period allocation for that year shall be increased in an amount equal to the shortfall in available PV deliveries. The extraction allocation available under this subsection shall be subject to any allocation reductions implemented in accordance with article 10 of this ordinance.

6.2.1.2 In any year in which the volume of surface water available for PV deliveries exceeds base-period PV deliveries, Pleasant Valley's base-period allocation for that year shall be reduced by the amount of excess available PV deliveries. In order to provide a minimum extraction allocation during periods when PV deliveries are not available, Pleasant Valley's allocation shall not be reduced below 50 percent of Pleasant Valley's base-period extraction. The minimum extraction allocation available under this subsection shall not be eligible for carryover under article 8 of this ordinance.

6.2.1.3 Surface water shall be deemed available for PV deliveries as demonstrated in an annual report to be submitted by United pursuant to subsection 6.2.1.8. In any year in which Pleasant Valley does not make full use of the surface water available for PV deliveries, Pleasant Valley's base-period allocation for that year shall be reduced by the amount of available surface water not taken by Pleasant Valley.

6.2.1.4 In any year in which the volume of surface water available for PTP deliveries is less than base-period PTP deliveries, United's base-period allocation for that year shall be increased in an amount equal to the shortfall in available PTP deliveries. The extraction allocation available under this subsection shall be subject to any allocation reductions implemented in accordance with article 10 of this ordinance.

6.2.1.5 In any year in which the volume of surface water available for PTP deliveries exceeds base-period PTP deliveries, United's base-period allocation for that year shall be reduced by the amount of excess available PTP deliveries. In order to provide a minimum extraction allocation during periods when PTP deliveries are not available, United's allocation shall not be reduced below 50 percent of United's base-period extraction. The minimum extraction allocation available under this subsection shall not be eligible for carryover under article 8 of this ordinance.

6.2.1.6 Surface water shall be deemed available for PTP deliveries as demonstrated in an annual report to be submitted by United pursuant to subsection 6.2.1.8. In any year in which United does not make full use of the surface water available for PTP deliveries, United's base-period allocation for that year shall be reduced by the amount of available surface water not used by United.

6.2.1.7 To provide Pleasant Valley and United with the operational flexibility to respond to annual variations in the availability of Santa Clara River water, any surcharge for excess extractions that would otherwise be assessed annually shall be determined at the end of each five-year period following the operative date of this ordinance. Surcharges for any excess extractions shall be assessed as provided in sections 6.3 and 6.4.

6.2.1.8 United shall submit an annual report on its diversion of Santa Clara River water during the preceding water year. The report shall state the total volume of river diversions, the total volume of surface water made available for PTP deliveries and PV deliveries and the total volume put to other uses. The report shall state these volumes in acre-feet, supported by meter readings, and include such other information determined by the Executive Officer to be reasonably necessary to carry out the intent of this article.

6.2.2 Pleasant Valley and United shall include in the Semi-Annual Extraction Statement required under section 2.3 of the Agency Ordinance Code a report on the use of Santa Clara River water and the resulting Santa Clara River Water Flex Allocation for the reporting year.

6.3 Pleasant Valley shall be subject to surcharges on extractions in excess of cumulative base-period allocations, as adjusted in accordance with this article, during the preceding five-year period. If excess extractions occur, Pleasant Valley shall be deemed to have exceeded the extraction allocation in each of the preceding five years. A surcharge assessed under this section shall be due and payable within 30 days of issuance of a notice of imposition of surcharges.

6.4 United shall be subject to surcharges on extractions in excess of cumulative base-period allocations, as adjusted in accordance with this article, during the preceding five-year period. If excess extractions occur, United shall be deemed to have exceeded the extraction allocation in each of the preceding five years. A surcharge assessed under this section shall be due and payable within 30 days of issuance of a notice of imposition ofsurcharges.

ARTICLE 7. ADDITIONAL REQUIREMENTS FOR REPORTING EXTRACTIONS

In order to facilitate a transition from a wellhead-based to a land-based allocation system, operators in the Basins shall comply with the following reporting requirements in addition to those specified in the Agency Ordinance Code.

7.1 Agricultural operators not subject to section 7.2 shall report thefollowing:

7.1.1 Each assessor's parcel number being supplied with groundwater produced by the operator's extraction facility;

7.1.2 The number of irrigated acres within each parcel; and

7.1.3 The source of all water used to irrigate those lands.

7.2 Mutual water companies, special districts and municipalities supplying groundwater or in lieu deliveries for agricultural use shall report the following:

7.2.1 Total volume of water from each source being supplied by the mutual water company, special district, or municipality;

7.2.2 Location and identifier of each agricultural turnout and meter owned by the mutual water company, special district, or municipality;

7.2.3 Monthly water deliveries to and meter readings from each agriculturalturnout;

7.2.4 List of assessor's parcel numbers served by each agricultural turnout and meter; and

7.2.5 Customer name associated with each parcel.

7.3 Mutual water companies, special districts and municipalities supplying groundwater or in lieu deliveries for municipal and industrial use shall report the following:

7.3.1 Total volume of water from each source being supplied by the mutual water company, special district, or municipality;

7.3.2 Monthly water deliveries for all water being supplied by the mutual water company, special district, or municipality; and

7.3.3 List of assessor's parcel numbers (or a GIS shape file) served by the mutual water company, special district, or municipality.

7.4 Domestic and municipal and industrial well operators shall report the following:

7.4.1 Each assessor's parcel number being supplied with groundwater produced by the operator's extraction facility.

ARTICLE 8. ALLOCATION CARRYOVER

Except as otherwise provided and subject to the provisions of this article, an unused extraction allocation may be carried over for use in a subsequent water year. A maximum of fifty percent of an extraction allocation shall be available for carry over. The first water extracted during any year shall be deemed to be an exercise of the carryover authorized by this article. The cumulative allocation carryover shall not exceed one hundred percent of an extraction allocation. An unused carryover extraction allocation is not transferable between operators, except in an Agency-approved water market, and shall expire five (5) years after it was accrued. Annual allocation carryover for extraction facilities combined under a single operator in accordance with section 5.2 shall be evenly divided among the combined extraction facilities. The Board may limit the use of carry over allocations consistent with the provisions of the groundwater sustainability plan, provided that any such limitation shall be imposed on all operators on an equal basis.

ARTICLE 9. ALLOCATION TRANSFERS

9.1 Allocation transfers may be necessary to provide flexibility during and after the transition from the Agency's current groundwater management program to sustainable groundwater management under SGMA. Notwithstanding section 5.3 of the Agency Ordinance Code, transfers of allocation established under this ordinance shall comply with the provisions of this article or be allowed under an Agency-approved water market.

9.2 Upon adoption of the groundwater sustainability plan, and except as otherwise provided, transfers or temporary assignments of an extraction allocation are authorized provided the Agency finds that it does not impede achievement of the sustainability goals of the groundwater sustainability plan and would not be detrimental to an Agency-approved water market. In making this determination, the Agency shall, at a minimum, consider the location of the extraction facilities, the total quantity of groundwater extracted in any year, groundwater quality impacts of the transfer and whether the proposed transfer or temporary assignment could be approved under an Agency-approved water market. Requests for the transfer or temporary assignment of extraction allocations shall be submitted jointly by the operators and owners involved and shall include the specific details of their proposal. To ensure consistency with the sustainability goals of the groundwater sustainability plan, transfers or temporary assignments of an extraction allocation shall be subject to conditions as determined by the Executive Officer. A temporary assignment of allocation shall not exceed one year.

9.3 Where there is a sale or transfer of a part of the acreage served by any extraction facility, the extraction allocation for that facility shall be equitably apportioned between the real property retained and the real property transferred by the owner of the extraction facility. This apportionment shall be approved by the Executive Officer who may modify the apportionment to assure equity.

9.4 When irrigated acreage changes to M&I use, the extraction allocation used to irrigate the acreage shall be transferred from the agricultural operator to the M&I operator on a one-to-one basis.

9.5 Transfers or temporary assignments of allocations between extraction facilities located within the same groundwater basin shall be considered for approval by the Executive Officer. All other requests for transfers or temporary assignments shall be submitted to the Board for approval.

ARTICLE 10. REDUCTION OF ALLOCATIONS

10.1 If the sustainable yield is less than the total extraction allocations established in article 6, then extraction allocations, adjusted or otherwise, shall be reduced according to a schedule and method to be determined by the Board following adoption of the groundwater sustainability plan. An operator's use of surface water in lieu of groundwater after the effective date of this ordinance shall not subject that operator to a greater allocation reduction than is imposed on other operators.

10.2 It is the intent of the Board to establish a minimum allocation for agricultural operators based on the sustainable yield and to exempt minimum allocations from the reductions contemplated in section 10.1 until such time as the Board determines that a reduction of the minimum allocation is necessary in order to facilitate implementation of the groundwater sustainability plan.

ARTICLE 11. VARIANCES

The Executive Officer may, on written request from a land owner or operator, grant a variance from the requirements of this ordinance based on the standards set forth in this article.

11.1 Variance Purpose and Standards - The sole purpose of any variance shall be to enable an owner or operator to make reasonable use of groundwater in the same manner as other users of groundwater in the Basins. Before any variance may be granted, the owner or operator must establish and the Agency must determine that all of the following standards are met:

11.1.1 That there are special circumstances or exceptional characteristics applicable to the owner or operator which do not apply generally to comparable owners or operators in the Basins; and

11.1.2 That granting a variance will not confer a special privilege inconsistent with the limitations upon other owners and operators in the Basins; and

11.1.3 That denial of a variance will result in practical difficulties or unnecessary hardships inconsistent with the general purpose of this ordinance; and

11.1.4 That the granting of a variance will not be inconsistent with the groundwater sustainability plan or the provisions of SGMA or with other regulations or ordinances of the Agency or detrimental to the Agency's ability to improve and protect the quantity or quality of groundwater supplies within the Basins; and

11.1.5 That the granting of a variance will not substantially impede the Agency's ability to achieve sustainable groundwater management or the actual sustainability of groundwater in the Basins.

11.2 Burden of Proof – A person seeking a variance shall have the burden of proving to the satisfaction of the Executive Officer that the above standards can be met.

11.3 The Agency may recognize and consider other mitigating factors demonstrated or proposed by the applicant. The Agency at its discretion may include and impose those or other factors as conditions of granting the variance request.

11.4 The Executive Officer may consider any prior requests, permits, other Agency decisions, or enforcement actions associated with the owner or operator.

11.5 Any new or increased extraction allocation granted by the Agency pursuant to a variance request may not be transferred without prior Agency approval.

11.6 Variance Procedures – All requests for a variance shall be filed in writing with the Agency.

11.7 Application Period – For the water year beginning October 1, 2020, variances may be applied for by June 30, 2010. For all subsequent water years, variances may be applied for by June 30 for use in the following the water year.

11.8 Review Period – The Executive Officer shall make reasonable efforts to render a decision on all applications within 90 days from the date the variance is requested. The Executive Officer's decision shall be in writing and include the findings made relative to the standards set forth in section 11.1.

11.9 Appeals – The Executive Officer's decision under this article is appealable in accordance with chapter 6.0 of the Agency Ordinance Code.

ARTICLE 12. CONFLICTS

Should any conflicts occur between the provisions of this ordinance and any other duly enacted Agency code or ordinance, the provisions of this ordinance shall govern.

ARTICLE 13. SEVERABILITY

Should any provision, section, subsection, paragraph, sentence or word of this ordinance be rendered or declared invalid by any final court action in a court of competent jurisdiction or by reason of any preemptive legislation, the remaining provisions, sections, subsections, paragraphs, sentences or words of this ordinance as hereby adopted shall remain in full force and effect.

ARTICLE 14. EFFECTIVE DATE; OPERATIVE DATE

This ordinance shall take effect on the thirty-first day after adoption and become fully operative on October 1, 2020.

PASSED AND ADOPTED this 23rd day of October, 2019, by the following vote:

AYES: 5

NOES: Ø

ABSENT: Ø

Chair, Board of Directors Fox Canyon Groundwater Management Agency

ATTEST:

By: Jamie Malos
Clerk of the Board

APPENDIX A-5

Public Draft GSP Comments

FCGMA Draft Groundwater Sustainability Plan Comments

September 2019

Oxnard Subbasin

Commenter			Chapter	Section	Subsection	Comment
Dan	Detmer	UWCD	Executive Summary	ES.1- Introduction	N/A	see attachment
Mary	Ngo	CDFW	2 - Basin Setting	2.3- Groundwater Conditions	2.3.1 Groundwater Elevation Data	Please see attached comment letter
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.3 Additional Plan Summaries	Concern in the following reflected quote on Page 1-40: "In recognition and acknowledgment of the limits on FCGMA to regulate the federal government, any such allocation shall be directly assigned to the federal agency and shall not be subject to the requirements of any allocation ordinance, including but not limited to allocation carryovers, borrowing, transfers, reductions and/or variances and fees." The description of Federal Reserved Water Rights (FRWR) in the GSP overstates the extent of federal law preemption. While it is true that FRWR are determined as provided under federal law, the text in the GSP does not acknowledge the importance of Congress' waiver of sovereign immunity in passing the McCarran Amendment. (43 U.S.C. § 666.) "[T]he McCarran Amendment was motivated in large part by the recognition of the interconnection of water rights among claimants to a common water source and the desire to avoid piecemeal adjudication of such rights." United States v. State of Oregon (9th Cir. 1994) 44 F.3d 758, 769.) The regulation of FRWR under California statutory law is appropriate under the McCarran Amendment and statements to the contrary should be removed from the GSP.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.4-Existing Monitoring and Management Plans	1.4.3 Operational Flexibility Limitations	Requested Revision of the following quote on Page 1-21 to 1-22; "For the Oxnard Subbasin, water purveyors collectively draw from a combination of sources—including local surface water, groundwater, imports from the State Water Project (SWP), and increasingly, recycled water— which differ in terms of the volume available, area served, timing of peak availability, and reliability. Climate and regulatory constraints (e.g., water quality standards, water rights, and minimum environmental flows) have historically had a greater impact on the availability of surface water supplies, whereas groundwater sources with adequate water quality were historically limited only by the capacity of production wells accessing the aquifer, leading to pumping in excess of many basins' sustainable yield. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, groundwater extraction will be limited by minimum thresholds established for each sustainability indicator. FCGMA has exercised its authority to limit groundwater production since 1983, and thus has managed the basin to void critical overdraft. Sustainable management criteria adopted in this GSP may limit operational flexibility by further reducing allowable groundwater production." revised to "For the Oxnard Subbasin, water purveyors collectively draw from a combination of sources—including local surface water, groundwater, imports from the State Water Project (SWP), and increasingly, recycled water—which differ in terms of the volume available, area served, timing of peak availability, and reliability. Climate and regulatory constraints (e.g., water quality standards, water rights, and minimum environmental flows) have historically had a greater impact on the availability of surface water supplies. Groundwater sources with adequate water quality were historically limited only by the capacity of production wells accessing the aquifer, until 1991 when FCGMA initiated a groundwater allocation reduction system. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, groundwater extraction will be further limited by minimum thresholds established for each sustainability indicator. FCGMA has exercised its authority to limit groundwater production since 1983, and thus has managed the basin in an effort to avoid critical overdraft. Because in 2014 the State Department of Water Resources listed the Oxnard Subbasin as being in a state of Critical Overdraft, the sustainable management criteria adopted in this GSP may limit operational flexibility." NOTE: Operational flexibility will not be so limited once the FCGMA considers projects to significantly replenish, and protect against seawater intrusion in, the basin. See attached Oxnard letter section I(D).

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.1-Purpose of the Groundwater Sustainability Plan	N/A	Concern regarding the following quote provided on page 1-2; "The purpose of this GSP is to define the conditions under which the groundwater resources of the entire Oxnard Subbasin . . . will be managed sustainably in the future." The City understands and assumes that the GSP is not self-executing and that it does not alter existing rights, including water rights, nor does it modify or supersede prior actions or approvals by FCGMA. For example, the City understands that existing allocation ordinances and conjunctive use programs are not modified by approval of the GSP and can only be changed by future FCGMA action on those specific programs. Accordingly, Oxnard has not commented on the effect of the GSP on any such existing rights or prior FCGMA actions or approvals. If we are mistaken about the non-self-executing nature of the GSP, we ask that FCGMA specify what rights, programs, actions or approvals are affected. We would also note that in such event, insufficient notice has been provided to allow meaningful public comment.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Concern regarding the following quote provided on page 1-8; "During the initial 5-year period after the GSP is adopted, FCGMA will explore opportunities to optimize basin management" Please see attached City of Oxnard letter for in-detail comment and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Concern regarding the following quote provided on page 1-10; "Under SGMA, its enabling legislation, FCGMA gained additional authority to impose regulatory fees and replenishment fees" Please see attached City of Oxnard letter for in-detail comments and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.1 General Plans	Please see attached City of Oxnard letter for in-detail comments and concern regarding Section 1.6 Land Use Elements or Topic Categories of Applicable General Plans.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	Please see attached City of Oxnard letter for in-detail comments and concern regarding Section 1.6.2 Urban Water Management Plans.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.3 Additional Plan Summaries	Please see attached City of Oxnard letter for in-detail comments and concern regarding Section 1.6.3 Additional Plan Summaries – City of Oxnard General Plan.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Concern regarding the following quote provided on page 2-65 to 2-66; "...expansion of the GREAT program to increase groundwater recharge by 4,500 AFY in the Saticoy Spreading Grounds... Because the projects that were incorporated into the Future Baseline With Projects Scenario included reduction of approximately 500 AFY from temporary fallowing in Oxnard, and deliveries of recycled water from the GREAT program, the groundwater extractions in the LAS decreased by approximately 4,000 AFY, relative to the Future Baseline Scenario." The City of Oxnard has no intention of utilizing recycled water produced by the GREAT Program for the purpose noted. References to the use of GREAT Program water for Saticoy Spreading Grounds and related basin recharge should be removed from model simulation and narrative. Please see attached City of Oxnard letter for additional in-detail comments and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.2-Project No. 1 – GREAT Program Advanced Water Purification Facility	N/A	Concern regarding the following quote provided on page 5-2; "The AWPF provides the City of Oxnard with a source of reclaimed water that can be used for landscape irrigation, agricultural, industrial process water, and groundwater recharge." Please see attached City of Oxnard letter for in-detail comments and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.2-Project No. 1 – GREAT Program Advanced Water Purification Facility	N/A	Please see attached City of Oxnard letter for in-detail comments and concern regarding Section 5.2.6 Economic Factors and Funding Sources for Project No.1
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.3-Project No. 2 – GREAT Program Advanced Water Purification Facility Expansion Project	N/A	Please see attached City of Oxnard letter for in-detail comments and concern regarding Section 5.3 Project No. GREAT Program Advanced Water Purification Facility Expansion Project.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.3-Project No. 2 – GREAT Program Advanced Water Purification Facility Expansion Project	N/A	Concern regarding the following quote provided on page 5-5; "GREAT Program AWPF Expansion Project water was included in future groundwater modeling scenarios to examine the impact that the project will have on the sustainability criteria. This project was incorporated in the modeling along with the GREAT Program AWPF Project (see Section 5.2, Project No. 1 – GREAT Program Advanced Water Purification Facility) and the temporary fallowing of agricultural land (see Section 5.6). Therefore, the relationship between the impact of this project alone and the sustainability indicators has not been quantified. Rather, the potential effect of this project in the context of all of three of these projects is presented in this discussion." Please see attached City of Oxnard letter for in-detail comments and concern.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.3-Project No. 2 – GREAT Program Advanced Water Purification Facility Expansion Project	N/A	Concern regarding the following quote reflected on page 5-7; "Under one potential expansion scenario, the facility upgrades are anticipated to cost approximately $16,600,000 (FCGMA 2018). Under this scenario, the water produced by the facility would cost approximately $1,900 per AF. Operations and maintenance costs for the expanded AWPF would be approximately $440 per AF." Please see attached City of Oxnard letter for in-detail comments and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.4-Project No. 3 – RiverPark–Saticoy GRRP Recycled Water Project	N/A	Concern regarding the following quote reflected on page 5-8; "The RiverPark–Saticoy GRRP Recycled Water Project is the same as the GREAT Program AWPF Expansion Project, as incorporated into the numerical groundwater model simulations, because the RiverPark–Saticoy GRRP Recycled Water Project simply provides the infrastructure to convey the water. It does not provide additional water to the Subbasin beyond what was modeled for the GREAT Program AWPF project.." Please see attached City of Oxnard letter for in-detail comments and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.4-Project No. 3 – RiverPark–Saticoy GRRP Recycled Water Project	N/A	Concern regarding the following quote reflected on page 5-9 "UWCD estimates that the RiverPark–Saticoy GRRP Recycled Water Project could be implemented in 18 to 24 months. The project is already in the preliminary design phase and a draft initial study/mitigated negative declaration has been prepared." Please see attached City of Oxnard letter for in-detail comments and concern.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.4-Project No. 3 – RiverPark–Saticoy GRRP Recycled Water Project	N/A	Concern regarding the following quote reflected on page 5-10 "UWCD proposes funding assistance from FCGMA for the capital cost of the project, which is estimated to be $6.4 million, with an annual operations and maintenance cost of approximately $5 million to $7.5 million. The resulting water cost would be approximately $1,000 to $1,500 per AF." Please see attached City of Oxnard letter for in-detail comments and concern.

Commenter			Chapter	Section	Subsection	Comment
Dan	Detmer	UWCD	5 - Project Management Actions	5.1- Introduction to Projects and Management Actions	N/A	Section 5.1 Although the sustainable yield for the Oxnard Subbasin as estimated in the Draft GSP is 30,000 acre-feet per year (AFY) less than recent groundwater extractions, the average rate of seawater intrusion—the primary driver for sustainable yield—reported in the Draft GSP is only 9,700 AFY. This difference between what some might perceive to be "overdraft" (30,000 AFY) versus the rate of seawater intrusion (9,400 AFY) that actually is a problem highlights the fact that much of the Oxnard Subbasin's groundwater sustainability challenge is a result of pumping in less-than-optimal locations, rather than excessive pumping. This challenge can potentially be partly mitigated by expanding the existing conjunctive-use projects by United, Pleasant Valley County Water District, Camrosa Water District, and Calleguas Municipal Water District that store groundwater and deliver surface-water when available. "New" sources of water supply, such as the recycled-water projects being developed by the Cities of Oxnard and Ventura, likely will also be needed to make up some of the difference, but costs and environmental impacts of such new sources can be minimized, while reliability and quality of these water sources can be maximized, if they are developed and implemented in coordination with conjunctive use projects. In addition, this issue highlights the importance of ensuring that the FCGMA's proposed allocation ordinance does not jeopardize the future viability of conjunctive-use projects. We recommend adding discussion to Section 5 describing the historical and potential future importance of conjunctive-use projects in optimizing sustainable yield of the Oxnard Subbasin. This section describes only the five new water-supply projects for the Oxnard subbasin and the one new project for the Pleasant Valley basin that were approved for consideration by the FCGMA; the existence of additional water-supply and optimization (conjunctive use) projects proposed by United and others last year when requested by the FCGMA should also be mentioned. Some of these other projects are not only viable, but are well into their feasibility planning and design stages at present (e.g., ASAPP and brackish-water treatment), and could make up much, if not all, of the shortfall indicated by the Draft GSP. We feel it's important that the Draft GSP at least mention these new water-supply and optimization projects, even if they couldn't be modeled with the available information, as they could add to our region's water portfolio prior to 2040. Stakeholders and the public should have at least basic information about these projects so they can make appropriate decisions about when to commence any future rampdown in groundwater allocations (if rampdowns are truly needed). An excessive or premature rampdown could affect business and municipal planning decisions and have significant financial, social, and environmental impacts on the Oxnard coastal plain. Sec 5.7.1 p 5-15 Text stating that the actual pumping reductions that may take place over the next five years will be determined by the Board deserves more emphasis both here and in the Executive Summary. Without additional emphasis on this point readers my think that the linear ramp down examples provided in the GSP is the planned/intended action to achieve sustainability.
Dan	Detmer	UWCD	4 - Monitoring Networks	4.1- Monitoring Network Objectives	N/A	Sec 4.3.3 p 4-8 (Spatial coverage by aquifer) No additional coastal monitoring wells are proposed, does this suggest the spacing of existing monitoring wells is considered adequate to assess changes in the location of the saline front? Sec 4.3.6 p 4-10 Please be more specific when describing locations of interconnected surface water. Existing language "SCR downstream of FD" should be changed to exclude the Forebay area where recorded depths to water near the SCR were consistently more than 100 feet in 2015. Sec 4.4.4 p 4-11 Some monitoring wells with stable water quality are sampled annually or twice annually (not quarterly). Sec 4.5 p 4-12 UWCD protocols for recognizing recent pumping include other indicators besides just a warm pump housing. Wet conditions at well and nearby fields also an indicator. Sec 4.6.3 p 4-14 UWCD currently gets a general mineral analysis at least annually for most monitoring well in the OP basin. Table 4-3 Screened aquifer and aquifer system for each well monitored was determined how? UWCD mapping of aquifer units?

Commenter			Chapter	Section	Subsection	Comment
Dan	Detmer	UWCD	3 - Sustainable Management Criteria	3.1- Introduction to Sustainable Management Criteria	N/A	Sec 3.3.2 p 3-5 Do we know that 380,000 AF of onshore GW flux was all seawater? Likely fresh water moving onshore in some areas, seawater in others. Sec 3.3.4.1 p 3-8 How will location of the inland extent of SWI be assessed in the future? Not a trivial task even though this is the sustainability criteria agreed to by FCGMA board. Sec 3.3.4.2 p 3-9 Again, what about recent and current ag practices? Recent nitrate conditions at El Rio have been among the worst ever recorded. Why would you say this likely related to "historical ag fertilizer application practices" and not include recent practices too? Section 3.3.7 Defining undesirable results using the three different metrics for each aquifer system as described in this section provides a level of flexibility that should enhance the ability to manage the Oxnard Subbasin to the benefit of all stakeholders, while protecting groundwater from significant and unreasonable impacts. We support this approach. Sec 3.4 p 3-13 Again, how will movement of saline water impact front be determined? Modeling or sampling of wells and geophysics? Sec 3.4.1 p 3-15 The contemplated redistribution of groundwater production and deepening of existing wells would require major a investment of capitol and is not a project contemplated in the GSP. It is not common practice to "deepen existing wells." Sec 3.4.3 p 3-16 Why suggest chloride is a poor indicator of seawater intrusion? Better to say monitoring network is not sufficient to use direct monitoring as a reliable indicator, Sec 3.4.6 p 3-20 Incorrect to state that the semi-perched aquifer does not extend into PV or the LPV. Sec 3.5 p 3-21 characterization of sustainability as equal time for WLEs above and below MOs is a little too simple, as WLEs go farther below the MOs in times of drought than the go above MOs in wet periods. Onshore and offshore flux volumes need to balance, not the time. This was in the 2007 management plan also but it is a poor metric for sustainability. Section 3.5.1 The interim milestones described in this section indicate that the FCGMA will define success of GSP implementation by achieving a linear, 25% increase in groundwater elevations in the Oxnard Subbasin from 2020 to 2025, and over each subsequent 5-year period. However, Section 4 of the Draft GSP recommends collection of additional data during the next 5 years (2020 to 2025) to improve monitoring of groundwater elevations in specific aquifers and areas. In addition, Section 5 of the Draft GSP recommends "that FCGMA will evaluate, model, and conduct feasibility studies of other projects for achieving sustainable groundwater management for the 5-year update to this Draft GSP to optimize basin management and minimize extraction restrictions" (presumably referring to a 2025 update of the GSP). We agree that both collection of additional groundwater data and further evaluation of potential projects are the most critical sustainability planning activities that the FCGMA and other stakeholders should be focused on for the next 5 years. Considering that the Draft GSP indicates the FCGMA will spend the next 5 years improving the monitoring network and evaluating feasibility of new and existing projects, it seems counterproductive to set target groundwater elevations for 2025 that are almost certainly not going to be achieved (rising 25% toward the 2040 sustainable target levels), without a clear, explicit description of what actions will be taken during those 5 years to achieve that target. At present, the Draft GSP briefly and vaguely describes potential new water-supply projects that could be built by entities other than the FCGMA, and one management action ("Reduction in Groundwater Production") that could potentially be implemented by FCGMA. However, the Draft GSP notes in Section 5 that "Because of the existing uncertainty associated with future conditions in the Subbasin, a plan for exact reductions and groundwater elevation triggers for those reductions has not been developed as part of this Draft GSP. Instead, FCGMA will work to develop this plan over next (sic) 20 years, as the level of uncertainty is reduced." We recommend that the FCGMA work with stakeholders to select a more realistic interim milestone for 2025, with the expectation that subsequent interim milestones may require a "steeper path" to achieve the sustainability goals by 2040. A second management action, the Water Market Pilot Program, is also described in Section 5 (incorrectly enumerated as "Management Action No. 3"), but the very brief (3-paragraph) description of this action concludes with the statement, "Analysis of the Water Market Pilot Program will be conducted and its suitability for incorporation as a management action for the Subbasin will be determined after the pilot program is completed in July 2019." The description of how or when this management action might be used to achieve interim milestones, measurable objectives, or minimum thresholds seems inadequate to be considered part of a "plan" for reaching groundwater sustainability. We recommend expanding the water market discussion to match the level of detail provided for "Management Action No. 1." At present, far less detail is provided for Management Action "No. 3" than was provided for many of the stakeholder projects rejected by the FCGMA for having insufficient information to model impacts. Figure 3-12 Take care to note that a linear path to sustainability is provided as an example but is not a path proposed by the GSP.

Commenter			Chapter	Section	Subsection	Comment
Dan	Detmer	UWCD	2 - Basin Setting	2.1- Introduction to Basin Setting	N/A	Sec 2.2.1 p. 2-5 Would be better to reference geological cross sections from United's modeling report than Mukae and Turner 1975, as the results represented in this report are based on United's aquifer and model results and not Turner or others. Would be good to note United's mapping of aquifers largely comparable to Mukae and Turner. Sec 2.2.3 p, 2-7 Suggests tile drains exist throughout urban areas as wells as Ag areas. Not sure this is the case, but certain features such as flood control channels likely functions as drains in some areas. Sec 2.2.3 2-10 Why no mention of UWCD mapping of aquifers and model results? Why cite Turner and state most FCA recharge occurs in the Forebay when model used in GSP does not support that conclusion? Sec 2.2.3 p. 2-12 Why state GCA aquifer props are unknown when calibrate GW flow model provides estimates of GCA aquifer properties? Sec 2.2.4 p. 2-12 Be careful not to overstate the significance of some of the data gaps identified in this section. Sec 2.3.1.1 p. 2-15 Vertical gradients discussion for all aquifers should include more context. Vertical gradients promotes recharge to the deeper aquifers, and downward flux from the UAS to the LAS is a major mechanism for recharge to the LAS. Under the current depleted basin conditions there is more distributed recharge to the LAS in the confined portions of the Oxnard Plain than there is direct recharge to the LAS in the Forebay. Sec 2.3.1.4 p. 2-22 In the Mugu area the vertical flow of water from the Mugu aquifer to the FCA is a major mechanism for seawater intrusion into the LAS. See sections N and M in the Appendices to United's GW flow model documentation, showing areas where the Hueneme aquifer is eroded away and Mugu lies unconformably on the FCA. Sec 2.3.3.1 p 2-28 Vertical gradient and SWI discussion should not be limited to movement of perched water to deeper zones. Mugu to FCA is also notable. Sec 2.3.3.3 p. 2-30 Chloride concentration over 19,000 mg/l should be characterized as brine and not seawater. Section 2.3.3.3 The Draft GSP correctly notes that seawater intrusion has largely been halted in most areas within the Upper Aquifer System (UAS) of the Oxnard Subbasin (except during extreme droughts), despite a slow continuous advance of the seawater intrusion front in the Lower Aquifer System (LAS). As also noted in the Draft GSP, the most challenging long-term sustainability issue that needs to be mitigated in the Oxnard subbasin is seawater intrusion in the LAS, which, due to different aquifer properties, occurs at a much slower pace than in the UAS. The groundwater flow paths depicted on Figures 2-63 through 2-68 of the GSP show few additional water-supply wells being impacted by seawater intrusion during the next 5 to 10 years, regardless of whether groundwater production continues "as-is" or is ramped-down starting in 2020. Furthermore, the difference in the estimated seawater intrusion fronts 5 years from now for "as is" versus "reduced pumping" scenarios are almost indistinguishable. Therefore, although mitigating seawater intrusion is the long-term driver for achieving groundwater sustainability in the Oxnard subbasin, it does not appear that implementing pumping reductions immediately will provide a significant benefit to the aquifers while data gaps are filled and additional water-supply projects are evaluated. We do not want to minimize the importance of addressing seawater intrusion in the LAS, and will continue working with the FCGMA to find viable solutions for this long-term challenge. However, we suggest that the FCGMA coordinate closely with stakeholders to decide whether they would prefer to commence pumping rampdowns immediately (while the FCGMA closes data gaps and evaluates potential future water-supply projects), or if they would prefer to wait until those uncertainties are reduced by 2025, even if pumping rampdowns may be a little steeper due to the delayed start. Sec 2.3.3.4 p 2-32 Poor characterization of connectivity between aquifer and seawater in the north coast area. The aquifers of the Oxnard Plain are believed to crop out on the ocean floor. Seawater intrusion has not been documented in onshore areas, but there is likely some SWI in certain offshore areas where direct documentation is very difficult. Sec 2.3.4 p 2-33 GW quality discussion ignores a lot of historical and recent data by limiting discussion to wells screened only in a single aquifer. It would be helpful to include some discussion related to what trends are apparent in typical production wells that are screened in more than a single aquifer in the UAS or LAS or both. That's what many well owners experience. DWR's preference for aquifer-specific discussion does not serve you well here. Sec 2.3.4.3 p 2-36 Incorrect to characterize nitrate problems as sourcing from only historical practices. Nitrate applications remain common in the Oxnard Forebay and other agricultural areas. Sec 2.3.4.3 p 2-37 Look at time series for well 01N22W23R02S. Your statement is factual but lacks context. Nitrate results in this well fluctuate between ND and 20 mg/l, suggesting vertical flow in the well and not LAS aquifer conditions of 20 mg/l in a deep confined setting distant from the Forebay. 2.3.4.6 p 2-39 Would be helpful to mention oil deposits are quite shallow in some areas of the Oxnard Plain. Trace oil in deep water wells may be natural and not the result of oilfield practices. Overdraft of the LAS may be promoting upward vertical gradients at depth, so groundwater overdraft would promote this migration of hydrocarbons, not oil production. Language in the plan is correct but a little more context would be helpful.

Commenter			Chapter	Section	Subsection	Comment
Dan	Detmer	UWCD	2 - Basin Setting	2.1-Introduction to Basin Setting	N/A	2.3.7 p 2-43 It is incorrect to map the Lower SCR GDE all the way up the Forebay reach to near Freeman Diversion (Fig 2-52). Why does the figure cite Santa Barbara County as a source, and not TNC or SFEI? Fig 2-52 is inconsistent with TNC mapping and narrative you include as Appendix K. This went through TAG and it was determined that the Forebay area is not a GDE. Also, Figure 2-53 does not adequately delineate the GDE area below RiverPark near HWY 101 from the distributed areas of riparian vegetation upstream in the Forebay. Sec 2.4 p 2-46 United began development of the GW flow model before the passage of SGMA, it was not specifically developed to support the GSP process, although the timing worked out well for that. Section 2.4.2.1 The third paragraph of this section summarizes exports from, and imports to, the Oxnard Subbasin by various entities. Notably missing from this summary is information about potential exports from the Oxnard Subbasin by the City of Ventura. Their wells in the vicinity of Ventura Municipal Golf Course pump a significant quantity of groundwater from the Oxnard Subbasin, and that groundwater is blended with other sources to supply residents and businesses primarily in the Mound basin (only a very small fraction of the City's land and population occur within the boundaries of the Oxnard Subbasin). For the sake of completing the export summary, we recommend quantifying how much water pumped by the City of Ventura from the Oxnard Subbasin is exported to and used within Mound or other basins. Sec 2.5 p 2-76 Not much clarity on how management areas might actually be used to help achieve sustainability.
Dan	Detmer	UWCD	1 - Administrative Information	1.1-Purpose of the Groundwater Sustainability Plan	N/A	Sec 1.1, p. 1-2 Not sure a "viable path" is the same as a defensible plan. Sec 1.2.6.1 p 1-6 Should also summarize progress towards developing new projects (not just describe progress to date). Sec 1.4.3 p 1-22 "Water diversion is primarily during large storm events" is not a good characterization of diversion practices at FD. Storm flows are not commonly diverted due to excessive turbidity. United commonly diverts during the recession limb of a storm hydrograph and during baseflow conditions, as allowed per NMFS diversion constraints. Sec 1.6.2 p 1-33. Why no mention of UWCD's routine purchase of Table A allocation of SWP? Only mention of transfers and special purchases. 3150 AF allocation commonly purchased and delivered from Pyramid to Piru (scaled to annual availability).
Dan	Detmer	UWCD	Executive Summary	ES.1-Introduction	N/A	The Executive Summary of the Draft GSP for the Oxnard subbasin focuses solely on seawater intrusion as the driver for development of sustainability criteria, without explaining how undesirable results for the other five sustainability criteria will be avoided. We understand from our participation in the FCGMA's Technical Advisory Group (TAG) that if the pumping reductions proposed in the Draft GSP to achieve minimum thresholds and measurable objectives for seawater intrusion are satisfied, then undesirable results would be avoided for the other five sustainability indicators. However, that concept is not discussed in the Executive Summary of the Draft GSP, and we are concerned that the reader might have difficulty finding it among the other technical details in the main body of the Draft GSP. Therefore, we suggest that FCGMA staff provide a brief explanation in the Executive Summary of how the other sustainability criteria will be met.
Susan	Rungren	City of Ventura/Ventura Water	Executive Summary	ES.1-Introduction	N/A	The "sustainable yield" in the GSP is not consistent with the Water Code and the Emergency Regulations adopted pursuant to the Sustainable Groundwater Management Act (SGMA). On page ES-1, the GSP states that the "sustainable yield" for the Oxnard Subbasin was calculated based on "currently available projects and management actions." This confuses the terms "sustainable yield" and "sustainability goal" as those terms are defined in the Water Code and the Emergency Regulations. The "sustainable yield" for the basin should be revised to reflect that the GSP must include two distinct calculations: (i) a "sustainable yield" that does not include future projects and management actions and which must be based on 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" (Wat. Code, § 10721(w).); and (ii) a "sustainability goal" which incorporates potential future projects and management actions and is calculated based on "the existence and implementation of one or more groundwater sustainability plans that achieve sustainable groundwater management by identifying and causing the implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield." (Wat. Code, § 10721(u); Cal. Code Regs., tit. 23, § 354.24.)
Susan	Rungren	City of Ventura/Ventura Water	Executive Summary	ES.2-Summary of Basin Setting and Conditions	N/A	The GSP lacks a firm commitment by the other two groundwater management agencies with jurisdiction over portions of the Subbasin outside Agency boundaries. Although the GSP has been prepared for the entire Oxnard Subbasin, certain portions of the Subbasin are outside the Agency's jurisdiction and are under the jurisdiction of either Camrosa OPV GSA or the Oxnard Outlying Area GSA. (GSP, p. ES-2) The GSP does not set out any firm commitment by the other two GSAs to implement the GSP. The City does not question the cooperative working relationship that currently exists between the Agency and the other two GSAs. Given the 20- to 50-year implementation period of the GSP, formal action by each respective GSA board committing to managing groundwater pumping in a manner consistent with the sustainability goal for the Subbasin is necessary to ensure the long-term health of the Subbasin.

Commenter			Chapter	Section	Subsection	Comment
Susan	Rungren	City of Ventura/ Ventura Water	Executive Summary	ES.5-Projects and Management Actions	N/A	The criteria for determining whether the UAS or LAS are experiencing an undesirable result is unclear. On page ES-6, the GSP lists three criteria for each of the UAS and LAS to determine whether the respective aquifer system is experiencing an undesirable result. It is unclear how the three criteria for each aquifer system operate, whether together or independently, or whether on a first-to-occur basis. This needs to be clarified to provide better guidance and eliminate confusion.
Susan	Rungren	City of Ventura/ Ventura Water	1 - Administrative Information	1.1-Purpose of the Groundwater Sustainability Plan	N/A	SGMA requires avoiding undesirable results, not their minimization or mitigation. There are several references in this Chapter and throughout the GSP related to managing the Subbasin in a manner that “limits,” “minimizes” or “mitigates” undesirable results. This standard is legally wrong. SGMA requires avoiding undesirable results by implementing sustainable groundwater management “that can be maintained during the planning and implementation horizon without causing undesirable results.” (Wat. Code, § 10721(v).) Those references need to be changed to comply with SGMA.
Susan	Rungren	City of Ventura/ Ventura Water	Tables	1-1 Estimate of Project Cost and Water Supply for First 5 Years	N/A	Cost estimates need more clarification. The City is unclear whether the cost estimates shown in Table 1-1 and Table 1-2 are for all basins managed by the Agency or whether they are specific to the Oxnard Subbasin. It is also unclear whether the estimated cost per acre-foot shown in Table 1-1 is based on amortized project development costs over the life of the respective project (see attached letter for footnote).
Susan	Rungren	City of Ventura/ Ventura Water	1 - Administrative Information	1.3-Description of Plan Area	1.3.2 Geography	The City’s demographic data should be added to Section 1.3.2.4. The Subbasin is a critical source of water for the City and the population it serves. It currently represents approximately 25-30% of the City’s water supply. Additionally, past, current and projected population statistics and discussion should be modified to include the City’s population and average household size. (GSP, pp. 1-19, 1-20; Table 1-9) This also requires updating the references cited in Section 1.9.
Susan	Rungren	City of Ventura/Ventura Water	Tables	1-9 Past, Current, and Projected Population for Ventura County, the Cities of Oxnard and Port Hueneme, and the Oxnard Plain	N/A	The City’s demographic data should be added to Section 1.3.2.4. The Subbasin is a critical source of water for the City and the population it serves. It currently represents approximately 25-30% of the City’s water supply. Additionally, past, current and projected population statistics and discussion should be modified to include the City’s population and average household size. (GSP, pp. 1-19, 1-20; Table 1-9) This also requires updating the references cited in Section 1.9.
Susan	Rungren	City of Ventura/Ventura Water	1 - Administrative Information	1.9-References Cited	N/A	The City’s demographic data should be added to Section 1.3.2.4. The Subbasin is a critical source of water for the City and the population it serves. It currently represents approximately 25-30% of the City’s water supply. Additionally, past, current and projected population statistics and discussion should be modified to include the City’s population and average household size. (GSP, pp. 1-19, 1-20; Table 1-9) This also requires updating the references cited in Section 1.9.

Commenter			Chapter	Section	Subsection	Comment
Susan	Rungren	City of Ventura/Ventura Water	1 - Administrative Information	1.4-Existing Monitoring and Management Plans	1.4.3 Operational Flexibility Limitations	Section 1.4.3 should be modified to more accurately reflect the progression of groundwater management and the operational flexibility that has historically occurred. The second paragraph under that section should be modified as follows (underlined text is to be added, strikethrough is to be deleted): "For the Oxnard Subbasin, water purveyors collectively draw from a combination of sources—including local surface water, groundwater, imports from the State Water Project (SWP), and increasingly, recycled water—which differ in terms of the volume available, area served, timing of peak availability, and reliability. Climate and regulatory constraints (e.g., water quality standards, water rights, and minimum environmental flows) have historically had a greater impact on the availability of surface water supplies,. whereas gGroundwater sources with adequate water quality were historically limited only by the capacity of production wells accessing the aquifer, until 1991 when FCGMA initiated a groundwater allocation reduction system. leading to pumping in excess of many basins' sustainable yield. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, groundwater extraction will be further limited by minimum thresholds established for each sustainability indicator. FCGMA has exercised its authority to limit groundwater production since 1983, and thus has managed the basin in an effort to avoid critical overdraft. Because in 2015 the State Department of Water Resources listed the Oxnard Subbasin as being in a state of Critical Overdraft, the sSustainable management criteria adopted in this GSP may limit operational flexibility by further reducing allowable groundwater production." (GSP, p. 1-21) (see attached comment letter to view formatted text).
Susan	Rungren	City of Ventura/Ventura Water	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.1 General Plans	Section 1.6.1 needs to be modified to more accurately describe the impact of General Plans on the GSP. The first sentence needs to be modified as follows, consistent with Cal. Code Regs., tit. 23, § 354.8 (underlined text is to be added, strikethrough is to be deleted): "General plans are considered applicable to the GSP if they have the potential to direct urban growth, zoning changes, or redevelopment anywhere to the extent they may change water demands within the Subbasin or affect the ability of the Agency to achieve sustainable groundwater management over the planning and implementation horizon." The City of Ventura's general plan should also be added to the list of general plans applicable to the Oxnard Subbasin. (GSP, p. 1-27) (see attached comment letter for formatted text).
Susan	Rungren	City of Ventura/Ventura Water	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	f. Section 1.6.2 needs to be modified to more accurately describe the City's UWMP. • The first sentence of the second paragraph on page 1-37 should read, "VWD's supplies are from Lake Casitas, the Ventura River, groundwater, and reclamation facilities." • The City's current allocation of 3,862 has been reduced since 2016, not 2018. This should be corrected at the top of page 1-38. • There is a typographical error near the end of the second paragraph: the phrase "wastewater prohibition" should be "water waste prohibition." • The reference to the Mound Groundwater Basin on page 1-38 should be removed; the City is permitted to utilize water pumped from its wells within the Oxnard Plain basin throughout its service area, not just within the Mound Basin. • The text discusses the City's use of groundwater from the Oxnard Subbasin, and then notes, "these continued extractions will need to be addressed as part of FCGMA's ongoing efforts to sustainably manage groundwater in the Oxnard Subbasin. However, the extraction has historically been subject to FCGMA management ordinances and will be subject to future FCGMA policies." These statements must be either deleted or added to other parts of the GSP where pumping by other than the City is discussed because they are applicable to every pumper in the Subbasin.
Susan	Rungren	City of Ventura/ Ventura Water	1 - Administrative Information	1.7-Well Permitting Policies and Procedures	1.7.1 FCGMA	Section 1.7 needs to be modified to include City's well permitting policies and procedures. In addition to County of Ventura and Agency requirements, a permit in the form of a well agreement with the City is required to construct a well within the City of Ventura's jurisdictional boundary.
Susan	Rungren	City of Ventura/Ventura Water	Tables	1-4 Summary of Land Ownership in the Oxnard Subbasin	N/A	Table 1-4 should be corrected by changing "Ventura Water District" to "Ventura Water Department." (GSP, p. 1-56)

Commenter			Chapter	Section	Subsection	Comment
Susan	Rungren	City of Ventura/Ventura Water	Figures	1-2 Administrative Boundaries for the Oxnard Subbasin	N/A	The northern boundary between Oxnard Subbasin and Mound Subbasin should reflect most recent boundary changes applied for by Mound Basin Groundwater Sustainability Agency and accepted by DWR in February 2019.
Susan	Rungren	City of Ventura/ Ventura Water	Figures	1-3 Weather Station and Stream Gauge Locations	N/A	Figure 1-3 should be corrected. The key shows a red star for the Freeman Diversion, but there are several red stars on the figure. Please revise as appropriate.
Susan	Rungren	City of Ventura/ Ventura Water	2 - Basin Setting	2.1-Introduction to Basin Setting	N/A	Reference to “DWR GSP Regulations, Section 354.14” should be corrected to more accurately reflect the regulations’ requirements. The GSP states that the “discussion of groundwater elevation is limited to production and monitoring wells screened in a single aquifer” in order to “conform with the DWR GSP Regulations, Section 354.14.” (GSP, p. 2-13) The correct regulation section is 354.16 (Cal. Code Regs., tit. 23, § 354.16(a).) Please note that the language used in the regulation does not create a limitation as stated in the GSP, rather it requires a description of current and historical groundwater conditions in the Subbasin “including . . . groundwater elevation . . . for each principal aquifer within the basin.” (Cal. Code Regs., tit. 23, § 354.16(a)(1).)
Susan	Rungren	City of Ventura/ Ventura Water	2 - Basin Setting	2.3-Groundwater Conditions	2.3.2 Estimated Change in Storage	Section 2.3.2 needs to be corrected. From the discussion it appears that Figure 2-24 should be titled “With Coastal Flux” not without coastal flux because it includes seawater intrusion. (GSP, p. 2-26)
Susan	Rungren	City of Ventura/Ventura Water	Figures	2-24 Oxnard Subbasin Annual Change in Storage Without Coastal Flux	N/A	Section 2.3.2 needs to be corrected. From the discussion it appears that Figure 2-24 should be titled “With Coastal Flux” not without coastal flux because it includes seawater intrusion. (GSP, p. 2-26)
Susan	Rungren	City of Ventura/ Ventura Water	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Section 2.4.1 needs to be corrected. In the first sentence of the fourth paragraph, the City of Ventura needs to be added as a predominant municipal water supplier. Also, please revise the sentence about the City later in the fourth paragraph to read in full as follows: “The City of Ventura also has wells in the Oxnard Subbasin.” The remainder of that sentence as written needs to be deleted because portions of the City’s water service area are within the Subbasin (alternatively, the sentence must be modified to clarify that the City’s water service area is both within and outside the Oxnard Subbasin). (GSP, p. 2-47)

Commenter			Chapter	Section	Subsection	Comment
Susan	Rungren	City of Ventura/ Ventura Water	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Information regarding model scenarios in Section 2.4.5 needs clarification. It is assumed that these scenarios are conceptual in nature for the exercise of bracketing sustainable yield estimates. It is not clear how the Agency can reduce pumping differentially between wells based on the aquifer system they pump from without implementing projects to replace their supply. (GSP, p. 2-62) This is particularly true since the Agency had mandated in the 1980's and early 1990's that pumpers replace wells pumping from the UAS with wells that pump from the LAS.
Susan	Rungren	City of Ventura/Ventura Water	3 - Sustainable Management Criteria	3.1-Introduction to Sustainable Management Criteria	N/A	Statements that undesirable results may occur between 2020 and 2039 are inconsistent with SGMA. There are numerous statements in Chapter 3 and throughout the GSP that presume that the occurrence of undesirable results between 2020 and 2039 is allowed under SGMA. This is not accurate. SGMA requires that the GSP outlines measures to be taken by the Agency in order to "achieve the sustainability goal in the basin within 20 years of the implementation of the plan." (Wat. Code, § 10727.2.) The sustainability goal "culminates in the absence of undesirable results within 20 years" of the implementation of the GSP. (Cal. Code Regs., tit. 23, § 354.24.) These requirements do not translate to permitting undesirable results up until the year 2039. Such interpretation does not take into consideration the length of time needed to rectify the undesirable result and implies that one year may be sufficient (because undesirable results should not occur beginning with the year 2040.). Further, assuming this GSP is approved, DWR has the authority to declare, at a future time, the approved GSP as either "incomplete" or "inadequate" following its periodic review of the Agency's progress towards achieving the sustainability goal for the Subbasin. (Cal. Code Regs., tit. 23, § 355.6(d).) One of the key criteria for DWR to make such future determination is whether "the exceedances of any minimum thresholds or failure to meet any interim milestones are likely to affect the ability of the Agency to achieve the sustainability goal for the basin." (Cal. Code Regs., tit. 23, § 355.6(c)(1).) An "incomplete" or "inadequate" determination by DWR may result in intervention by the State Water Resources Control Board as authorized under the Water Code. (Wat. Code, § D. 6, Pt. 2.74, Ch. 11.) The City does not support the proposition in the GSP that undesirable results may occur up until the year 2039 because it is not founded on best available information and best available science, as required by SGMA. Additionally, all references in the GSP to avoiding one or more undesirable results "after 2040" are vague because "after 2040" could mean any time period, and should be corrected to say that undesirable result would not occur "beginning in 2040," consistent with SGMA.
Susan	Rungren	City of Ventura/Ventura Water	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Potential economic disruption to municipal and industrial users must be considered. In Section 3.2, the GSP states that the proposed reductions must take into account the "potential economic disruption to the agricultural industry." (GSP, p. 3-2, paragraph 4.) This statement largely ignores potential impacts on the more than half million people who depend, in varying degrees, on Oxnard Subbasin water. The City proposes correcting the first sentence in that paragraph to read (underlined text is added): "Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin, the interference with municipal water supply planning and rate setting, and the uncertainty in the estimated sustainable yield of the Subbasin." Harm to municipal and industrial users should also be addressed in other portions of Chapter 3 where only harm to agricultural users are considered (e.g., Section 3.4.3 and others).
Susan	Rungren	City of Ventura/ Ventura Water	3 - Sustainable Management Criteria	3.1-Introduction to Sustainable Management Criteria	N/A	Any proposed reduction in production must be consistent with California water rights law. Compliance with SGMA does not exempt the Agency from complying with California water rights law. (Wat. Code, § 10720.5.) The GSP states in this Chapter and in other portions that the Agency is contemplating reducing production linearly over the 20-year GSP implementation period. (GSP, p. 3-2 and other sections) Established case law upheld reduction in groundwater production to safe yield that spans over a period ranging between 5 and 7 years. This is an important consideration for the Agency in terms of achieving the sustainability goal of the Subbasin. It informs the Agency's strategy in fulfilling its obligations under SGMA by necessitating the Agency to look at projects as the principal mechanism for bringing the Subbasin's yield to a sustainable level. The City reiterates its position that any proposed reduction in production must take into account production cutbacks and water conservation measure implemented by the City, especially during the recent drought.
Susan	Rungren	City of Ventura/ Ventura Water	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Section 3.2 needs to be corrected. In the fourth paragraph, the fourth sentence should be modified to state that the reduction in groundwater production over the first 5 years is approximately 900 AFY or 4,500 AF, not 4,500 AFY.
Susan	Rungren	City of Ventura/ Ventura Water	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.7 Defining Subbasin-Wide Undesirable Results	Section 3.3.7 needs to be corrected. On page 3-12, in the first paragraph, it states that, "…water levels in 6 of the 15 key wells…." However, the number of hydrographs for UAS wells shown in Figures 3-7a and 3-7b are only 14 wells. Either the sentence or the figures need to be corrected. (GSP, p. 3-12)

Commenter			Chapter	Section	Subsection	Comment
Susan	Rungren	City of Ventura/ Ventura Water	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.1 Chronic Lowering of Groundwater Levels	Statement regarding groundwater elevations with and without projects is inaccurate. The GSP states in Section 3.4 that "In general, the simulated groundwater elevations in the model scenario with projects were close to those in the scenario without projects, with any observed difference between the two limited to less than approximately 10 feet." (GSP, p. 3-14, first paragraph) This statement in the GSP does not recognize the difference between the scenarios as significant. An elevation differential of 5 to 10 feet along the coast is significant. In addition, the statement does not recognize that the impacts to groundwater users without the projects is vastly greater than with the projects.
Susan	Rungren	City of Ventura/ Ventura Water	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.1 Chronic Lowering of Groundwater Levels	Model assumptions must be recognized as a source of uncertainty in the model predictions. The GSP does not mention the model assumptions, which are the basis upon which model outputs are generated and thus the GSP relies, are a source of uncertainty as well. The City recommends that the following language be added to the last paragraph of Section 3.4 (p. 3-14): "There are also several ambiguities associated with the model's underlying assumptions, including but not limited to reported pumping, Subbasin boundary conditions, amount of seawater intrusion (flux at the coastline), tile drain discharges, and aquifer specific changes in storage resulting from changing groundwater elevations that add to the uncertainty of the modeling predictions."
Susan	Rungren	City of Ventura/ Ventura Water	3 - Sustainable Management Criteria	3.5- Measurable Objectives	3.5.1 Chronic Lowering of Groundwater Levels	Measurable Objectives Unclear. In Section 3.5, the GSP states that, "to prevent seawater intrusion after 2040, observed groundwater levels should be above the measurable objective 50% of the time." It is not clear how the 50% standard was determined or whether it was based on best available information and best available science as required by SGMA. (GSP, p. 3-21)
Susan	Rungren	City of Ventura/ Ventura Water	4 - Monitoring Networks	4.3- Monitoring Network Relationship to Sustainability Indicators	4.3.1 Chronic Lowering of Groundwater Levels	Reliance on groundwater elevations requires further equipping of all key wells. The recording of groundwater elevations as a mechanism for tracking progress towards reaching the sustainability goal for the Subbasin requires equipping all the key wells with pressure transducers for measurement accuracy and a higher temporal resolution in the data. This technical necessity needs to be reflected in Section 4.3.1 and any other GSP sections advancing this concept.
Susan	Rungren	City of Ventura/ Ventura Water	4 - Monitoring Networks	4.6-Potential Monitoring Network Improvements	4.6.1 Water Level Measurements: Spatial Data Gaps	Reference to the "northwestern Subbasin" needs to be corrected. In Section 4.6.1, p. 4-13, fourth paragraph, the last sentence in that paragraph references the "northwestern Subbasin" which needs to be corrected as no such Subbasin exists in Ventura County.
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.1- Introduction to Projects and Management Actions	N/A	Information regarding potential projects is not sufficient to meet SGMA requirements. In section 5.1, the GSP makes clear that the "inclusion of . . . projects does not constitute a commitment" by the Agency Board "to construct or fund the projects" and the timing of the management actions is ambiguous. SGMA requires that projects "shall be supported by best available information and best available science." (Cal. Code Regs., tit. 23, § 354.44(c).) SGMA also requires, among other things, that any projects identified in the GSP be accompanied with a "description the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred" as well as, for each project, a "time-table for expected initiation and completion, and the accrual of expected benefits." (Cal. Code Regs., tit. 23, § 354.44(b)(1)(A) and (b)(4).) The Agency must achieve this level of clarity at least as part of its next report to DWR or risk a negative determination by DWR as to the adequacy of the GSP and potential intervention by the State. (Cal. Code Regs., tit. 23, § 355.2(e); Wat. Code, § D. 6, Pt. 2.74, Ch. 11.) (GSP, pp. ES-8, 9; and Chapter 5.)

Commenter			Chapter	Section	Subsection	Comment
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.1-Introduction to Projects and Management Actions	N/A	No clearly articulated direction regarding the proposed projects or management actions to achieve the sustainability goal. As mentioned above, SGMA requires specificity as to project triggers and timetables. It is also unclear how the other two GSAs will contribute to projects or implement management actions consistent with the goal of bringing the Subbasin to sustainability. No projects have been identified that would either increase or maintain groundwater production at the presently reduced historical low levels (at least for certain producers). The GSP identifies a range of options under existing conditions, but no clear direction as to how the Agency intends to achieve sustainability without a significant disruption to all overlying users. If the contemplated groundwater allocation system proposed under Management Action No. 1 were included in the GSP, the City and other stakeholders could better evaluate the potential magnitude and timing of projects that need to be developed to lessen those impacts on overlying users. Absent such clarity, it is not possible to adequately comment on the projects and management actions, as currently presented in the GSP.
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.1-Introduction to Projects and Management Actions	N/A	Process for identifying projects should be improved. The City understands that the Agency's enabling legislation had limited its ability to fund and implement projects. However, as a GSA, the Agency is required under SGMA to assume a leadership role in developing projects that will reduce the need for excessive reductions in pumping allocations in the Subbasin.
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.4-Project No. 3 – RiverPark–Saticoy GRRP Recycled Water Project	N/A	UWCD is not authorized to impose or administer charges on Subbasin users for GSP projects. In discussing the economic impacts of Project No. 3 under Section 5.4.6, the GSP states that "These operating costs are anticipated to be provided by a pump charge administered either by UWCD or FCGMA." Any charges for GSP projects should be imposed and administered through by the Agency, not UWCD, and by following the proper statutory process. This statement in the GSP and any other similar statements in the GSP must be corrected.
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.7-Management Action No. 1 – Reduction in Groundwater Production	N/A	Timing and scope of the proposed management actions are unclear. It is unclear to the City if, when and how the two proposed management actions will be implemented. SGMA requires that management actions "shall be supported by best available information and best available science." (Cal. Code Regs., tit. 23, § 354.44(c).) To that end, with respect to the management action involving reduction in groundwater production, the City is of the position that any such management action must take into account reductions and conservation measures already implemented by the City and other municipal water providers, including those taken in compliance with the state-mandated requirements imposed during the recent drought period. Indeed, the Agency has applied this management action since 1991 to those pumpers who were limited to a specific historical allocation. Pumpers that could file for an efficiency allocation were allowed to increase their extraction of groundwater as long as the Agency deemed their use efficient. There has been considerable discussion between groundwater pumpers and Agency staff regarding the development of a pumping allocation system, which may include a reduction in groundwater production. The City reserves the right to comment about such system at a later time, including its equitable application among pumpers. It is not possible to adequately analyze or comment on this management action given the insufficient information provided in the GSP and the ambiguity regarding the timing and scope of its implementation. If the timing and scope of proposed management actions cannot be included in the GSP, they must be removed as they do not meet SGMA requirements.
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.7-Management Action No. 1 – Reduction in Groundwater Production	N/A	Uncertainty of model predictions must be considered before the Agency implements Management Action No.1. As noted on page 5-15, there are considerable uncertainties in the groundwater production rates that will prevent net seawater intrusion between the model scenarios chosen. The UAS estimates have an uncertainty of 12.8% to 18.75%, and the LAS has an uncertainty of 32.8% to 51.4%. As pointed out above, there are also uncertainties in the modeling assumptions and underlying data utilized in the model. In addition, the GSP states that, "The 1930 to 1979 50-year period with the 2070 DWR climate-change factor was found to be the most conservative and was used for the comparison with the other modeling simulations conducted." The City asks that the Agency keeps these uncertainties in mind when considering pumping reductions as a GSP management action. The Agency must consider investing in studies to fill data gaps and minimize uncertainties before imposing arbitrary pumping restrictions unaccompanied by projects.
Susan	Rungren	City of Ventura/Ventura Water	5 - Project Management Actions	5.1-Introduction to Projects and Management Actions	N/A	Missing Management Action No. 2. There appears to be a deleted or missing section in the GSP. The section numbering goes from Section 5.7 to Section 5.9, omitting Section 5.8. The City proposes considering a Water Market for municipal and industrial groundwater users as a management action and believes that such management action is necessary for more efficient coordination and conjunctive use of water. The City urges the Agency to include this as a potential management action.

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	Executive Summary	ES.2-Summary of Basin Setting and Conditions	N/A	Page ES-4. CONTEXT: The results of each of these scenarios indicated that continuing the 2015–2017 extraction rate would contribute to net seawater intrusion in both the Upper Aquifer System and Lower Aquifer System. In three additional scenarios, the groundwater production rate was decreased gradually over the first 20 years. COMMENT: There are 8 scenarios available through the Department of Water Resources (DWR) for future climate scenarios. Instead, FCGMA staff ran only 3. The GMA should test all climate scenarios to have a representative data set instead of just choosing the most conservative.
Amanda	Fagan	Naval Base Ventura County	Executive Summary	ES.3-Overview of Sustainability Criteria	N/A	Page ES-6. CONTEXT: In any single monitoring event, groundwater levels in 6 of 15 identified key wells are below their respective minimum thresholds. COMMENT: Will the GSP be updated if more wells are added prior to the 5 year review?
Amanda	Fagan	Naval Base Ventura County	Executive Summary	ES.3-Overview of Sustainability Criteria	N/A	Page ES-6. CONTEXT: The groundwater level in any individual key well is below the minimum threshold for either three consecutive monitoring events or three of five consecutive monitoring events, which occur in the spring and fall of each year. COMMENT: Droughts are 3-5 years on average, so how will this be taken into account? Stringent reductions in a wet year? Will consecutive years be used, or measurement periods (3 to 5 years, or 1.5 to 3 years)?
Amanda	Fagan	Naval Base Ventura County	Executive Summary	ES.3-Overview of Sustainability Criteria	N/A	Page ES-6. CONTEXT: The Lower Aquifer System would be determined to be experiencing an undesirable result if: • In any single monitoring event, groundwater levels in 8 of 19 identified key wells are below their respective minimum thresholds. • The groundwater level in any individual key well is below the minimum threshold for either three consecutive monitoring events or three of five consecutive monitoring events, which occur in the spring and fall of each year. COMMENT: Will the GSP be updated if more wells are added prior to the 5 year review? How will other items be considered if only one well is impacts (localized lows due to other well pumping rather than regional indications)?
Amanda	Fagan	Naval Base Ventura County	Executive Summary	ES.4-Overview of the Subbasin Monitoring Network	N/A	Page ES-8. CONTEXT: Pressure transducer records provide the high-temporal resolution data that allows for a better understanding of water level dynamics in the wells related to groundwater production, groundwater management activities, and climatic influence. COMMENT: Navy Subject Matter Expert (NAVFAC EXWC hydrogeologist) highly encourages this. Without clear temporal understanding in such a seasonal environment, they will be hampered by potentially overemphasizing summer declines and a lack of understanding of infiltration (which is currently treated as immediately entering the aquifer even though this is unrealistic).

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Page 1-6 / 1-7. CONTEXT: (1) FCGMA will evaluate the GSP at least every 5 years. This 5-year evaluation will be provided as a written assessment to DWR. The assessment shall describe whether the Plan implementation, including implementation of projects and management actions, are meeting the sustainability goal in the basin. The evaluation will include the following: (2) During the initial 5-year period after the GSP is adopted, FCGMA will explore options for filling data gaps identified in this GSP. The primary data gaps identified in the historical data are spatial and temporal gaps in groundwater elevation and groundwater quality measurements. COMMENT: (1) This section could benefit from a “report card” summary of the sustainability goals with a simple yes/no if the goal was met or not for all of the basins within the groundwater management area. (2) Naval Base Ventura County may share relevant data as it becomes available to help refine FCGMA analysis.
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.2-Agency Information	1.2.1 Agency Name	Page 1-7. CONTEXT: “to the degree that monitoring schedules and locations will change, a cost-sharing agreement will be developed between VCWPD and FCGMA” COMMENT: FCGMA has not had monitoring expenditures up to this point, since a majority of the data required is already available and collected by UWCD and VCWPD. It is worth noting this will be a driver in increasing monitoring costs. Additional clarification should be added as to when and how this cost sharing will be put into place, and whether it will be considered O&M or GSP specific work.
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.2-Agency Information	1.2.1 Agency Name	Page 1-10. CONTEXT: In general, FCGMA plans to fund its basic operations costs using groundwater extraction charges. Surcharges for extractions in excess of an allocation may also be used in carrying out FCGMA’s groundwater management functions. FCGMA collects a groundwater extraction fee of $6 per acre-foot and imposes a surcharge of up to $1,961 for excess extractions. COMMENT: Clarify this statement. Is $6/acre-ft the surcharge or the base rate? If it is the surcharge, what is the base rate? How is the surcharge scaled with surplus use?
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.3- Description of Plan Area	1.3.2 Geography	Page 1-18. CONTEXT: Urban and residential land uses are concentrated in Oxnard and Port Hueneme. Federal lands consist of the Naval Base Ventura County, which is a United States Navy base located south of Oxnard. The base was formed in 2000 through the merger of Naval Air Station Point Mugu (located in the southern portion of the Oxnard Plain) and Naval Construction Battalion Center Port Hueneme (located in the west-central part of the Oxnard Plain along the coast). Currently, there are about 19,000 military, civilian, and contract personnel working or stationed at Naval Base Ventura County (City of Oxnard 2011). COMMENT: Naval Base Ventura County (NBVC) has two primary operating locations within the Oxnard Subbasin, Point Mugu and Port Hueneme. NBVC Port Hueneme is located within the City of Port Hueneme, and NBVC Point Mugu is located in unincorporated Ventura County, generally southeast of Oxnard. The NBVC Economic Impact Assessment (2018) identified approximately 14,600 military, civilian, and contractor employees, based on Fiscal Year 2015 data. NBVC also has 1,344 total housing units (residences). However, it is important to note that the NBVC base population fluctuates with assigned missions and requirements.
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.8- Notification and Communicati on	1.8.2 Summary of Beneficial Uses and Users	Page 1-47. CONTEXT: The Federal Government. As discussed in Section 1.3.2.3, the federal government is a landowner and groundwater user in the Oxnard Basin through the Naval Base Ventura County. Representatives from the U.S. Navy have been coordinating with FCGMA staff regarding the development of the GSP, have participated in FCGMA public meetings, and are on the list of interested parties who receive electronic newsletters regarding the status and development of the Oxnard Subbasin GSP. COMMENT: Channel Islands Air National Guard Station (U.S. Air Force / California Air National Guard) is also a federal landowner and groundwater user in the Oxnard Basin, independent of Naval Base Ventura County. CIANGS does receive its drinking water through NBVC, but has its own groundwater extraction well on its property.

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	Tables	1-2 Groundwater Sustainability Plan Estimated Implementation Cost through 2040	N/A	Page 1-55. CONTEXT: The monitoring costs annually are value at $1,000,000 per year starting in 2020. There is about a 2.5% increase every year in the cost likely to account for inflation. COMMENT: The Operation and Monitoring costs do not reflect any increase in cost for the start of the monitoring cost-sharing program mentioned on page 1-7. Is it assumed that the cost-sharing program has already started before 2020 and that the costs will remain constant?
Amanda	Fagan	Naval Base Ventura County	Tables	1-6 Oxnard Plain Precipitation Station Information	N/A	Page 1-58. Table 1-6. CONTEXT: Oxnard Plain Precipitation Station Information COMMENT: No relation is present between precipitation and location based on the data provided. All precipitation is therefore likely about the same in this area and/or not impacted by elevation.
Amanda	Fagan	Naval Base Ventura County	Figures	1-6 Long-Term Precipitation Trends in the Oxnard Plain	N/A	Page 1-83. Figure 1-6. COMMENT: Consider compressing the primary y-axis (say 0 – 40” instead of 0 – 140”) so resolution of annual precipitation is better. Make colors/line type in the legend consistent with the figure (e.g. mean precipitation is shown in the figure as a solid line but is a dashed line in the legend).
Amanda	Fagan	Naval Base Ventura County	2 - Basin Setting	2.2-Hydrogeologic Conceptual Model	2.2.3 Principal Aquifers and Aquitards	Page 2-6. CONTEXT: River-deposited sands and gravels interbedded with minor silt and clay compose the semi-perched aquifer in the Oxnard Subbasin (DWR 1965; Turner 1975). The term “semi-perched aquifer” is used in this GSP as the name for the uppermost unit of the Oxnard Subbasin, which overlies the extensive clay cap in the pressure plain area of the Oxnard Subbasin (Figure 2-2 and Table 2-1). This name was used in the State Water Resources Control Board’s Bulletin 12 (SWRCB 1956) to distinguish the water-bearing sedimentary units in the pressure plain area from those in the Forebay area, and this terminology has been adopted by subsequent investigators (Mukae and Turner 1975; Turner 1975; Hanson et al. 2003; DWR 2006). Water-level data indicate that the sediments underlying the semi-perched aquifer are saturated. Therefore, the term “semi-perched aquifer” is used in this GSP to denote the limited migration of water from the uppermost aquifer to the underlying confined aquifer in the pressure plain area. COMMENT: Semi-perched systems can result in delayed or minimized infiltration into the units below (i.e. the prime aquifer zones). Therefore it is likely that infiltration will be slower and "less" than the totals flowing in. The current model does not allow for these potential time lags or reductions in infiltration estimates. This could significantly impact their model’s ability to predict aquifer rebound. We recommend that they study this through the use of continuous transducers, or additional work, as this could cause decreases to trigger more often when in reality recharge is just delayed in reaching the deeper zones.
Amanda	Fagan	Naval Base Ventura County	2 - Basin Setting	2.2-Hydrogeologic Conceptual Model	2.2.4 Data Gaps and Uncertainty in the Hydrogeologic Conceptual Model	Page 2-12. CONTEXT: “Potential impacts of increased production in the semi-perched aquifer” COMMENT: (1) Is there really production coming out of the semi-perched? Or does this refer to discharge from the French/tile drains in the agricultural fields? This should be clarified. Furthermore, the semi-perched zone is not considered in this GSP, therefore why do the impacts matter? (2) There is limited mention of uncertainty in the climate conditions used or the limitations of using only two climate scenarios. There should be a paragraph or section at least explaining any uncertainty associated with the climate assumptions.

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	2 - Basin Setting	2.4-Water Budget	2.4.2 Sources of Water Discharge	Page 2-55. Error! Reference source not found. Please fix reference error.
Amanda	Fagan	Naval Base Ventura County	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Page 2-62. CONTEXT: There is a preference to reduce the Oxnard LAS and UAS more than the connected PVB LAS and UAS and the WLPMA LAS. There are four reduction scenarios and in each scenario the reduction is double if not more in the Oxnard basin than PVB and WLPMA. Each scenario's results mentions a steady migration of salt water in the LAS regardless of the scenario. COMMENT: Has UWCD or Dudek run any scenarios where Oxnard, PVB, WLPMA, and Oxnard LAS aquifers are reduced the same amount? Despite the fact that the GSP is not setting the extraction reductions, the concern is that the extraction reductions would be roughly based off of modelled scenarios. In this case, the burden of the highest LAS reductions could be unfairly lumped on the Oxnard Sub-basin LAS users. More scenarios are recommended.
Amanda	Fagan	Naval Base Ventura County	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Page 2-65. CONTEXT: Oxnard LAS aquifers are reduced the same amount? Despite the fact that the GSP is not setting the extraction reductions, the concern is that the extraction reductions would be roughly based off of modelled scenarios. In this case, the burden of the highest LAS reductions could be unfairly lumped on the Oxnard Sub-basin LAS users. More scenarios are recommended. COMMENT: Recommend including this statement in the executive summary, as well as any other comments directly related to the past or present sustainability status of the basin. Executive summary 3 does a fine job describing the sustainability criteria but does not explain the state of basin given the criteria described in this GSP.
Amanda	Fagan	Naval Base Ventura County	Figures	2-12 Groundwater Well Hydrographs in the Mugu Aquifer	N/A	Page 2-135. Figure 2-12. CONTEXT: Groundwater Well Hydrographs in the Mugu Aquifer COMMENT: Appears to show partially confined conditions as some wells recover, but others don't.
Amanda	Fagan	Naval Base Ventura County	Figures	2-18 Groundwater Well Hydrographs in the Fox Canyon Aquifer	N/A	Page 2-149. Figure 2-18. CONTEXT: Groundwater Well Hydrographs in the Fox Canyon Aquifer COMMENT: Appears to show partially confined conditions as some wells recover, but others don't.
Amanda	Fagan	Naval Base Ventura County	Figures	2-22 Oxnard Subbasin Annual Change in Storage	N/A	Page 2-155. Figure 2-22. CONTEXT: Oxnard Subbasin Annual Change in Storage COMMENT: This figure shows 12 driest years, 7 dry years, 6 wet years, 5 wettest years. This is clearly biased toward dry years.

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.1 Chronic Lowering of Groundwater Levels	Page 3-4. CONTEXT: In addition to surface-water spreading, seawater intrusion into the aquifers of the Oxnard Subbasin has also sustained groundwater levels. Unlike surface-water spreading, seawater intrusion sustains groundwater levels at the expense of freshwater storage in the Subbasin (Section 2.3.3). Water levels in the aquifers of the LAS have remained below sea level even during drought recovery periods, thereby continuing to allow migration of seawater into the Subbasin near the Mugu and Hueneme Submarine Canyons (Section 2.3, Groundwater Conditions). Continued seawater intrusion has reduced the amount of freshwater in storage in the Subbasin. COMMENT: NBVC may consider potential recharge location(s) on base to partner with FCGMA and other local agencies, such as for storm water/sewer discharges.
Amanda	Fagan	Naval Base Ventura County	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.5 Land Subsidence	Page 3-10. There is no mention of Land Subsidence (aquifer compaction) as an impact on storage capacity. The lack of detail on aquifer compaction, underplays the impact subsidence can have on aquifer storage.
Amanda	Fagan	Naval Base Ventura County	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.1 Chronic Lowering of Groundwater Levels	Page 3-14. CONTEXT: “The minimum threshold groundwater elevations selected to protect against net seawater intrusion in the UAS and LAS are based on the lowest simulated groundwater elevation after 2040 for the two model simulations in which net seawater intrusion was minimized”. COMMENT: Which two model simulations were used? Which reduction or climate scenario was used and are they a part of the 6 model scenarios used to ascertain the sustainable yield?
Amanda	Fagan	Naval Base Ventura County	3 - Sustainable Management Criteria	3.5-Measurable Objectives	3.5.1 Chronic Lowering of Groundwater Levels	Page 3-21. CONTEXT: “Therefore, the measurable objectives were selected based on the median groundwater elevation between 2040 and 2070, simulated for each well, in model simulations that prevented net landward migration of the 2015 saline water impact front after 2040.” COMMENT: Median between which outputs? The median of the water levels of the 6 model scenarios?
Amanda	Fagan	Naval Base Ventura County	3 - Sustainable Management Criteria	3.5-Measurable Objectives	3.5.1 Chronic Lowering of Groundwater Levels	CONTEXT: “The median groundwater elevation was rounded down to the nearest 5-foot interval to account for uncertainty in the model simulated future groundwater elevations. In order to account for future sea level rise, the rounded groundwater elevations were increased by 2 feet. The median simulated groundwater elevation (from 2040 to 2070) at each well after rounding and accounting for sea level rise is the measurable objective (Table 3-1).” COMMENT: Why was the groundwater elevation rounded down? Wouldn’t choosing a median value already be incorporating some sort of buffering for the uncertainty?
Amanda	Fagan	Naval Base Ventura County	3 - Sustainable Management Criteria	3.5-Measurable Objectives	3.5.1 Chronic Lowering of Groundwater Levels	Page 3-21. Paragraph 4. CONTEXT: “In order to prevent net seawater intrusion in the Subbasin after 2040, observed groundwater levels should be above the measurable objective 50% of the time.” COMMENT: 50% of the time in a year or in 5 years or for the full 20-year period? Please clarify.
Amanda	Fagan	Naval Base Ventura County	Figures	3-6a Key Well Hydrographs for Wells Screened in the Oxnard Aquifer	N/A	Pages 3-43 through 3-61. Figure 3-6a through 3-11. CONTEXT: Key Well Hydrographs COMMENT: Water levels modeled in the threshold scenarios show rebounds over a 10 year period of greater than 80 feet at some locations. This suggests A LOT of well pumping being "turned off", or other changes, that may not be realistic.

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	4 - Monitoring Networks	4.6-Potential Monitoring Network Improvements	4.6.3 Groundwater Quality Monitoring	The GSP states there is a limited list of analytes being tested for and that it should be "expanded to include a full general minerals suite". What's currently being tested for?
Amanda	Fagan	Naval Base Ventura County	Tables	4-2 Network of Stations Monitoring Precipitation in the Vicinity of the Oxnard Subbasin	N/A	Page 4-20. Table 4-2. CONTEXT: Network of Stations Monitoring Precipitation in the Vicinity of the Oxnard Subbasin , (Specifically Station 223A, Point Mugu–USN) COMMENT: This station is being used to provide data. Who maintains this station?
Amanda	Fagan	Naval Base Ventura County	5 - Project Management Actions	5.6-Project No. 5 – Temporary Agricultural Land Fallowing Project	N/A	Page 5-12. CONTEXT: The Temporary Agricultural Land Fallowing Project would use replenishment fees to lease and temporarily fallow agricultural land (FCGMA 2018). This would result in decreased groundwater production on the parcels or ranches that are fallowed, and an overall reduction in groundwater demand in the Subbasin. Parcels or ranches in areas susceptible to seawater intrusion would be targeted with this project (FCGMA 2018). COMMENT: Cultivated agricultural lands provide an important buffer against urban development that may be incompatible with military operations. In addition, evidence from NAS Lemoore suggests that cultivated agricultural lands reduce the prey base, which reduces the risk of raptor strikes on aircraft, mitigating Bird Aircraft Strike Hazards (BASH). As the Fallowing Project proceeds, NBVC respectfully requests coordination with the Navy and project participants to ensure that fallowed lands do not attract prey that results in an elevated BASH risk.
Amanda	Fagan	Naval Base Ventura County	5 - Project Management Actions	5.9-Management Action No. 3 – Water Market Pilot Program	N/A	Page 5-17. CONTEXT: SWIM and Pumping Depression participants can only trade within their management area. This is a geographical limitation of the program. Other than these two distinctions, the geography is ignored by the water market program. COMMENT: When the GMA begins to set the extraction reduction plan, will geographic location be considered when deciding percentage reduced for a given management area?
Amanda	Fagan	Naval Base Ventura County	Appendices	J-GeoTracker Open Sites	N/A	Section 2.1. CONTEXT: Rather than using MODFLOW with the SWI2 package, the UWCD model adjusts general head boundaries at the ocean interface to reflect the hydrostatic head plus the density difference between fresh and sea water. Consequently, this model correctly represents the boundary conditions but cannot be relied upon to forecast seawater intrusion in all of its relevant detail. COMMENT: How can the UWCD model approach be sure, heads-wise? Did the analysis correct all the targets for density concerns? Consider use of MODFLOW-SWI2 or SEAWAT as a more reliable choice for this analysis.

Commenter			Chapter	Section	Subsection	Comment
Amanda	Fagan	Naval Base Ventura County	Appendices	J-GeoTracker Open Sites	N/A	Section 2.2.2. CONTEXT: It merely serves to highlight the daunting challenge one faces in trying to parameterize or calibrate groundwater models in a deterministic fashion. It also points out the limitations of local sensitivity analyses implemented in the USGS software PEST (Welter et al., 2015). COMMENT: This statement is misleading in multiple ways. First, PEST is a private software. The USGS code is called UCODE and a modified PEST version called PEST+. In addition to this misunderstanding, using automated calibration techniques in conjunction with local knowledge and human guidance has been shown to be a good approach to calibration. What Welter actually says: "Although there are many different GSA methods, all GSA methods strive to be more robust than traditional, derivative based local sensitivity analysis, which computes the local sensitivities at a single point in parameter space and is not always adequate for analyzing nonlinear problems where the sensitivities can change depending on where they are computed. Some GSA methods provide general information about the variability of the sensitivities and have relatively low computational requirements, whereas others provide detailed information on nonlinear behavior and interactions between parameters at the expense of larger computational requirements."
Amanda	Fagan	Naval Base Ventura County	Appendices	J-GeoTracker Open Sites	N/A	Section 2.3.1. CONTEXT: Figures 1 and 2 show that the ARM and Seawater Flux (seawater intrusion) are most sensitive to the values of hydraulic conductivity, which dominate the contributions from other hydrogeologic parameters. The results are presented in terms of the Sobol' indices (Saltelli et al., 2008). The global sensitivity analysis indicates that horizontal hydraulic conductivity values assigned to the Oxnard and Mugu aquifers in the Forebay (Zone 9 and adjacent Zones 10 and 19; see Appendix A for maps of model zones by layer) account for approximately 37% of the variance in the modelwide ARM for groundwater levels and approximately 24% of the variance in calculated seawater flux (these results are presented in the attached Tables 3 and 4 as well). COMMENT: The Figures raise a concern for the Navy subject matter expert that the representation of sea water intrusion could be inaccurate, and that this could be a large problem for the model.
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.1-Purpose of the Groundwater Sustainability Plan	N/A	General Comment re: "submarine canyons." COMMENT: The Mugu and Hueneme Submarine Canyons are located in close proximity to NBVC Point Mugu and NBVC Port Hueneme. The GSP should make clear that the seawater intrusion present in these areas is due to the coincident geographical location of NBVC, not as the result of any current or past activities at the Naval Base. At least one member of the public has raised an issue related to Navy activities, based on an incorrect assumption that the groundwater conditions in the Oxnard Subbasin are a result of Navy activities. The GSP should provide clarity to prevent confusion of geologic features and naval operations.
Amanda	Fagan	Naval Base Ventura County	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.3 Additional Plan Summaries	Pages 1-40 - 1-41. As noted in the letter from Naval Base Ventura County (NBVC) Commanding Officer dated July 17, 2019, consistent with the California Sustainable Groundwater Management Act, the Groundwater Sustainability Plan (GSP) and allocation ordinance should recognize the Federal Reserve water right and ensure a groundwater allocation that provides for a supply of water to support the current U.S. Navy and Air Force mission and anticipated growth. We acknowledge and appreciate the inclusion of language to that effect on pages 1-40 and 1-41 of the revised GSP. We respectfully request that this recognition continue forward through adoption and implementation of the GSP, to include the allocation ordinance and other management actions.

Commenter			Chapter	Section	Subsection	Comment
Ruthie	Redmond	The Nature Conservancy	1 - Administrative Information	1.8-Notification and Communication	1.8.2 Summary of Beneficial Uses and Users	Environmental Beneficial Uses and Users [Checklist Item 1 - Notice & Communication (23 CCR §354.10)] • Section 1.8.2, pp. 1-45 - 1-46 The GSP identifies the primary environmental users in the Oxnard Subbasin as the identified GDEs, as described in Section 2.3.7, and includes aquatic habitat, in-channel wetlands, riparian forest, and coastal marshes. The GSA has included representation of environmental users on their TAG, in a special meeting on GDEs and in GSP email and meeting notifications. Our suggestion is to explicitly list different types of beneficial uses and users of groundwater under each category. This would better clarify who these beneficial uses and users are in the basin. In regards to environmental beneficial uses and users, we recommend that GDEs identified in the Basin Setting section (i.e., the lower Santa Clara River, McGrath Lake, Ormond Beach wetlands, Mugu Lagoon, Calleguas Creek, and Revolon Slough) be specifically listed, as well as the RWQCB surface water environmental beneficial uses within GDEs listed in Section 2.3.7 (e.g., fish migration and wildlife habitat). The identified GDEs are inclusive of a variety of plant and animal species; some of which are recognized state or federally threatened and endangered or special status species and are designated critical habitat. We also recommend that the GSP specifically engage with the natural resource agencies, NOAA Fisheries, US Fish and Wildlife Service, CA Department of Fish and Wildlife, as stakeholders since they are important parties representing the public trust. In particular, the efforts to address the habitat needs of endangered species such as the endangered Southern California Steelhead in the development of the Multiple Species Habitat Conservation Plan is of particular importance. We suggest that the NOAA Fisheries be consulted to ensure the GSP addresses the ecological needs as represented by these public trust agencies.
Ruthie	Redmond	The Nature Conservancy	Tables	1-8 Past and Present Land Uses within the Oxnard Plain, 1990–2015	N/A	• Table 1-8 Please revise the Land Use Category from “Vacant” to “Open Space”. As noted in Section 1.3.2.3 - Historical, Current, and Projected Land Use and Section 1.6.1 – General Plans, this is a substantial acreage that is valued highly in Ventura County as open space, with ordinances such as the 1998 Save Open Space and Agricultural Resources ordinance. We need to do a better job of delineating open space and native habitat from the “vacant” category, as this devalues the environment and its water need.
Ruthie	Redmond	The Nature Conservancy	1 - Administrative Information	1.4-Existing Monitoring and Management Plans	1.4.3 Operational Flexibility Limitations	Description of general plans and other land use plans relevant to GDEs and their relationship to the GSP [Checklist Items 2 to 3 - (23 CCR §354.8)] Operational Flexibility Limitations (p. 1-19 to 1-20)] A Multiple Species Habitat Conservation Plan prepared by UWCD specifies flow conditions at the Freeman Diversion to be constrained by the habitat requirements for the federally endangered Southern California steelhead (Oncorhynchus mykiss) in the Santa Clara River.
Ruthie	Redmond	The Nature Conservancy	2 - Basin Setting	2.2-Hydrogeologic Conceptual Model	2.2.3 Principal Aquifers and Aquitards	Hydrogeologic Conceptual Model [Checklist Items 6, and 7 (23 CCR §354.14)] Principal Aquifers and Aquitards (p.2-6 to 2-7), with additional detail in Sections 1.3.2.1, 2.3.6, 2.3.7, 2.4.1.1, 2.4.2.5, Appendix K The Hydrogeologic Conceptual Model adequately describes the shallow groundwater that is interconnected with surface waters and GDEs. Basin-wide cross sections provided in Figures 2-3 and 2-4 include a graphical representation of the manner in which shallow groundwater may interact with ISWs or GDEs that would allow the reader to understand this topic. In the Oxnard Subbasin, the shallow groundwater unit, the semi-perched aquifer, is connected to surface waters (e.g., Santa Clara River, Calleguas Creek, Revolon Slough, McGrath Lake, and the coastal wetlands at Ormond Beach and Mugu Lagoon). The semi-perched aquifer is not considered a principal aquifer due to its limited groundwater production (<50 AFY).

Commenter			Chapter	Section	Subsection	Comment
Ruthie	Redmond	The Nature Conservancy	1 - Administrative Information	1.3-Description of Plan Area	1.3.2 Geography	Interconnected Surface Waters (ISW) [Checklist Items 8, 9, and 10 – (23 CCR §354.16); Identification of ISWs is a required element of Current and Historical Groundwater Conditions (23 CCR §354.16).] • Sections 1.3.2.1, 2.3.6, 2.3.7, 2.4.1.1, 2.4.2.5, Appendix K The Santa Clara River, Calleguas Creek, Revolon Slough, Mugu Lagoon, Ormond Beach, and McGrath Lake have all been identified as surface water bodies that may have a connection to the semi-perched aquifer in the Oxnard Subbasin. Qualitative statements are made regarding the interconnectedness, including gaining/losing reaches, and timing are provided, along with quantification, based on numerical modeling, of the recharge to groundwater from the Santa Clara River and Calleguas Creek. We disagree with the qualifying statements that the "surface water bodies that may have a connection" and "However, groundwater elevation data for the semi-perched aquifer in the Oxnard Subbasin are extremely limited, with no monitoring sites near enough to surface water bodies to establish the extent of the connection between these surface water bodies and underlying groundwater." There have been previous efforts to assess the quantity and timing of interconnected surface water and groundwater by other consultants working at or nearby the surface water bodies, such as shallow monitoring data and groundwater modeling at Naval Base Ventura County from site-specific groundwater investigations and surface water and groundwater monitoring data at the Santa Clara River estuary and lower floodplain. These data, including well elevation data dating back to 1990, have been described in TNC's Technical Memorandum: Assessment of Groundwater Dependent Ecosystems for the Oxnard Subbasin Groundwater Sustainability Plan (Appendix K). TNC's assessment of these reports indicate that the water elevation data and analyses corroborate the conceptual model that groundwater levels in the semi-perched aquifer relatively constant with a seasonal cyclical behavior, although there has been a downward trend with the recent (2011-16) drought. These reports and data provide estimates of quantity and timing of groundwater - surface water interactions. The GSA should review sed reports and data and revise these statements to be definitive statements of the connections of surface water and groundwater.
Ruthie	Redmond	The Nature Conservancy	2 - Basin Setting	2.3-Groundwater Conditions	2.3.7 Groundwater-Dependent Ecosystems	Identification, Mapping and Description of GDEs [Checklist Items 11 to 20 (23 CCR §354.16)] • Section 2.3.7 (pp. 2-43 – 2-46) & Appendix K GDEs have been identified and mapped during the GSP development process using an earlier version of the statewide database of GDE indicators (iGDE v0.3.1; TNC, 2017) and TNC's GDE Guidance document (Rohde et al., 2018). This evaluation is described in Appendix K, with a brief summary in Section 2.3.7. In addition to the mapping of basin GDEs, it also includes both an assessment of the hydrologic and ecological conditions of the GDEs and potential GDEs. • Executive Summary (p. 1-1); Section 1.1 (p.1-2) While we support the position that "Depletions of interconnected surface water have not occurred historically in the Subbasin, because the Groundwater-Dependent Ecosystems (GDEs) in the Subbasin are supported by shallow groundwater flows that are generally separated and disconnected from the primary groundwater aquifers," we would like to make this clear that historical conditions represent the time period referenced by SGMA – since the 1980s. As noted in Section 2.2.3, once agriculture grew in the Oxnard subbasin, groundwater levels in the semi-perched aquifer were lowered using the agricultural tile drains (installed in the 1900s) for drainage of irrigated water from the agricultural fields.
Ruthie	Redmond	The Nature Conservancy	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Water Budget [Checklist Items 21 and 22 (23 CCR §354.18)] • Section 2.4 The water budget now includes the semi-perched aquifer and the surface hydrologic components of the semi-perched aquifer, including the groundwater-surface water exchanges with the Santa Clara River and the Calleguas Creek and natural vegetation evapotranspiration (ET). We appreciate the separate inclusion of the semi-perched aquifer water budget.
Ruthie	Redmond	The Nature Conservancy	3 - Sustainable Management Criteria	3.1-Introduction to Sustainable Management Criteria	N/A	Sustainability Goal [Checklist Items 23 to 25 (23 CCR §354.24)] • Section 3.1 Introduction to Sustainable Management Criteria (p. 3-2) Fox Canyon Groundwater Management Agency (FCGMA) Board of Directors (Board) adopted planning goals in 2015 that "Promote water levels that mitigate or minimize undesirable results (including pumping trough depressions, surface water connectivity [emphasis added], and chronic lowering of water levels)." Under current and known future conditions, as described in Section 3.3.6, the sustainability goal does not require inclusion of sustainability criteria for surface water connectivity. We agree this as reasonable position for the GSP at this time, given that the semi-perched aquifer is not a principal aquifer and is not managed for water supply. However, if future projects are envisioned to produce water from the semi-perched aquifer, sustainability criteria will be developed.

Commenter			Chapter	Section	Subsection	Comment
Ruthie	Redmond	The Nature Conservancy	3 - Sustainable Management Criteria	3.3- Undesirable Results	3.3.6 Depletions of Interconnected Surface Water	Undesirable Results [Checklist Items 30 to 46 (23 CCR §354.26)] • Section 3.3.6 Depletions of Interconnected Surface Water (p. 3-10 - 3-11) The GSP clearly states: "The undesirable result associated with depletion of interconnected surface water in the Oxnard Subbasin is loss of groundwater-dependent ecosystem (GDE) habitat." We applaud this clear recognition of GDEs as an important beneficial use that must be protected. We also agree with further statements that 1) undesirable results are not currently occurring, 2) groundwater elevation monitoring will continue to be monitored in the semi-perched aquifer and 3) if future projects involve the use of the semi-perched aquifer, then "depletion of interconnected surface water is possible, and significant and unreasonable impacts may occur." While we agree that "Reevaluation of the effects on existing and potential GDEs should be conducted in conjunction with the project approval process for any such future projects," we urge stronger language to specifically state sustainability criteria will be developed at that future time.
Ruthie	Redmond	The Nature Conservancy	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.6 Depletions of Interconnected Surface Water	Minimum Thresholds [Checklist Items 27 to 29 (23 CCR §354.28)] • Section 3.4.6 Minimum Thresholds – Depletions of Interconnected Surface Water (p. 3-19 to 3-20) We applaud the language recognizing that future projects may have a potential impact on interconnected surface water and GDEs, and that "if projects that produce groundwater from the semi-perched aquifer are implemented, the need for specific water level minimum thresholds in the semi-perched aquifer should be reevaluated". This section defines minimum thresholds due to salinity front as it the modeling shows UAS levels support the groundwater elevations in the semi-perched aquifer. This is confusing as it seems like the recharge is predominantly downwards from the semi-perched aquifer to the UAS. It is unclear how the UAS is influencing the salinity front in the semi-perched aquifer.
Ruthie	Redmond	The Nature Conservancy	3 - Sustainable Management Criteria	3.5- Measurable Objectives	3.5.6 Depletions of Interconnected Surface Water	Measurable Objectives -Checklist Item 26 – (23 CCR §354.30) • Section 3.5.6 Measurable Objectives – Depletions of Interconnected Surface Water (p. 3-26 to 3-27) A measurable objective for interconnected surface water in the semi-perched aquifer is set to address seawater intrusion. We recommend adding a statement, as is done in Section 3.4.6, that "if projects that produce groundwater from the semi-perched aquifer are implemented, specific water level measurable objectives in the semi-perched aquifer should be developed".
Ruthie	Redmond	The Nature Conservancy	4 - Monitoring Networks	4.3- Monitoring Network Relationship to Sustainability Indicators	4.3.6 Depletions of Interconnected Surface Water	Monitoring Network [Checklist Items 47, 48 and 49 (23 CCR §354.34)] • Section 4.3.6 Depletions of Interconnected Surface Water (p.4-10) We recommend inclusion of remote sensing vegetative indices as a low cost approach to monitor baseline conditions of GDEs. The Nature Conservancy's free online tool, GDE Pulse, allows GSAs a way to assess changes in GDE health using remote sensing data sets; specifically, the Normalized Difference Vegetation Index (NDVI), which is a satellite-derived index that represents the greenness of vegetation and Normalized Difference Moisture Index (NDMI), which is a satellite-derived index that represents water content in vegetation.

Commenter			Chapter	Section	Subsection	Comment
Ruthie	Redmond	The Nature Conservancy	4 - Monitoring Networks	4.6-Potential Monitoring Network Improvements	4.6.5 Shallow Groundwater Monitoring near Surface Water Bodies and GDEs	Monitoring Network [Checklist Items 47, 48 and 49 (23 CCR §354.34)] • Section 4.6.5 Shallow Groundwater Monitoring near Surface Water Bodies and GDEs (p.4-15) The GSP notes the lack of shallow groundwater monitoring wells in the semi-perched aquifer that can be used to monitor interconnected surface water bodies/GDEs along the Lower Santa Clara River, McGrath Lake, Ormond Beach and Mugu Lagoon, and potential GDEs along the Revolon Slough and Lower Calleguas Creek in the Subbasin. We support the inclusion of monitoring wells with the potential GDEs to better assess the potential connectivity. A number of wells are in the vicinity of the GDEs and are monitored by other agencies for specific remediation cases or regional studies. These should be included in the GSP. It is to the benefit of the GSA to make use of these existing monitoring wells as they provide long term historical records, are already monitored by other agencies and are available at no cost to the GSA. The data have been made available for the GSP and it is recommended that monitoring agreements be put in place to receive ongoing data on these wells and ensure the long-term monitoring continues. In particular, we suggest the following wells to serve as representative monitoring wells for each GDE in order to monitor impacts caused by depletions of interconnected surface water (Figures 6-9, Appendix K): GDE Well Lower Santa Clara River 2N22W30A03S McGrath Lake GW-3 Ormond Wetlands 01N22W27G04S Mugu Lagoon MW6-6A
Ruthie	Redmond	The Nature Conservancy	4 - Monitoring Networks	4.6-Potential Monitoring Network Improvements	4.6.6 Surface Water: Flows in Agricultural Drains in the Oxnard Plain	Monitoring Network [Checklist Items 47, 48 and 49 (23 CCR §354.34)] • Section 4.6.6 Surface Water: Flows in Agricultural Drains in the Oxnard Plain (p.4-15 – 4-16) We would also recommend that we survey the water surface elevation in the drains, as they should be easy to measure, provide calibration head values for the numerical model and good indication of the semi-perched aquifer elevations.
Ruthie	Redmond	The Nature Conservancy	5 - Project Management Actions	5.9-Management Action No. 3 – Water Market Pilot Program	N/A	Projects and Management Actions to Achieve Sustainability Goal [Checklist Items 50 and 51 (23 CCR §354.44)] • Section 5.9 Management Action No. 3 – Water Market Pilot Program (p. 5-17 – 5-18) The GSP indicates that significant reductions in groundwater extractions will be needed to avoid undesirable results. These reductions may have serious impacts on existing extractors. We support development and implementation of a well-designed water market that will incentivize conservation and provide flexibility for pumpers in meeting the objectives of the GSP. The water market must have rules that prevent negative impacts to other beneficial users such as the environment and Disadvantaged Communities.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Concern regarding quote: No projects currently under development were identified in the Oxnard Subbasin, but two projects under development in the PVB were incorporated into the future baseline simulation because these projects affect inflows to the Oxnard Subbasin. The two projects in PVB are the City of Camarillo's North Pleasant Valley Desalter (desalination) Project and Conejo Creek Diversion deliveries to Pleasant Valley County Water District. (2-64) The Conejo Creek Diversion project is no longer under construction, but rather is in operation. Please revise and update narrative in the GSP.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Concern regarding quote: "It should be noted that these wells were selected for modeling purposes only and use of these wells in the model simulations was not intended to represent any planned pumping restrictions or limitations on these wells." (2-66) Update narrative to clarify that the projects (i.e., GREAT Program projects) were included for modeling purposes only, and that the inclusion of the City's projects in either narrative or modeling in the GSP does not constitute a binding commitment on the part of the City of Oxnard.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Concern regarding quote: "None of the model scenarios described in Section 2.4.5 successfully eliminated seawater intrusion in the LAS during the sustaining period, while the majority of the model scenarios resulted in net freshwater loss from the UAS to the Pacific Ocean. Therefore, none of the direct model scenarios was used to determine the sustainable yield of the Oxnard Subbasin. Instead, the relationship between seawater flux and groundwater production from each of the model scenarios was used to predict the quantity of groundwater production that would result in no net seawater intrusion over the sustaining period in either the UAS or the LAS." (2-74) This paragraph indicates that a no-loss scenario relative to freshwater impacts was not achievable in the direct modeling of the Subbasin. This calls into question the viability of the model scenarios, as well as the approach chosen to predict no net seawater intrusion groundwater production scenarios.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Concern regarding the quote: "In order to achieve the sustainability goal, groundwater production will need to be reduced relative to historical groundwater production rates. At the same time, groundwater production inland from the coast may be allowed to increase as infrastructure is developed to convey inland production to agricultural users on the coast." (3-2) The wording of this section is vague. Please revise to clarify intent as well as the mechanism by which differential increases in production and infrastructure expansion may be contemplated.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Concern regarding the quote: "Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin" (3-2) Proposed reductions in groundwater production will affect a vast variety of stakeholders not limited to the agricultural industry. Reductions could affect ratepayers of the City of Oxnard, M&I, and more.
Thien	Ng	City of Oxnard / Assistant Public Works	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Concern regarding the quote: "During the first 5 years following GSP adoption, it is anticipated that the combined groundwater production from both the UAS and the LAS will begin to be reduced toward the estimated sustainable yield" (3-2) It is unclear how the current observed groundwater production rate will be reduced toward sustainable yield. Revise section to clarify the regulatory mechanism that will compel the reduction in production to currently contemplated sustainable yield levels in the first 5 years following GSP adoption.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "One factor that contributed to the recovery of water levels following periods of drought was the amount of surface water that was diverted from the Santa Clara River and infiltrated through spreading basins to recharge the aquifers." (3-4) Revise section to address the mandatory reductions in the most recent drought, where M&I users were limited in pumping by Emergency Ordinance E on top of prior pumping restrictions. These reductions were likely a key factor in the recovery of aquifer elevations, as opposed to ephemeral diversions associated with the Santa Clara River.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "Based on the sustainability goals for the Oxnard Subbasin, the criterion used to define undesirable results for chronic lowering of groundwater levels is landward migration of the 2015 saline water impact front during the sustaining period from 2040 through 2069." (3-4) Revise section and narrative discussion of undesirable results related to saline impact and associated sustainability criteria. The discussion acknowledges both the effects of the 2015 saline water impact front, as well as elevated chloride concentrations associated with naturally occurring source unrelated to seawater intrusion. It is unclear how the differentiation between elevated chloride concentrations from the different sources will be accomplished and meaningful monitoring of sustainability criteria will occur.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.1- Introduction to Sustainable Management Criteria	N/A	Concern regarding the quote: "One factor that contributed to the recovery of water levels following periods of drought was the amount of surface water that was diverted from the Santa Clara River and infiltrated through spreading basins to recharge the aquifers. Surface-water flows are available during wetter-than-average precipitation periods. These surface-water diversions and spreading are controlled by the United Water Conservation District (UWCD), which anticipates maintaining the historical volume of water diverted from the Santa Clara River over the next 50 years (UWCD 2018)." (3-4) In the presence of heightened regulatory pressure associated with diversions due to lower Santa Clara River GDE's and other environmental factors noted in the GSP, it is unreasonable to conclude that the historical volume of diversions may be assumed to continue. Additionally, diversions associated with high flows in the Santa Clara River are related to hydrologic events that are inherently ephemeral in nature. Thus the contribution of diversions to aquifer recharge should be considered incidental in nature.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3- Undesirable Results	3.3.3 Seawater Intrusion	Concern regarding the quote: "Significant and unreasonable seawater intrusion is an undesirable result that is present or likely to occur in the Oxnard Subbasin. Seawater intrusion is the primary sustainability indicator in the Oxnard Subbasin." (Page 3-6) Seawater intrusion and related elevated chloride concentrations are noted as the primary sustainability indicator in the Oxnard Subbasin. Other sources of elevated chloride concentrations are discussed; however, further study, mapping and narrative of specific sources of connate water related to fine-grained lagoonal deposits should be conducted. This information will inform the process of evaluation of future chloride measurements in the saline water impact area.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3- Undesirable Results	3.3.3 Seawater Intrusion	Concern regarding the quote: "The connate water is released as groundwater head in the aquifer declines and fine-grained deposits compress." (Page 3-7) Clarify if "compress" should be revised to "expand."
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3- Undesirable Results	3.3.4 Degraded Water Quality	Concern regarding Section 3.3.4.2 Nitrate. Nitrate concentrations are noted as resulting in significant and unreasonable impacts to beneficial uses; however, ensuing discussion is weak in relation to actionable solutions. Merely stipulating historical contributions of nitrates as the source of elevated concentrations above WQOs and BMOs in the Forebay is not a sufficient acknowledgment of the observed issue. Further discussion of current practice and recommendations regarding restrictions on the continued nitrate loading related to agricultural operations should be included to address practices that perpetuate this undesirable result.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3- Undesirable Results	3.3.4 Degraded Water Quality	Concern regarding the quote: "Rather, nitrate concentrations above WQOs and BMOs in the Forebay are likely a legacy of historical septic discharges and historical agricultural fertilizer application practices." (Page 3-9) The contribution of septic systems has been on the decline for some time as septic to sewer conversions have become more common, and often mandated, by the RWQCB and local agencies. The observed nitrate loading continues with on-going agricultural operations, and while practices related to fertilizer application and constituents may be changing, an acknowledgment of their role in the observed issues should be included in narrative and mitigation measures should be stipulated.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3- Undesirable Results	3.3.4 Degraded Water Quality	Concern regarding the quote: "UWCD currently anticipates maintaining and potentially increasing surface-water recharge from the Santa Clara River in the future." (Page 3-9) Surface water diversions and related potential for recharge are likely to be reduced in the future due to environmental and regulatory restrictions identified elsewhere in the document. As noted previously, the contribution of recharge water-related to diversions from the Santa Clara River are ephemeral in nature and limited in their ability to meaningfully dilute nitrate concentrations in the Forebay. Related sections of the narrative should be revised accordingly.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.7 Defining Subbasin-Wide Undesirable Results	Concern regarding the quote: "Undesirable results are defined in three ways for the UAS in the Oxnard Subbasin. The first is based on the total number of wells, independent of management area or aquifer. Under this definition, the UAS will be determined to be experiencing undesirable results if, in any single monitoring event, water levels in six of the 15 key wells are below their respective minimum thresholds" (Page 3-12) The number of hydrographs for UAS wells noted in Figures 3-7a and 3-7b reflect only 14 wells.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "In general, the simulated groundwater elevations in the model scenario with projects were close to those in the scenario without projects, with any observed difference between the two limited to less than approximately 10 feet (Figures 3-6 through 3-11, Key Well Hydrographs)." (Page 3-14) This statement does not recognize the difference between the scenarios as significant; however, 5 to 10 feet higher water level elevations along the coast is potentially significant. In addition, the statement does not recognize that the impacts to groundwater users without the projects is likely greater.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "The lowest simulated value was then rounded down to the nearest 5-foot interval to further account for uncertainty in the future simulated groundwater elevations. The rounded groundwater elevation was then raised by 2 feet to account for predicted sea level rise by 2070." (Page 3-14) Clarify the rationale for rounding down 5 feet. This rounding is significant in comparison to the projected minimum thresholds for water levels. This appears contrary to SGMA's "reasonable margin of safety was established for each measureable objective." This is more than a 50% difference in minimum threshold change for some of the selected key wells. For example, Well 01N23W01C05S proposes a minimum thresholds of 7 ft msl from the 1.2 ft msl measured data in Table 3-1. The rounding of 2-5 feet appears to reflect a difference; if this is rounded by 5 feet, the difference is 80%.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.3 Seawater Intrusion	Concern regarding the quote: "Such a reduction may impact the value of agricultural land, drive changes in crop types, result in temporary fallowing of agricultural acreage, and cause economic disruption to the regional economy." (Page 3-17) Such a reduction would impact not only on the value of Agricultural land but all land. Also, further impacts of reduction would be impeding business and development and raising water rates.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.4 Degraded Water Quality	Concern regarding the quote: "For these concentrations, the recharge source water should be of the highest quality possible to maintain or improve future groundwater quality (Section 3.3.4, Degraded Water Quality)." (Page 3-17) The term "highest quality possible" is undefined in the context of existing RWQCB and DDW requirements for water quality. As the sources of degraded water quality have previously been discussed, the source of such "highest quality" should be identified and discussed.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.1-Monitoring Network Objectives	N/A	Concern regarding the entire Section 4.1 Monitoring Network Objectives Chapter 4 of the GSP addresses the proposed monitoring of progress towards sustainability goals, as well as measuring against minimum thresholds established. Such monitoring of groundwater elevations is a critical consideration in what will ultimately be a regulatory function of the monitoring network. The section narrative, together with the tabulated well network, indicate the presence of a significant number of agricultural production wells. Groundwater monitoring standards are written to address measurements and sampling related to dedicated monitoring wells, and these standards illustrate the limitations and potential error associated with utilizing data from production wells. While the inclusion of production wells in the State's CASGEM program was a result of the required well network established by Senate Bill 6 in 2009, it has been understood that the data would be used for informational purposes to monitor trends in groundwater levels basin-wide. The transition from the use of the monitoring network from informational to regulatory purposes requires the rigorous evaluation of the existing network, together with an understanding of the incompatibility of production wells with a regulatory monitoring system. The last paragraph of Section 4.1 notes the need for additional monitoring wells to better represent conditions in the aquifers than production wells. The City recommends that all production wells be replaced by dedicated monitoring wells to both provide adequate spacial coverage, as well as evaluating existing and proposed dedicated monitoring wells for the potential effects of adjacent agricultural production wells.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.2- Description of Existing Monitoring Network	4.2.2 Surface Conditions Monitoring	Concern regarding the quote: "These diversions are used to deliver surface water to agricultural users in lieu of groundwater production and are used for recharge, via UWCD's spreading grounds, to the groundwater aquifers in the Subbasin." (Page 4-2) Diversions do not represent a sustainable source of alternative water and should not use 'in-lieu' terminology.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.2- Description of Existing Monitoring Network	4.2.1 Groundwater Monitoring	Concern regarding the entire Section 4.2.1 Groundwater Monitoring The last paragraph on page 4-2 notes that the existing monitoring network is sufficient and that evaluation of the current network confirms this. Based on established DWR standards, this is an incorrect statement, as the network utilizes data derived from production wells, which are inherently prone to error. Please revise section narrative to clarify the need for removal of agricultural production wells from the network, and the replacement of these with properly designed and sited monitoring wells.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.3- Monitoring Network Relationship to Sustainability Indicators	4.3.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "To monitor conditions related to chronic lowering of groundwater levels, the groundwater monitoring network must be structured to accomplish the following: • Track short-term, seasonal, and long-term trends in water elevation. • Demonstrate groundwater elevations in mid-March and mid-October for each primary aquifer or aquifer system. • Record groundwater elevations in key wells in which minimum thresholds and measurable objectives have been identified to track progress toward the sustainability goals for the Subbasin. " (Page 4-5) The reliance on groundwater elevations to track all progress toward sustainability in the Subbasin should require all key wells to be instrumented with pressure transducers for measurement accuracy and a higher temporal resolution in the data.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.3- Monitoring Network Relationship to Sustainability Indicators	4.3.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "The Subbasin monitoring well density for groundwater elevations varies by aquifer (Tables 4-3 and 4-4). Of the primary aquifers in the Subbasin identified in Chapter 2, Basin Setting, the Grimes Canyon Aquifer has the lowest density of active wells in which groundwater elevations can be measured.." (Page 4-5) Revise narrative to include discussion of production wells and monitoring wells in the network, and clarify referenced standards.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.3- Monitoring Network Relationship to Sustainability Indicators	4.3.1 Chronic Lowering of Groundwater Levels	Concern regarding the quote: "There is no definitive rule for the density of groundwater monitoring points needed in a basin; however, for comparison, the monitoring well density recommended by CASGEM Groundwater Elevation Monitoring Guidelines ranges from 1 to 10 wells per 100 square miles (DWR 2010)." (Page 4-5) The reference document (DWR Groundwater Elevation Monitoring Guidelines- December 2010) utilizes USGS methodology that is written for monitoring, not production wells (page 8). Additionally, guidelines require that measurements from production wells should not be made for 24 hours after cessation of pumping due to well recovery considerations (page 14). This is a significant area of concern for how data will be collected and utilized.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.3- Monitoring Network Relationship to Sustainability Indicators	4.3.2 Reduction of Groundwater Storage	Concern regarding the quote: "The current network of wells is capable of documenting changes to both sustainability indicators." (Page 4-7) This does not correspond with the response to groundwater elevations.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.3-Monitoring Network Relationship to Sustainability Indicators	4.3.3 Seawater Intrusion	Concern regarding the quote: "Groundwater samples will continue to be collected and analyzed for total dissolved solids (TDS) and chloride in order to assess trends in groundwater quality related to seawater intrusion. The network of existing wells is capable of providing an adequate assessment of groundwater quality trends for these constituents." (Page 4-8) An additional concern about nitrates should be included in the water quality constituents.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.4-Monitoring Network Implementation	4.4.1 Groundwater Elevation Monitoring Schedule	Concern regarding the quote: "Short-term trends in groundwater elevation are currently, and will continue to be, monitored using transducers that are operated and maintained by UWCD." (Page 4-11) According to the GSP 'The United Water Conservation District (UWCD) collects groundwater elevation data from more than 100 monitoring and agricultural wells in the Subbasin ... Pressure transducers have been installed in 65 of these wells." . Clarify that this monitoring is not all inclusive but rather limited to a limited number of monitoring wells.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.5-Protocols for Data Collection and Monitoring	N/A	Concern regarding the entire Section 4.5 Protocols for Data Collection and Monitoring. The additional narrative should be provided to include how that collected data is utilized to support sustainability indicators, including determination/location of seawater intrusion contours, determination of storage volume, etc.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.5-Protocols for Data Collection and Monitoring	N/A	Concern regarding the quote: "If the pump housing is warm, the water level that is entered into the database is qualified with a Questionable Measurement Code, indicating recent pumping." (Page 4-12) According to Monitoring Protocols Best Management Practices (BMPs) produced by DWR, measurements from production wells should not be made for 24 hours after cessation of pumping due to well recovery considerations. The condition of the pump housing only indicates recent pump activity and does serve as an indicator of whether the pump has operated in the past 24 hours.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.7-Management Action No. 1 – Reduction in Groundwater Production	N/A	Concern regarding the entire Section 5.7 Management Action No. 1 – Reduction in Groundwater Production Projects that will be implemented to increase or maintain groundwater production at the presently reduced historical levels during the process of achieving sustainable yield have not been identified. The GSP has effectively framed the range of the sustainable groundwater resource under existing conditions but lacks a road map as to how the FCGMA plans to achieve sustainability without significantly impacting all groundwater users. If the groundwater allocation system to achieve Management Action No. 1 were included in the GSP, the stakeholders could understand the potential magnitude and timing of water supply projects that will need to be developed to lessen the impacts on groundwater users.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.9-Management Action No. 3 – Water Market Pilot Program	N/A	Concern regarding the quote: "Analysis of the Water Market Pilot Program will be conducted and its suitability for incorporation as a management action for the Subbasin will be determined after the pilot program is completed in July 2019." (Page 5-18) A Water Market for municipal and industrial groundwater users is necessary for coordination and conjunctive use of water resources amongst this category of groundwater pumpers.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	Executive Summary	ES.5-Projects and Management Actions	N/A	Concern regarding provided quote;"A comprehensive water allocation system for groundwater users in the Subbasin is under development by the FCGMA . . ." (Page ES-9) There has been considerable discussion between groundwater users and FCGMA staff about the system being developed. Until the allocation system is finalized, the equitable application or the impacts of Management Action No. 1 cannot be thoroughly assessed and commented on by groundwater pumpers in the FCGMA.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.1-Purpose of the Groundwater Sustainability Plan	N/A	Concern regarding provided quote;"Depletions of interconnected surface water have not occurred historically in the Subbasin, because the Groundwater-Dependent Ecosystems (GDEs) in the Subbasin are supported by shallow groundwater flows that are generally separated and disconnected from the primary groundwater aquifers." (Page 1-2) This statement contradicts the following statement made in Section 3.4.6 (See Page 3-19): "The selected groundwater elevations are anticipated to protect against depletion of interconnected surface water, because historical groundwater elevations in the semi-perched aquifer have maintained the documented and potential GDEs in the Subbasin . . ."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Concern regarding the provided quote; "The primary costs associated with implementing the GSP…" (Page 1-7) The GSP must include quantitative estimates of the cost of implementation, including costs of implementation that may be imposed on parties other than FCGMA. The qualitative discussion does not fulfill the requirements of Cal. Code Regs., tit. 23, § 354.6, subd. (e).
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Concern regarding Section 1.2.6.2 Data Gap Analysis and Priorities (Page 1-8) The recommendation to address the potential for anomalous data obtained from agricultural production wells with pressure transducers is flawed. The use of pressure transducers may provide a higher volume of water level measurement, but this volume of data does not necessarily address well recovery and the measurement of static water levels. According to DWR Groundwater Elevation Monitoring Guidelines (page 14), the measurement of water level must not be conducted within 24 hours after cessation of pumping. Monitoring must be tied to well pump operation for meaningful measurements.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Concern regarding the provided quote; "In addition, it is anticipated that basin optimization studies will be undertaken in the initial 5-year period after the GSP is implemented adopted…" (Page 1-9) The statement is not clear as to intent. Revise narrative to clarify whether "implemented" or "adopted" is the intended enabling event.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	Concern regarding the provided quote; "Groundwater supply assumptions made by urban water suppliers in their 2015 UWMPs will be superseded by the groundwater allocation reduction management actions discussed in Chapter 5 of this GSP." (Page 1-31) SGMA does not authorize FCGMA to supersede local land use powers. Wat. Code, § 10726.8, subd. (f) ["Nothing in this chapter or a groundwater sustainability plan shall be interpreted as superseding the land use authority of cities and counties, including the city or county general plan, within the overlying basin."

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.5-Existing Conjunctive-Use Programs	N/A	Concern regarding Section 1.5 Existing Conjunctive-Use Programs: City of Oxnard Advanced Water Purification Facility (Page 1-24) The GMA conjunctive use program does not restrict the use of allocation with the exception of a City of Oxnard program. GMA resolution 2013-02 limits the use of Forebay pumping based on Forebay available storage volume. This is an unfair practice, which the City of Oxnard finds objectionable.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.1 General Plans	Concern regarding the provided quote; "There are no agricultural water management plans applicable to the Oxnard Subbasin because none of the water purveyors serve more than 25,000 irrigated acres within the Subbasin (excluding recycled water deliveries)." (Page 1-25) Please provide clarification as to the intent of this sentence.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.8-Notification and Communication	1.8.2 Summary of Beneficial Uses and Users	Concern regarding Section 1.8.2 Summary of Beneficial Uses and Users – Surface Water Users (Page 1-45) The section on beneficial uses and users should include a subsection to address water import and water importers serving the Oxnard Subbasin as the import of water reduces the amount of groundwater that must be pumped from the Subbasin.
Thien	Ng	City of Oxnard / Assistant Public Works Director	Tables	1-9 Past, Current, and Projected Population for Ventura County, the Cities of Oxnard and Port Hueneme, and the Oxnard Plain	N/A	No data was provided for Oxnard in 2015. Please provide corresponding data in the table.
Thien	Ng	City of Oxnard / Assistant Public Works Director	Figures	1-2 Administrative Boundaries for the Oxnard Subbasin	N/A	Northern boundary between Oxnard Subbasin and Mound Subbasin should reflect most recent boundary changes accepted by DWR in February 2019.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.1-Introduction to Basin Setting	N/A	Concern regarding the provided quote; "In the UAS, the average annual change in freshwater storage is a loss of approximately 6,600 AFY, which is more than two times greater than the total average annual change in storage for the UAS (2,800 AFY), including seawater intrusion (Figure 2-24, Oxnard Subbasin Annual Change in Storage Without Coastal Flux)." (Page 2-26) It appears that Figure 2-24 should be titled "With Coastal Flux" not without coastal flux because it includes seawater intrusion.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	Figures	2-24 Oxnard Subbasin Annual Change in Storage Without Coastal Flux	N/A	It appears that Figure 2-24 should be titled “With Coastal Flux” not without coastal flux because it includes seawater intrusion as called out in Section 2.3.2 Estimated Change in Storage. "In the UAS, the average annual change in freshwater storage is a loss of approximately 6,600 AFY, which is more than two times greater than the total average annual change in storage for the UAS (2,800 AFY), including seawater intrusion (Figure 2-24, Oxnard Subbasin Annual Change in Storage Without Coastal Flux)." (Page 2-26)
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.3- Groundwater Conditions	2.3.3 Seawater Intrusion	Concern regarding the provided quote; "Although this section focuses on areas that are known to be susceptible to seawater intrusion, the precise extent of current seawater intrusion impacts is difficult to separate from the areas that are impacted by release of saline water from connate brines." (Page 2-29) The Oxnard Subbasin GSP states that the FCGMA cannot differentiate between seawater intrusion and sedimentary rock leeching. If the saline problem stems from the latter, under-pumping will make it worse. Effort should be put into identifying the difference.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.3- Groundwater Conditions	2.3.2 Estimated Change in Storage	Concern regarding the provided quote; "Annual change in storage is not strongly correlated to groundwater pumping in the Oxnard Plain (R2 < 0.5). In contrast, artificial groundwater recharge at the UWCD spreading grounds is correlated with change in storage (R2 > 0.8; see Figures 2-22 and 2-23)." (Page 2-26) The Oxnard Subbasin GSP reflects the reduction in groundwater pumping as the main objective/goal for the Subbasin. If there is not a strong correlation between groundwater pumping and change in storage why is there not more focus set on recharging the Subbasin in the GSP?
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.3- Groundwater Conditions	2.3.3 Seawater Intrusion	Additional paragraph should be included into section; In 1953, a bond issue was presented to the electors within UWCD to provide funds for the construction of one dam and the Lower River distribution system, including a pipeline to the Oxnard-Port Hueneme area. Simultaneous with the bond issue, UWCD entered into contracts with water users on the Oxnard Plain area for the construction of this pipeline. The City of Oxnard was the predominant user, and it contracted with UWCD in order to move the City’s pumping from the seawater intrusion front to the Montalvo Forebay. The voters authorized the bond-issue, and thereafter, the Santa Felicia Dam on Piru Creek and the Lower River Distribution System authorized by the bond issue were completed. The lower river distribution system, often called the Oxnard/Hueneme (O/H) Pipeline, was constructed during the forty year life of the original water delivery agreements. In 1994, the City of Port Hueneme and the Channel Islands Beach Community Services District created a joint powers agency, known as the Port Hueneme Water Agency (PHWA), which would later include also Naval Construction Battalion Center Port Hueneme and Naval Air Warfare Center Point Mugu. The PHWA likewise contracted to utilize the O/H Pipeline to move PHWA’s pumping from the seawater intrusion front inland to the Forebay in order to reduce seawater intrusion in the Oxnard Plain Basin.”
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.3- Groundwater Conditions	2.3.4 Groundwater Quality	Additional narrative should be provided addressing the State Department of Drinking Water’s requirements for potable water: Nitrate max contaminant level (MCL) is 10 ppm Sulfate secondary MCL is 500 ppm Boron notification level (unregulated) is 1 ppm
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.3- Groundwater Conditions	2.3.6 Groundwater–Surface Water Connections	Concern regarding the provided quote; "The UWCD model reports stream leakage from the Santa Clara River and Calleguas Creek into the underlying semi-perched aquifer. Numbers from the model represent net stream leakage and do not necessarily indicate direct connection between surface water bodies and groundwater in the semi-perched aquifer." (Page 2-42) This statement contradicts the following statements made in Section 3 (See Page 3-19): “The selected groundwater elevations are anticipated to protect against depletion of interconnected surface water, because historical groundwater elevations in the semi-perched aquifer have maintained the documented and potential GDEs in the Subbasin . . .”

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Additional narrative addressing Article 21 water should be included in the section. This water is unallocated State Water Project water made available to State Water Project contractors on a limited interim interruptible basis. The FCGMA has already invested funds to purchase this water, which should be acknowledged in the GSP.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Concern regarding the provided quote; "As discussed in Section 2.4.1.1, Surface Water, the UWCD-diverted surface water from the Santa Clara River may include State Water Project water used for groundwater recharge in UWCD spreading basins or water directly delivered to water users by either the PVP or the PTP." (Page 2-51) Additional reference and incorporation of Article 21 water should be added into section. Under the May, 2019 FCGMA approval, excess unallocated water is planned to be purchased and delivered via the Santa Clara River and diverted from the Freeman Diversion to recharge facilities in the Oxnard Forebay by United Water Conservation District (UWCD).
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Concern regarding the provided quote; "Much of the rain that falls in the Oxnard Subbasin quickly returns to the atmosphere via evaporation, or runs off to creeks, storm drains, and ultimately the ocean; the remainder percolates into the soil where it is subject to evapotranspiration (ET), soil absorption, or for plant use." (Page 2-52) Evapotranspiration depends on what the farmers are growing. This should be subject to change dependent on numerous factors.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.2 Sources of Water Discharge	Concern regarding the provided quote; "Available data indicate that during the calendar year 2015, a total of 80,814 AF (Table 2-14) of groundwater was extracted from the Oxnard Subbasin, of which, about 69% was for agricultural use (55,973 AF), 30% was for M&I use (24,648 AF), and about 0.2% was for domestic use (193 AF)." (Page 2-55) Clarify that the roughly 70-30 split noted was related to a year when Emergency Ordinance E was in effect, when M&I pumping was restricted a second time (after being restricted once before) though Agricultural extraction was not restricted; thus, this split of water is not indicative of the proportionate use as between these groups. This should be expressly stated in the GSP.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.3 Current and Historical Water Budget Analysis	Concern regarding Section 2.4.3.3 Current (2015) Groundwater Conditions This is no longer the current year. Update to reflect more current year or revise section.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Section 2.4.5 Projected Future Water Budget and Sustainable Yield Specific to model scenarios with a different percentage of reduction in pumping between UAS and LAS. It is assumed that these scenarios are conceptual in nature for the exercise of bracketing sustainable yield estimates. It does not appear probable that the FCGMA can reduce pumping differentially from wells in the LAS without projects to replace their supply since the FCGMA dictated the replacement of UAS wells with LAS wells in the 1980's and early 1990's.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Concern regarding the provided quote; "The sustainable yield was determined from the model scenarios that did not result in a net flux of seawater into either the UAS or the LAS in Oxnard Subbasin, within the level of the model uncertainty, during the 30-year sustaining period (Figure 2-63, Coastal Flux from the UWCD Model Scenarios).." (Page 2-62) None of the model scenarios resulted in no net flux of seawater into either the UAS or LAS in the Subbasin as reflected in Figure 2-63. Provide clarification on which model scenario was projected to be the objective outcome.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Section 2.4.5 Projected Future Water Budget and Sustainable Yield Only 6 of the 8 modeled scenarios are provided in bullet points. Additional modeled scenarios in Section 2.4.5.7 should be included.
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.5 Projected Future Water Budget and Sustainable Yield	Concern regarding the provided quote; "The 1930 to 1979 50-year period with the 2070 DWR climate-change factor was found to be the most conservative and was used for the comparison with the other modeling simulations conducted." (Page 2-63) Because the most conservative period was used for analysis, the FCGMA Board should keep this in mind when implementing initial pumping reduction management strategy.
Thien	Ng	City of Oxnard / Assistant Public Works Director	Executive Summary	ES.5-Projects and Management Actions	N/A	Requested Revision on Page ES-8 "Under this project, the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) Program's Advanced Water Purification Facility (AWPF) will provide the Subbasin with a source of reclaimed water that can be used for landscape irrigation, agricultural, industrial process water, and groundwater recharge" to "Under this project, the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) Program's Advanced Water Purification Facility (AWPF) could provide the Subbasin with a source of reclaimed water that can be used for landscape irrigation, agricultural, industrial process water, and/ or groundwater recharge lieu of pumping, at full price, with no exchange of recycled water pumping allocations."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.2-Agency Information	1.2.6 Groundwater Sustainability Plan Implementation andCost Estimate	Requested Revision on Page 1-9 "form other GSAs in basin.." to "from other GSAs, in the basin.."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.4-Existing Monitoring and Management Plans	1.4.3 Operational Flexibility Limitations	Requested Revision on Page 1-22 "Examples of projects that have increased operational flexibility within the Oxnard Plain include the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) project, and the Oxnard–Hueneme (OH) Pipeline and the Freeman Diversion Project, both operated by UWCD (Table 1-11)." to "Examples of projects that have increased operational flexibility within the Oxnard Plain include the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) Program, and the Oxnard–Hueneme (OH) Pipeline and the Freeman Diversion Project, both operated by UWCD (Table 1-11)."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.4-Existing Monitoring and Management Plans	1.4.3 Operational Flexibility Limitations	Requested Revision on Page 1-22 "Despite the coordination of projects and programs within the Oxnard Subbasin, limits to operational flexibility remain. These limits include constraints imposed by interaction with other regulatory programs, including the federal Endangered Species Act and the Recycled Water Policy (2009, amended 2013) that was adopted by the State Water Resources Control Board." to "Despite the coordination of projects and programs within the Oxnard Subbasin, limits to operational flexibility remain. State law prohibits the direct potable use of recycled water. Also, these limits include constraints imposed by interaction with other regulatory programs, including the federal Endangered Species Act and the Recycled Water Policy (2009, amended 2013) that was adopted by the State Water Resources Control Board. "

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.5-Existing Conjunctive-Use Programs	N/A	Requested Revision on Page 1-24 "Several of the projects and management actions identified in this GSP (Chapter 5) would build upon the GREAT program by expending the AWPF's capacity, increasing utilization of the recycled water in lieu of groundwater for irrigation, and connecting the recycled water delivery system to groundwater recharge facilities operated by UWCD." to "Several of the projects and management actions identified in this GSP (Chapter 5) would build upon the GREAT program by expanding the AWPF's capacity, increasing utilization of the recycled water in lieu of groundwater for irrigation. REMOVE FROM DOCUMENT:, and connecting the recycled water delivery system to groundwater recharge facilities operated by UWCD.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.5-Existing Conjunctive-Use Programs	N/A	Requested Revision on Page 1-24 "Reduced groundwater allocations may put increased pressure on water purveyors to use the maximum SWP allocations available, which are already highly limited by climate and competing demands." to "Reduced groundwater allocations may put increased pressure on water purveyors to use the maximum SWP allocations available, which are already very expensive and highly limited by climate and competing demands."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.5-Existing Conjunctive-Use Programs	N/A	Requested Revision on Page 1-24 "Several of the projects and management actions identified in this GSP (Chapter 5) would build upon the GREAT program by expending the AWPF's capacity, increasing..." to "Several of the projects and management actions identified in this GSP (Chapter 5) could build upon the GREAT program by expending the AWPF's capacity, increasing..."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	Requested Revision on Page 1-33 "Potential UWCD projects to be implemented in the future include the Full Advanced Treatment Program, which would entail a collaborative agreement between the City of Oxnard and several agricultural entities to deliver recycled water from the City of Oxnard's AWPF through UWCD's Pumping Trough Pipeline and the Pleasant Valley Pipeline for agricultural users in the Oxnard Plain." Remove this quote entirely from document.
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	Requested Revision on Page 1-35 "Oxnard's water supplies include imported water from CMWD, groundwater from UWCD, and groundwater produced from local wells." to "Oxnard's water supplies include imported water from CMWD, groundwater pumped by UWCD as part of a supply agreement negotiated in 1996, and groundwater produced from local wells."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	Requested Revision on Page 1-36 "Consumers of this recycled water include PVCWD and some agricultural operators. Potential consumers include PHWA and UWCD (City of Oxnard 2015)." Remove quote entirely from document. There are many more potential customers than what are listed.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.6-Land Use Elements or Topic Categories of Applicable General Plans	1.6.2 Urban Water Management Plans	Requested Revision on Page 1-37 "Because the City of Oxnard is a coastal city partially dependent on groundwater extractions and UWCD supplies, its UWMP will be impacted by these GSP components." to "Because the City of Oxnard is a coastal city significantly dependent on groundwater extractions, its UWMP will be impacted by these GSP components."
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.7-Well Permitting Policies and Procedures	1.7.1 FCGMA	Requested Revision on Page 1-42 "The permitting agencies monitor and enforce these standards by requiring drilling contractors with a valid C-57 license to submit permit applications for the construction, modification…" to "The permitting agencies monitor and enforce these standards by requiring drilling contractors with the appropriate valid contractor's license to submit permit applications for the construction, modification…"
Thien	Ng	City of Oxnard / Assistant Public Works Director	1 - Administrative Information	1.8-Notification and Communication	1.8.2 Summary of Beneficial Uses and Users	Requested Revision on Page 1-45 " Beneficial uses of groundwater from the Oxnard Subbasin include agricultural, M&I, urban, and environmental uses." to "Beneficial uses of groundwater from the Oxnard Subbasin include agricultural, M&I, and environmental uses."
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.3-Groundwater Conditions	2.3.3 Seawater Intrusion	Requested Revision on Page 2-27 "An elevated risk of seawater intrusion has been found to exist near Port Hueneme and Point Mugu due to the near shore presence of the groundwater–seawater contact in deeply incised submarine canyons (UWCD 2016a). " to "An elevated risk of seawater intrusion has been found to exist near Port Hueneme and Point Mugu due to the near shore presence of the groundwater–seawater contact in deeply incised submarine canyons (UWCD 2016a). Due to this higher risk at Oxnard's coastal area, the City of Oxnard chose to cease pumping in that area and instead entered into the OH pipeline agreement with UWCD."
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Requested Revision on Page 2-47 "These municipal users may also receive imported water supplied by the CMWD. " to "These municipal users also receive imported water supplied by the CMWD, which has been purchased in lieu of greater amounts of groundwater pumping."
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Requested Revision on Page 2-47 "UWCD's water source for the PTP and PVP consists primarily of surface water obtained at the Freeman Diversion, which may include State Water Project water from Lake Piru." to "UWCD's water source for the PTP and PVP consists primarily of surface water obtained at the Freeman Diversion, which may include State Water Project water from Lake Piru and Article 21 imported water."

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.1 Sources of Water	Requested Revision on Page 2-49: "These diversions may include State Water Project water held at Lake Piru and then delivered to the UWCD via the Santa Clara River." to "These diversions may include State Water Project water held at Lake Piru and then delivered to the UWCD via the Santa Clara River and purchased imported water."
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.3 Current and Historical Water Budget Analysis	Requested Revision on Page 2-51: "However, the first phase of the GREAT program's Advanced Water Purification Facility (AWPF) was recently completed, which provides this supply to PVCWD and other growers on the southern part of the Oxnard Subbasin." to "However, the first phase of the GREAT program's Advanced Water Purification Facility (AWPF) was completed in 2015, which provides this supply to PVCWD and other growers on the southern part of the Oxnard Subbasin."
Thien	Ng	City of Oxnard / Assistant Public Works Director	2 - Basin Setting	2.4-Water Budget	2.4.2 Sources of Water Discharge	Requested Revision on Page 2-55: "Error! Reference source not found." Revise with the correct input reference.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Requested Revision on Page 3-2: "Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin, and the uncertainty in the estimated sustainable yield of the Subbasin." to "Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin, the greater economic effects on the basin as a whole, the interference with municipal water supply planning and rate setting, and the uncertainty in the estimated sustainable yield of the Subbasin."
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.2-Sustainability Goal	N/A	Requested Revision on Page 3-2: "If production is reduced linearly between 2020 and 2040, the estimated groundwater production reduction necessary throughout the geographic extent of the Oxnard Subbasin over the first 5 years is approximately 4,500 AFY." to "If production is reduced linearly between 2020 and 2040, the estimated groundwater production reduction necessary throughout the geographic extent of the Oxnard Subbasin over the first 5 years is approximately 4,500 AF total (900 AFY)."
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.1 Chronic Lowering of Groundwater Levels	Requested Revision on Page 3-4: "It is expected that there will be some landward migration of this front between 2020 and 2040 as the FCGMA Board and stakeholders in the Subbasin undertake the necessary projects and management actions toward achieving sustainability in 2040." to "It is expected that there will be some landward migration of this front between 2020 and 2040 as the FCGMA Board and stakeholders in the Subbasin undertake projects and management actions toward achieving sustainability in 2040."
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.2 Reduction of Groundwater Storage	Requested Revision on Page 3-5: "Numerical groundwater model simulations indicate that there has been approximately 101,000 acre-feet (AF) of storage loss in the Oxnard Subbasin over the 31 years from 1985 to 2015 (Section 2.3.2, Estimated Change in Storage; Appendix C)." This is the wrong reference of Appendix C. Revise with the corresponding reference.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.3-Undesirable Results	3.3.6 Depletions of Interconnected Surface Water	Requested Revision on Page 3-10: "This unit is not currently considered a principal aquifer of the Oxnard Subbasin (Section 2.2.4, Principal Aquifers and Aquitards)." This is the wrong reference of Section 2.2.4. Revise with corresponding Section reference.
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.1 Chronic Lowering of Groundwater Levels	Requested Revision on Page 3-14: "It is important to remember that there are several sources of uncertainty in the model predictions. These sources of uncertainty include, but are not limited to, the prediction of future climate, future diversions from the Santa Clara River, and future groundwater production distribution in the Subbasin. The uncertainty in each of these factors is anticipated to decrease with time. As these factors are better understood, the minimum thresholds should be reassessed, and adjustments should be made, when warranted by the assessment." to "It is important to remember that there are several sources of uncertainty in the model predictions. These sources of uncertainty include, but are not limited to, the prediction of future climate, future diversions from the Santa Clara River, groundwater model assumptions and assigned values, and future groundwater production distribution in the Subbasin. The uncertainty in each of these factors is anticipated to decrease with time. As these factors are better understood, the minimum thresholds should be reassessed, and adjustments should be made, when warranted by the assessment."
Thien	Ng	City of Oxnard / Assistant Public Works Director	3 - Sustainable Management Criteria	3.4-Minimum Thresholds	3.4.3 Seawater Intrusion	Requested Revision on Page 3-17: "Such a reduction may impact the value of agricultural land, drive changes in crop types, result in temporary fallowing of agricultural acreage, and cause economic disruption to the regional economy." to "Such a reduction may impact the value of land, drive changes in crop types, result in temporary fallowing of agricultural acreage, impede development, raise water rates, and cause economic disruption to the regional economy."
Thien	Ng	City of Oxnard / Assistant Public Works Director	Tables	3-1 Minimum Threshold Groundwater Elevations by Well, Management Area, and Aquifer for Key Wells in the Oxnard Subbasin	N/A	The following wells; 02N21W07L06S 02N22W23B07S 02N22W36E05S 02N22W23B04S 02N22W23B05S 02N22W23B06S 02N22W36E03S 02N22W36E04S 01N23W01C02S 02N21W07L04S 01N21W07J02S 01N21W21H02S 02N21W07L03S 02N21W07L05S Do not match Table 3-2 proposed minimum thresholds. The included wells are recorded differently between the two tables and should be revised to coordinate.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	Tables	3-2 Measurable Objectives and Interim Milestones	N/A	The following wells; 02N21W07L06S 02N22W23B07S 02N22W36E05S 02N22W23B04S 02N22W23B05S 02N22W23B06S 02N22W36E03S 02N22W36E04S 01N23W01C02S 02N21W07L04S 01N21W07J02S 01N21W21H02S 02N21W07L03S 02N21W07L05S Do not match Table 3-1 proposed minimum thresholds. The included wells are recorded differently between the two tables and should be revised to coordinate.
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.2-Description of Existing Monitoring Network	4.2.2 Surface Conditions Monitoring	Requested Revision on Page 4-4: "These diversions are used to deliver surface water to agricultural users in lieu of groundwater production and are used for recharge, via UWCD's spreading grounds, to the groundwater aquifers in the Subbasin." to "These diversions are used to deliver surface water to agricultural users in conjunction with groundwater production used for recharge, via UWCD's spreading grounds, to the groundwater aquifers in the Subbasin."
Thien	Ng	City of Oxnard / Assistant Public Works Director	4 - Monitoring Networks	4.6-Potential Monitoring Network Improvements	4.6.1 Water Level Measurements: Spatial Data Gaps	Requested Revision on Page 4-13: "A monitoring well in this area would help constrain groundwater gradients in the northwestern Subbasin." to "A monitoring well in this area would help constrain groundwater gradients in the northwestern area of the Subbasin."
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.1-Introduction to Projects and Management Actions	N/A	Requested Revision on Page 5-1: "As currently envisioned, the projects in this GSP would be implemented by the project proponent or sponsoring agency. However, FCGMA may opt to implement projects in the future as necessary to achieve sustainability in the Subbasin." to "As currently envisioned, the projects in this GSP would be implemented by the project proponent or sponsoring agency at its discretion and with full compensation. However, FCGMA may opt to implement its own additional projects in the future as necessary to achieve sustainability in the Subbasin."

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.2-Project No. 1 – GREAT Program Advanced Water Purification Facility	N/A	Requested Revision on Page 5-2: "The AWPF is designed to initially treat approximately 8 to 9 million gallons per day (mgd) of secondary effluent from the Oxnard Wastewater Treatment Plant and produce 6.25 mgd of product water for reclaimed water uses. This is equivalent to 7,000 acre-feet per year (AFY) of product water that can be delivered through existing infrastructure. The AWPF is currently producing up to 4,600 AFY. Advanced purified water was first delivered to agricultural operators in 2016. The portion of the project that is being considered for inclusion in GSP is the additional water that is being purchased by FCGMA to reduce groundwater extractions for which no Recycled Water Pumping Allocation is issued." to "The AWPF is designed to initially treat approximately 8 to 9 million gallons per day (mgd) of secondary effluent from the Oxnard Wastewater Treatment Plant and produce 6.25 mgd of product water for reclaimed water uses. This is equivalent to 7,000 acre-feet per year (AFY) of product water that can be delivered through existing infrastructure. The AWPF is currently producing up to 4,600 AFY. Advanced purified water was first delivered to agricultural operators in 2016. By agreement and in accordance with FCGMA Resolution 13-02, the City receives Recycled Water Pumping Allocations at one acre-foot for each acre-foot of recycled water use that results in decreased groundwater pumping. The project that is being considered for inclusion in the GSP is to provide recycled water for landscape irrigation, agricultural, industrial process water and/ or groundwater recharge in lieu of pumping with FCGMA providing payment in exchange of recycled water pumping allocations.”
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.2-Project No. 1 – GREAT Program Advanced Water Purification Facility	N/A	Requested Revision on Page 5-4: "The City of Oxnard receives a Recycled Water Pumping Allocation for delivered water used by farmers in lieu of groundwater production. Implementation" to "The City of Oxnard receives payment plus a Recycled Water Pumping Allocation for delivered water used by farmers in lieu of groundwater production. Implementation”
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.2-Project No. 1 – GREAT Program Advanced Water Purification Facility	N/A	Requested Revision on Page 5-4: "The cost of the water produced by the GREAT Program AWPF Project is approximately $3,100 per AF." Remove quote entirely from GSP.
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.3-Project No. 2 – GREAT Program Advanced Water Purification Facility Expansion Project	N/A	Requested Revision on Page 5-5: "GREAT Program AWPF Expansion Project water was included in future groundwater modeling scenarios to examine the impact that the project will have on the sustainability criteria. This project was incorporated in the modeling along with the GREAT Program AWPF Project (see Section 5.2, Project No. 1 – GREAT Program Advanced Water Purification Facility) and the temporary fallowing of agricultural land (see Section 5.6). Therefore, the relationship between the impact of this project alone and the sustainability indicators has not been quantified. Rather, the potential effect of this project in the context of all of three of these projects is presented in this discussion." Remove Section 5.3.2 from Document.

Commenter			Chapter	Section	Subsection	Comment
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.4-Project No. 3 – RiverPark–Saticoy GRRP Recycled Water Project	N/A	Requested Revision on Page 5-8: "The RiverPark–Saticoy GRRP Recycled Water Project is the same as the GREAT Program AWPF Expansion Project, as incorporated into the numerical groundwater model simulations, because the RiverPark–Saticoy GRRP Recycled Water Project simply provides the infrastructure to convey the water. It does not provide additional water to the Subbasin beyond what was modeled for the GREAT Program AWPF project." to "The RiverPark–Saticoy GRRP Recycled Water Project simply provides the infrastructure to convey the water and is dependent upon the GREAT Program AWPF Expansion Project. This was incorporated into the numerical groundwater model simulations. It does not provide additional water to the Subbasin beyond what was modeled for the GREAT Program AWPF project."
Thien	Ng	City of Oxnard / Assistant Public Works Director	5 - Project Management Actions	5.9-Management Action No. 3 – Water Market Pilot Program	N/A	Requested Revision on Page 5-17: "5.9 MANAGEMENT ACTION NO. 3 – WATER MARKET PILOT PROGRAM" to "5.8 MANAGEMENT ACTION NO. 2 – WATER MARKET PILOT PROGRAM"
Thien	Ng	City of Oxnard	Executive Summary	ES.1-Introduction	N/A	Requested Revision in footnote 1, Page ES-1 "Sources of water high in chloride in the Oxnard Subbasin include modern-day seawater as well as non-marine brines and connate water in fine-grained sediments." to "Sources of water high in chloride in the Oxnard Subbasin include modern-day seawater as well as non-marine brines and connate brines in fine-grained sediments."

Deardorff
FAMILY FARMS
Sustainable Farming for a Healthier Life!

September 19, 2019

Via email: keely.royas@ventura.org and online portal for comments

Board of Directors
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009-1610

Re: ***Draft GSP***

To The Board of Directors:

Our company owns land and farms in the Oxnard Basin ("Oxnard Basin") and the Pleasant Valley Basin ("PV Basin"). The purpose of this correspondence is to provide comments to both (i) the Draft Groundwater Sustainability Plan for the Oxnard Basin dated July 2019 (the "Draft Oxnard GSP") and (ii) the Draft Groundwater Sustainability Plan for the Pleasant Valley basin dated July 2019 ("Draft PV GSP"). The Draft Oxnard GSP and the Draft PV GSP shall be referred to herein occasionally as the "Draft GSPs".

We have provided comments to the Fox Canyon GMA Board (the "Board") on various issues over the past 2 years that relate to the issues re-addressed in the Draft GSPs. We request that all those comment letters be made part of the record for this comment period.

Our additional comments to the Draft GSPs are as follows:

1. The Draft GSPs must be rejected as they were not created in a fair, independent or legal process of representative government.

The Board did not undertake a proper process for creation of the Draft GSPs because (i) there is not adequate representation of overlying water rights holders on the Board; (ii) there are conflicts of interest on the Board; and (iii) Jeff Pratt has several conflicting duties and holds incompatible offices.

a. No Adequate Representation. FCGMA was created as a public agency charged with the management of groundwater resources in the southwestern portion of Ventura County, California. The Board is made up of stakeholders in groundwater management. The makeup of the Board with these various stakeholders was appropriate at the time of creating FCGMA because the goal was to manage the water resources for the benefit of all stakeholders.

However, the Board does not have the proper representative makeup now that it is acting as a GSA to regulate groundwater use. The Board has effectively moved from "manager" to "regulator". For example, the Board will now be required to perform the duties and exercise the necessary powers of a GSA to develop, implement, and enforce a groundwater sustainability program under SGMA. As such, the Board must have adequate representation from the overlying water rights holders – who own 100% of the safe yield from the basin. However, the FCGMA rules do not provide for any representation whatsoever from overlying water rights holders. Instead, the FCGMA rules require the Board to be made up with (i) a member of the Board of Supervisor; (ii) a UWCD board member; (iii) a selection for the five city councils; (iv) a mutual water company representative; and (v) a representative from a local farm group. Because overlyers have no representation on the Board, the Board cannot legally act as a GSA. This is simply not a representative agency.

b. Conflicts of Interest. The Board claims that is has the power "over groundwater production". (Draft PV GSP at 5.3.1). Indeed, the central tenant of the Draft GSPs is that the Board will exert an alleged power to reduce groundwater pumping and allocate groundwater pumping to the various water users. The problem is every member of the Board is engaged in groundwater production. In other words, the Board allegedly now has power over their own groundwater production as well as the power over those who are competing with the Board members for a groundwater allocation. Therefore, the entire Board has a conflict of interest and cannot by law be making decisions on reductions and/or allocations. The Board members and the agencies they represent will personally benefit from the decisions made by the Board. That is a classic and clear conflict of interest and, therefore, the Draft GSPs must be rejected in their entirety and redone by an independent body of decision makers.

Conflicts of interest regarding water rights are so important that the court system is required to move cases deciding water production issues to a court outside their district. Even judges who are professionally trained in independence are presumed to have a conflict of interest for no other reason that they are present in a district in which the water production is occurring. As an example, the court in the Las Posas litigation moved the case from the Ventura County to Santa Barbara due to the possible conflicts of interest. The judge was not a groundwater pumper, he simply lived in Ventura County and, therefore, was legally deemed to have a conflict of interest. Here, it is even worse. The Board members are not just present in the district, they are in the groundwater business. So, the Board's conflicts are not just legal (like in the Las Posas case) they are actual and obvious. In short, the Board cannot legally exert power over water production decisions because they have a conflict of interest.

Clearly, FCGMA was never intended to have power "over groundwater production". If it were intended to have such power, the Board would consist of neutral parties who do not have any "legal" or "actual" conflicts of interest. This Board is made up of actual groundwater businesses that will personally benefit from exercising their newly claimed power "over groundwater production". This is a clear conflict requiring the Draft GSPs to be redone by a neutral party. If on the other hand, the Board claims there is no conflict, then the Board must at least even the playing field by appointing overlyers to the Board (see section 1.a., above). The Board cannot legally claim there is no conflict on the one hand and then on the other hand bar the most senior water rights holders from representation on the Board due to claims they are conflicted. The "rules" for some water users should apply to all water users as far as representation on the Board.

c. Incompatible Office. Jeff Pratt is currently holding two incompatible offices. The existence of incompatible offices occurs when the functions of one person in two distinct roles or offices are inherently inconsistent or detrimental to the public interest. Here, Mr. Pratt is both the Director of Public Works for Ventura County (in charge of the administration, billing, customer service, operation, maintenance, design, inspection, and construction of water services for the County) and the Executive Officer of the FCGMA (which now has the alleged power under the Draft GSPs "over groundwater production"). In short, Mr. Pratt runs the entity that consumes the groundwater (Public Works in Ventura County) and also the entity that has the power to decide who gets to consume the groundwater (FCGMA). He has been given the powers of the fox guarding the hen house. It is inherently inconsistent to have one of the main consumers of groundwater also in charge of allocating all of the groundwater. This is not only a conflict, but it raises to the level of incompatible offices because it is determinantal to the public interest in having fair, equitable and sustainable decisions made about the use and allocation of groundwater resources. Because the public interest and trust is so important, there is strong legal doctrines to prevent this type of self-dealing. The GSPs must be redone in a legal and independent process in order to protect this public interest.

2. The Draft GSPs must be rejected because they fail to present viable management actions to achieve sustainability.

The underlying premise of both Draft GSPs is that the Board has the power to reduce groundwater pumping. Indeed, the plan in the Draft GSPs to achieve sustainability is for the Board to force dramatic reductions in groundwater pumping. In some cases, the Board assumes it has the power to reduce groundwater pumping by 50-100% simply by using regulations. In other words, the Board assumes it has the power to regulate away all existing water right. There is no discussion in the Draft GSPs of where this power comes from or the legal basis for exercising the power. The Draft GSPs just assume that the Board has the power "over groundwater production". The assumption is wrong and the Drafts GSPs are woefully short of complying with SGMA.

SGMA requires that a GSP include a full description of every management action being used to meet the sustainability goals. In addition, SGMA requires a summary of the permitting or regulatory process for every management action and an explanation of how the management action will be accomplished, the legal authority for the management action and the costs.

Here, the Draft GSPs fail to follow SGMA because there is no explanation in the Draft GSPs of how the regulation of groundwater pumping will be accomplished, the legal authority for the regulations or the cost to implement regulations. The Draft GSP simply assumes the Board has the right to ignore water rights laws and regulate away all ground water pumping. There is no language in the Draft GSPs that even attempts to explain this power or otherwise comply with the legal requirement of SGMA regarding explanations of management actions. Nothing. As such, neither the State nor any stakeholders have the ability to properly review the Draft GSPs and the management actions therein to determine their viability. For that reason alone, the Draft GSPs must fail.

In addition, the Board does not have the legal power to regulate away groundwater rights. The right to groundwater production is a legal property right that has long been recognized in California. And, SGMA itself clearly states that nothing in the provisions nor in any groundwater management plan "determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights". The Draft GSPs do not in any way acknowledge this legal fact or incorporate it into the management actions. Accordingly, the Draft GSPs cannot be legally implemented in their current form.

The Draft GSP must incorporate existing water rights law. The current groundwater rights in the Oxnard Basin and PV Basin entitle overlyers to 100% of the safe yield. There has been no adjudication to alter this legal fact. The Draft GSPs must apply current water rights to the management actions. That has not been done here. The Board has instead considered several "allocation plans" over the past few years that would result in a re-assignment of water rights away from their rightful legal owners (the overlyers) and to the non-overlying entities (the cities, counties and mutual water districts that are represented by the Board members). In other words, the Board is using the SGMA process to self-adjudicate the basins in their own conflicted vision of redistributing water rights. The Board desires to take water rights from their rightful legal owners and assign the rights to their own entities. This attempted taking is illegal under the California Constitution, SGMA, California water codes and common law water rights. In short, the Draft GSPs have incorporated an illegal taking of groundwater rights as it principal management action and, therefore, must be completely rejected.

In addition, the overlyers right to 100% of the safe yield is a correlative right and, therefore, not subject to allocation. Using this as the starting point, the Draft GSPs are required to then explain the management actions to reach sustainability – which all stakeholders acknowledge may require reductions to groundwater production. The Draft GSP must explain how these reductions will be accomplished, the legal authority for the reduction plan and the costs of the plan. For example, the Draft GSPs could suggest a management action to purchase a portion of the 100% of groundwater owned by the overlyers. Some estimates call for 30,000 acre-feet of reductions. Using this example, the Draft GSP is required by SGMA to explain the purchase plan (maybe using the market that is also suggested in the Draft GSPs), the legal authority for the purchase plan and the costs (which using $1,500/ acre-foot would be $45,000,000 annually). If the Draft GSP provided all that detail (as required by SGMA), the proper analysis of the management action could be done. However, the Draft GSPs cannot simply assume there is an omnipresent power to steal the $45,000,000 of groundwater from its rightful owners under the guise of "management". Again, there is no power to take these water rights away from their rightful owners. The Draft GSPs need to fully explain a legal management action plan for the reduction of groundwater production. Stealing water rights is not a legal management plan.

3. The Draft GSPs must be rejected because no CEQA or environmental permitting issues have been addressed.

The Draft GSPs must only be considered after there has been a proper environmental impact report and all permitting issues have been explained. Admittedly, the creation of a GSP is exempt from CEQA. However, the implementation of a GSP and all projects or management actions must comply with CEQA. In addition, a GSP must (i) summarize how the management actions and projects are going to comply with CEQA; (ii) explain any and all permitting requirements; and (iii) analyze the costs of complying with CEQA and permits. Without meeting these requirements there is no way to analyze the projects, managements actions and general viability of a GSP.

In this case, the Draft GSPs propose the most significant change to groundwater pumping and stormwater control in the history of Ventura County. And, no one has done any review whatsoever of the environmental, physical, safety or economic consequences of these major changes. In addition, the Draft GSPs do not even explain the process, implications or costs for doing that review. In other words, there has been no due diligence on environmental matters. Why approve a plan now that will be later undone and/or substantially amended when the environmental review is conducted? That will just push back the proper management of these basins for years and years. For that reason, SGMA requires that all management actions be explained in detail along with the permitting and costs associated with implementation. These Draft GSPs fail to do so and, therefore, have not presented "viable" management action plans.

As one example, stormwater control in Ventura County will be substantially and forever impacted by the Draft GSPs. The Draft GSPs propose a substantial and permanent increase in the groundwater levels in the OPV Basin and the PV Basin. They further suggest that these groundwater levels be maintained every year – even in drought conditions. So, there will be no hydrological fluctuations that would naturally occur in the basins due to the occurrence of rainy, normal and dry years. Every year will maintain a high-water level. This type of artificial manipulation of the groundwater basins has never been done before. The effect on stormwater management will be the elimination of significant percolation and storage of stormwater runoff. In other words, every year will be an El Nino for stormwater runoff because there will no longer be any place for percolation and ground storage of rainfall. This will have significant and costly affects for the environment, for infrastructure and for health and safety of citizens. Significant flooding and erosion will occur every year – not just in wet years because the groundwater levels will be maintained at levels higher than those of recent wet years. These effects need to be studied in order to ensure the health and safety of the environment and citizen of Ventura County.

As another example, the Draft GSPs suggest that there will be a substantial reduction in groundwater pumping and do not provide an equal or offsetting source of replacement water. As such, some or all of the existing uses of water for residential, municipal, industrial or agricultural uses will be reduced – and in some cases, that reduction may be substantial. The Draft GSPs do not in any way discuss the environmental effects of such reductions. There is no doubt there will be substantial effects to the health and wellbeing of the citizens of Ventura County and the environment when safe water is no longer available in adequate amounts - think Flint, Michigan or dust bowl era effects. Ignoring these effects is simply at attempt at pollical expediency. Thankfully, SGMA does not allow the Board to ignore the citizens of Ventura County. SGMA requires the management actions be explained in full, the permits (like CEQA) analyzed and the costs analyzed in the GSP. That was not done here.

These are just two examples of the Draft GSPs potential effects. There are considerably more that all necessitate a professional and full analysis before any plans are approved and put into action. SGMA requires such analysis and these Draft GSPs need to be updated and brought into compliance with all such SGMA requirements.

4. The process for adoption of the Draft GSPs does not account for stakeholder input.

The Board is required to make a real effort to obtain stakeholder input on the Draft GSPs. Here, there is no plan for actual stakeholder input. Instead, the Board has adopted the fastest possible timeframe in order to exclude any real inclusion of stakeholder input in the final product. By doing so, the Board is not following the letter or spirit of SGMA.

The Board states that public comments to the Draft GSPs will be presented to the Board in early November and the final GSPs will be adopted on December 13, 2019 (just one month later). There is no schedule for public meetings, debates or review sessions to go over public comments. In addition, there is no time for staff and/or the third-party consultants to actually review the legal, scientific and logistical issues raised in the public comments. In short, the Board's plan is to simply attach the comments to the Draft GSPs and not actually engage in any analysis, debate or refinement of the Draft GSPs. This is unconscionable. This will be the biggest change to groundwater use, stormwater management and the overall economy in the history of Ventura County. And, the Board is going to just cram it down the throats of the citizens of Ventura County without any real public input in the process? Clearly, that should not, and cannot, legally happen.

The Draft GSPs need to be properly reviewed in a transparent and public process for a realistic period of time to allow for proper inclusion of comments. There are significant issues being raised in the public comments that staff and the third-party consultants need to review and address. A simple attachment of the comments is a failure for the entire process. The Board needs to finish the work required by SGMA and properly implement necessary changes to the Draft GSPs to address the public comments.

For the reasons stated above, and in the previous comment letters we have provided on the issues raised by the Draft GSPs, we suggest the Draft GSPs be pulled and redone in a way the addresses these concerns and legal deficiencies.

Sincerely,

Thomas D. Deardorff, II

The Nature Conservancy
Protecting nature. Preserving life.

CALIFORNIA WATER | **GROUNDWATER**

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nature.org
GroundwaterResourceHub.org

September 20, 2019

Jeff Pratt, Executive Officer
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, California 93009-1610

Submitted via website: http://fcgma.org/groundwater-sustainability-plan

Re: Oxnard Groundwater Subbasin Groundwater Sustainability Plan

Dear Mr. Pratt,

The Nature Conservancy (TNC) appreciates the opportunity to comment on the Oxnard Subbasin Groundwater Sustainability Plan being prepared under the Sustainable Groundwater Management Act (SGMA).

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 Oxnard Subbasin 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. The Nature Conservancy has identified each part of the GSP where consideration of beneficial uses and users are required. That list is available here: https://groundwaterresourcehub.org/importance-of-gdes/provisions-related-to-groundwater-dependent-ecosystems-in-the-groundwater-s. Please ensure that environmental beneficial users are addressed accordingly throughout the GSP. 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 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.

We appreciate the inclusion of an environmental representative on the Technical Advisory Group. In particular, we greatly appreciate the efforts by Fox Canyon GMA to work on an approach to the consideration of GDEs in the GSPs, including the creation of an Ad Hoc GDE Subcommittee and subsequent development of a TNC-led analysis of GDEs that was included in the draft GSP for Oxnard Groundwater Subbasin.

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 online[2] by the Department of Water Resources (DWR) as a starting point for the GDE map. The NC Dataset

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[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/*

was developed through a collaboration between DWR, the Department of Fish and Wildlife and TNC.

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. For your convenience, we've provided a list of freshwater species within the boundary of the Oxnard Subbasin in **Attachment C**. Our hope is that this information will help your GSA better evaluate the impacts of groundwater management on environmental beneficial users of surface water. We recommend that after identifying which freshwater species exist in your basin, especially federal and state listed species, that you contact staff at the Department of Fish and Wildlife (DFW), 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. We also refer you to the Critical Species Lookbook[3] prepared by The Nature Conservancy and partner organizations for additional background information on the water needs and groundwater reliance of critical species. 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.

Conclusion

The Nature Conservancy has thoroughly reviewed the Oxnard Subbasin Draft GSP. We appreciate the work that has gone into the preparation of various elements of this plan. We consider it to be **adequate** with respect to addressing environmental beneficial uses and meeting the ecosystem objectives of SGMA. We have provided some general and specific comments to further improve the GSPs identification and consideration of environmental uses, and in particular groundwater dependent ecosystems (GDEs).

Our specific comments related to the Oxnard Subbasin Draft GSP are provided in detail in **Attachment B** and are in reference to the numbered items in **Attachment A. Attachment C** provides a list of the freshwater species located in the Oxnard Subbasin. **Attachment D** 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 Dataset[2]. **Attachment E** 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.

[3] *The Critical Species LookBook is available at:* https://groundwaterresourcehub.org/sgma-tools/the-critical-species-lookbook/.

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

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** *23 CCR §354.10*	**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** *23 CCR §354.8*	**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** *23 CCR §354.14*	**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 Current & Historical Groundwater Conditions *23 CCR §354.16*	**Interconnected surface waters:**	8
		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 *was* 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 *was not* 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 *are available* 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 *are not available* 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** *23 CCR §354.44*	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
Oxnard Subbasin Groundwater Sustainability Plan, Public Review Draft

A complete draft of the Oxnard Subbasin Groundwater Sustainability Plan (GSP) was provided for public review on July 24, 2019. This attachment summarizes our comments on the complete public draft GSP, which includes the main GSP file and several separate appendix files. Comments are provided in the order of the checklist items included as Attachment A.

<u>Environmental Beneficial Uses and Users [Checklist Item 1 - Notice & Communication (23 CCR §354.10)]</u>

- Section 1.8.2, pp. 1-45 - 1-46
  The GSP identifies the primary environmental users in the Oxnard Subbasin as the identified GDEs, as described in Section 2.3.7, and includes aquatic habitat, in-channel wetlands, riparian forest, and coastal marshes. The GSA has included representation of environmental users on their TAG, in a special meeting on GDEs and in GSP email and meeting notifications. Our suggestion is to explicitly list different types of beneficial uses and users of groundwater under each category. This would better clarify who these beneficial uses and users are in the basin. In regards to environmental beneficial uses and users, we recommend that GDEs identified in the Basin Setting section (i.e., the lower Santa Clara River, McGrath Lake, Ormond Beach wetlands, Mugu Lagoon, Calleguas Creek, and Revolon Slough) be *specifically* listed, as well as the RWQCB surface water environmental beneficial uses within GDEs listed in Section 2.3.7 (e.g., fish migration and wildlife habitat). The identified GDEs are inclusive of a variety of plant and animal species; some of which are recognized state or federally threatened and endangered or special status species and are designated critical habitat.

  We also recommend that the GSP specifically engage with the natural resource agencies, NOAA Fisheries, US Fish and Wildlife Service, CA Department of Fish and Wildlife, as stakeholders since they are important parties representing the public trust. In particular, the efforts to address the habitat needs of endangered species such as the endangered Southern California Steelhead in the development of the Multiple Species Habitat Conservation Plan is of particular importance. We suggest that the NOAA Fisheries be consulted to ensure the GSP addresses the ecological needs as represented by these public trust agencies.

- Table 1-8
  Please revise the Land Use Category from "Vacant" to "Open Space". As noted in Section 1.3.2.3 - Historical, Current, and Projected Land Use and Section 1.6.1 – General Plans, this is a substantial acreage that is valued highly in Ventura County as open space, with ordinances such as the 1998 Save Open Space and Agricultural

Resources ordinance. We need to do a better job of delineating open space and native habitat from the "vacant" category, as this devalues the environment and its water need.

Description of general plans and other land use plans relevant to GDEs and their relationship to the GSP [Checklist Items 2 to 3 - (23 CCR §354.8)]

- Section 1.4.2 Operational Flexibility Limitations (p. 1-19 to 1-20)]
  A Multiple Species Habitat Conservation Plan prepared by UWCD specifies flow conditions at the Freeman Diversion to be constrained by the habitat requirements for the federally endangered Southern California steelhead (Oncorhynchus mykiss) in the Santa Clara River.

Hydrogeologic Conceptual Model [Checklist Items 6, and 7 (23 CCR §354.14)]

- Section 2.2.3 Principal Aquifers and Aquitards (p.2-6 to 2-7), with additional detail in Sections 1.3.2.1, 2.3.6, 2.3.7, 2.4.1.1, 2.4.2.5, Appendix K
  The Hydrogeologic Conceptual Model adequately describes the shallow groundwater that is interconnected with surface waters and GDEs. Basin-wide cross sections provided in Figures 2-3 and 2-4 include a graphical representation of the manner in which shallow groundwater may interact with ISWs or GDEs that would allow the reader to understand this topic. In the Oxnard Subbasin, the shallow groundwater unit, the semi-perched aquifer, is connected to surface waters (e.g., Santa Clara River, Calleguas Creek, Revolon Slough, McGrath Lake, and the coastal wetlands at Ormond Beach and Mugu Lagoon). The semi-perched aquifer is not considered a principal aquifer due to its limited groundwater production (<50 AFY).

Interconnected Surface Waters (ISW) [Checklist Items 8, 9, and 10 – (23 CCR §354.16); Identification of ISWs is a required element of Current and Historical Groundwater Conditions (23 CCR §354.16).]

- Sections 1.3.2.1, 2.3.6, 2.3.7, 2.4.1.1, 2.4.2.5, Appendix K
  The Santa Clara River, Calleguas Creek, Revolon Slough, Mugu Lagoon, Ormond Beach, and McGrath Lake have all been identified as surface water bodies that may have a connection to the semi-perched aquifer in the Oxnard Subbasin. Qualitative statements are made regarding the interconnectedness, including gaining/losing reaches, and timing are provided, along with quantification, based on numerical modeling, of the recharge to groundwater from the Santa Clara River and Calleguas Creek.

  We disagree with the qualifying statements that the "surface water bodies that may have a connection" and "However, groundwater elevation data for the semi-perched aquifer in the Oxnard Subbasin are extremely limited, with no monitoring sites near enough to surface water bodies to establish the extent of the connection between these surface water bodies and underlying groundwater." There have been previous efforts to assess the quantity and timing of interconnected surface water and groundwater by other consultants working at or nearby the surface water bodies, such as shallow monitoring data and groundwater modeling at Naval Base Ventura County from site-specific groundwater investigations and surface water and groundwater monitoring data at the Santa Clara River estuary and lower floodplain. These data, including well elevation data dating back to 1990, have been described in TNC's Technical Memorandum: Assessment of Groundwater Dependent Ecosystems for the Oxnard Subbasin Groundwater Sustainability Plan (Appendix K). TNC's assessment of these reports indicate that the water elevation data and analyses corroborate the conceptual model that groundwater levels in the semi-perched aquifer relatively constant with a seasonal cyclical behavior, although there has been a downward trend with the recent (2011-16) drought. These reports and data provide estimates of quantity and timing of groundwater - surface water interactions. The GSA should review sed reports and data and revise these statements to be definitive statements of the connections of surface water and groundwater.

<u>Identification, Mapping and Description of GDEs [Checklist Items 11 to 20 (23 CCR §354.16)]</u>

- Section 2.3.7 (pp. 2-43 – 2-46) & Appendix K
  GDEs have been identified and mapped during the GSP development process using an earlier version of the statewide database of GDE indicators (iGDE v0.3.1; TNC, 2017) and TNC's GDE Guidance document (Rohde et al., 2018). This evaluation is described in Appendix K, with a brief summary in Section 2.3.7. In addition to the mapping of basin GDEs, it also includes both an assessment of the hydrologic and ecological conditions of the GDEs and potential GDEs.
- Executive Summary (p. 1-1); Section 1.1 (p.1-2)
  While we support the position that "Depletions of interconnected surface water have not occurred historically in the Subbasin, because the Groundwater-Dependent Ecosystems (GDEs) in the Subbasin are supported by shallow groundwater flows that are generally separated and disconnected from the primary groundwater aquifers," we would like to make this clear that historical conditions represent the time period referenced by SGMA – since the 1980s. As noted in Section 2.2.3, once agriculture grew in the Oxnard subbasin, groundwater levels in the semi-perched aquifer were lowered using the agricultural tile drains (installed in the 1900s) for drainage of irrigated water from the agricultural fields.

<u>Water Budget [Checklist Items 21 and 22 (23 CCR §354.18)]</u>

- Section 2.4
  The water budget now includes the semi-perched aquifer and the surface hydrologic components of the semi-perched aquifer, including the groundwater-surface water exchanges with the Santa Clara River and the Calleguas Creek and natural vegetation evapotranspiration (ET). We appreciate the separate inclusion of the semi-perched aquifer water budget.

<u>Sustainability Goal [Checklist Items 23 to 25 (23 CCR §354.24)]</u>

- Section 3.1 Introduction to Sustainable Management Criteria (p. 3-2)
  Fox Canyon Groundwater Management Agency (FCGMA) Board of Directors (Board) adopted planning goals in 2015 that "Promote water levels that mitigate or minimize undesirable results (including pumping trough depressions, **surface water connectivity** [emphasis added], and chronic lowering of water levels)."

  Under current and known future conditions, as described in Section 3.3.6, the sustainability goal does not require inclusion of sustainability criteria for surface water connectivity. We agree this as reasonable position for the GSP *at this time*, given that the semi-perched aquifer is not a principal aquifer and is not managed for water supply. However, if future projects are envisioned to produce water from the semi-perched aquifer, sustainability criteria will be developed.

<u>Undesirable Results [Checklist Items 30 to 46 (23 CCR §354.26)]</u>

- Section 3.3.6 Depletions of Interconnected Surface Water (p. 3-10 - 3-11)
  The GSP clearly states: "The undesirable result associated with depletion of interconnected surface water in the Oxnard Subbasin is loss of groundwater-dependent ecosystem (GDE) habitat." We applaud this clear recognition of GDEs as an important beneficial use that must be protected. We also agree with further statements that 1) undesirable results are not currently occurring, 2) groundwater elevation monitoring will continue to be monitored in the semi-perched aquifer and 3) if future projects involve the use of the semi-perched aquifer, then "depletion of interconnected surface water is possible, and significant and unreasonable impacts may occur." While we agree that "Reevaluation of the effects on existing and potential GDEs should be conducted in conjunction with the project approval process for any such future projects," we urge stronger language to specifically state sustainability criteria will be developed at that future time.

<u>Minimum Thresholds [Checklist Items 27 to 29 (23 CCR §354.28)]</u>

- Section 3.4.6 Minimum Thresholds – Depletions of Interconnected Surface Water (p. 3-19 to 3-20)
  We applaud the language recognizing that future projects may have a potential impact on interconnected surface water and GDEs, and that "if projects that produce groundwater from the semi-perched aquifer are implemented, the need for specific water level minimum thresholds in the semi-perched aquifer should be reevaluated".
  This section defines minimum thresholds due to salinity front as it the modeling shows UAS levels support the groundwater elevations in the semi-perched aquifer. This is confusing as it seems like the recharge is predominantly downwards from the semi-perched aquifer to the UAS. It is unclear how the UAS is influencing the salinity front in the semi-perched aquifer.

<u>Measurable Objectives -Checklist Item 26 – (23 CCR §354.30)</u>

- Section 3.5.6 Measurable Objectives – Depletions of Interconnected Surface Water (p. 3-26 to 3-27)
  A measurable objective for interconnected surface water in the semi-perched aquifer is set to address seawater intrusion. We recommend adding a statement, as is done in Section 3.4.6, that "if projects that produce groundwater from the semi-perched aquifer are implemented, specific water level measurable objectives in the semi-perched aquifer should be developed".

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

- Section 4.3.6 Depletions of Interconnected Surface Water (p.4-10)
  We recommend inclusion of remote sensing vegetative indices as a low cost approach to monitor baseline conditions of GDEs. The Nature Conservancy's free online tool, GDE Pulse, allows GSAs a way to assess changes in GDE health using remote sensing data sets; specifically, the Normalized Difference Vegetation Index (NDVI), which is a satellite-derived index that represents the greenness of vegetation and Normalized Difference Moisture Index (NDMI), which is a satellite-derived index that represents water content in vegetation.

- Section 4.6.5 Shallow Groundwater Monitoring near Surface Water Bodies and GDEs (p.4-15)
  The GSP notes the lack of shallow groundwater monitoring wells in the semi-perched aquifer that can be used to monitor interconnected surface water bodies/GDEs along the Lower Santa Clara River, McGrath Lake, Ormond Beach and Mugu Lagoon, and potential GDEs along the Revolon Slough and Lower Calleguas Creek in the Subbasin. We support the inclusion of monitoring wells with the potential GDEs to better assess the potential connectivity. A number of wells are in the vicinity of the GDEs and are monitored by other agencies for specific remediation cases or regional studies. These should be included in the GSP. It is to the benefit of the GSA to make use of these existing monitoring wells as they provide long term historical records, are already monitored by other agencies and are available at no cost to the GSA. The data have been made available for the GSP and it is recommended that monitoring agreements be put in place to receive ongoing data on these wells and ensure the long-term monitoring continues. In particular, we suggest the following wells to serve as representative monitoring wells for each GDE in order to monitor impacts caused by depletions of interconnected surface water (Figures 6-9, Appendix K):

GDE	Well
Lower Santa Clara River	2N22W30A03S
McGrath Lake	GW-3
Ormond Wetlands	01N22W27G04S
Mugu Lagoon	MW6-6A

- Section 4.6.6 Surface Water: Flows in Agricultural Drains in the Oxnard Plain (p.4-15 – 4-16)
  We would also recommend that we survey the water surface elevation in the drains, as they should be easy to measure, provide calibration head values for the numerical model and good indication of the semi-perched aquifer elevations.

Projects and Management Actions to Achieve Sustainability Goal [Checklist Items 50 and 51 (23 CCR §354.44)]

- Section 5.9 Management Action No. 3 – Water Market Pilot Program (p. 5-17 – 5-18)

  The GSP indicates that significant reductions in groundwater extractions will be needed to avoid undesirable results. These reductions may have serious impacts on existing extractors. We support development and implementation of a well-designed water market that will incentivize conservation and provide flexibility for pumpers in meeting the objectives of the GSP. The water market must have rules that prevent negative impacts to other beneficial users such as the environment and Disadvantaged Communities.

Attachment C

Freshwater Species Located in the Oxnard Subbasin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result "depletion of interconnected surface waters", Attachment C provides a list of freshwater species located in the Oxnard Subbasin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the GSA's boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 2015[4]. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS[5] as well as on The Nature Conservancy's science website[6].

Scientific Name	Common Name	Legally Protected Species		
		Federal	State	Other
BIRDS				
Actitis macularius	Spotted Sandpiper			
Aechmophorus clarkii	Clark's Grebe			
Aechmophorus occidentalis	Western Grebe			
Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
Aix sponsa	Wood Duck			
Anas acuta	Northern Pintail			
Anas americana	American Wigeon			
Anas clypeata	Northern Shoveler			
Anas crecca	Green-winged Teal			
Anas cyanoptera	Cinnamon Teal			
Anas discors	Blue-winged Teal			
Anas platyrhynchos	Mallard			
Anas strepera	Gadwall			
Anser albifrons	Greater White-fronted Goose			
Ardea alba	Great Egret			
Ardea herodias	Great Blue Heron			
Aythya affinis	Lesser Scaup			
Aythya americana	Redhead		Special Concern	BSSC - Third priority
Aythya collaris	Ring-necked Duck			
Aythya marila	Greater Scaup			
Aythya valisineria	Canvasback		Special	
Botaurus lentiginosus	American Bittern			
Bucephala albeola	Bufflehead			

[4] Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoSONE, 11(7). Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710
[5] California Department of Fish and Wildlife BIOS: https://www.wildlife.ca.gov/data/BIOS
[6] Science for Conservation: https://www.scienceforconservation.org/products/california-freshwater-species-database

Bucephala clangula	Common Goldeneye			
Butorides virescens	Green Heron			
Calidris alpina	Dunlin			
Calidris mauri	Western Sandpiper			
Calidris minutilla	Least Sandpiper			
Chen caerulescens	Snow Goose			
Chen rossii	Ross's Goose			
Chlidonias niger	Black Tern		Special Concern	BSSC - Second priority
Chroicocephalus philadelphia	Bonaparte's Gull			
Cistothorus palustris palustris	Marsh Wren			
Cygnus columbianus	Tundra Swan			
Cypseloides niger	Black Swift	Bird of Conservation Concern	Special Concern	BSSC - Third priority
Egretta thula	Snowy Egret			
Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Fulica americana	American Coot			
Gallinago delicata	Wilson's Snipe			
Gallinula chloropus	Common Moorhen			
Grus canadensis	Sandhill Crane			
Haliaeetus leucocephalus	Bald Eagle	Bird of Conservation Concern	Endangered	
Himantopus mexicanus	Black-necked Stilt			
Histrionicus histrionicus	Harlequin Duck		Special Concern	BSSC - Second priority
Icteria virens	Yellow-breasted Chat		Special Concern	BSSC - Third priority
Limnodromus scolopaceus	Long-billed Dowitcher			
Lophodytes cucullatus	Hooded Merganser			
Megaceryle alcyon	Belted Kingfisher			
Mergus merganser	Common Merganser			
Mergus serrator	Red-breasted Merganser			
Numenius americanus	Long-billed Curlew			
Numenius phaeopus	Whimbrel			
Nycticorax nycticorax	Black-crowned Night-Heron			
Oreothlypis luciae	Lucy's Warbler		Special Concern	BSSC - Third priority
Oxyura jamaicensis	Ruddy Duck			
Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority

Phalacrocorax auritus	Double-crested Cormorant			
Phalaropus tricolor	Wilson's Phalarope			
Pipilo aberti	Abert's Towhee			
Piranga rubra	Summer Tanager		Special Concern	BSSC - First priority
Plegadis chihi	White-faced Ibis		Watch list	
Pluvialis squatarola	Black-bellied Plover			
Podiceps nigricollis	Eared Grebe			
Podilymbus podiceps	Pied-billed Grebe			
Porzana carolina	Sora			
Rallus limicola	Virginia Rail			
Recurvirostra americana	American Avocet			
Riparia riparia	Bank Swallow		Threatened	
Rynchops niger	Black Skimmer			
Setophaga petechia	Yellow Warbler			BSSC - Second priority
Tachycineta bicolor	Tree Swallow			
Tringa melanoleuca	Greater Yellowlegs			
Tringa semipalmata	Willet			
Tringa solitaria	Solitary Sandpiper			
Vireo bellii	Bell's Vireo			
Vireo bellii pusillus	Least Bell's Vireo	Endangered	Endangered	
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
CRUSTACEANS				
Americorophium spp.	Americorophium spp.			
Cambaridae fam.	Cambaridae fam.			
Cyprididae fam.	Cyprididae fam.			
Gammarus spp.	Gammarus spp.			
Hyalella spp.	Hyalella spp.			
FISH				
Catostomus santaanae	Santa Ana sucker	Threatened	Special Concern	Endangered - Moyle 2013
Eucyclogobius newberryi	Tidewater goby	Endangered	Special Concern	Vulnerable - Moyle 2013
Gasterosteus aculeatus williamsoni	Unarmored threespine stickleback	Endangered	Endangered	Endangered - Moyle 2013
Oncorhynchus mykiss - Southern CA	Southern California steelhead	Endangered	Special Concern	Endangered - Moyle 2013
HERPS				
Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC
Anaxyrus boreas boreas	Boreal Toad			
Pseudacris cadaverina	California Treefrog			ARSSC

Pseudacris regilla	Northern Pacific Chorus Frog			
Rana draytonii	California Red-legged Frog	Threatened	Special Concern	ARSSC
Spea hammondii	Western Spadefoot	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Taricha torosa	Coast Range Newt		Special Concern	ARSSC
Thamnophis hammondii hammondii	Two-striped Gartersnake		Special Concern	ARSSC
Thamnophis sirtalis sirtalis	Common Gartersnake			
INSECTS & OTHER INVERTEBRATES				
Abedus spp.	Abedus spp.			
Ablabesmyia spp.	Ablabesmyia spp.			
Aeshnidae fam.	Aeshnidae fam.			
Ambrysus spp.	Ambrysus spp.			
Anax junius	Common Green Darner			
Baetis spp.	Baetis spp.			
Berosus spp.	Berosus spp.			
Callibaetis spp.	Callibaetis spp.			
Centroptilum album	A Mayfly			
Centroptilum spp.	Centroptilum spp.			
Chironomidae fam.	Chironomidae fam.			
Chironomus anonymus				Not on any status lists
Chironomus spp.	Chironomus spp.			
Cladotanytarsus marki				Not on any status lists
Cladotanytarsus spp.	Cladotanytarsus spp.			
Coenagrionidae fam.	Coenagrionidae fam.			
Corisella decolor				Not on any status lists
Corixidae fam.	Corixidae fam.			
Cricotopus annulator				Not on any status lists
Cricotopus bicinctus				Not on any status lists
Cricotopus spp.	Cricotopus spp.			
Cryptochironomus spp.	Cryptochironomus spp.			
Dicrotendipes adnilus				Not on any status lists
Dicrotendipes spp.	Dicrotendipes spp.			
Diphetor hageni	Hagen's Small Minnow Mayfly			
Ephydridae fam.	Ephydridae fam.			

Eukiefferiella claripennis				Not on any status lists
Eukiefferiella spp.	Eukiefferiella spp.			
Fallceon quilleri	A Mayfly			
Hetaerina americana	American Rubyspot			
Hydropsyche spp.	Hydropsyche spp.			
Hydroptila spp.	Hydroptila spp.			
Hydroptilidae fam.	Hydroptilidae fam.			
Hygrotus spp.	Hygrotus spp.			
Laccobius spp.	Laccobius spp.			
Leptoceridae fam.	Leptoceridae fam.			
Libellula comanche	Comanche Skimmer			
Libellula spp.	Libellula spp.			
Limnophyes spp.	Limnophyes spp.			
Microcylloepus spp.	Microcylloepus spp.			
Micropsectra nigripila				Not on any status lists
Micropsectra spp.	Micropsectra spp.			
Microtendipes caducus				Not on any status lists
Microtendipes spp.	Microtendipes spp.			
Nectopsyche spp.	Nectopsyche spp.			
Ochthebius apache				Not on any status lists
Ochthebius spp.	Ochthebius spp.			
Optioservus spp.	Optioservus spp.			
Orthocladius appersoni				Not on any status lists
Orthocladius spp.	Orthocladius spp.			
Oxyethira spp.	Oxyethira spp.			
Paratanytarsus grimmii				Not on any status lists
Paratanytarsus spp.	Paratanytarsus spp.			
Peltodytes spp.	Peltodytes spp.			
Pentaneura inconspicua				Not on any status lists
Pentaneura spp.	Pentaneura spp.			
Phaenopsectra spp.	Phaenopsectra spp.			
Polypedilum albicorne				Not on any status lists
Polypedilum spp.	Polypedilum spp.			
Postelichus spp.	Postelichus spp.			
Procladius barbatulus				Not on any status lists
Procladius spp.	Procladius spp.			
Pseudochironomus spp.	Pseudochironomus spp.			
Pseudosmittia forcipata				Not on any status lists

Pseudosmittia spp.	Pseudosmittia spp.			
Psychodidae fam.	Psychodidae fam.			
Rheotanytarsus hamatus				Not on any status lists
Rheotanytarsus spp.	Rheotanytarsus spp.			
Simulium anduzei				Not on any status lists
Simulium spp.	Simulium spp.			
Sperchon spp.	Sperchon spp.			
Stictotarsus spp.	Stictotarsus spp.			
Tanytarsus angulatus				Not on any status lists
Tanytarsus spp.	Tanytarsus spp.			
Tipulidae fam.	Tipulidae fam.			
Trichocorixa arizonensis				Not on any status lists
Trichocorixa spp.	Trichocorixa spp.			
Tricorythodes spp.	Tricorythodes spp.			
Tropisternus spp.	Tropisternus spp.			
MAMMALS				
Ondatra zibethicus	Common Muskrat			Not on any status lists
MOLLUSKS				
Lymnaea spp.	Lymnaea spp.			
Physa acuta	Pewter Physa			Not on any status lists
Physa spp.	Physa spp.			
Pisidium spp.	Pisidium spp.			
PLANTS				
Anemopsis californica	Yerba Mansa			
Arundo donax	NA			
Azolla filiculoides	NA			
Baccharis salicina				Not on any status lists
Batis maritima	Saltwort			
Berula erecta	Wild Parsnip			
Bidens laevis	Smooth Bur-marigold			
Bolboschoenus maritimus paludosus	NA			Not on any status lists
Bolboschoenus robustus				Not on any status lists
Chloropyron maritimum maritimum		Endangered	Endangered	CRPR - 1B.2
Cotula coronopifolia	NA			
Cyperus involucratus	NA			
Distichlis littoralis	NA			Not on any status lists
Eleocharis montevidensis	Sand Spikerush			

Eleocharis parishii	Parish's Spikerush			
Euthamia occidentalis	Western Fragrant Goldenrod			
Helenium puberulum	Rosilla			
Hydrocotyle umbellata	Many-flower Marsh-pennywort			
Hydrocotyle verticillata verticillata	Whorled Marsh-pennywort			
Jaumea carnosa	Fleshy Jaumea			
Juncus acutus leopoldii	Spiny Rush		Special	CRPR - 4.2
Juncus rugulosus	Wrinkled Rush			
Juncus textilis	Basket Rush			
Lasthenia glabrata coulteri	Coulter's Goldfields		Special	CRPR - 1B.1
Limonium californicum	California Sea-lavender			
Ludwigia peploides peploides	NA			Not on any status lists
Myriophyllum aquaticum	NA			
Phacelia distans	NA			
Pluchea odorata odorata	Scented Conyza			
Potamogeton foliosus foliosus	Leafy Pondweed			
Potentilla anserina pacifica				Not on any status lists
Rumex crassus				Not on any status lists
Rumex fueginus				Not on any status lists
Rumex salicifolius salicifolius	Willow Dock			
Ruppia cirrhosa	Widgeon-grass			
Ruppia maritima	Ditch-grass			
Salicornia bigelovii	Dwarf Glasswort			
Salix exigua exigua	Narrowleaf Willow			
Salix exigua hindsiana				Not on any status lists
Salix lasiolepis lasiolepis	Arroyo Willow			
Schoenoplectus acutus occidentalis	Hardstem Bulrush			
Schoenoplectus americanus	Three-square Bulrush			
Schoenoplectus californicus	California Bulrush			
Solidago spectabilis	Nevada Goldenrod			
Spartina foliosa	California Cordgrass			
Suaeda calceoliformis	American Sea-blite			

Suaeda californica	California Sea-blite	Endangered	Special	CRPR - 1B.1
Suaeda esteroa	Estuary Suaeda		Special	CRPR - 1B.2
Triglochin maritima	Common Bog Arrow-grass			
Triglochin striata	Three-ribbed Arrow-grass			
Typha domingensis	Southern Cattail			
Typha latifolia	Broadleaf Cattail			
Veronica americana	American Speedwell			
Veronica anagallis-aquatica	NA			

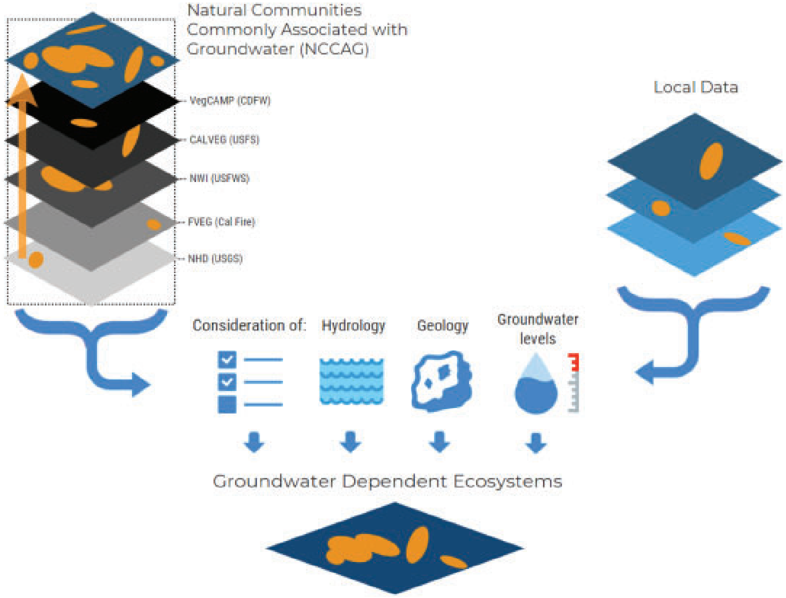
Attachment D

July 2019

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) online[7] 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)[8]. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.



[7] *NC Dataset Online Viewer: https://gis.water.ca.gov/app/NCDatasetViewer/*

[8] 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

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, springs, and seeps commonly associated with groundwater in California[9]. 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 dataset[10] on the Groundwater Resource Hub[11], 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 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*.

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[9] *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*

[10] "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/

[11] *The Groundwater Resource Hub: www.GroundwaterResourceHub.org*

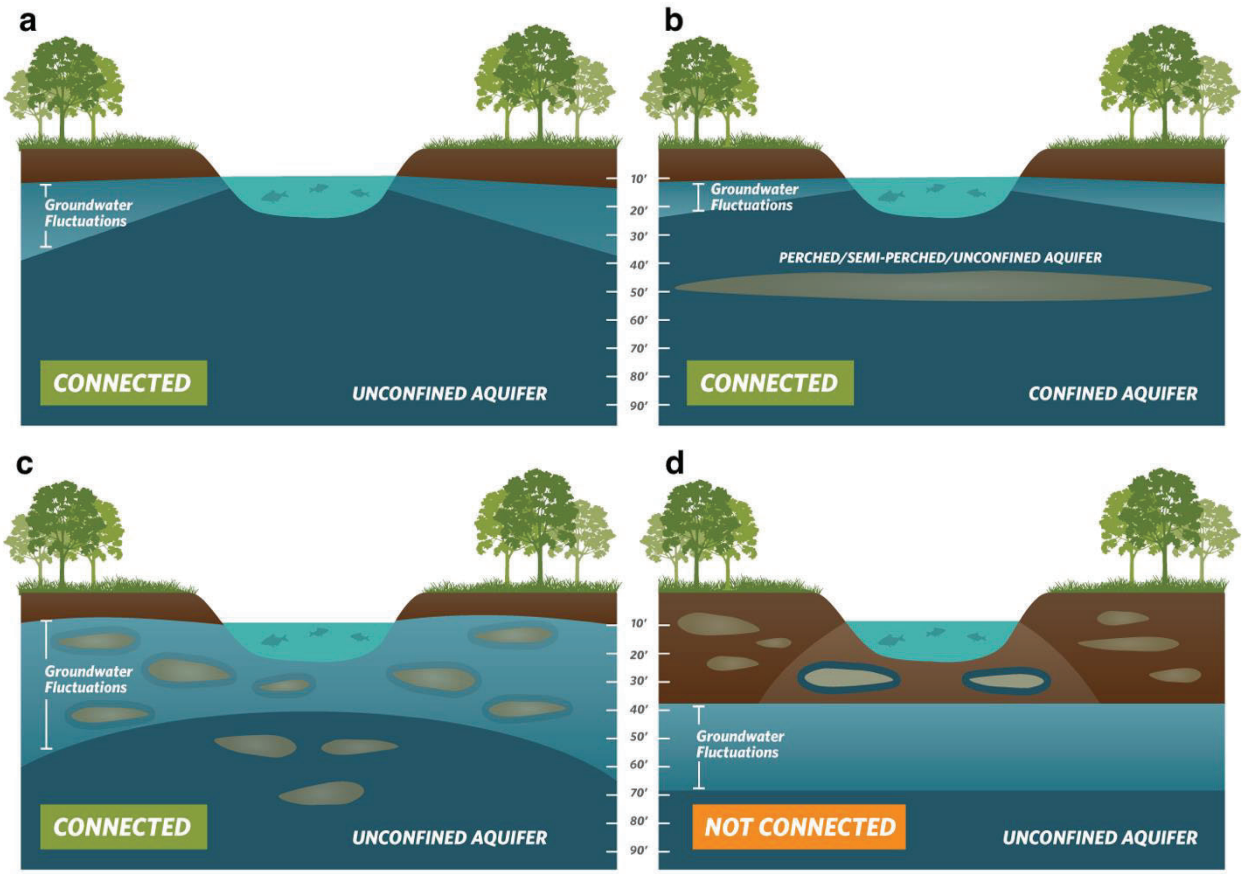

Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. **(b)** Depth-to-groundwater in the shallow aquifer is connected to overlying 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 budgets[12] 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 baseline[13] 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 approach[14] 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 document[4], 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 feet[4] 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 Viewer[15]. 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).

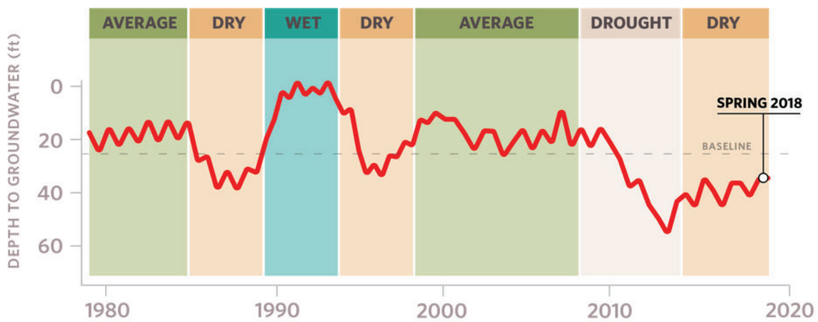

Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so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

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[12] 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

[13] *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)]*

[14] 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 GSPs[4]).

[15] *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 animals[16], 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).

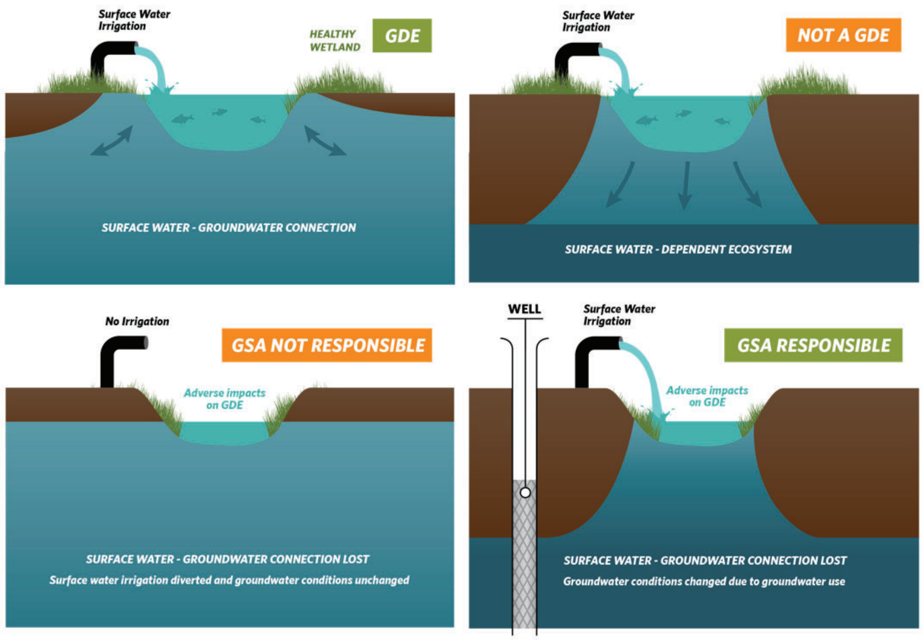


Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. **(Right)** Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. **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.

[16] *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.

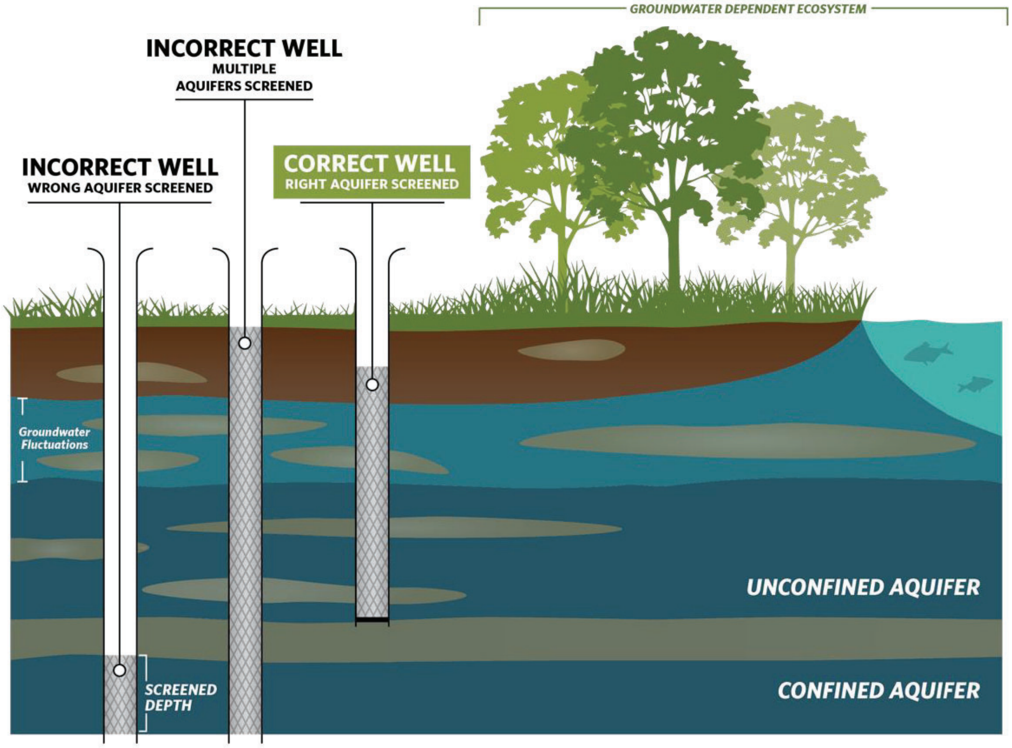


Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

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)[17] 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.

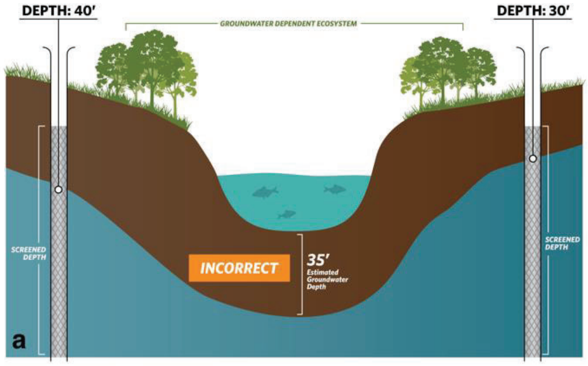


Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. **(b)** Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

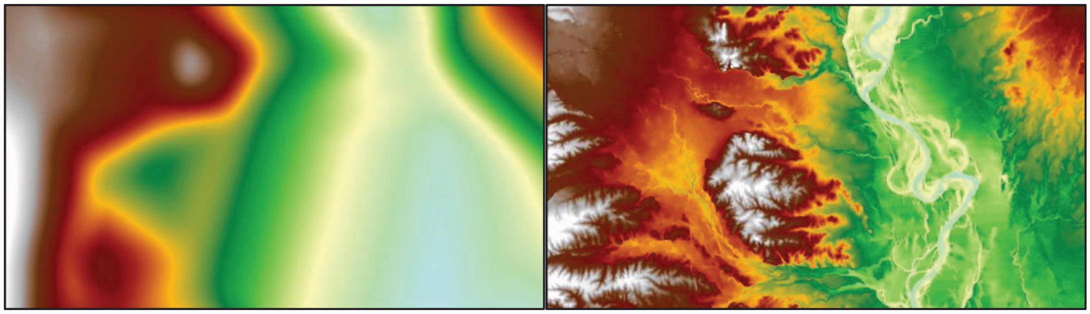


Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. **(Right)** Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation 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.

[17] 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.

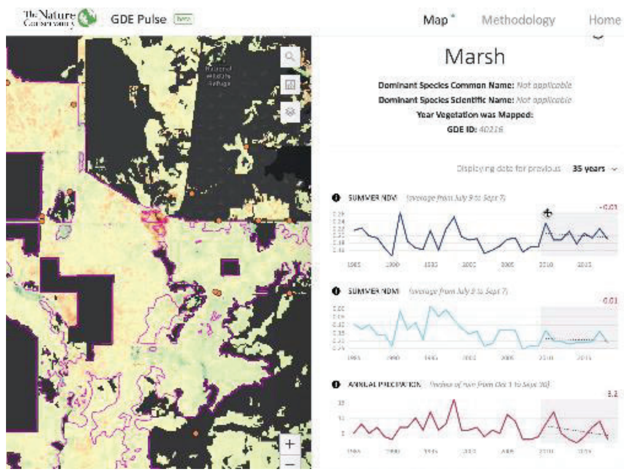
Attachment E

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.

The Nature Conservancy
Protecting nature. Preserving life.

Visit
https://gde.codefornature.org/



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 Dataset[18]. 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 dataset[19]. 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.

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[18] *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/#*

[19] The PRISM dataset is hosted on Oregon State University's website: http://www.prism.oregonstate.edu/

DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY
311 MAIN ROAD, SUITE 1
POINT MUGU, CA 93042-5033

IN REPLY REFER TO:
5090
Ser N0000CV/0811
September 18, 2019

Mr. Eugene West
Chair, Board of Directors
Fox Canyon Groundwater Management Agency
800 S. Victoria Avenue
Ventura, CA 93009

Dear Chairman West,

SUBJECT: NAVAL BASE VENTURA COUNTY REVIEW COMMENTS ON FOX CANYON GROUNDWATER MANAGEMENT AGENCY REVISED DRAFT OXNARD SUB BASIN GROUNDWATER SUSTAINABILITY PLAN

Thank you for the opportunity to review and provide comments regarding the subject plan. These comments are provided in enclosure 1.

As noted in our letter dated July 17, 2019, consistent with the California Sustainable Groundwater Management Act, the Groundwater Sustainability Plan (GSP) and allocation ordinance should recognize the Federal Reserve water right and ensure a groundwater allocation that provides for a supply of water to support the current U.S. Navy and Air Force mission and anticipated growth. We acknowledge and appreciate the inclusion of language to that effect on pages 1-40 and 1-41 of the revised draft GSP. We respectfully request that this recognition continue forward through adoption and implementation of the GSP, to include the allocation ordinance and other management actions.

We appreciate the continued recognition by the Fox Canyon Groundwater Management Agency Board of Directors of the importance of water to military sustainability, resiliency, and compatibility, and the importance of Naval Base Ventura County to our national defense and to the local community.

For additional information and coordination, please contact Ms. Amanda Fagan, Community Planning Liaison Officer at COMM: (805) 989-9752 or by email at: amanda.fagan@navy.mil.

Sincerely,

J. E. CHISM
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. NBVC Comments on Revised Draft Oxnard Subbasin GSP

Copy to:
Mr. Rod Butler, Executive Director
Port Hueneme Water Agency
250 N. Ventura Road
Port Hueneme, CA 93041

Encl (1). Naval Base Ventura County Comments on Revised Draft Oxnard Subbasin GSP

23 Sep 2019

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1.	ES-4	ES.2	The results of each of these scenarios indicated that continuing the 2015–2017 extraction rate would contribute to net seawater intrusion in both the Upper Aquifer System and Lower Aquifer System. In three additional scenarios, the groundwater production rate was decreased gradually over the first 20 years	There are 8 scenarios available through the Department of Water Resources (DWR) for future climate scenarios. Instead, FCGMA staff ran only 3. The GMA should test all climate scenarios to have a representative data set instead of just choosing the most conservative.
2.	ES-6	ES.3	In any single monitoring event, groundwater levels in 6 of 15 identified key wells are below their respective minimum thresholds.	Will the GSP be updated if more wells are added prior to the 5 year review?
3.	ES-6	ES.3	The groundwater level in any individual key well is below the minimum threshold for either three consecutive monitoring events or three of five consecutive monitoring events, which occur in the spring and fall of each year.	Droughts are 3-5 years on average, so how will this be taken into account? Stringent reductions in a wet year? Will consecutive years be used, or measurement periods (3 to 5 years, or 1.5 to 3 years)?
4.	ES-6	ES.3	The Lower Aquifer System would be determined to be experiencing an undesirable result if: • In any single monitoring event, groundwater levels in 8 of 19 identified key wells are below their respective minimum thresholds.	Will the GSP be updated if more wells are added prior to the 5 year review?
5.	ES-6	ES.3	• The groundwater level in any individual key well is below the minimum threshold for either three consecutive monitoring events or three of five consecutive monitoring events, which occur in the spring and fall of each year.	How will other items be considered if only one well is impacts (localized lows due to other well pumping rather than regional indications)?
6.	ES-8	ES.4	Pressure transducer records provide the high-temporal resolution data that allows for a better understanding of water level dynamics in the wells related to groundwater production, groundwater management activities, and climatic influence.	Navy Subject Matter Expert (NAVFAC EXWC hydrogeologist) highly encourages this. Without clear temporal understanding in such a seasonal environment, they will be hampered by potentially overemphasizing summer declines and a lack of understanding of infiltration (which is currently treated as

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				immediately entering the aquifer even though this is unrealistic).
7.	1-6	1.2.6.1	FCGMA will evaluate the GSP at least every 5 years. This 5-year evaluation will be provided as a written assessment to DWR. The assessment shall describe whether the Plan implementation, including implementation of projects and management actions, are meeting the sustainability goal in the basin. The evaluation will include the following:	This section could benefit from a "report card" summary of the sustainability goals with a simple yes/no if the goal was met or not for all of the basins within the groundwater management area.
8.	1-7	Data Gap Analysis and Priorities	During the initial 5-year period after the GSP is adopted, FCGMA will explore options for filling data gaps identified in this GSP. The primary data gaps identified in the historical data are spatial and temporal gaps in groundwater elevation and groundwater quality measurements.	Naval Base Ventura County may share relevant data as it becomes available to help refine FCGMA analysis.
9.	1-7	1.2.6.2 / Data Collection, Validation, and Analysis / Paragraph 2	"to the degree that monitoring schedules and locations will change, a cost-sharing agreement will be developed between VCWPD and FCGMA".	FCGMA has not had monitoring expenditures up to this point, since a majority of the data required is already available and collected by UWCD and VCWPD. It is worth noting this will be a driver in increasing monitoring costs. Additional clarification should be added as to when and how this cost sharing will be put into place, and whether it will be considered O&M or GSP specific work.
10.	1-10	1.2.6.3	In general, FCGMA plans to fund its basic operations costs using groundwater extraction charges. Surcharges for extractions in excess of an allocation may also be used in carrying out FCGMA's groundwater management functions. FCGMA collects a groundwater extraction fee of $6 per acre-foot and imposes a surcharge of up to $1,961 for excess extractions.	Clarify this statement. Is $6/acre-ft the surcharge or the base rate? If it is the surcharge, what is the base rate? How is the surcharge scaled with surplus use?
11.	1-18	1.3.2.3	Urban and residential land uses are concentrated in Oxnard and Port Hueneme. Federal lands consist of the Naval Base Ventura County, which is a United States Navy base located south of Oxnard. The base was formed in 2000 through the merger of Naval Air Station Point Mugu (located in the southern portion of the Oxnard Plain) and Naval Construction Battalion Center Port Hueneme (located in the west-central part of the Oxnard Plain along the coast). Currently, there are about 19,000 military, civilian, and contract	Naval Base Ventura County (NBVC) has two primary operating locations within the Oxnard Subbasin, Point Mugu and Port Hueneme. NBVC Port Hueneme is located within the City of Port Hueneme, and NBVC Point Mugu is located in

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			personnel working or stationed at Naval Base Ventura County (City of Oxnard 2011).	unincorporated Ventura County, generally southeast of Oxnard. The NBVC Economic Impact Assessment (2018) identified approximately 14,600 military, civilian, and contractor employees, based on Fiscal Year 2015 data. NBVC also has 1,344 total housing units (residences). However, it is important to note that the NBVC base population fluctuates with assigned missions and requirements.
12.	1-47	1.8.2	The Federal Government. As discussed in Section 1.3.2.3, the federal government is a landowner and groundwater user in the Oxnard Basin through the Naval Base Ventura County. Representatives from the U.S. Navy have been coordinating with FCGMA staff regarding the development of the GSP, have participated in FCGMA public meetings, and are on the list of interested parties who receive electronic newsletters regarding the status and development of the Oxnard Subbasin GSP.	Channel Islands Air National Guard Station (U.S. Air Force / California Air National Guard) is also a federal landowner and groundwater user in the Oxnard Basin, independent of Naval Base Ventura County. CIANGS does receive its drinking water through NBVC, but has its own groundwater extraction well on its property.
13.	1-55	Table 1-2 / … Estimated Implementation Cost Through 2040	The monitoring costs annually are value at $1,000,000 per year starting in 2020. There is about a 2.5% increase every year in the cost likely to account for inflation.	The Operation and Monitoring costs do not reflect any increase in cost for the start of the monitoring cost-sharing program mentioned on page 1-7. Is it assumed that the cost-sharing program has already started before 2020 and that the costs will remain constant?
14.	1-58	Table 1-6	Oxnard Plain Precipitation Station Information	No relation is present between precipitation and location based on the data provided. All precipitation is therefore likely about the same in this area and/or not impacted by elevation.
15.	1-83	Figure 1-6		Consider compressing the primary y-axis (say 0 – 40" instead of 0 – 140") so resolution of annual precipitation is better. Make colors/line type in the legend consistent with the figure (e.g.

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				mean precipitation is shown in the figure as a solid line but is a dashed line in the legend)
16.	2-6	2.2.3	River-deposited sands and gravels interbedded with minor silt and clay compose the semi-perched aquifer in the Oxnard Subbasin (DWR 1965; Turner 1975). The term "semi-perched aquifer" is used in this GSP as the name for the uppermost unit of the Oxnard Subbasin, which overlies the extensive clay cap in the pressure plain area of the Oxnard Subbasin (Figure 2-2 and Table 2-1). This name was used in the State Water Resources Control Board's Bulletin 12 (SWRCB 1956) to distinguish the water-bearing sedimentary units in the pressure plain area from those in the Forebay area, and this terminology has been adopted by subsequent investigators (Mukae and Turner 1975; Turner 1975; Hanson et al. 2003; DWR 2006). Water-level data indicate that the sediments underlying the semi-perched aquifer are saturated. Therefore, the term "semi-perched aquifer" is used in this GSP to denote the limited migration of water from the uppermost aquifer to the underlying confined aquifer in the pressure plain area.	Semi-perched systems can result in delayed or minimized infiltration into the units below (i.e. the prime aquifer zones). Therefore it is likely that infiltration will be slower and "less" than the totals flowing in. The current model does not allow for these potential time lags or reductions in infiltration estimates. This could significantly impact their model's ability to predict aquifer rebound. We recommend that they study this through the use of continuous transducers, or additional work, as this could cause decreases to trigger more often when in reality recharge is just delayed in reaching the deeper zones.
17.	2-12	2.2.4 / Data Gaps and Uncertainty in the Hydrogeologic Conceptual Model / Bullet 8	"Potential impacts of increased production in the semi-perched aquifer".	Is there really production coming out of the semi-perched? Or does this refer to discharge from the French/tile drains in the agricultural fields? This should be clarified. Furthermore, the semi-perched zone is not considered in this GSP, therefore why do the impacts matter?
18.	2-12	2.2.4 / Data Gaps and Uncertainty in the Hydrogeologic Conceptual Model		There is limited mention of uncertainty in the climate conditions used or the limitations of using only two climate scenarios. There should be a paragraph or section at least explaining any uncertainty associated with the climate assumptions.
19.	2-55	2.4.2.1	Error! Reference source not found	Please fix reference error
20.	2-62	2.4.5 Projected	There is a preference to reduce the Oxnard LAS and UAS more than the connected PVB LAS and UAS and the WLPMA LAS.	Has UWCD or Dudek run any scenarios where Oxnard, PVB, WLPMA, and

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		Future Water Budget and Sustainable Yield	There are four reduction scenarios and in each scenario the reduction is double if not more in the Oxnard basin than PVB and WLPMA. Each scenario's results mentions a steady migration of salt water in the LAS regardless of the scenario.	Oxnard LAS aquifers are reduced the same amount? Despite the fact that the GSP is not setting the extraction reductions, the concern is that the extraction reductions would be roughly based off of modelled scenarios. In this case, the burden of the highest LAS reductions could be unfairly lumped on the Oxnard Sub-basin LAS users. More scenarios are recommended.
21.	2-65	2.4.5.1	Based on these factors, the current areal and aquifer-system distribution of groundwater production at the extraction rates modeled in the Future Baseline Scenario was determined not to be sustainable.	Recommend including this statement in the executive summary, as well as any other comments directly related to the past or present sustainability status of the basin. Executive summary 3 does a fine job describing the sustainability criteria but does not explain the state of basin given the criteria described in this GSP.
22.	2-135	Figure 2-12	Groundwater Well Hydrographs in the Mugu Aquifer	Appears to show partially confined conditions as some wells recover, but others don't.
23.	2-149	Figure 2-18	Groundwater Well Hydrographs in the Fox Canyon Aquifer	Appears to show partially confined conditions as some wells recover, but others don't.
24.	2-155	Figure 2-22	Oxnard Subbasin Annual Change in Storage	This figure shows 12 driest years, 7 dry years, 6 wet years, 5 wettest years. This is clearly biased toward dry years.
25.	3-4	3.3.1	In addition to surface-water spreading, seawater intrusion into the aquifers of the Oxnard Subbasin has also sustained groundwater levels. Unlike surface-water spreading, seawater intrusion sustains groundwater levels at the expense of freshwater storage in the Subbasin (Section 2.3.3). Water levels in the aquifers of the LAS have remained below sea level even during drought recovery periods, thereby continuing to allow migration of seawater into the Subbasin near the Mugu and Hueneme Submarine Canyons (Section 2.3, Groundwater Conditions). Continued seawater	NBVC may consider potential recharge location(s) on base to partner with FCGMA and other local agencies, such as for storm water/sewer discharges.

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			intrusion has reduced the amount of freshwater in storage in the Subbasin.	
26.	3-10	3.3.5 Land Subsidence		There is no mention of Land Subsidence (aquifer compaction) as an impact on storage capacity. The lack of detail on aquifer compaction, underplays the impact subsidence can have on aquifer storage.
27.	3-14	3.4 MINIMUM THRESHOLDS / Paragraph 2	"The minimum threshold groundwater elevations selected to protect against net seawater intrusion in the UAS and LAS are based on the lowest simulated groundwater elevation after 2040 for the two model simulations in which net seawater intrusion was minimized".	Which two model simulations were used? Which reduction or climate scenario was used and are they a part of the 6 model scenarios used to ascertain the sustainable yield?
28.	3-21	3.5 MEASURABLE OBJECTIVES / Paragraph 3	"Therefore, the measurable objectives were selected based on the **median groundwater elevation between 2040 and 2070**, simulated for each well, in model simulations that prevented net landward migration of the 2015 saline water impact front after 2040".	Median between which outputs? The median of the water levels of the 6 model scenarios?
29.	3-21	3.5 MEASURABLE OBJECTIVES / Paragraph 4	"The median groundwater elevation was rounded down to the nearest 5-foot interval to account for uncertainty in the model simulated future groundwater elevations. In order to account for future sea level rise, the rounded groundwater elevations were increased by 2 feet. The median simulated groundwater elevation (from 2040 to 2070) at each well after rounding and accounting for sea level rise is the measurable objective (Table 3-1)."	Why was the groundwater elevation rounded down? Wouldn't choosing a median value already be incorporating some sort of buffering for the uncertainty?
30.	3-21	3.5 MEASURABLE OBJECTIVES / Paragraph 4	"In order to prevent net seawater intrusion in the Subbasin after 2040, observed groundwater levels should be above the measurable objective 50% of the time."	50% of the time in a year or in 5 years or for the full 20-year period? Please clarify.
31.	3-43 through 3-61	Figure 3-6a through 3-11	Key Well Hydrographs	Water levels modeled in the threshold scenarios show rebounds over a 10 year period of greater than 80 feet at some locations. This suggests A LOT of well pumping being "turned off", or other changes, that may not be realistic.

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32.	4-14	4.6.3 Groundwater Quality Monitoring		The GSP states there is a limited list of analytes being tested for and that it should be "expanded to include a full general minerals suite". What's currently being tested for?
33.	4-20	Table 4-2	Network of Stations Monitoring Precipitation in the Vicinity of the Oxnard Subbasin , (Specifically Station 223A, Point Mugu–USN)	This station is being used to provide data. Who maintains this station?
34.	5-12	5.6.1	The Temporary Agricultural Land Fallowing Project would use replenishment fees to lease and temporarily fallow agricultural land (FCGMA 2018). This would result in decreased groundwater production on the parcels or ranches that are fallowed, and an overall reduction in groundwater demand in the Subbasin. Parcels or ranches in areas susceptible to seawater intrusion would be targeted with this project (FCGMA 2018).	Cultivated agricultural lands provide an important buffer against urban development that may be incompatible with military operations. In addition, evidence from NAS Lemoore suggests that cultivated agricultural lands reduce the prey base, which reduces the risk of raptor strikes on aircraft, mitigating Bird Aircraft Strike Hazards (BASH). As the Fallowing Project proceeds, NBVC respectfully requests coordination with the Navy and project participants to ensure that fallowed lands do not attract prey that results in an elevated BASH risk.
35.	5-17	5.9 MANAGEMENT ACTION NO. 3 – WATER MARKET PILOT PROGRAM	SWIM and Pumping Depression participants can only trade within their management area. This is a geographical limitation of the program. Other than these two distinctions, the geography is ignored by the water market program.	When the GMA begins to set the extraction reduction plan, will geographic location be considered when deciding percentage reduced for a given management area?
36.	2	Appendix J: Section 2.1	Rather than using MODFLOW with the SWI2 package, the UWCD model adjusts general head boundaries at the ocean interface to reflect the hydrostatic head plus the density difference between fresh and sea water. Consequently, this model correctly represents	How can the UWCD model approach be sure, heads-wise? Did the analysis correct all the targets for density concerns? Consider use of MODFLOW-

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			the boundary conditions but cannot be relied upon to forecast seawater intrusion in all of its relevant detail.	SWI2 or SEAWAT as a more reliable choice for this analysis.
37.	4	Appendix J: Section 2.2.2	It merely serves to highlight the daunting challenge one faces in trying to parameterize or calibrate groundwater models in a deterministic fashion. It also points out the limitations of local sensitivity analyses implemented in the USGS software PEST (Welter et al., 2015).	This statement is misleading in multiple ways. First, PEST is a private software. The USGS code is called UCODE and a modified PEST version called PEST+. In addition to this misunderstanding, using automated calibration techniques in conjunction with local knowledge and human guidance has been shown to be a good approach to calibration. What Welter actually says: "Although there are many different GSA methods, all GSA methods strive to be more robust than traditional, derivative based local sensitivity analysis, which computes the local sensitivities at a single point in parameter space and is not always adequate for analyzing nonlinear problems where the sensitivities can change depending on where they are computed. Some GSA methods provide general information about the variability of the sensitivities and have relatively low computational requirements, whereas others provide detailed information on nonlinear behavior and interactions between parameters at the expense of larger computational requirements."
38.	6	Appendix J: Section 2.3.1	Figures 1 and 2 show that the ARM and Seawater Flux (seawater intrusion) are most sensitive to the values of hydraulic conductivity, which dominate the contributions from other hydrogeologic parameters. The results are presented in terms of the Sobol' indices (Saltelli et al., 2008). The global sensitivity analysis indicates that horizontal hydraulic conductivity values assigned to the Oxnard and Mugu aquifers in the Forebay (Zone 9 and adjacent Zones 10 and 19; see Appendix A for maps of model zones by layer) account for	The Figures raise a concern for the Navy subject matter expert that the representation of sea water intrusion could be inaccurate, and that this could be a large problem for the model.

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			approximately 37% of the variance in the modelwide ARM for groundwater levels and approximately 24% of the variance in calculated seawater flux (these results are presented in the attached Tables 3 and 4 as well).	
39.		General	"submarine canyons"	The Mugu and Hueneme Submarine Canyons are located in close proximity to NBVC Point Mugu and NBVC Port Hueneme. The GSP should make clear that the seawater intrusion present in these areas is due to the coincident geographical location of NBVC, not as the result of any current or past activities at the Naval Base. At least one member of the public has raised an issue related to Navy activities, based on an incorrect assumption that the groundwater conditions in the Oxnard Subbasin are a result of Navy activities. The GSP should provide clarity to prevent confusion of geologic features and naval operations.

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September 23, 2019

Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009

ATTN: Board of Directors

SUBJECT: TECHNICAL REVIEW COMMENTS - OXNARD SUBBASIN DRAFT GROUNDWATER SUSTAINABILITY PLAN

Dear Directors:

Daniel B. Stephens and Associates, Inc. (DBS&A) appreciates the opportunity to submit our technical review comments on the draft Groundwater Sustainability Plan (GSP) for the Oxnard subbasin. Our comments are being submitted on behalf of Marathon Land, Inc. It is apparent that an extensive effort was needed to produce the draft GSP and the stakeholders are appreciative of the efforts of the Board of Directors, staff, and its consultants.

Our technical review comments can be grouped into two major categories:

- Plan adequacy; and
- Process documentation and data transparency.

We have provided additional comments as an attachment to this letter. In some instances, the attachment provides additional elaboration on the Plan Adequacy and Process Documentation and Data Transparency comment categories.

Plan Adequacy

Our technical team evaluated the draft GSP from the perspective of how well the GSP conformed with the expectations of the California Department of Water Resources (DWR) as outlined in their guidance documents (GDs) and best management practices (BMPs), as well as the expectations of the stakeholders in the subbasin.

From a high-level perspective, our review of the draft GSP failed to identify a clearly defined plan for this subbasin over the next five years. The plan contains many references to what might be done in the future (e.g., gather more data, investigate possible projects, perform additional groundwater modeling, develop allocation plans, propose groundwater extraction ramp down scenarios), but does not provide the stakeholders (or the Board of Directors) with a clear vision of how the GSP leads the agency and its stakeholders to sustainability by 2040.

Daniel B. Stephens & Associates, Inc.

3916 State Street, Suite 1A 805-683-2409

Santa Barbara, California 93105 FAX 805-683-2419

It is appropriate for the GSP to identify activities that it would likely perform to minimize data gaps, evaluate the groundwater resource impacts of various projects, explore groundwater extraction ramp down scenarios, etc., but it was expected that the GSP would include a rationale for each of these activities. As an example, it is logical to suggest that additional monitoring wells would be needed to address data gaps, but the GSP does not offer a definitive plan that explains what questions would be addressed by new monitoring wells, where they should be located, their construction timing, sampling protocols, or the costs (both CAPEX and OPEX). The draft GSP did not contain a *Sampling and Analysis Plan (SAP)* to determine the sampling frequency, sampling protocols, and analytical program needed to minimize the data gaps. It was expected that a *Data Quality and Objectives (DQO)* document (consistent with that referenced in two of the best management practices) would be a part of the GSP. The DQO would give the reader an understanding of why the collection of these data are important to achieving basin sustainability.

The draft GSP contains numerous references to the FCGMA's authority to implement a groundwater extraction ramp down, but also states that the ramp down plan has not yet been finalized. In the absence of a stated plan, it is impossible for stakeholders to evaluate the adequacy of the GSP to guide them towards sustainability or to determine the impacts the yet to be defined ramp downs will have on their municipal or agricultural operations.

The draft GSP also alludes to its ongoing efforts to prepare a groundwater extraction allocation plan. Unfortunately, a formal allocation plan is not a part of the draft GSP. It is unclear what the action of the Board of Directors will be upon its adoption of the GSP and consequently stakeholders have difficulty evaluating the GSP with this information void.

Process Documentation and Data Transparency

Transparency is a fundamental premise of the GSP development process. This transparency extends from the development of the communication and engagement plan and implementation of the stakeholder outreach process to sharing the details of the data sets and analyses used in the GSP.

The draft GSP says that allocation schemes and potential ramp down programs will be developed in the future, but in fact, albeit inadvertently, the draft GSP does include an "allocation plan" AND a variety of ramp down programs, but does not clarify which, if any, of the programs are guiding the draft GSP. The draft GSP offers sustainable yields for this subbasin that were derived, at least in part, from groundwater modeling that was performed by United Water Conservation District that included an allocation scheme (i.e., groundwater extractions set at average 2015-17 quantities) and various groundwater extraction ramp downs (e.g., 25% reduction of UAS, 60% reduction from LAS). Based on the discussions at multiple Board meetings over the past several months, it is clear that the FCGMA intends to implement a, yet to be defined, ramp down program upon adoption of the GSP but it is unclear to the stakeholders from reviewing this plan what the proposed timing, magnitude and economic impacts might be in implementing this plan.

The ramp downs embedded in UWCD's modeled scenarios included in the GSP are entirely dependent on future projects (or lack of future projects). The projects portion of the GSP is inadequate and appears to arbitrarily exclude reasonable project concepts. The Operations Committee project vetting process was overly restrictive, but was, in general, consistent with DWR guidelines. The FCGMA Board of Directors developed criteria that were used to establish whether a potential project would be included in the GSP. Potential projects that could have positively impacted the sustainable yield of the basin, or at a minimum offer options to assist reaching sustainability goals were excluded from the process. The plan fixates on the demand side of the equation (pumping curtailment) but needs to discuss additional realistic possibilities of increasing the supply side.

The GSP should list the projects that were rejected so the stakeholders can determine if those projects should be advanced to determine their impact on sustainable yield. It was offered that many projects did not survive the vetting process as a project proponent had not been identified. It is clearly within the authority of the FCGMA, as a GSA, to assume the project proponent role and bring other projects into the sustainable yield setting process. For example, the brackish water treatment project and a coastal injection project are just two of the projects that should be discussed in the GSP.

The project evaluation process should include an evaluation of the estimated CAPEX and OPEX project costs so that stakeholders and the Board can compare the cost effectiveness of each project or suite of projects. Project costs did not appear to get detailed consideration in the draft GSP.

Similarly, the draft GSP does provide summaries of the groundwater modeling efforts performed by United Water Conservation District, but the results of that modeling effort (e.g., groundwater elevation maps, comparisons of modeled groundwater elevations with Minimum Thresholds [MTs] and Measurable Objectives [MOs], detailed descriptions of the modeling input parameters). This information is a critical part of the GSP and it is recommended that this information be added to the plan as a technical appendix. In the absence of this information, it is difficult for the stakeholders or technical representatives to feel comfortable with modeling summaries (and the sustainable yields derived from the modeling effort).

Future Baseline Scenarios set groundwater extractions to a constant simulated value of 2015-17 average, but these were adjusted based on surface water deliveries. Was the pumping also adjusted based on precipitation or ET or some other parameter to account for fluctuations in demand? For example, although not described in the GSP, it is believed from communication with UWCD staff, that total water use was not reduced during wet periods in the modeling scenarios. Farmers are typically not watering their crops when it is raining as erroneously assumed in the modeled scenarios. In addition, not all groundwater pumpers have access to surface water, so it is assumed in the absence of documentation, that these pumpers did not have their groundwater extractions reduced even if demand was lower due to precipitation. Were the groundwater extraction rates for those without surface water access kept at the 2015-17 average value?

It is unclear how exactly the sustainable yield and associated uncertainty was estimated for the subbasin. From the information available in the GSP, the method appears to be highly subjective, arbitrary and unsupported as a standard method for establishing a basin's sustainable yield. The sustainable yield as proposed in the GSP is highly tied to the modeled scenarios and their inherent assumptions. Different scenarios could result in very different sustainable yield values.

Summary

An extensive amount of information is contained in this draft GSP. However, our review has identified shortcomings that we feel warrant addressing prior to adoption of the GSP by the FCGMA Board of Directors. We are most concerned that the draft GSP does not contain a definitive path (e.g., activities, timelines, costs, impacts) that demonstrate how groundwater sustainability can be achieved by 2040. As currently presented, the GSP provides in various places in the document, a variety of generic activities that might be pursued in the future, but without any indication of why or if those activities contribute to refining the sustainable yield, minimizing a data gap, or management actions. Without a definitive plan, it is not clear what the Board of Directors will be asked to consider for adoption. It is perfectly acceptable to lay out a plan for filling data gaps, etc., but it is awkward for the Board of Directors to be asked to consider adopting a GSP that has no definitive plan, undefined impacts on the groundwater extractors in the subbasin, and an unclear path to sustainability.

We want to emphasize, that we believe the UWCD groundwater model to be the best available science and tool for use in this GSP, and are confident in its predictive capabilities. At the same time, however, we are not convinced that this tool and the regional groundwater resource expertise available to the FCGMA has been appropriately leveraged to adequately identify projects which maximize basin yield and potentially lessen the impact to groundwater extractors in the subbasin.

We appreciate the hard work that went into the preparation of this draft GSP and for the opportunity to submit our comments for your consideration. If you need further clarification of any items in this letter or on the materials provided in support of this letter, please do not hesitate to contact me at 805-290-3862 (cell) or tmorgan@geo-logic.com.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Tony Morgan, PG, CHG
Vice President/Principal Hydrogeologist, DBS&A
Market Leader, Water Planning and Development, GLA

Attachments: Tech Review Comment Table - Oxnard subbasin

cc: Marathon Land, Inc.
Project File

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Admin / General		The draft GSP has compiled significant quantities of groundwater and related information. However, the GSP is lacking in a clearly stated plan for the next 20 years. The reader sees multiple references to topics that will be discussed in the next 5 years and that "conditions might change" or projects may or may not be constructed, but is left without concrete descriptions of what the GSA proposes to do to implement steps towards sustainability. Stakeholders need to see what the agency intends to do over the next 20 years to achieve sustainability. The approach of the GSP appears to be *"...we'll study it some more over the next 5 years..."* Does the GSA/FCGMA intend to modify groundwater extraction quantities in the next 5 years or start the fallowing program mentioned in the GSP?
Admin / General		John Mann's 1959 report: "A Plan For Ground Water Management" does not appear to be referenced anywhere in the GSP including the Basin Setting Section. Many later investigators relied heavily on this predominately primary source work. Was this reference considered in preparing the Basin Setting Chapter of the GSP?
Admin / General	ES-1	The GSP makes only a very limited effort to identify conditions that would maximize the sustainable yield. Given the magnitude of the groundwater extraction reductions anticipated to be needed to achieve the sustainable yield, an "optimization" effort is appropriate for inclusion in this version of the GSP.
Admin / General	1.3.1 - page 1-11 to 1-13	UWCD Oxnard and Oxnard Forebay historically used basin boundaries should be added to the list of formerly used Administrative Boundaries identified on page 1-11. Early version of UWCD's VRGWFM may have used these boundaries. As mentioned in the GSP, the 2016 DWR Bulletin 118 Oxnard Basin boundary was modified by 2018 DWR basin boundary modifications (resulting from Mound and Santa Paula basins modifications). At least one outlying area (in the northwest corner of the Oxnard Basin) was removed by the basin boundary modification. Were DWR 2016 boundaries used consistently in modeling scenarios and water budget calculations? Are 2018 boundaries anticipated to be used in annual reporting and 5-year GSP updates?
Admin / General	1.3.1 - page 1-6 and 1-12	"This GSP will be implemented by FCGMA in coordination with the other GSAs in the PVB..." Later in the GSP it is stated, *"The County and CWD will rely on this GSP and coordinate with the FCGMA, as necessary, to ensure that the Subbasin is sustainably managed in its entirety, in accordance with SGMA."* Were formal coordination agreements adopted by the FCGMA that detail proposed coordination activities with the other GSAs in the Subbasin? Do the County and CWD Boards need to officially adopt the GSP, as well, since FCGMA boundaries do not cover the EPVMA or all of the PVB Outlying Areas? Seems appropriate to have all three GSAs (i.e., FCGMA, Camrosa WD, and Pleasant Valley Basin Outlying Areas) adopt the final GSP.
Admin / General	ES-1	This section mentions that *"...additional studies* [will be] *undertaken to fill data gaps..."* Where are those recommended studies identified in the GSP?
Sustainable Management Criteria	ES-6	The GSP states in regards to determining if the Subbasin is experiencing undesirable results, *"The groundwater level in any individual key well is below the minimum threshold for either three consecutive monitoring events or three*

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		of five consecutive monitoring events, which occur in the spring and fall of each year." Typically water levels in a given well are lowest in the fall and highest in the spring. Spring high water level measurements are often more reliable than fall low water levels which are more susceptible to data quality issues (e.g., non-static unrecovered water levels impacted from a nearby pumping well). A potential result of the above rule is that one key well that may or may not be characteristic of the area it represents may drive the determination of a finding of undesirable results. In addition the "three of five consecutive monitoring events" clause could create a situation where difficult to accurately measure fall water level measurements in one well could drive the determination of a finding of undesirable results. It might make sense to amend the rule to state that a pressure transducer and data logger would be installed in a well if *"three of five consecutive monitoring events"* show water levels below the MT to assess the quality of the data and determine if a true fall static water level is below the MT. Or alternatively, a focused study would be conducted to determine if the water levels measured in the well are representative of surrounding wells of similar construction.
Sustainable Management Criteria	ES-5 to ES-6	The GSP states that in order to allow for operational flexibility during periods of drought, *"In order to prevent net seawater intrusion over periods of drought and recovery, the periods during which groundwater elevations are below the measurable objective must be offset by periods when the groundwater elevations are higher than the measurable objective."* Likely water levels will rarely be at exactly the MO so should this be taken to mean that water levels must be above the MO at least one half of the time? This seems to be setting a much higher bar than required by SGMA. Did the estimates of sustainable yield account for the requirement of a "pay-back" system for periods of drought that must then be offset by an equal period of above MO water levels? If it takes 20 years (or more) to raise water levels to the MO then must the groundwater of the Subbasin be managed to maintain water levels above the MO to "pay-back" for the 20 years implementation period to get to sustainability?
Sustainable Management Criteria	3.3	Expected to see SMC-specific discussion of the appropriate metrics, rationale used for establishing the significance and unreasonableness of the metric for each SMC, and more detailed validation of the undesirable results avoided by not exceeding the MTs. No discussion of how the decision was made to select groundwater elevation as the surrogate metric for all SMCs. (e.g., how does groundwater elevation relate to SMC such as degraded water quality)(page 3-8 to 3-9).
Sustainable Management Criteria	3.3.1 - page 3-5 and Figure 3-1	The East Oxnard Plain Management Area (EOPMA) is reported as not having any wells in which water levels can be monitored by aquifer. From the GSP, "Until a monitoring well is installed in the EOPMA, the water level thresholds set for the wells closest to the EOPMA are presumed to be protective for the EOPMA".

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		The EOPMA was presumably designated due to potential groundwater compartmentalization resulting from the Bailey Fault. It seems to be a stretch to assume in the absence of data that wells across the fault in the Saline Intrusion Management Area and/or Oxnard Pumping Depression Management Area are "presumed to be protective for the EOPMA".
Sustainable Management Criteria	3.3.2 - Page 3-5 to 3-6	Undesirable results for reduction in groundwater storage is limited to that associated with potential lowering of WLEs to a level that promotes seawater intrusion in the Oxnard Subbasin. How about a metric assessing the quantity of groundwater in storage for future droughts? We did not see a discussion of this aspect of this SMC. If this aspect is not applicable (e.g., hydrographs indicate that water levels are sufficient to provide water for a 5 or 7-year drought - groundwater modeling could be useful), then it would be helpful to indicate as such.
Sustainable Management Criteria	3.3.4 - page 3-8 to 3-9	How does groundwater elevation relate to degraded water quality? The document only discusses qualitative relationships and does not show, for example, graphical relationships between WLEs and water quality values.
Projects and Budgets	Table 1-1 - page 1-55	The table shows estimated project costs and water supply for the first 5 years of GSP implementation. What percentage of these costs are expected to be paid from funds collected by FCGMA rate payers? What percentage will be paid by City of Oxnard residents (e.g., GREAT program), UWCD rate payers (e.g., Freeman Diversion Expansion), and other sources? Note that some pumpers may be subject to fees/assessments from all three of these agencies/city.
Projects and Budgets	5.1 - page 5-1	The Operations Committee project vetting process was overly restrictive, but was, in general, consistent with DWR guidelines. The FCGMA Board of Directors developed criteria that were used to establish whether a potential project would be included in the GSP. Potential projects that could have positively impacted the sustainable yield of the basin, or at a minimum offer options to assist reaching sustainability goals were excluded from the process. The GSP should list the projects that were rejected so the stakeholders can determine if those projects should be advanced to determine their impact on sustainable yield. It was offered that many projects did not survive the vetting process as a project proponent had not been identified. It is clearly within the authority of the FCGMA, as a GSA, to assume the project proponent role and bring other projects into the sustainable yield setting process.
Projects and Budgets	5.7.7 - page 5-17	According to text in this section, the *"...FCGMA will work to develop this plan over next 20 years, as the level of uncertainty is reduced. FCGMA recognizes that a specific long-term plan that incorporates stakeholder feedback and the need for flexibility in groundwater management will have to be adopted by 2040 to provide users of groundwater in the Subbasin with the tools necessary to plan for sustainable groundwater production into the future."* SGMA requires that sustainability be achieved by 2040, but the draft GSP only commits the FCGMA to adopting a plan by 2040 to *"...plan for sustainable groundwater production into the future."* A plan to achieve sustainability must be adopted well in advance of the 2040 deadline. The draft GSP does not lay out the plan describing how the agency will lead the

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		effort to develop a plan in time for its implementation phase to achieve the yet to be defined sustainable groundwater conditions.
Sustainable Yields	2.4.5 - page 2-62 and Figure 2-63	Sustainable Yield of the Oxnard Basin is directly tied to maintaining water levels at levels that allow no net seawater intrusion. Figure 2-63 shows no scenario where LAS coastal flux is seaward. How was a sustainable yield estimated for the LAS if no scenario achieved the LAS goal of no net seawater intrusion?
Sustainable Yields	ES-1	By submitting estimated sustainable yields for the UAS and LAS with large uncertainties, the estimated sustainable yield range using the extreme uncertainties range of 29,400 to 48,600 AFY. This large range will make it difficult for decision makers to know what their goal is and when they have achieved it. Obviously the low end estimate will require more drastic measures to reach sustainability than the high end estimate. Is there a specific plan for how best to reduce the uncertainties and narrow the target range rather than simply saying that uncertainties will be reduced as data gaps are filled in the future (when in the future)?
Sustainable Yields		It is unclear how exactly the sustainable yields were estimated for the UAS and LAS. Was a consistent method used to estimate the sustainable yield for the UAS and LAS? It appears at least for the UAS that the following process was used although a diagram/figure included in the GSP might add clarity to the process: The 6 UWCD modeled scenarios were plotted with seawater flux on the Y-axis and groundwater production on the X-Axis. (1) A linear regression (best fit) line was interpolated through the six plotted points; (2) A horizontal line was drawn from the Y-Axis zero (no net seawater flux); (3) where the horizontal line crossed the best fit line, a vertical line was drawn down to the X-axis. Where the vertical line landed along the X-Axis became the sustainable yield. This method appears to be highly subjective, arbitrary and unsupported as a standard method for establishing a basin's sustainable yield. The sustainable yield as proposed in the GSP is highly tied to the 6 modeled scenarios and assumptions contained in each. If different scenarios were used, then a very different sustainable yield value might be estimated. What is the justification for using a liner regression, instead of, for example, an exponential function that would likely fit the data better?
Management Actions		Management actions were not proposed for this basin in the draft GSP, but the FCGMA reserved the right to implement a reduction in groundwater extractions. The reader is left to wonder if extraction reductions are being considered in the near future (e.g., immediately after adoption of the GSP by the Board) or at some later date and how would those reductions would be beneficial to achieving sustainability. The draft GSP identifies a few scenarios where various groundwater extraction schemes and project implementations were simulated using the groundwater model in an attempt to define a sustainable yield. Unfortunately, none of the scenarios achieved the desired goal of no net onshore seawater flux or off shore groundwater flow. Please clarify if the management action of groundwater extraction reductions will be initiated, the timing of that initiation, the magnitude of the reduction, and the positive effects such a reduction will have on the sustainable yield.

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Management Actions	3.5.1 Interim Milestones and Figure 3-12	Is it misleading to submit a linear interpolated interim milestone path to sustainability to DWR without including in the GSP a description of the plan to get to sustainability? Without an allocation plan and/or proposed pumping ramp down schedule in place and included in the GSP, is it likely that the 2025 interim milestone will be met? Would it make more since to use an exponential function path that would commit stakeholders to a less extreme early path towards sustainability and allow them time to plan for the future while also using the early time to gather the needed data to reduce the uncertainty of the subbasin's sustainable yield range?
Management Actions		If it assumed that 39,000 AFY is the sustainable yield of the Oxnard Subbasin and the 1985-2015 rounded average pumping for the subbasin is 80,000 AFY (Table 2-14) then there is a deficit of 41,000 AFY. Figure 3-12 shows 4 future linearly interpolated milestones (i.e., 2025, 2030, 2035, 2040) which means approximately 10,000 AFY must either be made up by projects or the deficit must be made up by pumping curtailment. By submitting to DWR Figure 3-12 it appears to be implied that unless projects come online in the next 5 years, pumping must be reduced by 12.5% (10,000/80,000) over the next 5 years to meet the first milestone (and an additional 12.5% of the historical average pumping to meet each of the subsequent milestones).
Modeling / Scenarios	2.4.5 - page 2-61 to 2-71	How were the six modeling scenarios and associated assumptions and pumping reductions arrived at? Where in the GSP are the detailed documentation of the assumptions of each scenario (that expand on the summaries in page 2-63 to 2-71) and how they were implemented in the model? Might this be an appropriate tech memo appendix to the GSP?
Modeling / Scenarios	2.4.5.1 - page 2-63	Future Baseline Scenarios set groundwater extractions to a constant value of 2015-17 average, but adjusted based on surface water deliveries. Was the pumping adjusted based on precipitation or ET or ?? to account for fluctuations in demand? Not all groundwater pumpers have access to surface water. Were the groundwater extraction rates for those without surface water access kept at the 2015-17 average value?
Modeling / Scenarios	Figure 2-63	Why was a modeling scenario not generated that turned off all groundwater pumping within the model domain? This recommended scenario although dependent on assumptions and simplifications could serve as a pre-development baseline. Prospectively this scenario would show a condition in which the LAS flux would be seaward and would be valuable in estimating LAS sustainable yield.
Modeling / Scenarios	1.2.6.2 - page 1-9	The GSP states, *"...it is anticipated that basin optimization studies will be undertaken in the initial 5-year period after the GSP is implemented adopted to assess projects that were not included in this GSP. This assessment is expected to include an investigation of how adjustments to the location of groundwater production will minimize seawater intrusion in the Oxnard Subbasin, while maximizing the sustainable yield of the combined aquifer systems of the Oxnard Subbasin, the PVB, and the West Las Posas Management Area."* Later in the GSP it is explained that the boundary between the Oxnard Subbasin and Pleasant Valley Basin is delineated as a result of UAS facies changes. In effect, the LAS of the Oxnard Subbasin and Pleasant Valley Basin are "one basin" with unimpeded LAS groundwater flow across the boundary making it

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		akin to a jurisdictional boundary in the LAS. The GSP proposes a sustainable yield of the Oxnard Subbasin of 7,000 AFY (with simulated 2015-17 average groundwater production of 29,000 AFY) resulting in a deficit of 76%; and a sustainable yield of the Pleasant Valley Basin of 11,600 AFY (with simulated 2015-17 average groundwater production of 14,000 AFY) resulting in a deficit of only 17%. It seems that if pumping restrictions were implemented for pumpers in the two basins, the pumpers of the Oxnard Subbasin LAS would be required to reduce their production by a much greater percentage (and volume) than the pumpers across an arbitrary jurisdictional boundary. It would seem more equitable to combine the sustainable yields of the Oxnard Subbasin LAS with the Pleasant Valley Basin (18,600 AFY with a combined simulated 2015-17 average groundwater production of 43,000 AFY). This would make any potential pumping ramp downs more equitable for users of the same groundwater. By arbitrarily splitting the Oxnard LAS from the Pleasant Valley Basin, the GSP is effectively proposing basin optimization that it is not currently authorized by the FCGMA board.
Water Budgets	1.8.2 - page 1-45	Is the following GSP statement accurate in regards to Municipal Well Operators and Public/Private Water Purveyors*: "All of the purveyors in the Oxnard Plain, including all municipal well operators, are supplied water by either UWCD or CMWD."* Was the meaning intending to indicate that these water purveyors all benefit from UWCD or CMWD activities?
Water Budgets	ES.2 - page ES-4	The GSP reports, *"Groundwater pumping during these yea*rs [1985-2015] *averaged 47,080 AFY in the Upper Aquifer System and 28,893 AFY in the Lower Aquifer System."* This sums to 75,973 while Table 2-14 shows an average of 80,450 AFY for the same years.
Water Budgets	Table 2-14 - page 2-107	The table shows pumping amounts from UWCD's model. UWCD prepared a Tech Memo, *"Reported Pumping Database Comparison Within the Oxnard Plan and Pleasant Valley Basins, FCGMA and UWCD Record Sets"*, in response to Dudek's preliminary comparison of FCGMA and UWCD's independently maintained groundwater pumping database. The UWCD Tech Memo (dated September 2017) was delivered to Dudek. There are a number of differences in reported pumping in Table 2 of the Tech Memo than reported in GSP Table 2-14. Was the UWCD Tech Memo considered in preparing the GSP?
Water Budgets	2.4.5.1 - page 2-63 and Table 2-15	The GSP reports, ...*"the average annual 2015–2017 production rates were simulated. For the Oxnard Subbasin, this rate is approximately 68,000 AFY, combined, for both the UAS and the LAS (Table 2-15)."* Why was the average pumping rate simulated and not calculated? Were estimates of the future availability of surface water considered in the average annual 2015-2017 production rates? Where is the explanation of how this average was simulated and how does it compare with the calculated 2015-17 average production rate for the Oxnard Subbasin (2016 and 2017 pumping does not appear to be reported in the GSP)? If only groundwater (and not surface water) is represented by the 68,000 AFY figure, then the simulated value is likely on the order of 10,000 AFY too low.
Stakeholder Engagement		The draft GSP contains many references to documents prepared by others. Many of the references cited at the end of each Chapter are not easily

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		publically accessible (e.g., the 1999 UWCD Surface and Groundwater Conditions Report cited in Chapter 2 is not available on the District's website although the 2015 installment is available).
Stakeholder Engagement	2.4.5 - page 2-61 to 2-62	How were the stakeholders engaged in selecting the six modeling scenarios and associated assumptions and pumping reductions contained in each? Were they informed early in the process how pivotal the results of modeled scenarios would be in arriving at the subbasin's sustainable yield range?
Stakeholder Engagement	Appendix B - 1.1 - page 1-3	Section 1.1 seems to discuss the composition of the FCGMA Board and neglects to present how that Board makes decisions (the title of the section). The section was expected to discuss how the Board would consider, for example, input from its Technical Advisory Group (i.e., is the input from the TAG merely advisory [as the name implies] or is it afforded some other level of credence), how the Board would address stakeholder input that was poorly informed, what are the roles and responsibilities of the Board v. staff v. consultant in the implementation of the Public Outreach and Engagement Plan (POEP), does the Board have guiding principles that set the tone for how the engagement process would be developed and implemented, and how will the Board handle stakeholder responses that are inconsistent with FCGMA Director interests.
Stakeholder Engagement	Appendix B - 4.2.1 - page	There are many more stakeholder groups with interests in the groundwater resources of this subbasin. Stakeholder groups are not meant to be limited to just the groundwater extractors in the basin. SGMA defines "stakeholder" much more broadly and could include environmental groups, residents, or community groups, for example. The intent of SGMA is for stakeholder groups, in the broadest definition, to have opportunities to provide input into the GSP development process and their input should not be defined as just *"...providing opportunities for their voices to be heard in open public forums before the FCGMA Board."*
Stakeholder Engagement	Appendix B	The POEP is intended to be the play book stakeholders can refer to which guides them on how to engage with the FCGMA on the GSP development process and to document to DWR how a GSA complied with the stakeholder engagement process that is a part of SGMA. It is expected that the POEP would identify the specific stakeholders for this subbasin (e.g., which DACs, what industry or municipal groups, tribal entities, municipalities, general interest public groups, residents of which cities, towns, or communities), the specific points of contact (POC) for these groups, and a summary of the outreach efforts made to these POCs. Listing generic groups without any details of the "who, what, when, and where" of the outreach to these groups is not in the spirit of SGMA and does not provide convincing evidence to DWR that concerns of "interested parties" were considered in preparation of the GSP.
Stakeholder Engagement	Appendix B - 5 - page 15	The discussion of the draft GSPs being brought before the FCGMA Board in December 2017 is confusing. A preliminary draft was released, but the draft GSP was released in July 2019. It would be helpful to update this language to reflect the current GSP review and update process.
Monitoring	1.4.1 - page 1-20; Table 1-10 - page 1-63 to 1-64	UWCD's extensive groundwater level measurement network (including manual measurement and pressure transducers/data loggers) is not included in the existing monitoring programs table or in the narrative on page 1-20 although it is mentioned in other places in the GSP. UWCD routinely shares these water

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		level data with FCGMA. Were these data considered in preparation of the GSP and specifically in identifying key wells?
Monitoring	4.3.1 - page 4-2	The document states on page 4-2 that, *"The spatial and temporal coverage of the existing groundwater monitoring network is sufficient to provide an understanding of representative conditions in the UAS and LAS throughout the Subbasin, and this network will be used to demonstrate progress toward the sustainability goals for the Subbasin."* It appears that the only criterion for adequacy discussed in Chapter 4 is the number of wells per square mile as compared to CASGEM Groundwater Elevation Monitoring Guidelines. However, The East Oxnard Plain Management Area (EOPMA) is reported on page 3-5 as not have any wells in which water levels can be monitored by aquifer. It's not clear how the document arrives at the conclusion that spatial distribution of this network of monitoring wells is adequate.
Monitoring	4.3.1	DWR's BMP on Monitoring Networks and Identification of Data Gaps states that, *"Spatial data gaps may occur from a monitoring network with low or uneven density in three dimensions"*. Discussion should also address the impact of clustered wells such that significant portions of the management areas are not covered.
Monitoring	4.6.4	The analysis of the need for subsidence monitoring presented in this section appears to be inadequate. The Monitoring Networks and Identification of Data Gaps BMP states that prior to development of a specific subsidence monitoring network a screening level analysis should be conducted that includes review of any known regional or correlative geologic conditions where subsidence has been observed. The USGS presents areas of recorded subsidence—historical and current—across California. Significant portions of the Oxnard Plain are included in the areas mapped by the USGS. The map is located at < https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html> It is recommended that this section be reconsidered to address this information and all other available data and information on subsidence in the subbasin.
Monitoring	Chapter 4	While it may be addressed on a general level elsewhere in the GSP, the chapter on monitoring networks does not state that a 5-year review of the adequacy of the monitoring network will be conducted as specified in 23 CCR §354.38. Assessment and Improvement of Monitoring Network (BMP 2; PDF pg. 26).
Monitoring	4.5	The GSP Regulations specifically call out the need to utilize protocols identified in the Groundwater Monitoring Protocols, Standards, and Sites BMP (BMP #1), or develop similar protocols. The document wording on monitoring program protocols is vague. No specific protocols are identified that will be used. There is a description of what is currently used, and a statement that the FCGMA plans to work with agency partners to ensure that future data collection is conducted according to relevant protocols in the BMPs. More appropriate would be a statement that affirms that the GSA has adopted (as part of this GSP), or will develop and adopt prior to the first sampling date after the deadline date for submittal of the GSP, sampling protocols consistent with BMP #1 that will be used at all times for sampling in the Oxnard Subbasin.
Monitoring	4.4	BMP #1 (pdf pg. 8) states that at a minimum, for each monitoring site, long-term access agreements are needed. Access agreements should include year-

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		round site access to allow for increased monitoring frequency. That information or procedure should be collected and documented. Experience teaches that site access can cause major time delays in groundwater studies. While it may be obvious to the GSA that site access agreements are not a problem, a discussion of the plan to secure site access agreements for both existing and newly established monitoring points should be included in the document. In other words, in this regard, the current plan as written does not sound like a plan, but rather sounds like a plan to write a plan.
Monitoring	4.1	BMP #1 and BMP #2 both suggest that, "… *each GSP incorporate the Data Quality Objective (DQO) process following the US EPA Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA, 2006). Although strict adherence to this method is not required, it does provide a robust approach to ensuring data is collected with a specific purpose in mind*". Associated with the DQO process, the BMPs also recommend that a description be given of the data necessary to evaluate the sustainability indicators and other GSP requirements (i.e., water budget). Although exact replication of the EPA DQO process may not be necessary, the discussion of the monitoring plan would be improved by a section that demonstrates the nexus between the data being collected and factors that comprise the water budget, the groundwater model, the sustainability criteria and how sustainability will be evaluated through that nexus. Inclusion of this methodical approach would ensure that a complete evaluation of the adequacy of the monitoring system for the three-dimensional aquifer systems of the Oxnard Subbasin is conducted. For example, groundwater elevation contours will need to be interpreted for individual aquifer systems in order to evaluate the stored groundwater status, direction of flow, and gradients. However, if the data quality objective is to draw groundwater contours, current aquifer specific data points are not sufficient to credibly accomplish that task. The DQO process is designed to reveal this type of inadequacy so that a plan can be developed to overcome this challenge.
Monitoring	4.6.1	This section does not sound like a plan. Rather it sounds like recommendations for the GSA to consider at some unspecified time in the future. For example, the following phrases are used in describing the need for additional wells: • *"Additional monitoring wells could be used to improve spatial coverage for groundwater elevation measurements in the West Oxnard Plain Management Area, the Oxnard Pumping Depression Management Area, and the EOPMA."* • *"The groundwater monitoring network in the Subbasin could be improved by adding monitoring wells in the Oxnard Pumping Depression Management Area"* • *"In the West Oxnard Plain Management Area, the groundwater monitoring network could be improved by adding a monitoring well to the area north of Highway 101 and south of the Oxnard Forebay."* • There are additional examples of this kind of vague plan language.

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		A proper plan (and what is specified in the collective DWR BMPs) states exactly what will be done, why it will be done, how it will be done (and, in this case of multiple agencies, who is responsible for execution), when it is scheduled to be done, how it meets the DQO objectives, and how the resulting data will be used. A straightforward qualifying statement can be added stating that the plan is subject to change, depending on the field and financial conditions encountered at the time of implementation. This section should be re-written in this way, as an actual plan, and then considered for approval by the GSA board.

VENTURA WATER™

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September 23, 2019

Chair Eugene F. West and Board Members
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, California 93009-1610

Subject: Comment letter on the July 2019 Draft Groundwater Sustainability Plan for the Oxnard Subbasin

Dear Chair West and Board Members:

The City of San Buenaventura and its Ventura Water Department (collectively, "City") respectfully submit this letter to the Fox Canyon Groundwater Management Agency ("Agency") Board of Directors ("Board") to comment on the July 2019 Draft Groundwater Sustainability Plan for the Oxnard Subbasin (GSP). The City thanks the Board and the Agency staff for their efforts towards devising a path to sustainably manage this Subbasin. The City's comments are organized in a manner that follows the structure of the GSP. These comments are sent in the spirit of improving the GSP to ensure the Final GSP approved later this year is ultimately approved by DWR.

1. Executive Summary

a. The "sustainable yield" in the GSP is not consistent with the Water Code and the Emergency Regulations adopted pursuant to the Sustainable Groundwater Management Act (SGMA). On page **ES-1**, the GSP states that the "sustainable yield" for the Oxnard Subbasin was calculated based on "currently available projects and management actions." This confuses the terms "*sustainable yield*" and "*sustainability goal*" as those terms are defined in the Water Code and the Emergency Regulations. The "sustainable yield" for the basin should be revised to reflect that the GSP must include two distinct calculations: (i) a "sustainable yield" that does not include future projects and management actions and which must be based on 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*" (Wat. Code, § 10721(w).); and (ii) a "sustainability goal" which incorporates potential future projects and management actions and is calculated based on "*the existence and implementation of one or more groundwater sustainability plans that achieve sustainable groundwater management by identifying and causing the implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield.*" (Wat. Code, § 10721(u); Cal. Code Regs., tit. 23, § 354.24.)

b. The GSP lacks a firm commitment by the other two groundwater management agencies with jurisdiction over portions of the Subbasin outside Agency boundaries. Although the GSP has been prepared for the entire Oxnard Subbasin, certain portions of the Subbasin are outside the Agency's jurisdiction and are under the jurisdiction of either Camrosa OPV GSA or the Oxnard Outlying Area GSA. (GSP, p. **ES-2**) The GSP does not set out any firm commitment by the other two GSAs to implement the GSP. The City does not question the cooperative working relationship that currently exists between the Agency and the other two GSAs. Given the 20- to 50-year implementation period of the GSP, formal action by each respective GSA board committing to managing groundwater pumping in a manner consistent with the sustainability goal for the Subbasin is necessary to ensure the long-term health of the Subbasin.

c. The criteria for determining whether the UAS or LAS are experiencing an undesirable result is unclear. On page **ES-6**, the GSP lists three criteria for each of the UAS and LAS to determine whether the respective aquifer system is experiencing an undesirable result. It is unclear how the three criteria for each aquifer system operate, whether together or independently, or whether on a first-to-occur basis. This needs to be clarified to provide better guidance and eliminate confusion.

2. Chapter 1: Administrative Information

a. SGMA requires avoiding undesirable results, not their minimization or mitigation. There are several references in this Chapter and throughout the GSP related to managing the Subbasin in a manner that "limits," "minimizes" or "mitigates" undesirable results. This standard is legally wrong. SGMA requires avoiding undesirable results by implementing sustainable groundwater management "*that can be maintained during the planning and implementation horizon without causing undesirable results.*" (Wat. Code, § 10721(v).) Those references need to be changed to comply with SGMA.

b. Cost estimates need more clarification. The City is unclear whether the cost estimates shown in **Table 1-1** and **Table 1-2** are for all basins managed by the Agency or whether they are specific to the Oxnard Subbasin. It is also unclear whether the estimated cost per acre-foot shown in **Table 1-1** is based on amortized project development costs over the life of the respective project.[1]

c. The City's demographic data should be added to Section 1.3.2.4. The Subbasin is a critical source of water for the City and the population it serves. It currently represents approximately 25-30% of the City's water supply. Additionally, past, current and projected population statistics and discussion should be modified to

[1] The Agency has an obligation to provide a detailed cost-benefit analysis when advancing a proposed project that is anticipated to be funded through fees and assessments paid by pumpers. The City reserves the right to further comment on any such proposed fees and assessments proposed by the Agency as part of the GSP implementation. In addition, the GSP does not include any commitment by the other two GSAs, whose pumpers stand to benefit from the projects, to contribute to those costs.

include the City's population and average household size. (GSP, pp. **1-19, 1-20; Table 1-9**) This also requires updating the references cited in **Section 1.9**.

d. Section 1.4.3 should be modified to more accurately reflect the progression of groundwater management and the operational flexibility that has historically occurred. The second paragraph under that section should be modified as follows (underlined text is to be added, strikethrough is to be deleted): "For the Oxnard Subbasin, water purveyors collectively draw from a combination of sources—including local surface water, groundwater, imports from the State Water Project (SWP), and increasingly, recycled water—which differ in terms of the volume available, area served, timing of peak availability, and reliability. Climate and regulatory constraints (e.g., water quality standards, water rights, and minimum environmental flows) have historically had a greater impact on the availability of surface water supplies~~,~~. ~~whereas~~ ~~g~~Groundwater sources with adequate water quality were historically limited only by the capacity of production wells accessing the aquifer, until 1991 when FCGMA initiated a groundwater allocation reduction system. ~~leading to pumping in excess of many basins' sustainable yield~~. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, groundwater extraction will be further limited by minimum thresholds established for each sustainability indicator. FCGMA has exercised its authority to limit groundwater production since 1983, and thus has managed the basin in an effort to avoid critical overdraft. Because in 2015 the State Department of Water Resources listed the Oxnard Subbasin as being in a state of Critical Overdraft, the s~~S~~ustainable management criteria adopted in this GSP may limit operational flexibility by further reducing allowable groundwater production." (GSP, p. **1-21**)

e. Section 1.6.1 needs to be modified to more accurately describe the impact of General Plans on the GSP. The first sentence needs to be modified as follows, consistent with Cal. Code Regs., tit. 23, § 354.8 (underlined text is to be added, strikethrough is to be deleted): "General plans are considered applicable to the GSP ~~if they have the potential to direct urban growth, zoning changes, or redevelopment anywhere~~ to the extent they may change water demands within the Subbasin or affect the ability of the Agency to achieve sustainable groundwater management over the planning and implementation horizon." The City of Ventura's general plan should also be added to the list of general plans applicable to the Oxnard Subbasin. (GSP, p. **1-27**)

f. Section 1.6.2 needs to be modified to more accurately describe the City's UWMP.

- The first sentence of the second paragraph on page **1-37** should read, "VWD's supplies are from Lake Casitas, the Ventura River, groundwater, and reclamation facilities."
- The City's current allocation of 3,862 has been reduced since 2016, not 2018. This should be corrected at the top of page **1-38**.
- There is a typographical error near the end of the second paragraph: the phrase "wastewater prohibition" should be "water waste prohibition."

- The reference to the Mound Groundwater Basin on page **1-38** should be removed; the City is permitted to utilize water pumped from its wells within the Oxnard Plain basin throughout its service area, not just within the Mound Basin.
- The text discusses the City's use of groundwater from the Oxnard Subbasin, and then notes, "these continued extractions will need to be addressed as part of FCGMA's ongoing efforts to sustainably manage groundwater in the Oxnard Subbasin. However, the extraction has historically been subject to FCGMA management ordinances and will be subject to future FCGMA policies." These statements must be either deleted or added to other parts of the GSP where pumping by other than the City is discussed because they are applicable to every pumper in the Subbasin.

g. Section 1.7 needs to be modified to include City's well permitting policies and procedures. In addition to County of Ventura and Agency requirements, a permit in the form of a well agreement with the City is required to construct a well within the City of Ventura's jurisdictional boundary.

h. Table 1-4 should be corrected by changing "Ventura Water District" to "Ventura Water Department." (GSP, p. **1-56**)

i. Figure 1-2 should be corrected. The northern boundary between Oxnard Subbasin and Mound Subbasin should reflect most recent boundary changes applied for by Mound Basin Groundwater Sustainability Agency and accepted by DWR in February 2019.

j. Figure 1-3 should be corrected. The key shows a red star for the Freeman Diversion, but there are several red stars on the figure. Please revise as appropriate.

3. <u>Chapter 2: Basin Setting</u>

a. Reference to "DWR GSP Regulations, Section 354.14" should be corrected to more accurately reflect the regulations' requirements. The GSP states that the "discussion of groundwater elevation is limited to production and monitoring wells screened in a single aquifer" in order to "conform with the DWR GSP Regulations, Section 354.14." (GSP, p. **2-13**) The correct regulation section is 354.16 (Cal. Code Regs., tit. 23, § 354.16(a).) Please note that the language used in the regulation does not create a limitation as stated in the GSP, rather it requires a description of current and historical groundwater conditions in the Subbasin "*including . . . groundwater elevation . . . for each principal aquifer within the basin.*" (Cal. Code Regs., tit. 23, § 354.16(a)(1).)

b. Section 2.3.2 needs to be corrected. From the discussion it appears that **Figure 2-24** should be titled "With Coastal Flux" not without coastal flux because it includes seawater intrusion. (GSP, p. **2-26**)

c. Section 2.4.1 needs to be corrected. In the first sentence of the fourth paragraph, the City of Ventura needs to be added as a predominant municipal water supplier. Also, please revise the sentence about the City later in the fourth paragraph to read in full as follows: "The City of Ventura also has wells in the Oxnard Subbasin." The remainder of that sentence as written needs to be deleted because portions of the City's water service area are within the Subbasin (alternatively, the sentence must be modified to clarify that the City's water service area is both within and outside the Oxnard Subbasin). (GSP, p. **2-47**)

d. Information regarding model scenarios in Section 2.4.5 needs clarification. It is assumed that these scenarios are conceptual in nature for the exercise of bracketing sustainable yield estimates. It is not clear how the Agency can reduce pumping differentially between wells based on the aquifer system they pump from without implementing projects to replace their supply. (GSP, p. **2-62**) This is particularly true since the Agency had mandated in the 1980's and early 1990's that pumpers replace wells pumping from the UAS with wells that pump from the LAS.

4. Chapter 3: Sustainable Management Criteria

a. Statements that undesirable results may occur between 2020 and 2039 are inconsistent with SGMA. There are numerous statements in Chapter 3 and throughout the GSP that presume that the occurrence of undesirable results between 2020 and 2039 is allowed under SGMA. This is not accurate. SGMA requires that the GSP outlines measures to be taken by the Agency in order to "*achieve the sustainability goal in the basin within 20 years of the implementation of the plan.*" (Wat. Code, § 10727.2.) The sustainability goal "*culminates in the absence of undesirable results within 20 years*" of the implementation of the GSP. (Cal. Code Regs., tit. 23, § 354.24.) These requirements do not translate to permitting undesirable results up until the year 2039. Such interpretation does not take into consideration the length of time needed to rectify the undesirable result and implies that one year may be sufficient (because undesirable results should not occur beginning with the year 2040.). Further, assuming this GSP is approved, DWR has the authority to declare, at a future time, the approved GSP as either "incomplete" or "inadequate" following its periodic review of the Agency's progress towards achieving the sustainability goal for the Subbasin. (Cal. Code Regs., tit. 23, § 355.6(d).) One of the key criteria for DWR to make such future determination is whether "*the exceedances of any minimum thresholds or failure to meet any interim milestones are likely to affect the ability of the Agency to achieve the sustainability goal for the basin.*" (Cal. Code Regs., tit. 23, § 355.6(c)(1).) An "incomplete" or "inadequate" determination by DWR may result in intervention by the State Water Resources Control Board as authorized under the Water Code. (Wat. Code, § D. 6, Pt. 2.74, Ch. 11.) The City does not support the proposition in the GSP that undesirable results may occur up until the year 2039 because it is not founded on best available information and best available science, as required by SGMA. Additionally, all references in the GSP to avoiding one or more undesirable results "after 2040" are vague because "after 2040" could mean any time period, and should be corrected to say that undesirable result would not occur "beginning in 2040," consistent with SGMA.

b. Potential economic disruption to municipal and industrial users must be considered. In **Section 3.2**, the GSP states that the proposed reductions must take into account the "potential economic disruption to the agricultural industry." (GSP, p. **3-2**, paragraph 4.) This statement largely ignores potential impacts on the more than half million people who depend, in varying degrees, on Oxnard Subbasin water. The City proposes correcting the first sentence in that paragraph to read (underlined text is added): "Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin, <u>the interference with municipal water supply planning and rate setting,</u> and the uncertainty in the estimated sustainable yield of the Subbasin." Harm to municipal and industrial users should also be addressed in other portions of Chapter 3 where only harm to agricultural users are considered (e.g., **Section 3.4.3** and others).

c. Any proposed reduction in production must be consistent with California water rights law. Compliance with SGMA does not exempt the Agency from complying with California water rights law. (Wat. Code, § 10720.5.) The GSP states in this Chapter and in other portions that the Agency is contemplating reducing production linearly over the 20-year GSP implementation period. (GSP, p. **3-2** and other sections) Established case law upheld reduction in groundwater production to safe yield that spans over a period ranging between 5 and 7 years. This is an important consideration for the Agency in terms of achieving the sustainability goal of the Subbasin. It informs the Agency's strategy in fulfilling its obligations under SGMA by necessitating the Agency to look at projects as the principal mechanism for bringing the Subbasin's yield to a sustainable level. The City reiterates its position that any proposed reduction in production must take into account production cutbacks and water conservation measure implemented by the City, especially during the recent drought.

d. Section 3.2 needs to be corrected. In the fourth paragraph, the fourth sentence should be modified to state that the reduction in groundwater production over the first 5 years is approximately 900 AFY or 4,500 AF, not 4,500 AFY.

e. Section 3.3.7 needs to be corrected. On page **3-12**, in the first paragraph, it states that, "...water levels in 6 of the 15 key wells...." However, the number of hydrographs for UAS wells shown in **Figures 3-7a and 3-7b** are only 14 wells. Either the sentence or the figures need to be corrected. (GSP, p. **3-12**)

f. Statement regarding groundwater elevations with and without projects is inaccurate. The GSP states in **Section 3.4** that "In general, the simulated groundwater elevations in the model scenario with projects were close to those in the scenario without projects, with any observed difference between the two limited to less than approximately 10 feet." (GSP, p. **3-14**, first paragraph) This statement in the GSP does not recognize the difference between the scenarios as significant. An elevation differential of 5 to 10 feet along the coast is significant. In addition, the statement does not recognize that the impacts to groundwater users without the projects is vastly greater than with the projects.

g. Model assumptions must be recognized as a source of uncertainty in the model predictions. The GSP does not mention the model assumptions, which are the basis upon which model outputs are generated and thus the GSP relies, are a source of uncertainty as well. The City recommends that the following language be added to the last paragraph of **Section 3.4** (p. **3-14**): "There are also several ambiguities associated with the model's underlying assumptions, including but not limited to reported pumping, Subbasin boundary conditions, amount of seawater intrusion (flux at the coastline), tile drain discharges, and aquifer specific changes in storage resulting from changing groundwater elevations that add to the uncertainty of the modeling predictions."

h. Measurable Objectives Unclear. In **Section 3.5**, the GSP states that, "to prevent seawater intrusion after 2040, observed groundwater levels should be above the measurable objective 50% of the time." It is not clear how the 50% standard was determined or whether it was based on best available information and best available science as required by SGMA. (GSP, p. **3-21**)

5. <u>Chapter 4: Monitoring Networks</u>

a. Reliance on groundwater elevations requires further equipping of all key wells. The recording of groundwater elevations as a mechanism for tracking progress towards reaching the sustainability goal for the Subbasin requires equipping all the key wells with pressure transducers for measurement accuracy and a higher temporal resolution in the data. This technical necessity needs to be reflected in **Section 4.3.1** and any other GSP sections advancing this concept.

b. Reference to the "northwestern Subbasin" needs to be corrected. In **Section 4.6.1**, p. **4-13**, fourth paragraph, the last sentence in that paragraph references the "northwestern Subbasin" which needs to be corrected as no such Subbasin exists in Ventura County.

6. <u>Chapter 5: Projects and Management Actions</u>

a. Information regarding potential projects is not sufficient to meet SGMA requirements. In section 5.1, the GSP makes clear that the "inclusion of . . . projects does not constitute a commitment" by the Agency Board "to construct or fund the projects" and the timing of the management actions is ambiguous. SGMA requires that projects "*shall be supported by best available information and best available science.*" (Cal. Code Regs., tit. 23, § 354.44(c).) SGMA also requires, among other things, that any projects identified in the GSP be accompanied with a "*description the circumstances under which projects or management actions shall be implemented, the* *criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred*" as well as, for each project, a "*time-table for expected initiation and completion, and the accrual of expected benefits.*" (Cal. Code Regs., tit. 23, § 354.44(b)(1)(A) and (b)(4).) The Agency must achieve this level of clarity at least as part of its next report to DWR or risk a negative determination by DWR as to the adequacy of the GSP and potential intervention by the State. (Cal. Code Regs., tit. 23, § 355.2(e); Wat. Code, § D. 6, Pt. 2.74, Ch. 11.) (GSP, pp. **ES-8, 9**; and **Chapter 5**.)

b. No clearly articulated direction regarding the proposed projects or management actions to achieve the sustainability goal. As mentioned above, SGMA requires specificity as to project triggers and timetables. It is also unclear how the other two GSAs will contribute to projects or implement management actions consistent with the goal of bringing the Subbasin to sustainability. No projects have been identified that would either increase or maintain groundwater production at the presently reduced historical low levels (at least for certain producers). The GSP identifies a range of options under existing conditions, but no clear direction as to how the Agency intends to achieve sustainability without a significant disruption to all overlying users. If the contemplated groundwater allocation system proposed under Management Action No. 1 were included in the GSP, the City and other stakeholders could better evaluate the potential magnitude and timing of projects that need to be developed to lessen those impacts on overlying users. Absent such clarity, it is not possible to adequately comment on the projects and management actions, as currently presented in the GSP.

c. Process for identifying projects should be improved. The City understands that the Agency's enabling legislation had limited its ability to fund and implement projects. However, as a GSA, the Agency is required under SGMA to assume a leadership role in developing projects that will reduce the need for excessive reductions in pumping allocations in the Subbasin.

d. UWCD is not authorized to impose or administer charges on Subbasin users for GSP projects. In discussing the economic impacts of Project No. 3 under **Section 5.4.6**, the GSP states that "These operating costs are anticipated to be provided by a pump charge administered either by UWCD or FCGMA." Any charges for GSP projects should be imposed and administered through by the Agency, not UWCD, and by following the proper statutory process. This statement in the GSP and any other similar statements in the GSP must be corrected.

e. Timing and scope of the proposed management actions are unclear. It is unclear to the City if, when and how the two proposed management actions will be implemented. SGMA requires that management actions "*shall be supported by best available information and best available science.*" (Cal. Code Regs., tit. 23, § 354.44(c).) To that end, with respect to the management action involving reduction in groundwater production, the City is of the position that any such management action must take into account reductions and conservation measures already implemented by the City and other municipal water providers, including those taken in compliance with the state-mandated requirements imposed during the recent drought period. Indeed, the Agency has applied this management action since 1991 to those pumpers who were limited to a specific historical allocation. Pumpers that could file for an efficiency allocation were allowed to increase their extraction of groundwater as long as the Agency deemed their use efficient. There has been considerable discussion between groundwater pumpers and Agency staff regarding the development of a pumping allocation system, which may include a reduction in groundwater production. The City reserves the right to comment about such system at a later time, including its equitable application among pumpers. It is not possible to adequately analyze or comment on this management action given the insufficient information provided in the GSP and the ambiguity regarding the timing and scope of its implementation. If the timing and scope of proposed management actions cannot be included in the GSP, they must be removed as they do not meet SGMA requirements.

f. Uncertainty of model predictions must be considered before the Agency implements Management Action No.1. As noted on page **5-15**, there are considerable uncertainties in the groundwater production rates that will prevent net seawater intrusion between the model scenarios chosen. The UAS estimates have an uncertainty of 12.8% to 18.75%, and the LAS has an uncertainty of 32.8% to 51.4%. As pointed out above, there are also uncertainties in the modeling assumptions and underlying data utilized in the model. In addition, the GSP states that, "The 1930 to 1979 50-year period with the 2070 DWR climate-change factor was found to be the most conservative and was used for the comparison with the other modeling simulations conducted." The City asks that the Agency keeps these uncertainties in mind when considering pumping reductions as a GSP management action. The Agency must consider investing in studies to fill data gaps and minimize uncertainties before imposing arbitrary pumping restrictions unaccompanied by projects.

g. Missing Management Action No. 2. There appears to be a deleted or missing section in the GSP. The section numbering goes from Section 5.7 to Section 5.9, omitting Section 5.8. The City proposes considering a Water Market for municipal and industrial groundwater users as a management action and believes that such management action is necessary for more efficient coordination and conjunctive use of water. The City urges the Agency to include this as a potential management action.

We appreciate the Agency Board's consideration of these comments. If you have any questions, please contact me at (805) 667-6500 or srungren@cityofventura.ca.gov, or contact Jennifer Tribo at jtribo@cityofventura.ca.gov.

Sincerely,

Susan Rungren, P.E.
General Manager

MARATHON LAND, INC.
SOUTHLAND SOD FARMS
P.O. Box 579
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Fox Canyon Groundwater Management Agency
800 S. Victoria Ave
Ventura, CA 93009

ATTN: Board of Directors

SUBJECT: OXNARD AND PLEASANT VALLEY DRAFT GROUNDWATER SUSTAINABILTY PLAN COMMENTS

Dear Directors,

We are submitting technical comments to the Oxnard and Pleasant Valley Draft GSPs via Tony Morgan of Daniel B. Stephens & Associates, Inc. This letter is more in the vein of a landowner's questions and comments in reaction to the conclusions in the reports.

The Fox Canyon is one aquifer underlying three DWR basins: the Oxnard Plain, Pleasant Valley and West Las Posas. The draft GSPs deal with sustainability on a basin by basin basis. We understand that this is required by SGMA, but it creates significant inequities in the form of the disparate cutbacks. The Oxnard Basin bears the brunt of cuts at 43.5%. Pleasant Valley is only cut 4.5%, while West Las Posas is cut 10.7%. How can this be justified within one continuous aquifer, that for reasons we do not understand, has been divided into three basins resulting in three GSAs.

In your new role as GSA, will you manage the Fox Canyon aquifer as a whole, or in three pieces? Assuming you intend to manage the aquifer as a whole, as you have done in the past, then these draft GSPs should have their individual Fox Canyon yields combined into a single sustainable yield. Again, we understand that DWR has designated three basins, but by the same token SGMA designated one GSA for those three basins. We infer that to bestow authority on the FCGSA to continue past practice and manage the Fox Canyon aquifer systems under one plan thereby maximizing sustainable yield for all pumpers. It has been determined that *where* groundwater extraction occurs is nearly as important as *how much* pumping occurs. To maximize sustainable yield, pumping would need to be strategically positioned throughout the aquifer systems across the multiple basins.

The Draft GSPs are not plans in the sense that they provide a pathway to solution. While the consultants ran various model scenarios honing in on the problem. They did not run any scenarios incorporating pumping optimization or seawater barriers. In reading the Oxnard report Table 2-11 shows the average recharge to the basin at 73,669 acre-feet. Table 2-14 shows total pumping of 80,450 acre-feet. That is a difference of -6,781 acre-feet. Yet the cuts required for sustainability in the Oxnard Basin are 30,000 acre-feet, four and half times greater than the pumping overdraft per the water budget. Clearly, this could be mitigated by pumping optimization and other FCGSA area wide management strategies.

The “Projects” section is woefully inadequate. We believe that is the result of unnecessarily restrictive criteria for inclusion in the report. To abate sea water intrusion, both an injection barrier and a series of brackish water extraction wells have been considered by local agencies. The GREAT program was originally envisioned to include a sea water intrusion barrier. United has done a feasibility study on a brackish water extraction and treatment plan. These are some of our best options to solve sea water intrusion. They should be included in the GSPs with a nod toward replenishment fees as the funding source.

Absent a robust project providing additional water we are left with only cutbacks. Again, the individual Oxnard GSP contemplates a 30,000 acre-foot cut, which would translate into fallowing 43.5% of Oxnard farmland, amounting to over 11,000 acres. It would devastate the agricultural economy resulting in at least $500 million in lost production and hundreds of millions more in lost property value. A cut of that magnitude would not be passively accepted by those who would suffer the economic consequences. Certainly, lawsuits will ensue. First pitting agricultural landowners against cities, then landowner against landowner at great cost in time and money to all stakeholders and the FCGSA. Given these consequences, this is no time to be restrictive in consideration of projects. The FCGSA Board must take bold leadership toward developing alternatives that will inspire the confidence of its stakeholders to cooperate rather than starting a water war.

Recently, Dr. Jason Sun, the designer of United’s model made a presentation to the American Public Works Association. The presentation discussed his modeling of an injection barrier to control seawater intrusion. It showed that that if an injection barrier were in place, cutbacks could be limited to the difference between recharge and pumping.

I recall a presentation made by Tony Morgan a few years ago on the seawater extraction barrier concept for which United had completed a feasibility study. It not only stopped seawater intrusion, but also created additional water. My sense of the Board’s reaction was that it was before its time. That is no longer the case.

Both of these projects provide compelling strategies to abate seawater intrusion and overdraft. We respectfully suggest that United be asked to repeat these presentations at the next available FCGSA board meeting, and further that the board give some direction as to its level of support and begin the discussion of funding.

There are a couple of house cleaning items we picked up in reviewing the data. These will be in Tony Morgan's report, but they bear repeating here. When modeling the hydrological cycles, downward adjustments to pumping were made for the increased quantity of surface water that would be available in wet years. However, pumping was not adjusted for the fact that in wet years, regardless of surface water availability, pumping is less. That is to say there are two increments to lower pumping in wet years: 1) More surface water in the summer, 2) Less pumping during the rainy months in the winter. It is the second increment that is not accounted for in the draft.

We also noticed that the average amount of surface water factored into the future scenarios was only about 9,000 acre-feet. United has recently been more optimistic and is thinking in terms of 15,000 acre-feet.

To summarize and emphasize we believe the plan should include bold projects and your focus should be on implementation reflecting the urgency necessary to avoid an economic disaster and a legal nightmare.

Sincerely,

Jurgen Gramckow
President
Marathon Land, Inc.
Southland Sod Farms

CAMROSA WATER DISTRICT
BUILDING WATER SELF-RELIANCE

Board of Directors
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93004

September 23, 2019

FCGMA Board of Directors:

We appreciate the opportunity to comment on the Preliminary Draft (Subject to Change) Groundwater Sustainability Plan (GSP) for the Oxnard Basin.

Camrosa Staff have only one comment regarding the FCGMA Oxnard GSP; detailed comments from Terry Foreman, Camrosa Water District Board member and the FCGMA Special Districts' appointee to the GSP technical advisory group (TAG), are attached for your review.

1. This year, DWR implemented a new naming convention to standardize GSA names. As of July 26, 2019, the official name for the Camrosa GSA is "Camrosa Water District GSA – Oxnard."

Thank you for considering these comments. Should you have any questions, please do not hesitate to contact me.

Sincerely,

Tony Stafford

Tony Stafford, General Manager

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Phone: (805) 482-4677 ▪ FAX: (805) 987-4797
Website: www.camrosa.com

Due to the technical complexity of groundwater sustainability plans, Camrosa is relying on the expertise of Terry Foreman, the Special Districts' appointee to the FCGMA TAG, Vice President of the Camrosa Water District Board, and Vice President of the Arroyo Santa Rosa Groundwater Sustainability Agency Board, for specific comments on the Preliminary Draft (Subject to Change) of the Oxnard Basin Groundwater Sustainability Plan. His comments on behalf of Camrosa are provided below in two parts: general comments followed by more specific line-by-line questions and responses to various sections of the draft plan.

Comments on Draft (Subject to Change) Groundwater Sustainability Plan for the Oxnard Subbasin, dated July 2019
By Terry L Foreman, PG 4020, HG 155
September 23, 2019

GENERAL COMMENTS

1. There is not a specific plan to achieve Sustainability. Subarticle 5. Projects and Management Actions of the SGMA regulations, specifically Sections 354.44 (b) (1) (A) and (B), (2), (3), (4), (6), (7), and (8) require specific projects, costs, sources of funding, schedule and milestones be provided to demonstrate how sustainability will be achieved by the GSP. It seems as though much of these requirements are left to later determinations; however, it is clear that these items are expected to be part of the Plan. The set of simulations of various future scenarios, from which the sustainable yield (SY) was estimated included annual reductions in pumping over the 20-year implementation period. However, throughout the document and in Chapter 5, there is no specific plan proposed to achieve sustainability, only that fallowing and pumping reductions are tools that could be used to achieve sustainability. This vague discussion will likely not meet DWR's requirements for a specific plan. The plan can change in the future as new projects or management actions are further assessed and adopted, but there should be a plan in place in this GSP.

2. There is less emphasis on pumping in the Pleasant Valley Basin (PVB) and its impacts on seawater intrusion in the Oxnard Basin (OxB) in this GSP, however, it is implied from the simulation results and emphasized in the draft PVB GSP. Why are PVB pumpers responsible for limiting seawater intrusion into Oxnard? There has/is projected to be groundwater flow from PVB to OxB in all future scenarios. Why isn't flow from the East Las Posas Management Area required to provide groundwater flow to PVB, so that PVB can continue to meet flow to OxB? What is the fair and reasonable flow to be provided from PVB to OxB? There is no limit to OxB pumping that PVB might be required to support in order to avoid seawater intrusion in the OxB. As presented in the GSP, it seems that PVB pumpers are expected to make an unfair contribution to avoid seawater intrusion in OxB. At TAG, we pointed out that the cuts proposed in PV to limit seawater intrusion in Oxnard appeared to be disproportionate and unreasonable.

3. There is no documentation of future scenarios presented in the GSP. Sustainable Yields of each basin cannot be reviewed critically because of the gaps in documentation. Groundwater models used for simulation of future scenarios have not been documented. Documentation, similar to that prepared for groundwater models of historical conditions, is required for the following: boundary conditions, projected stream flows including stream leakage (e.g., Santa Clara River,

Arroyo Las Posas, Conejo Creek, and Calleguas Creek), operations (including rules) of diversion of surface water for direct deliveries and managed recharge, location and timing of applied waters (e.g., imported water, surface water, recycled water, and groundwater), mountain front recharge, recharge from precipitation, groundwater flow between basins, location (including aquifer) and timing of groundwater pumping and location of discharge to streams, seawater (coastal groundwater) intrusion/outflow, conjunctive use operations, etc. All water budget components simulated in the models, including assumptions and methods used need to be documented. Such documentation has not been presented for stakeholder review and understanding of the basis of presented Sustainable Yields.

There needs to be a clear presentation of all projected water supplies and their uses, especially conjunctive use expectations: timing and amounts of surface water and groundwater use. Conjunctive use operations are buried within the estimates of SY for the OxB and PVB. For example, the modeling of future scenarios vary groundwater pumping over 1000s of AFY depending on availability of surface water and the SY value is the average of pumping over the 50-year simulation period. For example, the 2015 through 2017 average pumping in the Oxnard and Pleasant Valley Basins is 76,834 and 17,181 AFY respectively, which is stated as the pumping rates used in the Base Case scenarios. However, average pumping in each basin over the 50-year simulation period is reported as 68,000 AFY and 14,000 AFY, respectively, with annual values varying significantly (e.g., between about 9,000 to 21,000 AFY in the Pleasant Valley Basin). These differences are due to conjunctive use operations and represent average pumping over the 50-year simulation period. So, it is important that these conjunctive use operations are fully disclosed and clearly documented in order to understand the basis of the SY estimates and expected variations of pumping and surface water deliveries under different hydrologic conditions (e.g., wet, dry, or average). This understanding will be important in determining impacts of allocation decisions on allowed year-to-year pumping variations.

4. The derivation of the SY value from the series of future simulations is not clearly documented. The calculations of SY should be presented so the reader understands the exact methodology used to obtain the values presented in the GSP. There was some additional information on the methodology presented at the August 21/22 workshops, but this information is still insufficient. The calculations used to arrive at the SY values presented in the report should be shown in the GSP, especially given the values in the GSP are new and have not been reviewed at TAG.

5. The uncertainty analysis approach used in the GSP is not the conventional approach used in the groundwater community. The uncertainty analysis presented in the GSPs are at best gross approximations, what may change significantly using more conventional approaches. The UWCD and CMWD models peer review reports provided by Dudek as appendices in the GSPs present “uncertainty analysis” of potential SYs based on Global Sensitivity Analysis (GSA). The GSA approach limits the analysis to small sets of parameters and does not maintain calibration of the groundwater flow models in assessing uncertainty of model parameters to model outputs, which leads to serious questions of the validity of the uncertainty bounds presented (both in the peer review reports and GSPs). Use of GSA in the groundwater models peer review is a significant departure from the scope of work approved by the FCGMA Board. The peer review scope of work called for uncertainty analysis based on the following process described by

USGS in ***Approaches to Highly Parameterized Inversion: A Guide to Using PEST for Model-Parameter and Predictive Uncertainty Analysis***, by John Doherty, Randall J. Hunt, and Matthew J. Tonkin, 2010. Use of GSA is not a conventional approach being used as an industry standard for uncertainty analysis in surface water and groundwater studies. GSA has been introduced relatively recently as a means to assess relative importance of parameters in groundwater modeling (see for example, ***Approaches in Highly Parameterized Inversion: PEST++ Version 3, A Parameter ESTimation and Uncertainty Analysis Software Suite Optimized for Large Environmental Models*** *by* David E. Welter, Jeremy T. White, Randall J. Hunt, and John E. Doherty, 2015.*)*. GSA is not the industry standard being used to assess uncertainty and as such has not undergone extensive scrutiny and peer review by groundwater professionals. Review of popular modeling software platforms such as GMS, Groundwater Vistas, and Visual MODFLOW typically integrate the PEST suite of programs for model calibration and uncertainty analysis. The USGS has focused their efforts on uncertainty analysis through the use of and further development of the PEST suite of programs in cooperation with Dr. John Doherty. It is recommended that the approach used by the USGS, as in the original scope of work, be considered in further assessing uncertainty. In addition, these approaches can be used to assess the worth of data of future monitoring programs to focus expensive data collection programs (such as installation of new groundwater monitoring wells).

6. Use of groundwater level thresholds as surrogates for water quality and land subsidence is not supported. There is no analysis showing how proposed groundwater level thresholds will not result in undesirable results in water quality or subsidence. The use of groundwater levels as surrogate threshold levels for various sustainability indicators is not supported in any substantial manner. Specifically, historical low groundwater levels are stated as minimum thresholds protective of degraded water quality and land subsidence. In order to use surrogates, such groundwater levels, for these sustainability indicators, there needs to be a demonstration that there is a direct relation between the sustainability indicator and the surrogate indicator, i.e., groundwater levels that will protect against an undesirable result. Presently, there is no analysis presented in the GSPs to support the selection of the surrogate indicator and its relation to the sustainability indicator to demonstrate that the minimum threshold will not be exceeded if groundwater levels are maintained above historical low levels. For example, subsidence is a slow process where consolidation of fine-grained sediments occurs in response to a decrease in groundwater levels. Subsidence may be initiated upon a drop in groundwater levels below a specific threshold value, where consolidation of fine-grained sediments is initiated, but may not go to completion (i.e., full potential subsidence) as groundwater levels recover. So, additional consolidation may be reinitiated as a groundwater levels decline below threshold levels. There has been no analysis of the potential subsidence under varying groundwater level declines except references to previous USGS analysis of subsidence in the basins. Given the observations of subsidence, including those of the USGS, Farr (2017) and UNAVCO's monitoring stations (especially Station P729 in the West Las Posas Basin), these issue need to be further explored for all the basins.

7. The bases for defining Basin-wide Undesirable results appear to be somewhat arbitrary. The basis for claiming that a certain numbers of wells, or timing sequences, exceeding local minimum thresholds will create a basin-wide undesirable result is not supported by any analysis

or demonstrations. Such analysis and demonstration should be provided and reviewed by stakeholders to support the recommendations.

8. There needs to be clear objectives stated for proposed monitoring program and a more rigorous analysis of the cost-benefits of each monitoring element. There should be, a) clearer explanations of data being collected to address data gaps and, b) data collected to assess progress of sustainability attainment. Future monitoring will add hundreds of thousands of dollars to GSP implementation and new monitoring features, such as monitoring wells, potentially will cost millions of dollars, so the monitoring program should be optimized to avoid collection of data of limited value. Optimization techniques as described in the USGS report identified in General Comment No. 5 above should be considered for use in evaluating data worth.

SPECIFIC COMMENTS

Only selected specific comments are provided here due to the limitations of time given for review of the three extensive draft GSP documents. However, many of the issues identified in the draft PVB GSP are issues in this GSP, which have been folded into the General Comments on this GSP.

Executive Summary

p. ES-6, bullet lists. There are no bases or rationale given for the proposed conditions listed in these bullet lists. The proposed conditions appear to be arbitrary. There is no basis or rationale given in the body of the report either.

p. ES-7, Section ES.4. It is stated that the current monitoring network is capable of delineating groundwater conditions in the OxB. However, the discussion goes on to mention various data gaps and potential additional monitoring. There needs to be a more comprehensive assessment of monitoring program needs and prioritization of installation of new monitoring features as future monitoring is expected to be a significant future expense. This topic has not been fully fleshed out at TAG or with stakeholders. The current assessment and discussion does not do this topic the justice it merits.

p. ES-8, Section ES.5. This section does not provide a recommended roadmap to bring the OxB to sustainability, including specific milestones to be met over the 20-year implementation period. There are only ideas such as fallowing and pumping reductions but no specific plans to implement either to achieve SY. I think DWR is expecting to see an adopted plan to achieve sustainability, with the understanding that the plan might change in the future. I think there needs to be a commitment to a specific plan until a new plan is adopted in subsequent GSP updates. Otherwise, DWR will not see a commitment to achieve SY and milestones to show progress.

Chapter 1

p. 1-1, para. 3. Please provide references to the documentation of historical land subsidence and depletion of interconnected surface waters.

p. 1-2, Section 1.2. This section describes the Agency and organization and management structure of the FCGMA, which is one of the GSAs for the OxB. It seems that the agencies, organizations and management structures should be provided for each of the applicable GSAs.

p. 1-9, Cost Estimate. It needs to be made clear that the cost estimates in Table 1-2 are for the entire FCGMA budget and not for OxB only. Also, it needs to be clear that these are preliminary estimates and subject to FCGMA Board approval annually.

p. 1-17, Projected Climate. The discussion in this section is irrelevant. The discussion should be based on the DWR projections which are used for this specific study. There should be documentation of how climate change has been accounted for in the future scenarios as indicated in General Comment No. 3.

Chapter 2

p. 2-12, Section 2.3. Much work and time was put into creating groundwater level contour maps for 2015 for each aquifer of the PVB (and OxB). UWCD and FCGMA produces groundwater level contour maps annually, yet there was no comparison and contrasts of the findings of this GSP effort with those efforts. These new groundwater level contour maps show the importance of contouring individual aquifers as opposed to aquifer systems. In addition, it would be useful to understand from the groundwater modeling, significant observations about groundwater levels differences between aquifers and potential implications regarding potentially significant and unreasonable adverse impacts. The modeling analysis could provide insight to whether or not monitoring of individual aquifers is important or not for various basin operating scenarios. So, recommendations should be provided regarding future production of groundwater level contour maps as compared to current mapping approach of FCGMA.

p. 2-14, Section 2.3.1.1. United Water Conservation District collected data for many Shallow Aquifer wells. It does not appear that these data have been included, so it would be useful to include this information in this section.

p. 2-14, Section 2.3.1.1. It would be useful to discuss data gaps that limit your ability to draw contour maps and temporal trends, which can be evaluated, including an analysis of data gaps using the numerical groundwater flow model, i.e., where would additional data be most useful in understanding groundwater conditions and will the data be value added in this understanding? This comment applies to the remaining sections (aquifers) discussions.

p. 2-33, Section 2.3.4. In general, there is no discussion of the quality of source waters that directly or indirectly recharge the basin. This is a significant oversight as the stakeholders and public should understand the quality of the various sources of recharge waters and potential implications to groundwater quality. In addition, there should be more discussion of coordination with other water quality plans, such as the Salt and Nutrient Management Plans and Total Maximum Daily Load Implementation Plans. DWR recognizes that guidance is lacking regarding addressing groundwater quality in the GSPs, so they are now working with the State Water Resources Control Board to develop some additional guidance on this subject. Secondly, there is no discussion about trends in groundwater quality. It is unreasonable for the reader to review all the data in appendices to assess historical trends. Historical trends should be provided as part of the discussion.

p. 2-34, Section 2.3.4.1. There is no attempt to explain the variation in TDS throughout the basin; it is only a presentation of data for a limited snapshot in time. Also, there is no discussion of whether values are increasing, decreasing or steady. To the extent it is possible to discuss these issues they should be discussed. There have been studies of potential sources of TDS and trends, so selective use of those studies observations and findings would be appropriate. This would help readers understand what if any groundwater quality impacts may be associated with pumping versus other effects, such as recharge source water quality. This comment applies to all constituents discussed in the GSP.

p. 2-41, Section 2.3.5. This section is incomplete and somewhat confusing. In part, it seems to suggest that subsidence is a potential (i.e., see reference to USGS report) yet, there are no data or suggestion for need to assess it (only reference to keeping groundwater levels to above historical lows). Subsidence was discussed at TAG meetings. For example, at the October 2015 TAG meeting, Mr. Foreman presented a proposal from Neva Ridge Technologies to assess the potential for applying InSAR technology to identify potential subsidence in the basin. This proposal was not pursued by GMA staff even though the cost was minimal and the technology is widely accepted. The State of California has engaged the Jet Propulsion Laboratory (JPL) to assess subsidence statewide as mentioned in the GSP (Farr 2017). The publication shows some potential subsidence in the western part of the Oxnard Basin for March 2015 to September 2016. The GSP states that the Farr, 2017 report shows less than one foot of subsidence. There is no quantification of how much less, but any subsidence over a 15 month period is potentially significant and would warrant further assessment. Further use of InSAR data may be used to assess whether there has been subsidence in the past and potential for the future as proposed by Neva Ridge Technologies. It seems like there is a data gap regarding subsidence which should be addressed in any proposed monitoring program.

p. 2-51, para. 2. The UWCD groundwater flow model assumes that only 5 percent of M&I water deliveries become recharge to groundwater. The 5 percent value is less than water losses reported by most M&I agencies. If 60% of M&I water use is outdoor use, and 20% of that outdoor water becomes groundwater recharge, then UWCD's value is low by a factor of 2 to 3. This additional recharge may not be significant in the overall water budget but it is important as a potential source of M&I water supply, as M&I agencies have a right to recapture their percolated foreign waters. As commented in the previous comment, it is not clear that UWCD includes all foreign water delivered by CWD.

p. 2-51, Section 2.4.1.4. Dudek retained Daniel B. Stephens & Associates (DBS&A) as a subconsultant to assess water budgets of the groundwater basins of the FCGMA. DBS&A used their Distributed Parameter Watershed Model (DPWM) to estimate groundwater recharge from precipitation and applied waters for irrigation. Dudek indicated that they had high confidence in the DBS&A DPWM analysis and used the results from DPWM in the water budget tables presented in the previous draft of this GSP. The DBS&A DPWM work has been completed eliminated from this draft which I think is inappropriate. I think the DPWM (or similar model such as DWR's Integrated Water Flow Model Demand Calculator [IDC]) would be a better, more useful tool for estimating water budgets for input to the groundwater models. These models also provide a means to incorporate climate changes conditions, including temperature change projections, which are not easily addressed by the current methodology used by UWCD. As stated in this paragraph, the estimates of recharge from precipitation are subject to uncertainty, but this was not evaluated in the uncertainty analysis discussed in Appendix I.

p. 2-53, Section 2.4.1.7. This item is not in UWCD's model and should be included explicitly.

p. 2-54, para. 2.4.1.8. This item should be updated based on DBS&A as DBS&A did a more thorough assessment of delivered water. UWCD's estimates of delivered water, particularly by M&I providers, should be reviewed in light of DBS&A's work and updated appropriately.

p. 2-54, Section 2.4.1.9. Same comment as provided on p. 2-51, Section 2.4.1.4 above.

p. 2-55, Section 2.4.2.1. Unreported pumping is not discussed. However, Kim Loeb reported at a FCGMA Board meeting that unreported pumping by agricultural pumpers within the FCGMA may be 5 percent based on review of reporting in the proposed allocation base period of 2005-2014. This item does not address potential under reporting or non-reporting west of the Bailey Fault. Eta estimates (as described in Attachment 3 of Camrosa's April 3, 2018 comment letter on the Preliminary Draft (Subject to Change) Groundwater Sustainability Plan (GSP) for Pleasant Valley Basin) could help identify irrigated areas that may not be reported or under reported. Pumping uncertainty has not been assessed in the uncertainty analysis discussed in Appendix I. This is a data gap that should be addressed in future studies.

p. 2-55, Section 2.4.2.2. Pleasant Valley County Water District is reportedly gaging discharge of some drains, so this information should be pursued to assess computed drain flows. Drain flow uncertainty has not been assessed in the uncertainty analysis discussed in Appendix I. This is a data gap that should be addressed in future studies.

p. 2-56, Section 2.4.2.3. Eta estimates vary between DBS&A (2017) and UWCD's groundwater model. Potentially these estimates could be substantially improved through implementation of the approach described in Attachment 3 of Camrosa's April 3, 2018 comment letter on the Preliminary Draft (Subject to Change) Groundwater Sustainability Plan (GSP) for the Oxnard Subbasin. Eta uncertainty has not been assessed in the uncertainty analysis discussed in Appendix I. This is a data gap that should be addressed in future studies.

p. 2-59, Section 2.4.3.4. See my comments on the draft PVB GSP section. The discussion of historical sustainable yield presented in this section is largely speculative and relies on observed or projected (simulated) seawater intrusion in the OxB, suggesting that pumping in the PVB is a major factor in affecting seawater intrusion in the OxB.

p. 2-60, Section 2.4.4. The uncertainty analysis approach used in the GSP (Appendix I Peer Review) is not the conventional approach used in the groundwater community as described in General Comment No. 5. The uncertainty analysis presented in the GSPs are at best gross approximations, what may change significantly using more conventional approaches. Also, a number of additional uncertainties and data gaps have been identified in my comments preceding this comment, which are not addressed in this section. Uncertainties, data gaps and plans to address data gaps through additional studies and/or monitoring should be provided in a summary table, at a minimum, to highlight future efforts to improve sustainable yield estimates.

p. 2-61, para. 1 of Section 2.4.5. There were many assumptions used in developing the hydrology and other model input conditions, most of which have not been documented as a part of the GSP. There has been no analysis/discussion of potential uncertainties associated with the future scenarios models. The uncertainty analysis applied in the Peer Review report (Apendix I) was for the historical model and not the future scenarios modeling. Discussion of the assumptions of the model inputs, limitations and uncertainties should be part of the GSP documentation.

p. 2-63, para. 2. The GSP references the climate cycles assuming the reader understands how and why the referenced cycles are used in the GSP. There needs to be discussion of what climate cycles are and why the particular cycles were selected and how they were selected.

p. 2-63, 1st bullet in the bullet list. It needs to be clear that the pumping values referenced in this bullet are not the average pumping over 2015 through 2017. These pumping values are the simulated pumping values in the base case, which fluctuates pumping based on conjunctive use with Santa Cara River flows available for delivery to agricultural users. Also, it needs to be clear over which period these values are taken, the full 50 years or last 30 years of the simulation.

p. 2-63, 3rd through 5th bullets in the bullet list. There is no documentation of the flows mentioned, assumptions used and methodology as to how these flows were derived and the actual flows developed for use in the models. The brief statements on approach are not sufficient to base any meaningful review of the information.

p. 2-64, para. 1, after bullet list. There is no documentation of the flows mentioned, assumptions used and methodology as to how these flows were derived and the actual flows developed for use in the models. The brief statements on approach are not sufficient to base any meaningful review of the information.

p. 2-64, para. 2 through 4. In meetings with UCWD on August 13, 2019, it became clear that implementation of the projects described here requires description of the methodology used for implementation and results in terms of actual pumping that was simulated. For example, the City of Camarillo desalter pumping only occurs from 2020 through 2045, then pumping ceases, so the City of Camarillo pumping would drop below its potential allocation based on the 2005 through 2014 base period. Second, the pumping transferred to CWD through the Conejo Creek Project was not maintained because groundwater levels dropped significantly and the groundwater model procedure reduced pumping. Lastly, there is no discussion of the availability of Santa Clara River water, rules for diversion to UWCD's surface water delivery systems and ultimate delivery to PVCWD's systems, and reductions in pumping as a result of surface water deliveries. There needs to be documentation so the reader understands the base case, including hydrological conditions, water uses, and operational assumptions on which it is based. Also, see General Comment No. 3.

p. 2-65, para. 1. In discussing the results of the Baseline simulation, the discussion is limited to seawater intrusion in the OxB. There is no discussion of other conditions such as water level fluctuation and storage.

p. 2-45, Section 2.4.5.2. As stated in my earlier comments, there needs to be documentation of all modeled scenarios so the reader understands the scenario, including hydrological conditions, water uses, and operational assumptions on which it is based. This comments applies to all the scenarios. Also see General Comment no. 3.

p. 2-67, footnote 10. This information in this footnote indicates that production rates are a function of a number of variables which are not documented in the GSP. As stated in my earlier comments, there needs to be documentation of all modeled scenarios so the reader understands the scenario, including hydrological conditions, water uses, and operational assumptions on which it is based. Also, see General Comment No. 3. This comments applies to all the scenarios.

p. 2-68, footnote 11. This information in this footnote indicates that production rates are a function of a number of variables which are not documented in the GSP. As stated in my earlier comments, there needs to be documentation of all modeled scenarios so the reader understands the scenario, including hydrological conditions, water uses, and operational assumptions on which it is based. Also, see General Comment No. 3. This comments applies to all the scenarios.

p. 2-69, footnote 12. This information in this footnote indicates that production rates are a function of a number of variables which are not documented in the GSP. As stated in my earlier comments, there needs to be documentation of all modeled scenarios so the reader understands the scenario, including hydrological conditions, water uses, and operational assumptions on which it is based. Also, see General Comment No. 3. This comments applies to all the scenarios.

p. 2-71, Section 2.4.5.7. The GSP references the climate cycles assuming the reader understands how and why the referenced cycles are used in the GSP. There needs to be discussion what climate cycles are and why the particular cycles were selected and how they were selected. Also, see General Comment No. 3. This comments applies to all the scenarios.

p. 2-72, Section 2.4.5.8. The uncertainty analysis approach used in the GSP (Appendix I Peer Review) is not the conventional approach used in the groundwater community as described in General Comment No. 5. The uncertainty analysis presented in the GSPs are at best gross approximations, what may change significantly using more conventional approaches. In addition, there is no discussion of future conditions, assumptions, limitation and associated uncertainties with regards to SY estimates.

p. 2-74, Section 2.4.9. The methodology used to interpolate uncertainty for the OxB from the OxB model simulations should be provided along with specific calculations used to derive the OxB SY values so there is no question as to how the values were derived.

p. 2-75, para. 2 and 3. These paragraphs presents a SY value for the OxB, as well as values for the shallow aquifer and LAS, but the derivation of these values is not provided, just a general suggestion that it comes out of the various future scenarios simulations. Calculations showing how the SY value was derived should be presented so the reader does not have to guess as to how the value is derived.

Chapter 3

p. 3-2, para. 2. I think there needs to be care in how sustainability is evaluated using the 30-year period from 2040 through 2069. The sustainability is evaluated based on achievement of measurable objectives and complying with minimum thresholds in the 30 year period. However, the water balance , including pumping, in the earlier 20-year period contributed to the sustainable conditions that are achieved in the later 30 years of the 50-year period. So, it is inappropriate to suggest that the sustainable yield is the pumping that occurred in the 30-year sustaining period only. The sustainable yield is the average pumping over the full 50-year period. I submitted a Memorandum dated February 11, 2019 regarding Sustainable Yield Analysis to support my view on estimating sustainable yield from the future scenario groundwater model simulations. I asked that this memorandum be put on a future agenda for discussion at TAG but it was never agendized. I include this memorandum as Attachment 1 to my comments here.

p. 3-4, para. 2. It has not been demonstrated or documented that UWCD will maintain the historical volume of water diverted from the Santa Clara River over the next 50 years. See General Comment No. 3.

p. 3-8, para. 1. The GSP seems to change views on whether groundwater pumping affects brine migration/poor quality water movement. It seems that the UWCD (2016) document referenced in this section indicates that pumping and resulting decreased groundwater levels does result in groundwater quality degradation. There does not appear to be any quantification of the cause (lowered water levels) and effect (increase in TDS or Cl, etc.) however, UWCD does present data, including information from the USGS, that suggest there is a linkage. In addition, UWCD (2016) indicates that shallow groundwater contains poor quality groundwater (e.g., high TDS and Cl) that migrates downward due to vertical gradients produced by pumping. This issue of shallow poor water migration has not been addressed in this GSP. The GSP seems to minimize the relation between groundwater quality and lowered groundwater levels and resulting impacts on degraded water quality, thereby, simply suggesting that maintaining groundwater levels above historical low groundwater levels should solve the issue. At a minimum, this seems to be a data gap that deserves further assessment to determine a more quantitative relation between groundwater levels and brine/poor quality water migration. SGMA requires that groundwater levels can be used as a surrogate minimum threshold if there is a clear relation between the sustainable criterion and groundwater level, which has not been done in this GSP.

p. 3-9, para. 4. See comment on p. 3-5, para. 1. SGMA regulations and best management practices require consideration of Federal and State water quality standards, which do not appear to be addressed. Also, there are some TMDL requirements that relate to groundwater. You need to revisit Section 2.3.4 to address these regulatory programs as required by SGMA. GSPs are required to explain if and why State and Federal requirements are not used as standards.

p. 3-8, para. 6. The cause of increases in nitrate, sulfate, and boron is not substantiated in this GSP.

p. 3-9, Section 3.3.5. You need to describe the groundwater level conditions that could lead to subsidence and its magnitude. Some stakeholders might have varying opinions on different levels of subsidence and what is significant or unreasonable, especially if there is differential subsidence, which would result where different thicknesses of fine-grained units exist. The potential for subsidence, it's location and magnitude as related to specific groundwater conditions needs to be fleshed out for stakeholders to review and provide input as to significance and unreasonableness. Potential subsidence needs to be further investigated and reviewed with stakeholders to determine whether there are significant and unreasonable impacts and ways to address them as appropriate. It is not clear whether all the subsidence that could occur with historical low water levels has occurred. Subsidence may have been initiated but not reached its full potential at that historical low water level, so this is a data gap that needs to be explored further. Given there is potential for further subsidence (based on the earlier USGS analysis), it seems that monitoring for subsidence would be a prudent recommendation.

p. 3-11, Section 3.3.7. The proposed undesirable result conditions seem to be arbitrary as there is no rationale or explanation for the proposal; x of y wells below their respective minimum threshold. There should be a rationale provided for the proposal.

p. 3-16, para. 4. It should be acknowledged that hydraulic gradients are the key driver of groundwater flow and that the intent is to have a balance or slight overbalance, where the magnitude and direction of hydraulic gradients on average favor groundwater flow landward to seaward. It should be acknowledged that water levels from the groundwater model simulations are being used as surrogates for these conditions given the simulated net movement of groundwater along the coast. I think it would be appropriate to identify wells in the OxB for use in monitoring groundwater levels (and calculating gradients in each aquifer) and water quality to confirm that the intended objective is being met.

p. 3-17, Section 3.4.4. As stated above, groundwater level minimum thresholds used as surrogates for water quality criteria and subsidence criteria have not be directly established, which needs to be done in order to use water levels thresholds as a surrogate threshold.

p. 3-20, para. 5. As stated in this paragraph, progress towards measurable objectives will depend on climate, stream flows, and deliveries from Santa Clara River. None of these variables have been documented in this GSP. See General Comment No. 3 for the need to document the basis of the future scenarios.

p. 3-22, para. 4. I think the process used to assess milestone accomplishments, or not, going forward is too simplified. It is good that the GSP acknowledges that actual climate and actual management actions will affect groundwater levels that might result in not achieving proposed milestones. I think there is a better approach. I think that milestones can be set relative to actual climate and actual management actions. I think groundwater model simulations could be used to assess achievement of milestones. You can simulate actual climate and no action and compare to simulations of actual climate and actions taken to show expected progress. Actual groundwater levels can be compared with simulated groundwater levels to see how actual conditions compare, within the uncertainty of the model simulations. As time goes on, the model would presumably also be improved, so that modeled results would become less uncertain. At each 5-year milestone, you would make 50-year projections to show that your management actions, original or modified, will advance you to sustainability. It may be possible to simply explain how this approach is to be used and put a range or band on the milestone plot illustrating that the band accounts for actual climate and management actions, with the goal to get to the end point, even if the path might be highly variable depending on actual climate conditions and actions. This comment applies to all discussions of interim milestones in this section.

The information provided in this GSP, as well as the GSP for the Pleasant Valley Basin, identifies some potential new issues that should be considered in establishing Minimum Thresholds (MTs) and Measurable Objectives (MOs).

1) Some hydrographs of simulated groundwater levels in the Oxnard Forebay area show, a) groundwater levels above observed historical high groundwater levels, which seem unreasonable given the Forebay area was considered "full" during these high groundwater level conditions and, b) groundwater levels are above ground surface in some cases, which is not physically possible. It is likely that too much recharge was forced into the model, above that which is realistic, driving simulated groundwater levels above ground surface. Examples of these conditions are shown in hydrographs for wells 02N21W07L05S and 02N22W23B03S as given in Attachment 2. This issue should be investigated further and corrected given this condition is unrealistic.

2) Groundwater levels in many wells and aquifers appear to be above land surface elevation. This is physically possible and not an unexpected condition for confined aquifers in coastal basins. However, maintaining high groundwater levels may result in flowing wells (artesian conditions) and the potential for liquefaction in urban areas such that groundwater will flow at the surface in nonpumping wells, standby wells and improperly abandoned wells. Flowing wells were found to be a widespread issue on the Oxnard Plain during the mid- to late 1990s, resulting in the GMA and County to implement an aggressive well abandonment program to seal these flowing wells. It is not known if the groundwater model captures this potential wasted water from such flowing wells in the water budgets, however, review of simulated water budgets show that there is significant increases in drain flows for the "sustainable pumping" scenarios, which is water that is otherwise wasted under current operations (i.e., water is discharged to channels that flow to the ocean). Examples of hydrographs showing groundwater levels potentially above land surface include wells 01N21W32Q04S and 01N22W20J05S as attached.

3) As I have mentioned in previous comments to the GMA Board, I am concerned that the simulated pumping of agricultural wells is too simplified. Pumping is simulated in the model as a constant value as opposed to variable pumping, e.g., likely increases in pumping seasonally and in dry periods. Ramp up of pumping seasonally and in dry periods will result in increases in drawdown (lowering of groundwater levels) and greater overall fluctuations in groundwater levels over those levels simulated in the model. As MTs are based on model simulations, these MTs may be set too high and so they may be violated seasonally and in dry periods as a result of the actual increased drawdown. Examples of these issues are shown by hydrographs for wells 01N21W32Q04S and 01N22W20J05S as attached.

I have developed a table included in Attachment 2 that identifies which wells exhibit the potential issues described in Items 1 through 3 above. This table includes the same columns as the MT-MO tables provided by Dudek. I have added 4 columns as follows:

- Google Earth Approximate Land Surface Elevation in feet above mean sea level (ft MSL). This value should be confirmed with other land surface datum information as Google Earth data are approximate and may be in error in some cases.
- High WLs Above LS: if high groundwater levels are above land surface, an "x" is placed in this column. If it is uncertain, then a "?" is placed in the column and if groundwater levels are not above land surface, then it is left blank.
- Historical fluctuations > Future Simulated Fluctuations: simulated future groundwater-level fluctuations are compared to observed historical groundwater-level fluctuations. This comparison was made to assess the potential that the model under-predicts groundwater-level fluctuations such

that MTs may be violated in the future as a result of likely increased seasonally and dry-period pumping, driving groundwater levels lower than those simulated by the models. An "x" is placed in this column if simulated groundwater level fluctuations are significantly less than observed historical fluctuations.

- Potential issues: color coded dots are placed in this column to highlight potential issues indicated by the hydrograph of the given well. The potential issues are those described in Items 1 through 3 above. The explanation for the color code is given at the end of the table.

The issues identified herein have not been discussed at TAG given the timing of the availability of the MTs and MOs. In addition, I have asked for groundwater contour maps (for selected high and low groundwater level conditions) and plot of land surface elevation on hydrographs, so we could review these issues, such as identified herein. This commentary adds to the need for documentation of the future scenarios as described as part of my General Comments.

Chapter 4

p. 4-1. This Chapter as written does not provide a clear connection between data gaps identified in Sections 2 and 3 and proposed monitoring. There should be a clear connection between proposed monitoring and how this monitoring addresses data gaps and uncertainties identified in previous sections of the GSP. For example, there was significant time and effort spent on preparing the groundwater level contour maps presented in Section 2. However, there is no discussion of the data gaps identified in preparing these maps and the need for specific monitoring wells to fill these data gaps. A number of data gaps and uncertainties, including needs for additional data/studies have been identified in my comments that should be addressed in this Chapter.

p.4-3, Groundwater Extractions. There needs to be a discussion of under reporting and non-reporting which has been discussed at numerous FCGMA and TAG meetings. Eta can be generated from satellite images and used to assess potential non-reporting and under reporting. This analysis should be included for consideration. This Eta analysis can be used to address improve estimates of recharge from precipitation and applied water as indicated my comments above in Chapter 2.

p. 4-3, Surface Water. This section describes existing/historical monitoring gages as if all of them still exist and will be monitoring in the future; some of these gages no longer exist. It is not clear what monitoring is proposed going forward. There are needs for additional surface water flow monitoring of the various creeks to better estimate stream losses for groundwater recharge and to assess groundwater/surface water interaction.

p. 4-13, Sections 4.6.1 and 4.6.2. Installation of the number of monitoring wells proposed in this section will be very expensive: hundreds of thousands of dollars for each proposed new well. Each proposed monitoring well should be evaluated as to its specific monitoring objectives and whether its cost is justified by the benefits. This could be done using the UCWD groundwater model, in fact, groundwater model simulations should be used to determine best locations for monitoring wells to fill significant data gaps, to address uncertainties and for threshold level monitoring as described in my General Comments. The groundwater model presumably will be used in the future to interpret between data points (well data), so the model can be used to check whether there are significant differences in water levels between existing data points and the need for additional data points (wells). For example, if water levels are projected to be smooth (no significant ups or downs) between existing monitoring points, then additional data points would not be very useful, however, if there projected to be significant higher or lower water levels between existing data points, then it may be appropriate to install additional wells to monitor those fluctuations if they could be significant.

p. 4-14, Section 4.6.3. It seems that there is a data gap regarding pumping and migration of poor quality water along faults and from deeper aquifer zones. A data collection, monitoring, and study should be considered to further evaluate sustainability criteria for degraded water quality associate with this issue.

p. 4-15, Section 4.6.4. Consideration should be given to further monitoring subsidence until is can be shown that there is not a potential for significant adverse subsidence conditions to develop. The State should be contacted to determine their plans for further statewide monitoring as reported in Farr (2017). If the State does not plan to continue statewide monitoring then the FCGMA should consider retaining a firm like Neva Ridge (mentioned in comments above) to apply InSAR techniques to monitor subsidence.

<u>Chapter 5</u>

It does not appear that this Chapter meets the requirements of DWR to demonstrate how the FCGMA will bring the Pleasant Valley Basin to sustainability. Subarticle 5. Projects and Management Actions of the SGMA regulations, specifically Sections 354.44 (b) (1) (A) and (B), (2), (3), (4), (6), (7), and (8) require specific projects, costs, sources of funding, schedule and milestones be provided to demonstrate how sustainability will be achieved by the GSP. It seems as though much of these requirements are left to later determinations; however, it is clear that these items are expected to be part of the Plan. The set of simulations of various future scenarios, from which the sustainable yield (SY) was estimated included annual reductions in pumping over the 20-year implementation period. However, throughout the document and in Chapter 5, there is no specific plan proposed to achieve sustainability, only that fallowing and pumping reductions are tools that could be used to achieve sustainability. This vague discussion will likely not meet DWR's requirements for a specific plan. The plan can change in the future as new projects or management actions are further assessed and adopted, but there should be a plan in place in this GSP.

Appendix A GSA Formation Documentation – no comment.

Appendix B Public Outreach – no comment.

Appendix C Water Elevation Hydrographs – no comment.

Appendix D UWCD Model Report

1. Overall UWCD has developed a useful tool to assess sustainable yield of the OxB-PVB-WLP basins. Overall, I think the conceptual and numerical model represents groundwater flow conditions in the basins. I do have technical issues in a few areas which I think can be resolved through future refinements and analysis of the model and as additional data are gathered to address data gaps.
2. I think both the United and Calleguas models in the Las Posas Basin need to better account for recharge through a deep unsaturated zone. I think Calleguas has accounted for this process in an indirect way, as they simply apply recharge without large annual variability. However, they indicate, as I understand it, that deep percolation of applied water is assumed to be negligible, which I think is incorrect; in my opinion, it is just delayed in its arrival to the deep water table. I have done some simulations of unsaturated flow using the USGS VS2DI model. In my view, these simulations show that, 1) unsaturated flow is very likely an important mechanism of long-term deep percolation of water infiltrating at the surface, especially, applied water, 2) water

applied at the surface can reach several hundred to a few hundred feet in a few decades, such that irrigation water applied during development of the basin is likely recharging the basin today, and 3) large annual fluctuations in infiltration can be significantly dampened compared to actual fluctuations observed as recharge at a deep water table, due to the long unsaturated flow path, where saturation varies over time to dampen the infiltration pulses. You can see the large swings in United's simulated water levels in the shallow aquifer wells (likely due to assumed instantaneous recharge of precipitation and applied water) compared to the flatter actual observed water levels, which are more likely the result of a more continuous dampened recharge rate that actually takes place at the water table. I plan to talk about this at the next TAG meeting.

3. Water budget tables ES-1, Table 2-2, and Table 3-3 do not include recharge from Conejo Creek and Calleguas Creek that occurs in the Pleasant Valley and Oxnard Plain Basins. These simulated recharge values need to be added to the tables.

4. Detailed water use estimates (similar to Tables 2-4 through 2-10 in the PV GSP, for example) are not provided anywhere in the report, so it is not possible to assess the basis of the model simulated water budget values. It was clear that there were discrepancies between United's water use values and Dudek's GSP data summaries for water uses in the various basins. As Dudek (and GSI earlier) completed a detailed canvassing of water use from various users, it seems like the Dudek estimates may be more valid. There needs to be a comparison and reconcilation of the water use estimates. For example, Camrosa provided detailed water use (including sources of water) data for the Pleasant Valley Basin, which shows higher applied water than the use that United shows (based on earlier data tables). Also, United does not account for diversions from Conejo Creek that took place prior to 2002; these diversions, which occurred throughout the 1985 to 2015 simulation period were provided to the Dudek team. These water uses need to be accounted for.

5. There seems to be an underlying theme that recharge at the surface does not affect groundwater conditions in deeper aquifers. However, inspection of Tables 4-2, 4-3 and 4-5 does show significant vertical downward flow. For example, Table 4-2 shows that on average 9,124 AFY flows from the Shallow Aquifer to the UAS and that 19,091 AFY flows from the UAS into the LAS, which shows significant and important vertical movement of water. Table 4-3 shows on average 11,763 AFY flows from the Shallow Aquifer to the UAS and that 10,005 AFY flows from the UAS into the LAS in the Pleasant Valley Basin. Note that in the PV Basin these flows are approximately equal to the pumping in these units. In Table 4-5, 8,431 flows from the Shallow Aquifer to the UAS, but oddly enough, there is essentially no flow from the UAS to the LAS in the West Las Posas Basin. I question that this is the case, that there is no flow. I suspect that the other recharge components may be overstated and the vertical flow understated. The distribution of this vertical flow should be evaluated to, 1) assess where the exchange is occurring, 2) assess the reasonableness of the magnitude, and 3) its sensitivity on model results, especially as it may affect seawater intrusion (that is, coast to landward flow of groundwater).

6. On page 34, Section 2.7, it is suggested that because recharge at the spreading grounds is so large, that other components are less important. This is simply not true. If the hypothetical error of 4,500 AFY existed, then this error would be propagated through the model simulation and result in an error of about 140,000 AF over the 31-year simulation period. Such an error would significantly impact the estimate of sustainable yield, i.e., underpredict it if simulated recharge is low by 4,500 AFY and over predict sustainability if it is too high by 4,500 AFY. Also, mis-identifying the actual contribution from each item may greatly impact future simulation results. For example, if deep percolation from rainfall is overestimated compared to deep

percolation of applied water, then future simulations will show higher sustainability than might actually exist because the contribution of applied water is actually more important. This is why there needs to be a qualification of each component of the water budget's contribution to the overall water balance and characterization of its changes into the future. As written, I think the write-up on this page is not properly informing the reader about the various components of the water budget.

7. It seems that there could be merit in assessing the model simulated drain flows with measured Revlon Slough flows as presented in Figure 2-6. Presumably, most (or all) of the flow during dry-weather periods in Revlon Slough is drain discharge water, so there may be some meaningful comparisons with the flows at 776 and 776A. Also, there should be an explanation of the 10,410 AFY decrease in drain flows in the Oxnard Plain Basin and the increase of 2,420 AFY in drain flows in the Pleasant Valley Basin compared to the values reported in the draft GSPs.

8. Page 39, Section 2.7.1.3. and 2.7.1.4. These section seems to bias toward recharge from precipitation and applied water in agricultural areas based on assumptions and relations used to derive deep percolation from these sources. I think this needs to be assessed and the DBS&A work could aid greatly in this assessment. It is not clear why DBS&A's values were not used as a test of the model. Based on the sensitivity analysis, the DBS&A estimates may work well based on the latest revised estimates of recharge from these two sources. I think the deep percolation of applied water in M&I areas is understated and recharge improperly attributed. United appears to have accounted for only distribution system losses (and this is likely too low, as these losses are likely 6% or larger), so deep percolation of applied water is not accounted for.

9. On page 34, Section 2.7, last sentence. See Comment 5 above. I think the significance of vertical flow between aquifers in the basins is understated.

10. On page 38, Section 2.7.1.2. There is no discussion of the Conejo Creek and Calleguas Creek. These creeks provide significant recharge.

11. Page 40, second paragraph. See Comment 5 above.

12. Page 39, Section 2.7.1.3. and 2.7.1.4. These sections seem to bias recharge from precipitation and applied water to agricultural areas based on assumptions and relations used to derive deep percolation from these sources. I think this needs to be assessed and the DBS&A work could aid greatly in this assessment. It is not clear why DBS&A's values were not used as a test of the model. I think the deep percolation of applied water in M&I areas is understated and recharge improperly attributed (see Comment 8 about attribution). United appears to have accounted for only distribution system losses (and this is likely too low, as these losses are likely 6% or larger), so in effect, deep percolation of applied water is not accounted for.

13. Page 49. The discussion on this page indicates that groundwater pumping is a significant contributor to high chlorides in the basin due to drawdown and upwelling of poor quality water. This needs to be further addressed in the GSP as part of the water quality criteria.

14. As seawater intrusion in the Oxnard Plain Basin is a key issue, I would expect that model would be more rigorously assessed relative to flow and hydraulic gradients along the coastal area. Two observations suggest that more should be done to assess the veracity of the model to simulate movement of groundwater along the coast. I think a good first step has been taken by dividing the coast line into segments. However, there is little analysis/discussion of the veracity of the model simulation. The sensitivity analysis suggest that vertical hydraulic conductivity is

an important parameter. Coastal gradients drive the rate of inflow, so it would be instructive to develop cross sections showing observed versus simulated groundwater levels in order to compare simulated versus observed gradients. It seems on visual inspection of Figures 4-1 through Figure 4-21, that the simulated gradients may be higher than the data-contoured water levels. I noticed this in the Dudek groundwater level contour maps, which to me seem to suggest possibly more flow vertically. I suspect that vertical flow may be effected by abandoned wells to some extent; that could be significant in some areas. In addition, further work using pathline analysis is warranted to assess movement of flow along the coastline. These analysis would be helpful in assessing the model simulation of groundwater flow along the coastline.

15. The groundwater models for the East and West Las Posas Basin should address the lag between infiltration at the surface and recharge at depth. See my presentation dated September 6, 2018 regarding this issue (provided at September TAG meeting).
16. The model should be used to assess data gaps and future monitoring programs. I am sure that the United modeling staff (as well as the Calleguas modeling staff) can identify key data gaps to be addressed in future data collection and monitoring programs, including those described in the draft GSPs. For example, groundwater levels can be retrieved from the models and used to construct hydrographs. These hydrographs can be compared to available hydrographs to judge the potential added value of proposed new monitoring locations in the draft GSPs or other proposed monitoring locations.
17. Application of uncertainty analysis as described in, ***Approaches in Highly Parameterized Inversion: PEST++ Version 3, A Parameter ESTimation and Uncertainty Analysis Software Suite Optimized for Large Environmental Models*** *by* David E. Welter, Jeremy T. White, Randall J. Hunt, and John E. Doherty, 2015, would be useful in assessing model uncertainty and assessing data gaps. Model uncertainty should be assessed relative to more than just seawater intrusion. TAG could be consulted to identify key model outputs that need to be analyzed.

Appendix E Water Quality Hydrographs – no comment

Appendix F FCGMA Water Quality Statistics – no comment

Appendix G Pleasant Valley Basin 303(d) List Reaches – no comment

Appendix H GeoTracker Open Sites – no comment

Appendix I Model Peer Review

1. The uncertainty analysis approach used in the Peer review is not the conventional approach used in the groundwater community. The uncertainty analysis presented is, at best, gross approximations, which may change significantly using more conventional approaches. The UWCD and CMWD models peer review reports provided by Dudek as appendices in the GSPs present “uncertainty analysis” of potential SYs based on Global Sensitivity Analysis (GSA). The GSA approach limits the analysis to small sets of parameters and does not maintain calibration of the groundwater flow models in assessing uncertainty of model parameters to model outputs, which leads to serious questions of the validity of the uncertainty bounds presented (both in the peer review reports and GSPs). Use of GSA in the groundwater models peer review is a significant departure from the scope of work approved by the FCGMA Board. The peer review scope of work called for uncertainty analysis based on the following process described by USGS in ***Approaches to Highly Parameterized Inversion: A Guide to Using PEST for Model-Parameter and Predictive Uncertainty Analysis***, by John Doherty, Randall J. Hunt, and Matthew

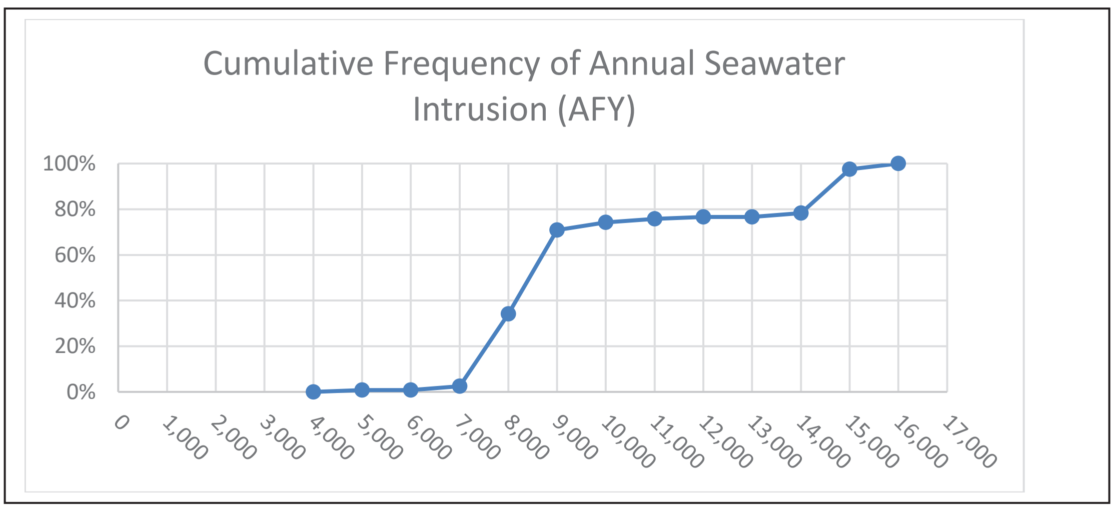
J. Tonkin, 2010. Use of GSA is not a conventional approach being used as an industry standard for uncertainty analysis in surface water and groundwater studies. GSA has been introduced relatively recently as a means to assess relative importance of parameters in groundwater modeling (see for example, ***Approaches in Highly Parameterized Inversion: PEST++ Version 3, A Parameter ESTimation and Uncertainty Analysis Software Suite Optimized for Large Environmental Models*** *by* David E. Welter, Jeremy T. White, Randall J. Hunt, and John E. Doherty, 2015.*)*. GSA is not the industry standard being used to assess uncertainty and as such has not undergone extensive scrutiny and peer review by groundwater professionals. Review of popular modeling software platforms such as GMS, Groundwater Vistas, and Visual MODFLOW typically integrate the PEST suite of programs for model calibration and uncertainty analysis. The USGS has focused their efforts on uncertainty analysis through the use of and further development of the PEST suite of programs in cooperation with Dr. John Doherty. It is recommended that the approach used by the USGS, as in the original scope of work, be considered in further assessing uncertainty. In addition, these approaches can be used to assess the worth of data of future monitoring programs to focus expensive data collection programs (such as installation of new groundwater monitoring wells).

2. Not all Type IV parameters are included in the analysis and some non-type IV parameters are included, only 20 of 35 listed by UWCD are examined in this peer review. Also, about one third of the parameters are from the WLP basin. Please explain how the subset was selected. It seems some of these parameters, e.g., L6Kh and L6Kz zone values could be significant. Also, Type II parameters did show significant sensitivity to water budget (>1,000 AFY), so why were these parameters not considered in the analysis as water budget components are significant relative to seawater intrusion?
3. RMSE and ARM values are degraded from the original calibrated groundwater model value. What efforts were undertaken to assess which, if any, of the model simulations of the 120 realizations continue to represent the observed groundwater levels in the basins? Were hydrographs constructed to see how groundwater levels changed between realizations? The advantage of conducting uncertainty analyses using the conventional approach described in Comment No. 1 is that the groundwater model is required to maintain its calibration, while assessing changes in parameter values and combination of parameters, which does not appear to be the case in this GSA-type uncertainty analysis.
4. The last sentence of paragraph 3 on page 6 is very important. Only a small subset of parameters and variances of those parameters were assessed. The conventional approach to uncertainty analysis as described in Comment No. 1 would assess a much larger suite of parameters and variances, using Bayesian analysis to examine the uncertainty of model outputs to inputs. Using a sensitivity analysis to select parameters for a more limited GSA analysis may eliminate some important combinations of parameters that may significantly impact uncertainty, particularly posterior estimates.
5. This GSA analysis was focused on seawater intrusion, however, there are other uncertainties that are important to SY analysis, including interbasin flows, basin storage, and recharge from the different surface waters.
6. The commentary/recommendations on page 7, paragraph 5 seem highly important and throw some doubt/questions about the current analysis. ARM and RMSE is highly dependent on the Forebay such that the analysis is less sensitive to heads and gradients near the coast. It would

be important to weight the coastal heads and gradients. Also, need to look at vertical gradients across aquitards, which is not considered in this analysis.

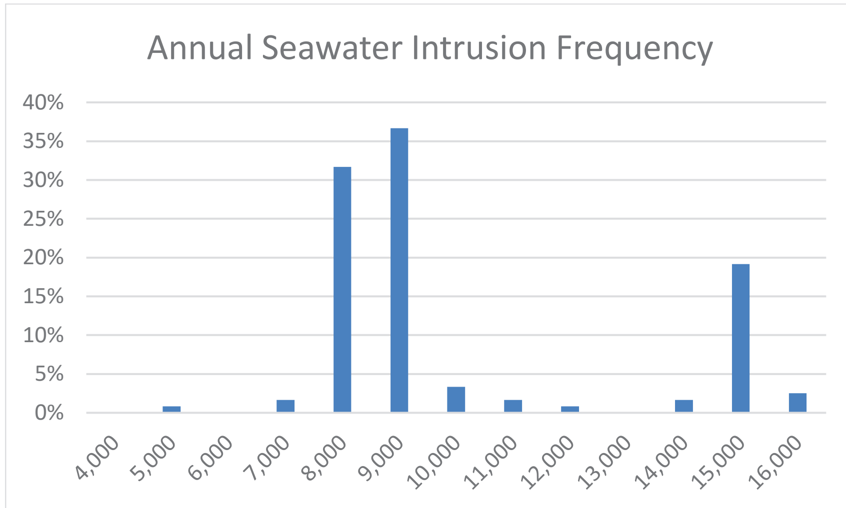
7. It is not clear that the analysis presented in Section 2.3.2.1 is a valid analysis of seawater flux differences based on differences between modeled and observed water levels. Obviously, groundwater (seawater) flux is based on hydraulic gradients, not water levels. It is not clear how comparing groundwater level residuals will relate to any meaningful relation to hydraulic gradients. It would be interesting to see a comparison between the results obtained in Section 2.3.2.2 for each segment of the coastline analyzed in this section. In Section 2.3.2.2, the conclusion is that the uncertainty calculated between the 2 methods is comparable, but it this simply a coincidence? A more direct comparison would show how the two methods are similar or different.

8. The stated mean seawater flux from the 120 realizations is 312,064 AF on page 9, paragraph 3. I get a mean value of 299,880 AF (9,674 AFY) based on the values reported in Table 2. Also, the median calculated from Table 2 is 258,977 AF (8,354 AFY), half the values are lower and half are higher. Nearly 75% of the values are lower than 10,000 AFY (approximately value estimated by UWCD). The cumulative frequency plot of the annual seawater values does not follow a classic cumulative probability curve as shown in the following plot.



7385 Santa Rosa Road ▪ Camarillo, CA 93012-9284
Phone: (805) 482-4677 ▪ FAX: (805) 987-4797
Website: www.camrosa.com

A histogram of annual seawater intrusion frequency shows a bi-model distribution as shown in the following plot.



9. The standard deviation, or uncertainty, of the combined UAS+LAS seawater intrusion is given as 2,994 AFY on page 9, paragraph 3. However, the standard deviation of the seawater intrusion values in Table 2 is calculated as 2,847 AFY.

10. I submitted a memorandum dated March 3, 2019, to TAG in review of Section 2.3.2.2 Sustainable Yield. I asked for this memorandum to be agendized at a future TAG meeting but it was not agendized for discussion so I am including this memorandum as Attachment 3, as part of my comments on the Peer Review report.

Attachment 1

Memo

To: Kim Loeb, TAG Members and Dudek

From: Terry Foreman

Date: February 11, 2019

Re: Sustainable Yield Analysis

This memorandum is a follow-up to my comments at the February 6th TAG meeting. The sustainable yield values presented in Dudek's January 31, 2019 Memorandum do not represent the sustainable yield of the basins. In fact, the sustainable yield values presented in the memo are simply pumping rates over a 30-year period for one set of alternatives (two) to attempt to achieve sustainability. Dudek's proposed pumping rates are those rates believed necessary to offset higher pumping rates in the first 20 years of a 50-year simulation period, to minimize the potential for seawater intrusion. As will be shown herein, the sustainable yield could be as much as 40 percent higher than the values proposed by Dudek. In fact, the simulated pumping and resulting yield values have an implicit assumption that the basins require in-lieu replenishment (pumping below the sustainable yield) to refill basin depleted storage, resulting in substantially lower sustainable yield values are than necessary. The discussion of replenishment of depleted storage should be provided more explicitly for stakeholder understanding and input.

What is Sustainable Yield?

In order to assess sustainable yield, it is important to review the definition as intended by the State legislature. One has to go to the definitions given in the Sustainable Groundwater Management Act (Act) of 2014 to find the definition of sustainable yield as there is no explicit definition provided in the regulations, except to refer to the Act itself and Bulletin 118. Sustainable yield as defined in the Act is as follows:

"*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 effect.*"

This definition is commonly used in literature, groundwater basin adjudications, and is also the definition used for safe yield in early editions of Bulletin 118 (more recent versions refer to overdraft, which essentially is the resulting condition when safe yield is exceeded).

So, the key points are, 1) maximum quantity of water that can be withdrawn annually, 2) over a base period representative of long-term conditions (land use, pumping patterns, hydrology, and other water supply uses) and 3) without causing undesirable results (e.g., seawater intrusion, water quality degradation, chronic lowering of groundwater levels, depletion of storage and land subsidence). Dudek's assessment of sustainable yield are not consistent with key points 1 and 2 of the definition. Key points 1 and 2 are addressed below, key point 2 first, then key point 1. There is more stakeholder discussion required relative to key point 3, so it is not addressed in any substantive fashion as a part of this Memo.

Base Period Representative of Long-Term Conditions

TAG had a number of discussions about the base period and selected two time frames as representative of long-term hydrologic conditions: 1930-1979 and 1940-1989. In addition, existing land use and recent pumping pattern distributions were assumed to be representative of land use and water uses going forward. As there was agreement that these two 50-year periods are representative of long-term hydrologic conditions based on cumulative departure from average precipitation I will not discuss the selection of the base period further.

Dudek's assessment of sustainable yield departs from using the 50-year base periods as representative of long-term conditions, as selected by TAG. Instead, Dudek divides the 50-year period into 2 periods: a 20-year implementation period, which is the period in which a GSA has to achieve sustainability, and a 30-year sustaining period to show sustainability (I do not believe these terms are specifically defined by DWR, but instead used by Dudek for discussion purposes). This division was done presumably in response to DWR's draft Sustainable Management Criteria BMP (DWR, November 2017), which indicates that violation of Minimum Thresholds and Measurable Objectives are acceptable during the implementation period, whereas violation of them is not acceptable during the sustaining period. Dudek assesses that the sustainable yield of the basins is the pumping rate that precludes undesirable results (largely based on limiting the potential for seawater intrusion in the case of West Las Posas, Pleasant Valley and Oxnard Basins) during the 30-year sustaining period. This is simply incorrect.

The sustainable yield should be based on the entire 50-year base period as selected by TAG. Use of any sub period of the base period risks not being representative of long-term conditions. For example, Figure 1 shows the cumulative departure from average precipitation of a precipitation station located at Oxnard's Water Department. The long-term average precipitation from 1930 to 1979 at this station is 14.39 inches. The average precipitation from 1930 to 1949 is 15.02 inches and from 1950 to 1979 is 13.97 inches. Figure 2 shows the volume of precipitation simulated in UWCD's groundwater model for the period 1930-1979, 1930-1949 and 1950-1979 over the 3 basins: West Las Posas, Oxnard and Pleasant Valley Basins. Both charts show that the implementation period and sustainability periods are not representative of long-term conditions in the basins and therefore cannot be used to assess sustainable yield over these periods. The correct period for assessing sustainable yield, as selected by TAG, is the full 50-year representative period.

Maximum Quantity Of Water That Can Be Withdrawn Annually

The maximum quantity of water that can be withdrawn annually over the representative base period will satisfy the following water balance equation:

$$\sum R - \sum D = \Delta S, \text{ where } \Delta S=0 \qquad (1)$$

and, $\sum$ is the summation operator, R is recharge components (precipitation, streamflow leakage, applied water, interbasin flows, etc.), D is discharge components (pumping, evapotranspiration, discharge to streams, interbasin flow, etc.) and ΔS is change in groundwater storage. This equation states that the sum of recharge components and sum of discharge components are in balance over the long-term base period such that the long-term cumulative change in storage is unchanged (0) by the end of the base period. So, the long-term average pumping rate that makes the D, discharge term in Equation 1 balance the recharge terms, and make $\Delta S=0$, is the sustainable yield pumping rate. There are specific local conditions that may limit pumping to lower values, however, discussion of those conditions is beyond the scope of this Memo.

Based on Equation 1, the average pumping rate over the 50-year simulation period, simulated in UWCD's groundwater model, is the sustainable yield of the basin, not the pumping rate over the 30-year non-representative "sustaining" period. The error in the analysis can be demonstrated by substituting the various pumping rates (50-year average versus 30-year sustaining period average) into UWCD's groundwater model and rerunning the model over the 50-year base period. However, we can also do a simplified model, using Excel and the annual water budget components simulated in UWCD's groundwater model, to show that the sustainable yield of a basin is not the pumping rate over the 30-year sustaining period. While this more simplified analysis demonstrates the actual likely sustainable yield, it would be advised to use UWCD's groundwater model to more fully validate the sustainable yield values.

I have selected the 35Ox20PVWLP scenario model simulation results for the Pleasant Valley Basin to demonstrate that Dudek's assessment of sustainable yield is incorrect. I created a table of annual water budget components, recharge and discharge, and simply changed the pumping rates, recomputed the annual ΔS in accordance with Equation 1, and then plotted cumulative change in storage to show the ending change in storage compared to the beginning basin storage. While some groundwater budget components might change with these changed pumping rates, I think the changes would not significantly change the principal critique presented in this Memo.

Based on UWCD's groundwater model, the average pumping in the Pleasant Valley Basin over the 50-year base period is approximately 9,800 AFY. The average pumping over the 30-year sustaining period is 7,600 AFY. Note this 7,600 AFY value is 600 AFY higher than presented in Dudek's Memo, this is likely due to boundary edge effects that incorporates pumping outside the true basin in model cells that approximate the Pleasant Valley Basin. This difference does not affect the analysis here, but the pumping rates might be slightly off from the actual values within the actual basin boundary (i.e., the pumping outside the basin would need to be excluded from the yield as it is yield in another adjacent basin).

Figure 3 shows the cumulative change in storage for the Original Model simulation results, substitution of Dudek's 7,600 AFY pumping as the sustainable yield and substitution of 9,800 AFY for pumping as the sustainable yield. It is important to note that the Original Model pumping rate averaged 9,800 AFY over the 50-year simulation period, but pumping in the first 20 years averaged 13,100 AFY, representing the assumed ramp down from the basin average 2015-2017 pumping rate over the first 20 years.

Figure 3 shows that pumping at an average of 7,600 AFY over the 50-year representative base period is significantly lower than that required to balance Equation 1. In fact, storage in the basin increases by more than 150,000 AF over the beginning storage in the basin. Using an average of 9,800 AFY over the 50-year representative base period results in an ending storage that is equal to the ending storage condition simulated in the Original Model simulation, which is expected. However, the path in the change is storage is different as a result of average pumping as opposed to high pumping in early years and lower pumping in later years. It is clear from this analysis that the sustainable yield of the basin should be assessed as the average pumping over the 50-year base period and not the pumping rate over the 30-year sustaining period.

Dudek's Assessment Implicitly Assumes An In-Lieu Replenishment Requirement

Figure 3 shows that the cumulative change in storage is +48,870 AF over the 50-year period for the Original Model and for the case using a constant 9,800 AFY sustainable yield. In effect, the ΔS is +48,870 AF, not 0, which indicates a surplus of recharge relative to discharge. In actuality, the sustainable yield is defined as the maximum quantity of water that can be extracted annually without undesirable results, which is assumed to be the case when ΔS is 0 (i.e., water budget is balanced). In order for the water budget to be balanced, pumping can be increased to approximately 10,800 AFY as shown in Figure 4. This value is 3,200 AFY, about 40%, greater than the sustainable yield assessed by Dudek. The difference in the sustainable yield value of 10,800 and 9,800 AFY indicates that there is a need to increase storage in the Pleasant Valley Basin by about 1,000 AFY over the 50-year base period, otherwise, 10,800 AFY would be the sustainable yield supported by Equation 1. This 1,000 AFY implies an in-lieu replenishment (recharge by reduction of pumping) rate requirement to raise storage in the basin. If this replenishment is required to address historical storage depletion in the basin, then it should be explicitly acknowledged, so it can be understood and subject to discussion by stakeholders.

It is beyond the scope of this Memo to comment on the need for in-lieu replenishment, so this issue is not discussed further in this Memo.

Discussion

This Memo demonstrates that the sustainable yield assessed by Dudek's January 31st Memo is not correct. The correct sustainable yield is determined from the full 50-year representative base period. Dudek simply mistook the average pumping rate over the 30-year sustaining period as the sustainable yield of each basin, which is incorrect. In fact, Dudek has presented only one set of alternatives for extracting the sustainable yield over the representative base period, which involves higher pumping in the early years and lower pumping in later years. Alternatively, pumping could immediately be reduced to 10,800 AFY on average, which may not be preferred but it is another option that could be further evaluated with other alternatives. Clearly, there are other alternatives for reaching sustainability. In addition, Dudek implicitly assumes that there is a requirement to replace depleted storage in the basins: such requirement should be identified explicitly and explained for transparency to all stakeholders.

It is clear from Figures 3 and 4 that groundwater levels will be different for various alternatives to achieve sustainability. Groundwater levels will be defined by the scenario simulated, so this fact needs to be clearly understood and addressed in setting Minimum Thresholds and Measurable Objectives. It is certain that actual groundwater levels in the future will be different than those simulated, with the water-level differences depending on departures of actual hydrology, pumping and management actions from those simulated with the groundwater model.

It is important to accurately state the sustainable yield of the basins (as best as we can estimate it, given with any uncertainty about these best estimates), so that all stakeholders are working from the same basic understanding. This will allow all interested parties to identify and propose alternative approaches to achieve sustainability as the process moves forward.

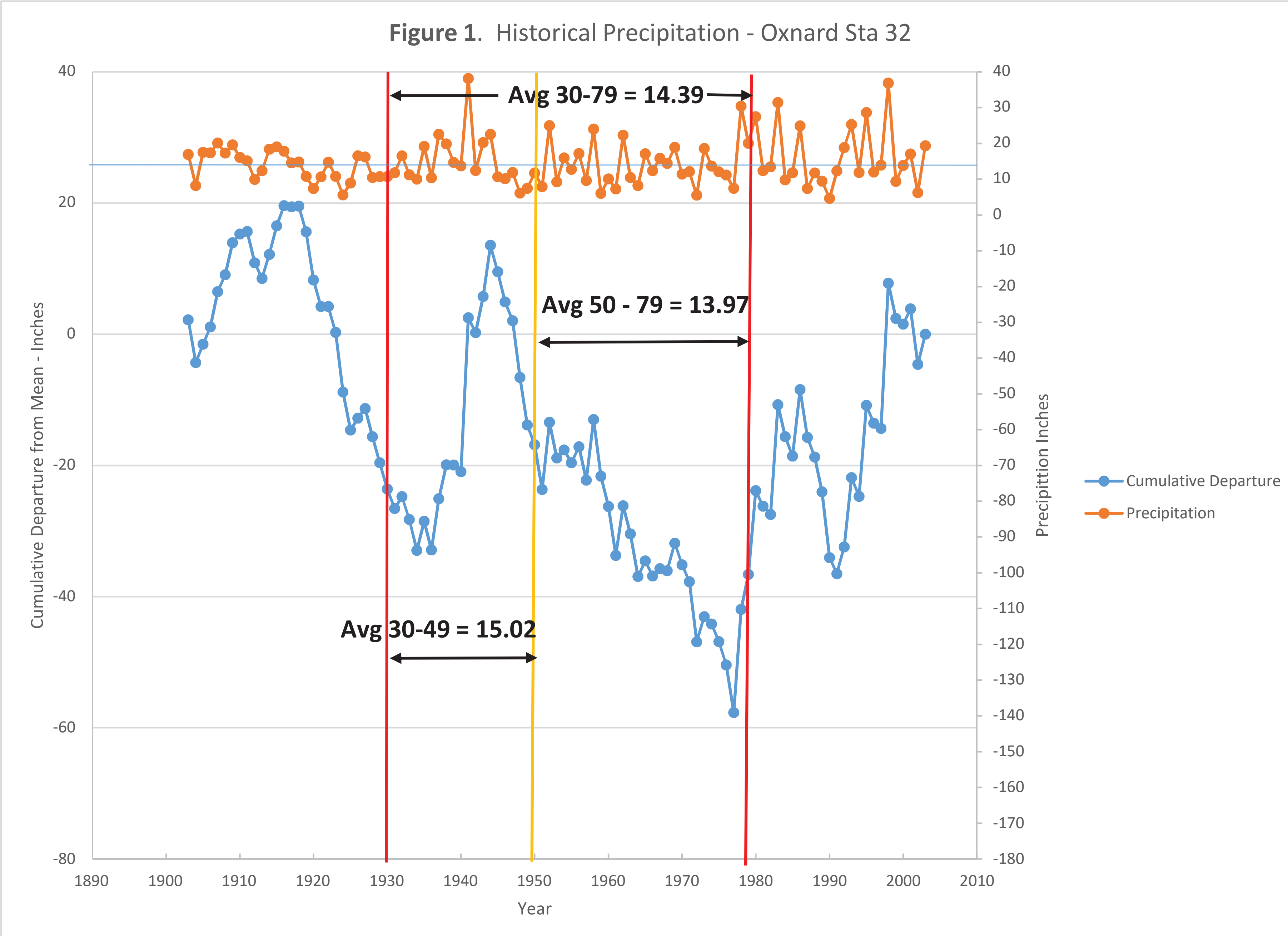


Figure 1. Historical Precipitation - Oxnard Sta 32
Avg 30-79 = 14.39
Avg 50 - 79 = 13.97
Avg 30-49 = 15.02
Cumulative Departure from Mean - Inches
Precipition Inches
Year
Cumulative Departure
Precipitation
40
20
0
-20
-40
-60
-80
30
10
-10
-30
-50
-70
-90
-100
-110
-120
-130
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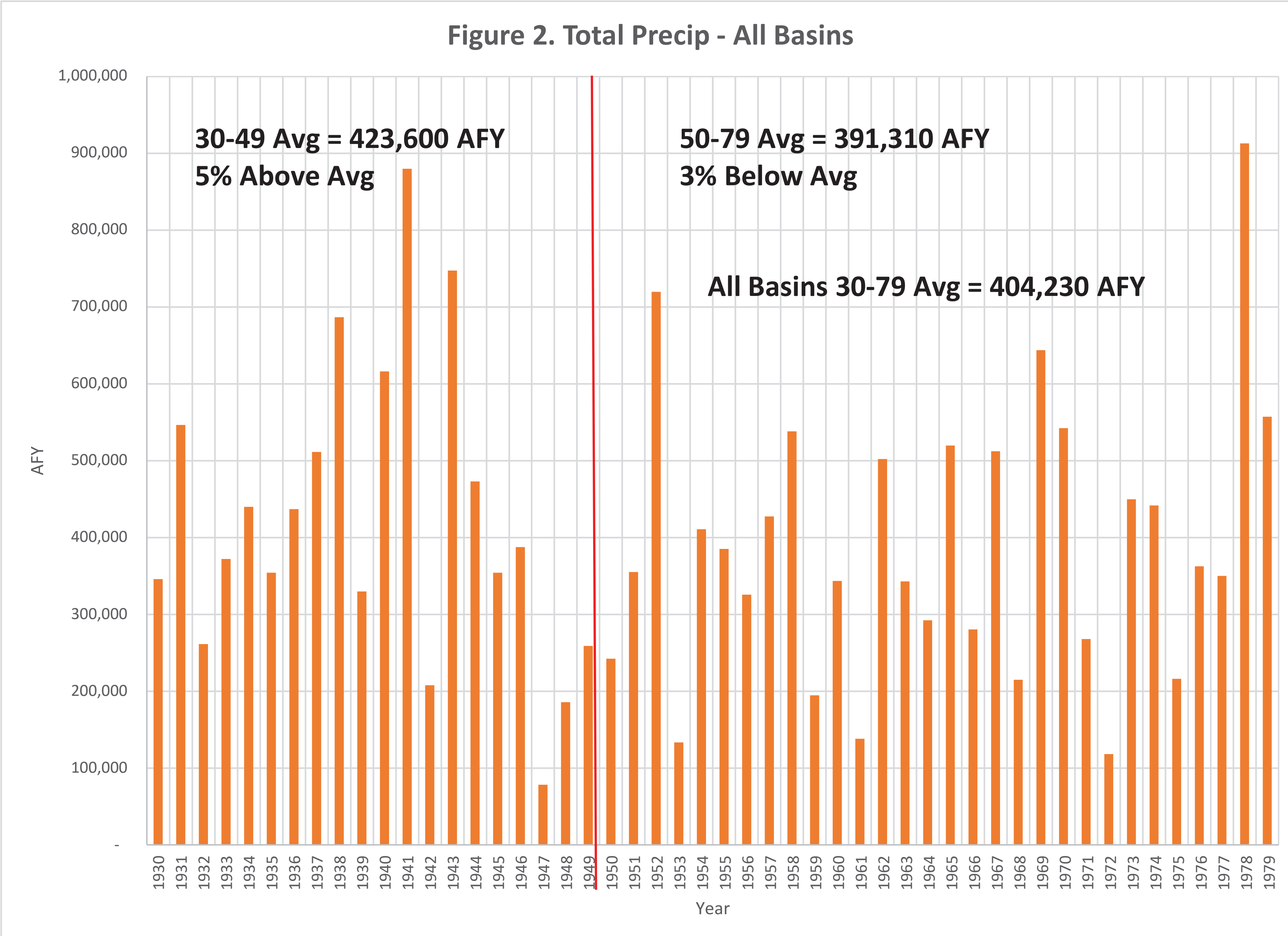


Figure 2. Total Precip - All Basins
30-49 Avg = 423,600 AFY
5% Above Avg
50-79 Avg = 391,310 AFY
3% Below Avg
All Basins 30-79 Avg = 404,230 AFY
AFY
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
-
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
Year

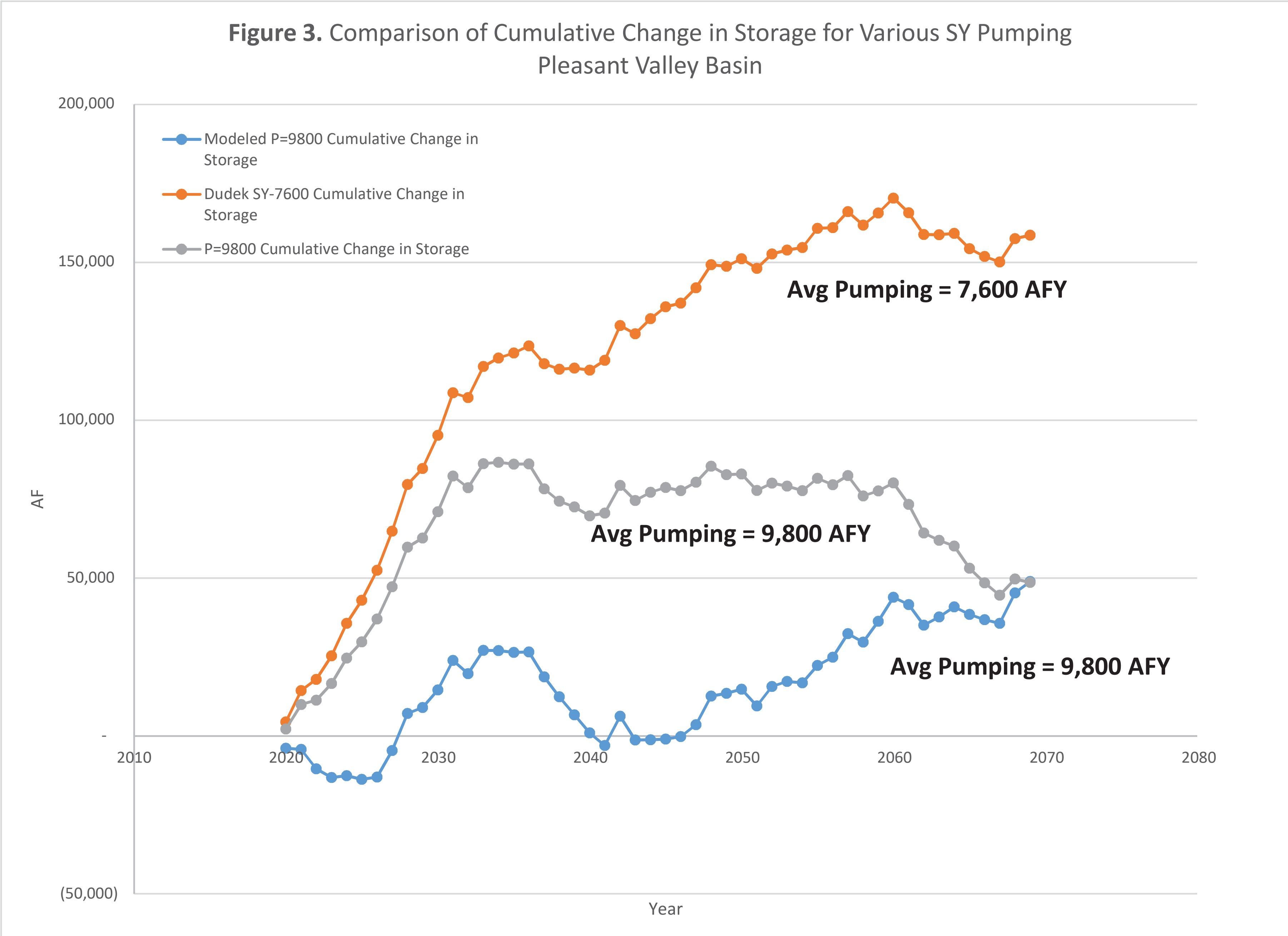
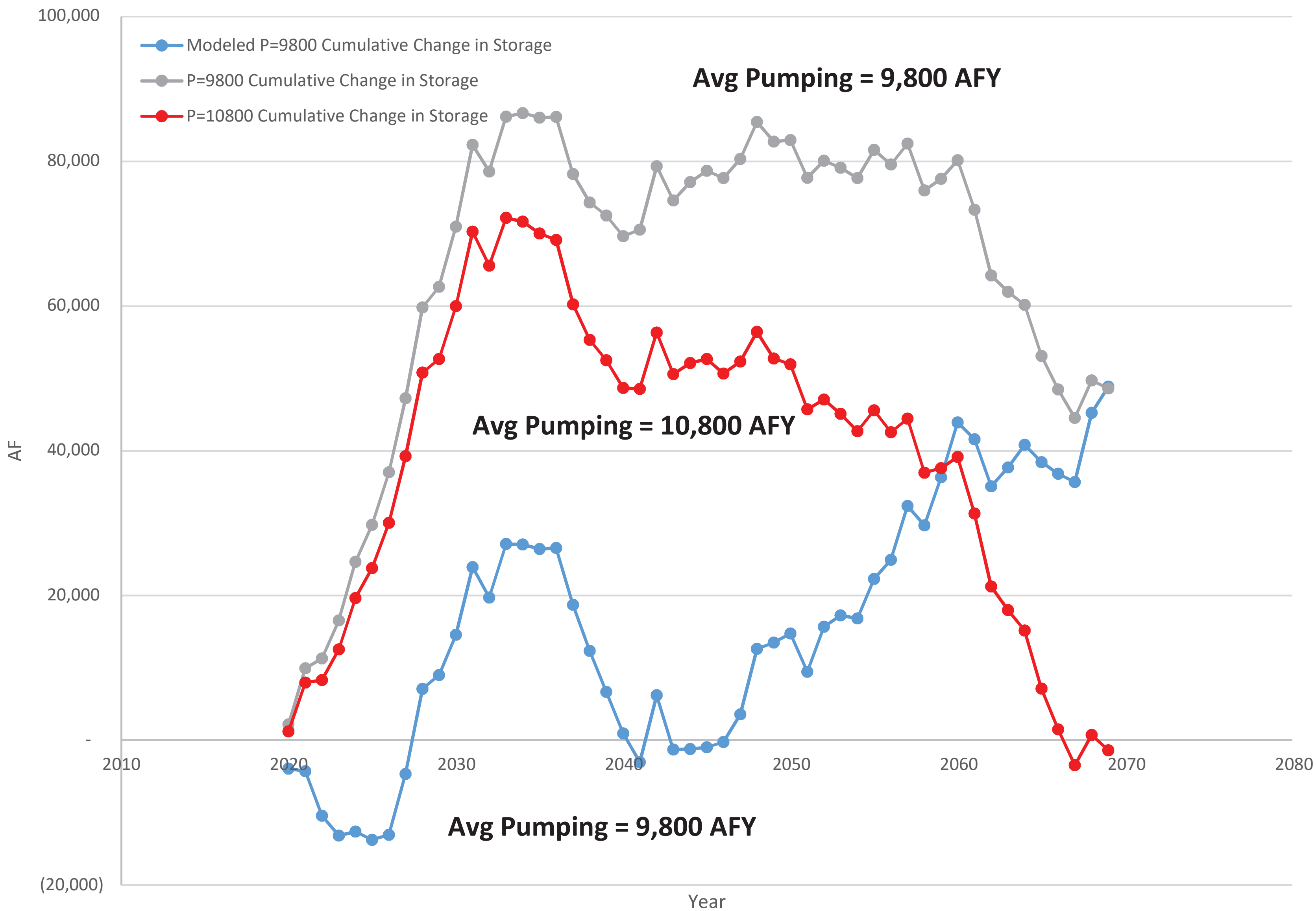


Figure 3. Comparison of Cumulative Change in Storage for Various SY Pumping
Pleasant Valley Basin
200,000
150,000
100,000
50,000
-
(50,000)
AF
2010
2020
2030
2040
2050
2060
2070
2080
Year
Modeled P=9800 Cumulative Change in Storage
Dudek SY-7600 Cumulative Change in Storage
P=9800 Cumulative Change in Storage
Avg Pumping = 7,600 AFY
Avg Pumping = 9,800 AFY
Avg Pumping = 9,800 AFY

Figure 4. Comparison of Cumulative Change in Storage for Various SY Pumping Values
Pleasant Valley Basin

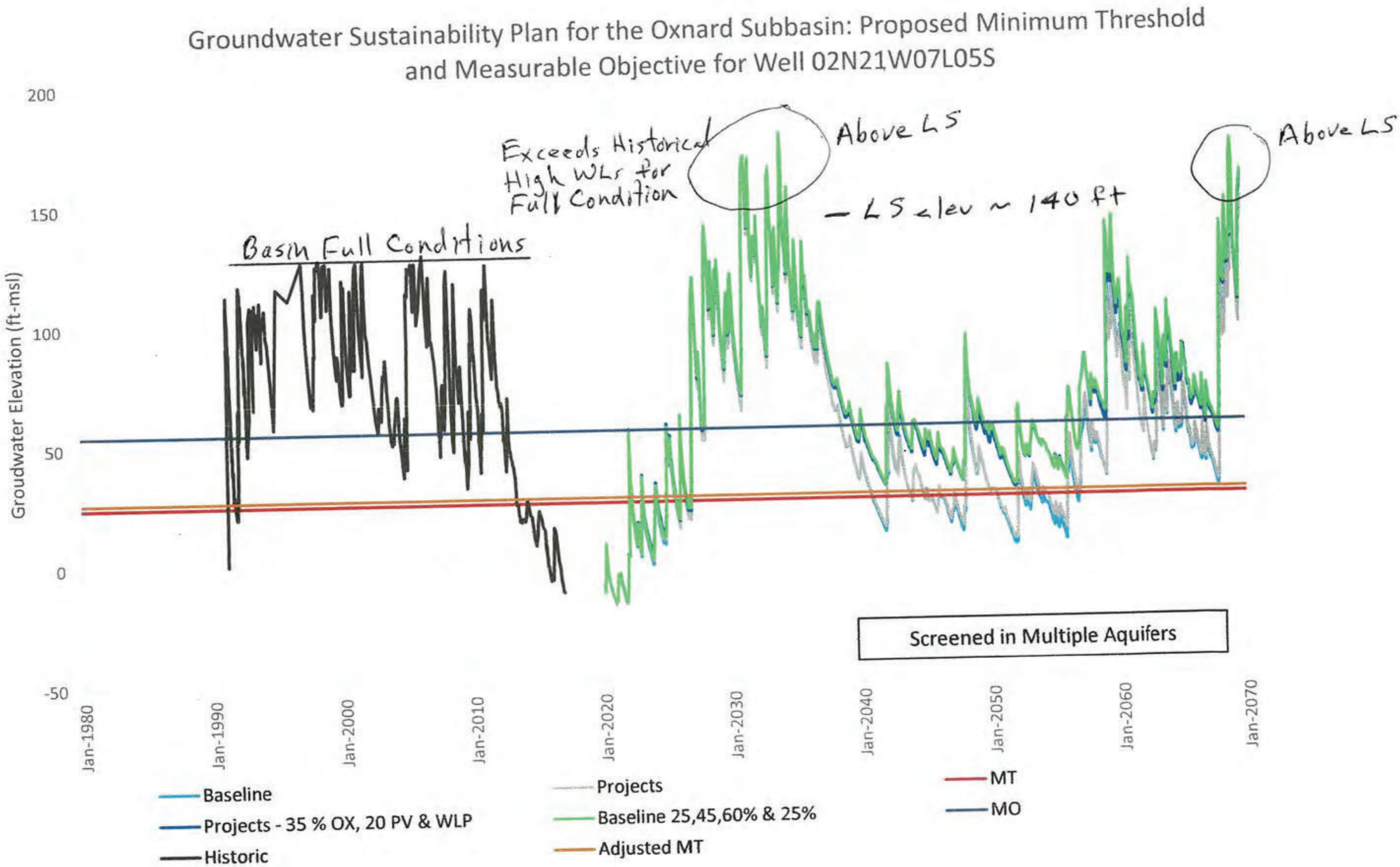


Attachment 2

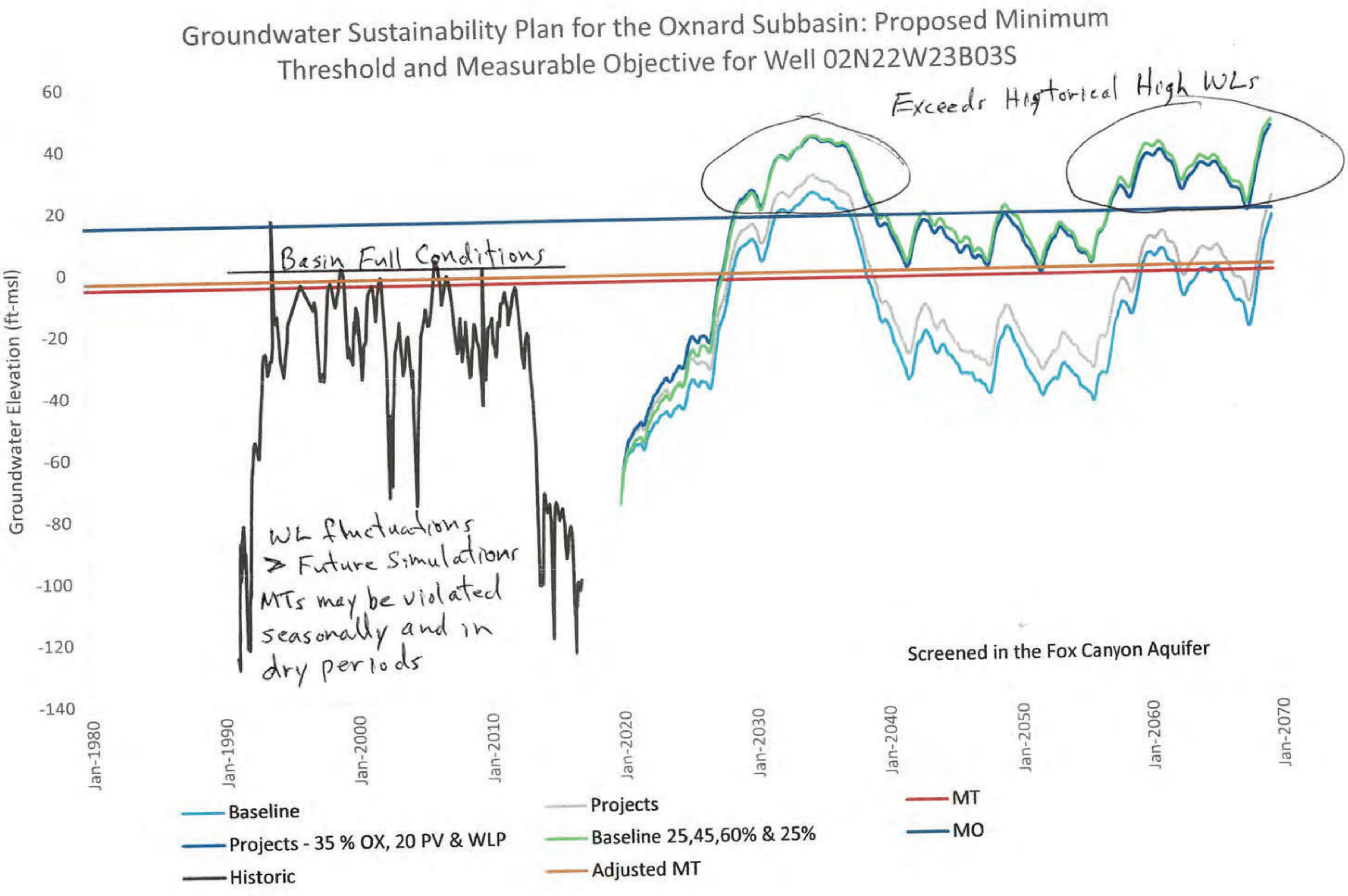
Well/Basin	Aquifer	Minimum Threshold (ft MSL)	Adjusted Minimum Threshold (ft MSL)	Measurable Objective (ft MSL)	Historic Minimum (ft MSL)	Historic Maximum (ft MSL)	Google Earth Approximate Land Surface Elev. (ft MSL)	High WLs Above LS	Historical Fluctuations > Future Simulated Fluctuations	Potential Issues
Oxnard Basin										
01N21W32Q06S	Oxnard	0	2	15	-25.84	5.23	5	x	x	
01N22W20J08S	Oxnard	5	7	15	-18.01	26.21	23	x	x	
01N22W26J04S	Oxnard	0	2	15	-28.32	20.39	5	x	x	
01N22W27C03S	Oxnard	5	7	15	-18.64	22.31	5	x	x	
01N23W01C05S	Oxnard	5	7	15	-6.85	23.85	23	x		
02N22W36E06S	Oxnard	10	12	35	-30.18	42.61	62	x		
01N21W32Q05S	Mugu	0	2	15	-111.58	-17.45	10	x	x	
01N21W32Q07S	Mugu	0	2	15	-75.31	-8.52	10	x	x	
01N22W20J07S	Mugu	5	7	15	-19.87	24.36	23	x	x	
01N22W26J03S	Mugu	0	2	15	-52.64	10.55	12	x	x	
01N22W27C02S	Mugu	5	7	15	-27.25	21.38	5	x	x	
02N21W07L06S	Mugu	25	27	60	-12.21	133.27	132	x		
02N22W23B07S	Mugu	15	17	45	-40.91	83.04	100	?		
02N22W36E05S	Mugu	10	12	35	-22.41	64.49	57	x		
01N22W20J05S	Hueneme	0	2	15	-35.73	23.96	20	x	x	
01N23W01C03S	Hueneme	5	7	20	-38.67	26.43	23	x		
01N23W01C04S	Hueneme	5	7	20	-35.16	32.53	23	x	x	
02N22W23B04S	Hueneme	-5	-3	15	-147.08	92.97	100			
02N22W23B05S	Hueneme	-5	-3	15	-121.01	16.85	100			
02N22W23B06S	Hueneme	15	17	45	-45.7	74.3	100	?		
02N22W36E03S	Hueneme	10	12	35	-51.77	63.53	70	?		
02N22W36E04S	Hueneme	10	12	35	-32.12	63.08	70	?		
01N21W32Q04S	Fox	-25	-23	0	-120.74	-19.46	5	x	x	
01N22W20J04S	Fox	0	2	15	-47.19	17.91	23	x	x	
01N22W26K03S	Fox	-20	-18	0	-105.69	-21.84	8	x		
01N23W01C02S	Fox	5	7	20	-48.3	17.27	23	x	x	
02N21W07L04S	Fox	15	17	40	-32.02	102.76	121			
02N22W23B03S	Fox	-5	-3	15	-128.69	16.52	103		x	
01N21W32Q02S	Grimes	-25	-23	0	-118.83	-21.21	5	x	x	
01N21W32Q03S	Grimes	-25	-23	0	-129.7	-20.56	5	x	x	
01N21W07J02S	Multiple	-40	-38	0	-213.41	-15.5	131		x	
01N21W21H02S	Multiple	-70	-68	-10	-171.23	-19.09	5	x	x	
02N21W07L03S	Multiple	15	17	35	-24.59	99.16	139	x		
02N21W07L05S	Multiple	25	27	55	-12.22	129.35	139	x		

Well/Basin	Aquifer	Minimum Threshold (ft MSL)	Adjusted Minimum Threshold (ft MSL)	Measurable Objective (ft MSL)	Historic Minimum (ft MSL)	Historic Maximum (ft MSL)	Google Earth Approximate Land Surface Elev. (ft MSL)	High WLs Above LS	Historical Fluctuations > Future Simulated Fluctuations	Potential Issues
Pleasant Valley										
02N21W34G05S	Older Alluvium (Oxnard	30	32	40	-69	43.94	86		x	
01N21W03K01S	Older Alluvium (Mugu)	-55	-53	5	-113.98	-3.98	54		x	
02N21W34G04S	Older Alluvium (Mugu)	-50	-48	5	-131.5	-2.568	86		x	
01N21W03C01S	Fox	-50	-48	0	-181.6	-15.2	70		x	
02N20W19M05S	Fox	-135	--	65	3.47	103.3	200			
02N21W34G02S	Fox	-55	-53	0	-172.8	-10.61	86			
02N21W34G03S	Fox	-55	-53	0	-173.7	-10.92	86		x	
01N21W02P01S	Multiple	-45	-43	5	-120.42	4.18	54		x	
01N21W04K01S	Multiple	-50	-48	0	-145.48	-18.48	54		x	

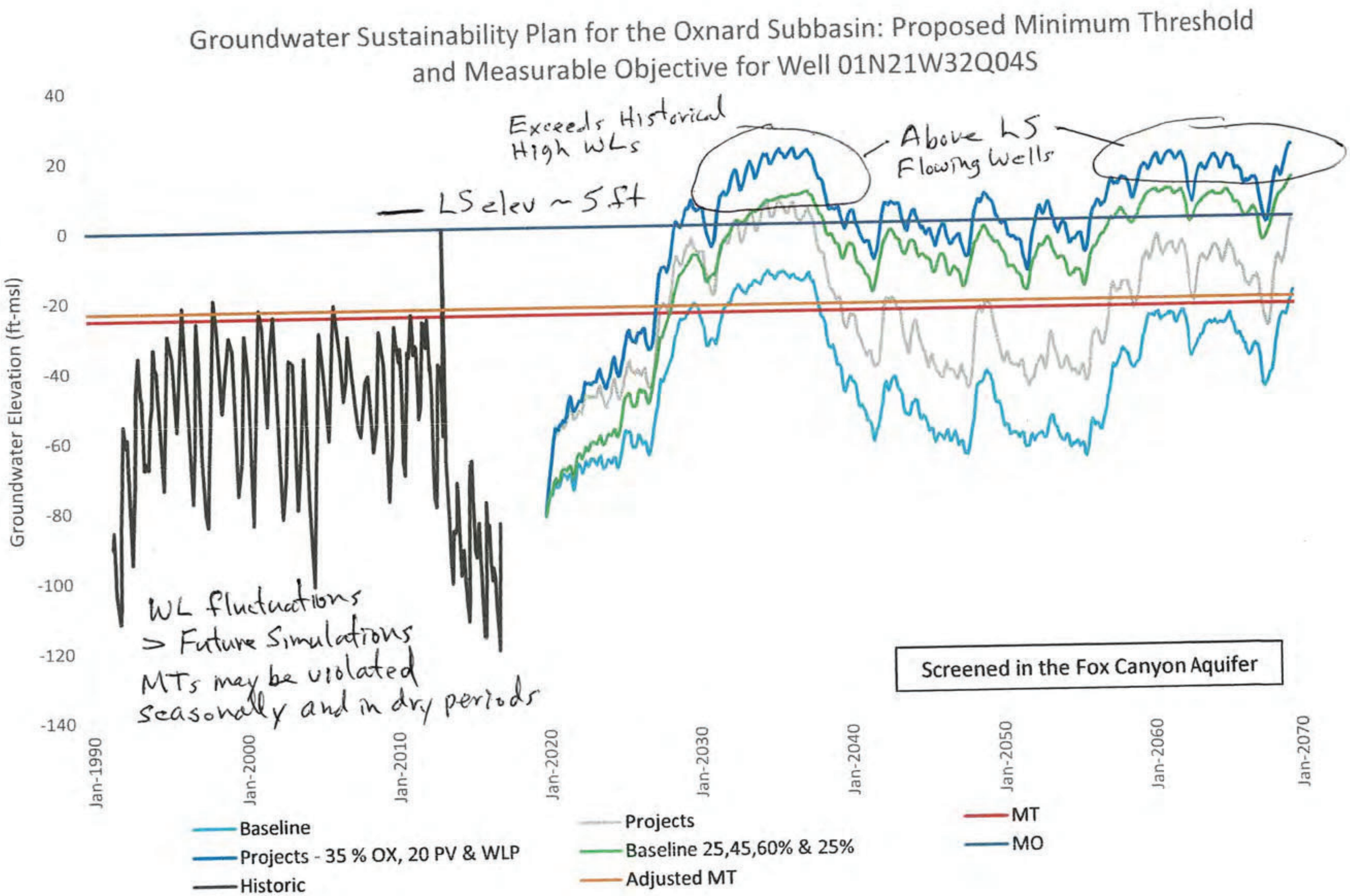
Simulated highs above historic high WLs in Forebay- simulated WLs may not be realistic
Potential for flowing wells
Historical WL fluctuations greater than future simulated fluctuations
MTs may be violated due to seasonal and dry-period amplifications
WL - groundwater levels
LS - land surface
MSL - mean sea level



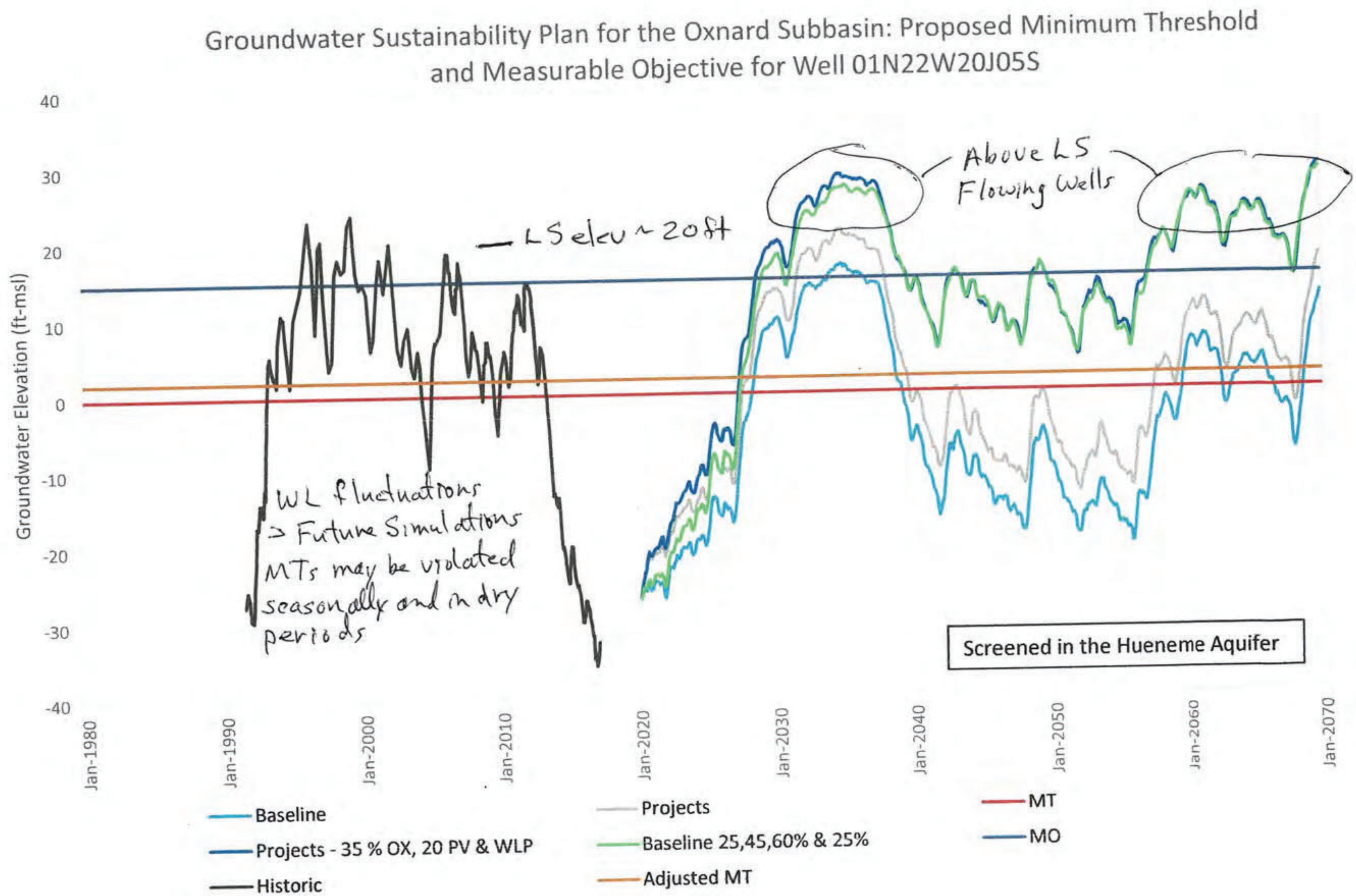
Prepared on 3/6/2019



Prepared on 3/6/2019



Prepared on 3/6/2019



Prepared on 3/6/2019

Attachment 3

Memo

To: TAG Members
Kim Loeb/GMA
Peter Quinlan/Dudek

From: Terry Foreman

Date: March 1, 2019

Re: Pumping Versus Seawater Intrusion Relations

This Memo is a follow-up to our discussion at the February 19th TAG meeting. I expressed concern about the relations between pumping and seawater intrusion as shown in Figures 4 through 7 of your Peer Review report dated February 2019, which are based on the last 30 years of groundwater model simulation results for future scenarios of pumping in the Oxnard-Pleasant Valley-West Las Posas areas. You agreed to redo the plots using all 50 years of simulation. I expressed concern that the relation between pumping and seawater intrusion is more complex than defined by a simple linear relationship between pumping and seawater intrusion, even though the groundwater equations are linear. I will show in this Memo the basis of my concerns. However, I do agree that the linear analysis that you are using is a reasonable first approximation of allowable pumping to limit seawater intrusion, provided the estimates are caveated as described in this Memo. However, relations of pumping versus seawater intrusion should be used as a tool, not as a solution, to iterate to possible maximum sustainable yield values using groundwater model simulations. Groundwater model simulations should be conducted to assess actual sustainable yield of groundwater basins given the complex nature of groundwater flow conditions and effects of pumping on other water budget items in the basin.

I have divided my comments and assessments presented in this Memo into the following areas:

- Pumping Versus Seawater Intrusion Is Linear For Steady-State Conditions
- Real Groundwater Basins Conditions Complicate the Application of The Linear Relation Between Pumping and Seawater Intrusion
- Use of Pumping Versus SWI Plots to Assess Sustainable Yield – Oxnard Basin
- Use of Pumping Versus SWI Plots to Assess Sustainable Yield – Oxnard-PV-WLP
- Discussion

Pumping Versus Seawater Intrusion Is Linear For Steady-State Conditions

The following equation describes the water balance for a groundwater basin.

$$\sum R - \sum D = \Delta S \qquad 1$$

Where a basin is in a steady-state condition, ΔS = 0, i.e., there is no change in basin storage, and recharge is equal to discharge. We can expand Equation 1 for steady-state conditions as follows:

$$R - SWI - P = 0 \qquad 2$$

By rearranging terms, we can show the following:

$$R - P = SWI \qquad 3$$

Where, for R>P, SWI is positive, meaning outflow of groundwater to the ocean and for R<P, SWI is negative, meaning inflow from the ocean.

Clearly, Equations 3 is linear, so that any change in pumping (or recharge) results in a linear change in SWI (note that SWI is used to represent both inflow from the seaward direction and outflow from the basin to the sea as opposed to only "intrusion"). This linear assumption is the underpinning for Figures 4 through 7 of the Peer Review Report. However, as shown next, the application of this relationship is more complicated in actual groundwater basins.

Real Groundwater Basins Conditions Complicate the Application of Linear Relation Between Pumping and Seawater Intrusion

The application of the relation between pumping and seawater intrusion in real groundwater basins is complicated by the fact that groundwater flow generally is not steady-state, distribution of pumping can change transient responses of other terms in Equation 1. For short-time periods, changes in storage can dampen changes in SWI with changes in P. I think the steady-state issue can be somewhat overcome if the analysis is completed for a long enough period such that transient effects are largely overcome. I will not dwell on this issue here and assume that the 50-year period is sufficient for the purposes of analysis, however, this should be confirmed in future follow-up analyses.

The principal issues of concern as I see them for the OPV-WLP area are the effects of changes in distribution of pumping on the other R terms (such as stream leakage and interbasin flow) and resulting change in SWI. So, in effect, SWI is not only dependent on changes in P, but it is also similarly dependent on changes in other terms that make up R in Equation 1, which occur with changes in P distribution and timing.

There are several situations where changes in pumping distribution and timing can effect recharge. For example, if pumping is reduced near streams, groundwater levels can build up and cause rejection of stream leakage during wet periods. As recharge from stream leakage is reduced, then there would need to be an increase in seawater intrusion to balance Equation 1. However, alternatively, if pumping is increased near a stream to induce more stream leakage during wet periods, then seawater intrusion would decrease as pumping is balanced by stream leakage as opposed to seawater intrusion. Another example is where pumping is distributed inland, further from the coastline. Pumping far inland requires longer times to induce a gradient from the ocean toward inland areas of pumping. During dry periods, hydraulic gradients continue to increase from the coast toward inland pumping; however, recharge occurring during wet periods can interrupt this gradient formation before significant seawater intrusion take place. On the other hand, pumping near the coast can immediately induce seawater intrusion and may not be mitigated by recharge during wet periods. Obviously, there are many variations on these themes that can affect the terms in Equation 1, which then will affect the relation between pumping and seawater intrusion.

Figure 4 in the Peer Review Report illustrates the above points. As can be seen in Figure 4, the points do not fall on a straight line. I have recreated a plot similar to Figure 4, using the 50-year simulation results, instead of only the last 30-years of the 50-year simulation period, for each of the surrogate models. The surrogate models are the future scenario models used in the Sustainability Assessments discussed at the last few TAG meetings, as follows:

- Baseline – Future Baseline Simulation (2015-2017 average production rates; existing projects; 2070 DWR climate change)

- Projects - Future Baseline Simulation with Projects (2015-2017 average production rates; existing projects; 2070 DWR climate change; potential future projects that met the DWR conditions for incorporation in the GSP)

- Ox35PVWLP20 - Reduction With Projects (35% reduction of 2015-2017 average production rates for the upper aquifer system (UAS) and lower aquifer system (LAS) in the Oxnard Subbasin, 20% reduction for the UAS and LAS in PVB; and 20% in the LAS in WLPMA; existing projects, 2070 DWR climate change; potential future projects that met the DWR conditions for incorporation in the GSP)

- Ox45PVWLP25 - Reduction Without Projects (Reduction of 2015-2017 average production rates by 25% in the UAS, 60% in the LAS and 45% for wells screened in both aquifer systems in the Oxnard Subbasin; 25% reduction for the UAS and LAS in PVB; and 25% in the LAS in WLPMA; existing projects, 2070 DWR climate change)

- Ox55PVWLP0 - Reduction Without Projects (Reduction of 2015-2017 average production rates by 55% for wells Oxnard Subbasin; no pumping reduction PVB or WLP, 2070 DWR climate change)

- Ox55PVWLP20 - Reduction Without Projects (Reduction of 2015-2017 average production rates by 55% for wells Oxnard Subbasin; 20% pumping reduction in PVB and WLP, 2070 DWR climate change)

The relation between pumping and seawater intrusion for the UAS in the Oxnard Basin is shown in Figure A of this Memo (comparable to Figure 4 of the Peer Review Report). I have also labelled several of the points with the modeled scenario name and plotted a blue line to show the path of changes in pumping (lowest to highest) and resulting changes to SWI. As shown in Figure A, the path from the least pumping to the most pumping simulated is not a straight line. The path is affected by the manner of pumping changes as well as the pumping change itself. For example, those scenarios that involve "projects" shift the change relation to the right (i.e., more pumping is allowed, with less seawater intrusion) compared to the baseline scenarios. This change in pumping pattern is significant as shown for the differences in scenarios Baseline OX55PVWLP0 and Projects Ox35PVWLP20, which shows for an increase in pumping of about 7,000 AFY, there is almost no change in SWI. Similarly, the difference in the Baseline and Projects scenarios shows that an increase in pumping resulted in a decrease in SWI, which is the opposite of the overall general relation between pumping and SWI.

The shift in relations between pumping versus seawater intrusion is related to the effects of pumping distribution on other recharge terms in Equation 3, as described above. The changes in R are mostly related to change in interbasin flows if one examines the model water budgets from the simulations (not included here but they are provided by United). Figure A shows two orange lines that bracket the range in relations between pumping and seawater intrusion. The difference in allowable pumping, where the lines cross the "0" SWI line, is about 7,000 AFY. This difference is related to the path one takes to limit seawater intrusion. It turns out that the linear regression on all six scenarios produces a line that crosses the "0" SWI line at the same point as the blue path line shown in Figure A, which is at about 33,000 AFY of pumping.

There are likely other scenarios that may increase the spread of this difference, including scenarios that will allow for a higher level of pumping than shown for the limited number of scenarios examined in the sustainable yield assessments. **It should be stated that the analysis presented here is only for the specific set of modeled scenarios**. Clearly, there is uncertainty in the simulated seawater intrusion as described in the Peer Review Report. Those uncertainties in seawater intrusion are in addition to the variations resulting from pumping distribution and timing.

Based on the assessments for this Memo, the relation of pumping versus SWI appears to be a reasonable first approximation of allowable pumping in the UAS of the Oxnard Basin, however, the caveats described in this Memo should be provided along with the estimate of allowable pumping: that is, allowable pumping is estimated for specific assumed pumping, where the basin is assumed to be in equilibrium over the long-term, and for the assumed hydrologic and land use conditions.

Use of Pumping Versus SWI Plots to Assess Sustainable Yield – Oxnard Basin

The Sustainable Yield for the UAS of the Oxnard Basin is reported as about 27,000 AFY as described in Dudek's January 31, 2019 Memorandum titled Assessing the Sustainable Yield of the Oxnard Subbasin, Pleasant Valley Basin and Las Posas Valley. Based on the analysis using the relation between pumping and SWI, the sustainable yield is approximately 33,000 AFY. This is the mid-range of the potential allowable pumping, so it could be a few thousand AFY higher. This 33,000 AFY value is about 6,000 AFY higher compared to the Dudek January 31, 2019 value. The 33,000 AFY value accounts for averaging over the entire 50-year representative hydrologic period as proposed in my February 11, 2019 Memo to TAG.

The Peer Review Report provided Figure 6, showing the relation between pumping and SWI for the combined UAS and LAS. As shown in Figure 5 of the Peer Report, there is not as much "wondering" in the path for changes in pumping versus SWI, which suggests there is less sensitivity between pumping and other components of R terms of Equation 1, resulting in a more straight line relation. Similar to Figure 6, I plotted pumping versus SWI for the LAS for the full 50-year simulation period of the six modeled scenarios. Figure B, shows the plot. Again, the relation presents more of a straight line, so that using a linear regression on the six scenarios seems reasonable in this case. Projection of the line to "0" SWI results in an allowable pumping value of about 7,300 AFY.

Using combined UAS and LAS pumping and SWI and plotting relations between pumping and SWI to find a pumping value that results in "0" SWI is not technically valid. There is an Equation 1 for the LAS and a different Equation 1 for UAS, so technically, each term of Equation 1 should have subscripts of "LAS" or "UAS" as appropriate. For example, R includes stream leakage for the UAS, which may not apply to the LAS. Similarly, R for the LAS includes leakage across specific aquitards that are not applicable to the UAS. The uniqueness of the relationship is shown by the slope of the regression lines for the UAS and LAS. The slope for the UAS is 0.3153 whereas the slope for the LAS is 0.2257, so there are differential reductions in SWI for the same change in pumping. It is clear from these slopes, that for a 10,000 AFY reduction in pumping, we would see a 3,153 AFY reduction of SWI in the UAS and a 2,257 AFY reduction of SWI in the LAS, a nearly 900 AFY difference. So, using the results of Figure A and Figure B, where SWI=0, we get approximately 33,000 AFY for the UAS and 7,300 AFY for the LAS for a sustainable yield of 40,300 AFY. Figure C shows a combined pumping versus SWI plot for the Oxnard UAS+LAS. The slope of this line is 0.2926, which indicates a reduction of 2,926 AFY of SWI for a 10,000 AFY of pumping, which is in between the UAS and LAS pumping versus SWI slopes, but closer to the slope for the UAS. Clearly, where pumping is reduced, areal and aquifer-specific, is critically important, as shown by the current set of simulations, which shows that there is groundwater outflow (land to sea) from the UAS and seawater inflow (sea to land) in the LAS.

The regression line shown in Figure C crosses at about 42,000 AFY, plus or minus several thousand acre feet per year. This plot allows for slightly higher pumping than using pumping versus SWI relations for the separate aquifer systems because it is more strongly influenced by the UAS pumping versus SWI relation. In addition, because the relation for the UAS is affected by the manner in which pumping is changed, the effect on the P v. SWI relation for the whole basin needs to acknowledge that there is a range of allowable pumping, which even exceeds the 42,000 AFY value obtained from Figure C. So, the allowable pumping should be caveated appropriately as described above.

It should be noted that the pumping and SWI numbers do not include pumping or SWI in the Semi-perched Aquifer, so these values should be provided to give the complete picture.

In conclusion, the pumping versus SWI plots should be applied by aquifer as opposed to using such plots as representative for the whole basin's aquifer systems. In addition, these plots should be used as a guide to develop new scenarios, including pumping similar to rates suggested by these plots, that can be tested to iterate towards a maximum sustainable yield for a basin. The plots should not be used by themselves to make conclusions about sustainable yield.

Use of Pumping Versus SWI Plots to Assess Sustainable Yield – Oxnard-PV-WLP

I think there are even greater complications to trying to extend the pumping versus SWI relation to the whole modeled area of the OPV-WLP areas. These complications are related to the same complications described above: the fact that groundwater flow generally is not steady-state and distribution of pumping can change transient responses of other terms in Equation 1.

We can explore the potential impacts of trying to apply the relations of pumping to SWI across all basins by comparing potential pumping reductions to achieve SWI of "0" computed for an individual basin to pumping reductions required considering pumping in all basins. Figure B shows pumping reductions required to reduce SWI to "0" for the LAS in the Oxnard Basin, based only on pumping in the Oxnard Basin. Figure D shows the same plot except that pumping is included for all basins. Notice again that the path of pumping to reduce SWI is not a simple straight line, which indicates other terms in Equation 1 are changing in addition to pumping. Figure B shows that pumping needs to be reduced by about 7,500 AFY to bring SWI to "0" whereas Figure D shows pumping is required to be reduced by about 9,500 AFY, using a linear regression line based on all six future scenarios. So, there is a difference in indicated pumping reductions of about 2,000 AFY. Significant observations that can be made from this comparison: 1) it is likely more efficient to make pumping reductions in the Oxnard Plain to effect reductions in SWI than uniform reductions in pumping across all basins and, 2) applying the pumping versus SWI analysis to all basins at once may overestimate the required pumping reductions to bring SWI to “0”.

Similar to the Oxnard Basin analysis above, I plotted pumping versus SWI for each of the UAS and LAS aquifers for pumping in Oxnard-PV-WLP. The slopes of the regression lines are very different: 0.3098 for the UAS and 0.1771 for the LAS. These plots indicate allowable pumping, where SWI=0, of about 37,000 AFY for the UAS and 23,000 AFY for the LAS, for a total of 60,000 AFY. Figure E shows the plot for all basins combined pumping versus SWI. This plot shows that the allowable pumping is approximately 66,000 AFY on average, which is 6,000 AFY higher than the value obtained using the separate plots, showing that plots for combined aquifer system analysis should be used with caution.

Based on these pumping versus SWI analysis, the sustainable yield values are about 3,000 to 9,000 AFY higher than the sustainable yield value reported in the Dudek January 31, 2019 Memorandum (summing for all basin areas). However, these graphical analyses include elimination of SWI in the LAS, so the sustainable yield from this analysis is significantly higher, by as much as 16,000 AFY than stated in the January 31, 2019 Memorandum (because the January 31st Memorandum has an implicit requirement for about 7,500 AFY of additional pumping reductions in the LAS, which further lowers that reported sustainable yield value).

In conclusion, the pumping for SWI plots should be used by aquifer as opposed to using such plots as representative for the whole basin’s combined aquifer systems. In addition, these plots should be used as a guide only to develop new scenarios, including pumping similar to rates suggested by these plots, that can be tested to iterate towards a maximum sustainable yield for a basin.

Discussion

The relation between pumping and SWI (positive or negative) is somewhat complicated in that pumping changes may also affect other terms of Equation 1, so that the relation of pumping to seawater intrusion may not be a straight line relation over the range of pumping changes. More likely, the relation between pumping and seawater intrusion will be a range of values as shown herein due to interactions of pumping and other water budget terms, in addition to seawater intrusion. Relations between pumping and seawater intrusion should be applied to individual aquifer systems as the relations are different (as shown by slopes of linear regressions) for each aquifer system. However, linear analysis of pumping and seawater intrusion results from long-term simulations periods may be used with caution, as long as the results of this analysis are caveated as described herein, namely, that allowable pumping is estimated for specific assumed pumping distributions, where the basin is assumed to be in equilibrium over the long-term, and for the assumed hydrologic and land use conditions.

Further caution should be when using pumping versus SWI relations over large multiple basin areas as the relation between pumping and SWI is further complicated by pumping changes that likely affects other terms of Equation 1. If such an analysis is used, it should be similarly caveated as described above.

Relations of pumping versus seawater intrusion should be used as a tool to iterate to possible maximum sustainable yield values using groundwater model simulations. Groundwater model simulations should be conducted to assess actual sustainable yield of groundwater basins given the complex nature of groundwater flow conditions and effects of pumping on other water budget items in the basin.

The analysis contained herein does not account for uncertainty in seawater intrusion simulation results due to uncertainties in model input parameters, so further caveat of the results should be provided relative to these uncertainties.

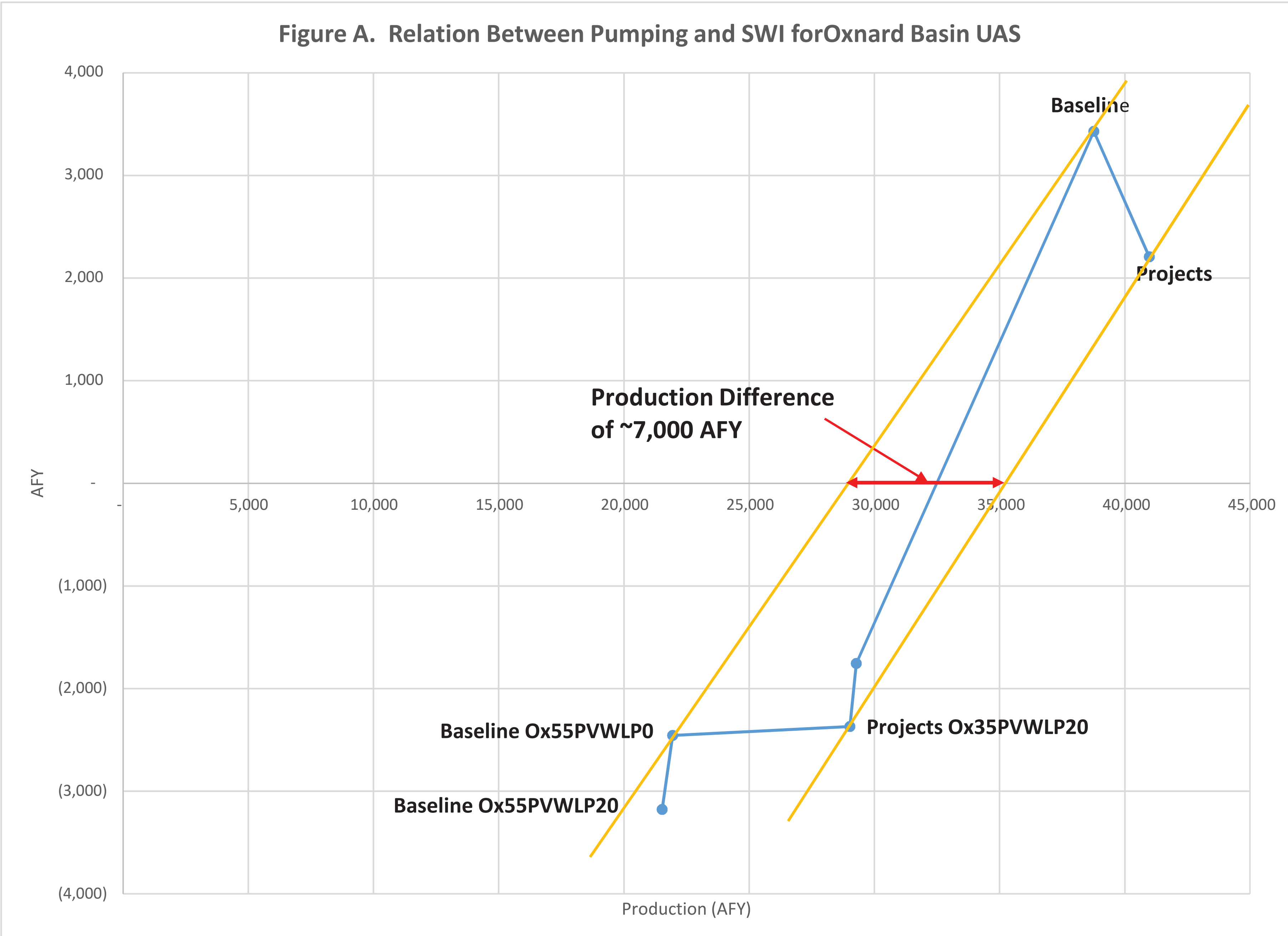


Figure A. Relation Between Pumping and SWI forOxnard Basin UAS
4,000
3,000
2,000
1,000
-
(1,000)
(2,000)
(3,000)
(4,000)
AFY
-
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
Production (AFY)
Baseline
Projects
Production Difference
of ~7,000 AFY
Baseline Ox55PVWLP0
Projects Ox35PVWLP20
Baseline Ox55PVWLP20

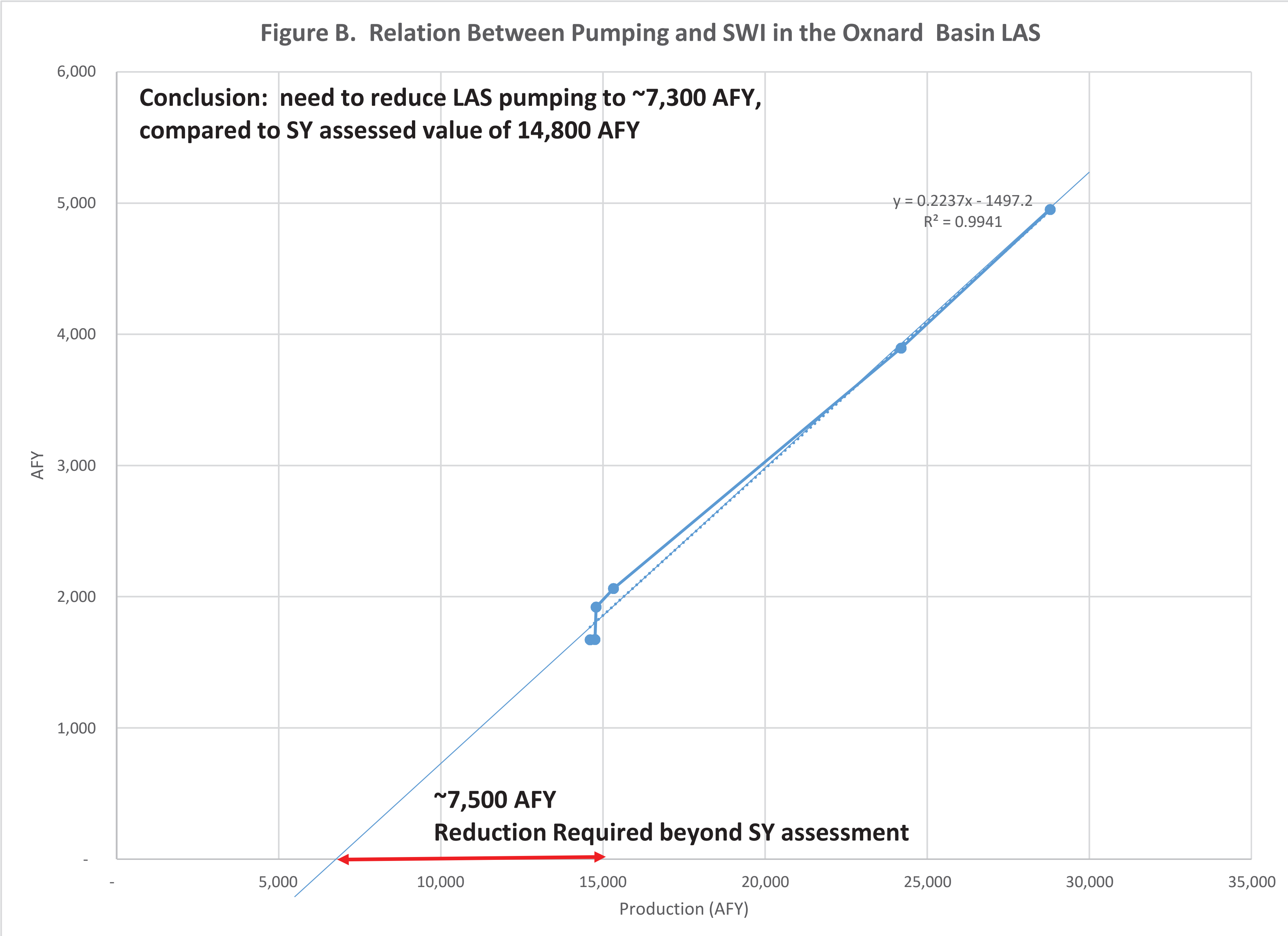


Figure B. Relation Between Pumping and SWI in the Oxnard Basin LAS
Conclusion: need to reduce LAS pumping to ~7,300 AFY,
compared to SY assessed value of 14,800 AFY
y = 0.2237x - 1497.2
R² = 0.9941
~7,500 AFY
Reduction Required beyond SY assessment
AFY
6,000
5,000
4,000
3,000
2,000
1,000
-
-
5,000
10,000
15,000
20,000
25,000
30,000
35,000
Production (AFY)

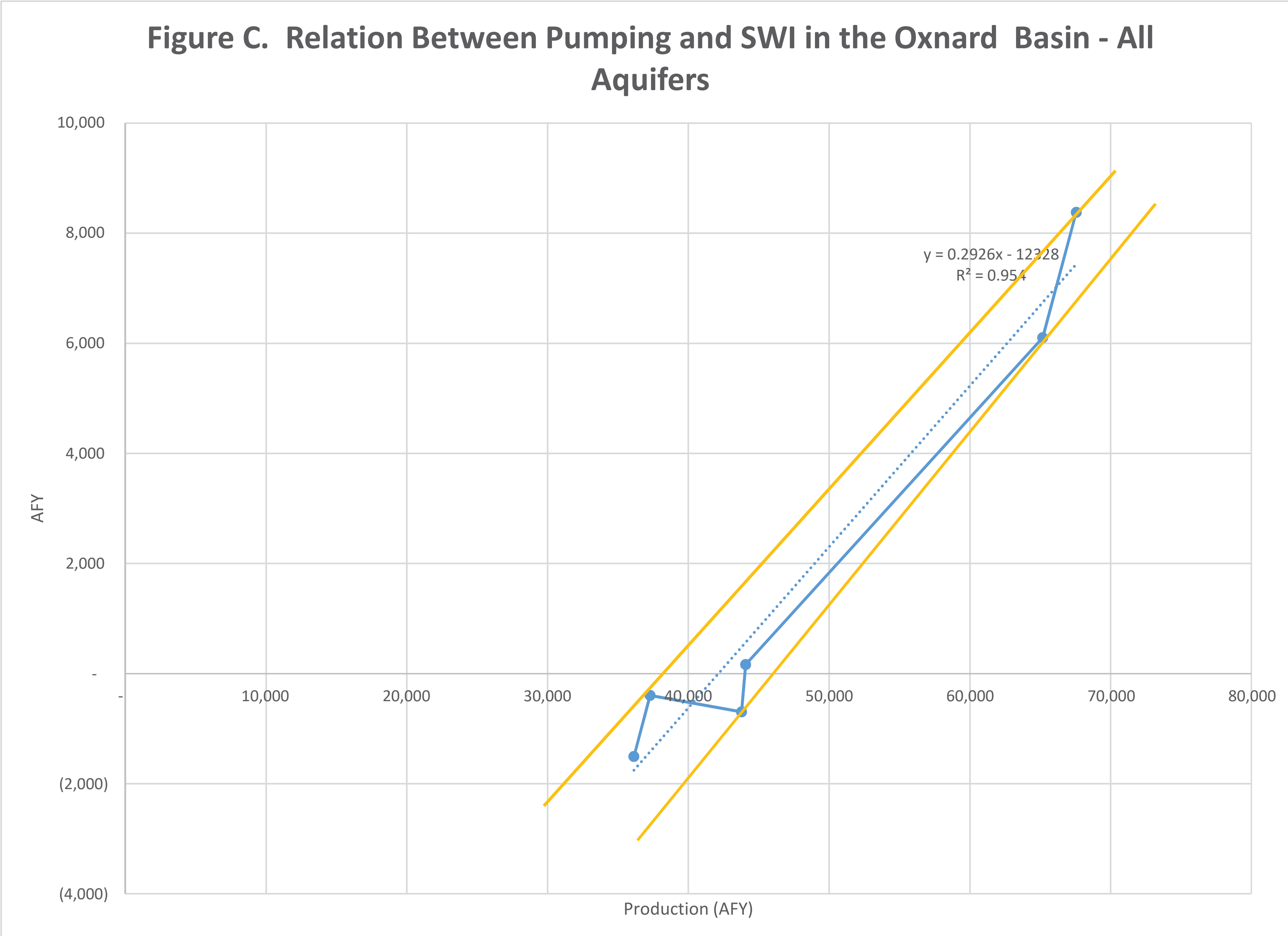


Figure C. Relation Between Pumping and SWI in the Oxnard Basin - All Aquifers
10,000
8,000
6,000
4,000
2,000
-
(2,000)
(4,000)
AFY
-
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
Production (AFY)
y = 0.2926x - 12328
R² = 0.954

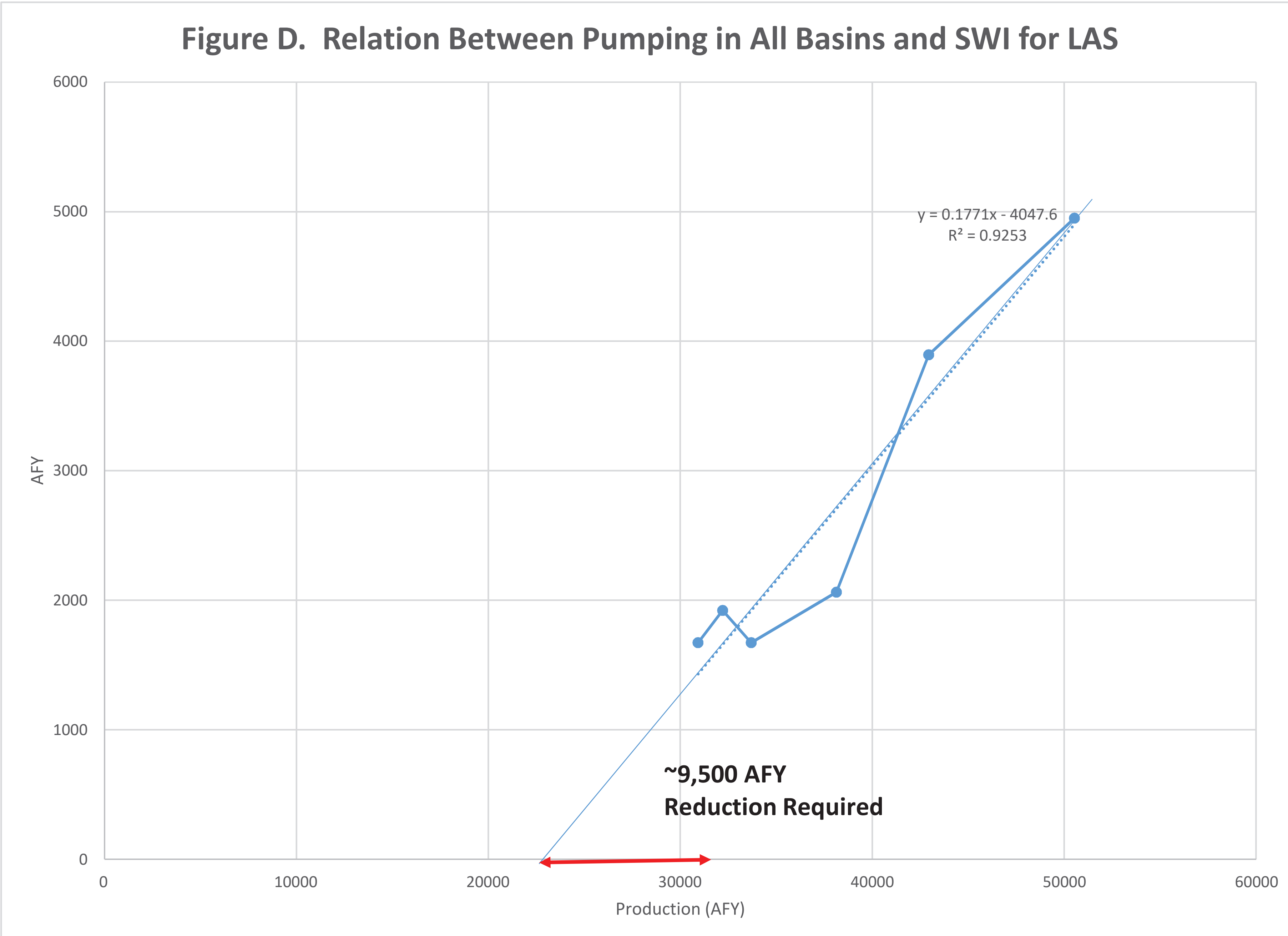


Figure D. Relation Between Pumping in All Basins and SWI for LAS
6000
5000
4000
3000
2000
1000
0
AFY
y = 0.1771x - 4047.6
R² = 0.9253
~9,500 AFY
Reduction Required
0
10000
20000
30000
40000
50000
60000
Production (AFY)

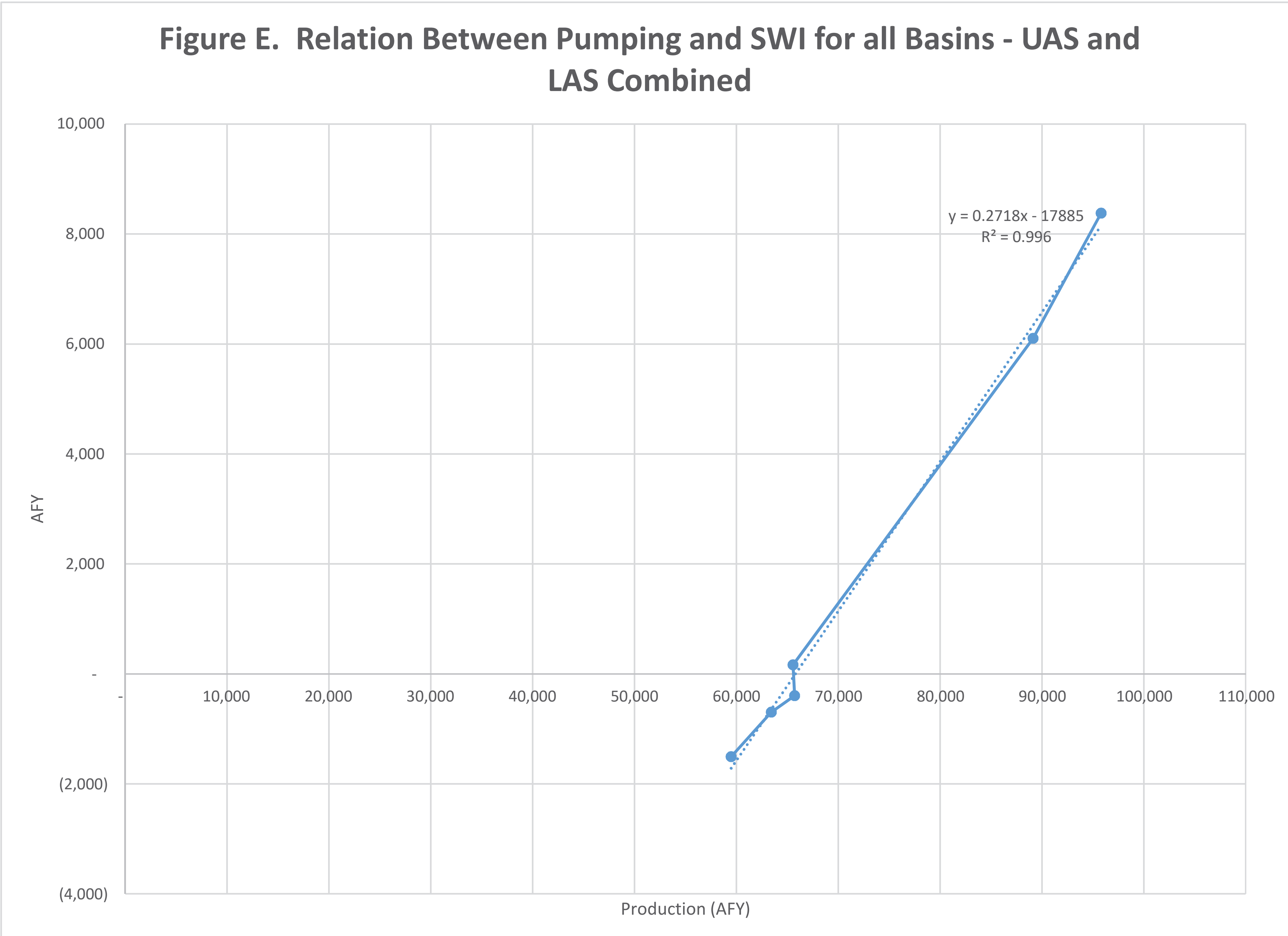


Figure E. Relation Between Pumping and SWI for all Basins - UAS and LAS Combined
10,000
8,000
6,000
4,000
2,000
-
(2,000)
(4,000)
AFY
-
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
110,000
Production (AFY)
y = 0.2718x - 17885
R² = 0.996

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September 23, 2019

Via Electronic Delivery

Honorable Board Chair Eugene F. West and Members of the Board of Directors
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009-1610

Re: City of Oxnard Comments on July 2019 Draft Groundwater Sustainability Plans for the Oxnard Subbasin and Pleasant Valley Basin

Dear Honorable Chair West and Board Members:

Thank you for the opportunity to review and provide comments on behalf of the City of Oxnard (City or Oxnard) on the Draft Groundwater Sustainability Plan for the Oxnard Subbasin and, to the extent it impacts the City or implicates the same issues, the Draft Groundwater Sustainability Plan for the Pleasant Valley Basin, each dated July 2019 (the GSPs). As the most populous city in Ventura County and a city with jurisdictional boundaries that overlie much of the Oxnard Subbasin, Oxnard is committed to safeguarding our regional water resources. The City fully supports the efforts of the Fox Canyon Groundwater Management Agency (FCGMA or Agency) and our other regional partners in developing a plan to manage local groundwater resources sustainably. Oxnard is grateful for FCGMA's major investment of time and resources in developing these GSPs, and we believe these efforts have provided many important foundational elements that will be useful in building a complete and viable plan to sustainability. These GSPs provide an opportunity for FCGMA to provide leadership and creative vision to address a long-standing regional problem.

The work FCGMA has done in preparing the GSPs is commendable. However, the City believes there is much more work to be done before the GSPs can be finalized and brought into compliance with the Sustainable Groundwater Management Act (SGMA). SGMA authorizes local and regional agencies to sustainably manage groundwater basins within their jurisdictions and provides for State intervention if necessary to protect groundwater resources. Oxnard is concerned that the GSPs do not chart a course to sustainability because the proposed management action cannot be implemented without causing irreparable harm to our local economy and community and the proposed projects are too modest to address the basin-wide problems. Three of the five projects proposed in the Oxnard Subbasin GSP depend on the City's Groundwater Recovery Enhancement and Treatment (GREAT) Program, but the GSPs fail to accurately describe Oxnard's projects or its plans for the GREAT Program in the future. In other basins around the State, innovative projects have been implemented to significantly increase sustainable yield and effectively control seawater intrusion. We believe that SGMA requires these GSPs to develop similar projects. As currently drafted, the GSPs rely almost entirely on the imposition of groundwater pumping allocations. This management tool has been used by FCGMA for over 35 years. Past pumping restrictions were not significant enough to bring the basin into sustainability, and the GSPs have not provided any basis to suggest such pumping restrictions could actually be implemented in the future without inflicting catastrophic damage on our local economy.

The City has other concerns about the GSPs. The analysis in the GSPs indicates they are based on unreliable data and modeling. The GSPs assume that FCGMA will be able to use powers under SGMA beyond those granted in the Fox Canyon Groundwater Management Act, but they do not include the facts and findings necessary to do that. Though SGMA requires GSPs to analyze local general plans and land use laws and to describe how implementation of the GSP may affect those plans, these GSPs do not include the necessary analysis. This is especially concerning because the GSPs contemplate a 43 percent reduction in groundwater availability at the same time the State is requiring the City to develop up to 12,111 new housing units, yet the current GSPs do not address this policy conflict.

Oxnard realizes that the problem of achieving groundwater sustainability has been a long time in the making, much longer than the four years FCGMA has been working to address the problem under SGMA. The City also realizes it is probably not realistic to believe the GSPs could be revised to substantively cure the deficiencies we raise in these comments before the January 2020 deadline to submit the GSPs to the State. What Oxnard requests, and what we believe SGMA requires, is that the GSPs be revised to acknowledge these issues and include a schedule of actions to fix them. Furthermore, only very modest pumping restrictions should be implemented before the substantive deficiencies are addressed.

I. The GSPs do not describe a viable and sufficient plan to achieve sustainability

A. The pumping reduction proposed in the GSP cannot be implemented because it would unacceptably damage the regional economy and its residents

Under SGMA, groundwater sustainability plans "shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin."[1] The GSPs as currently drafted do not meet this requirement. The GSPs do not appear to include a FCGMA determination that the listed projects and management actions will achieve sustainability goals. In fact, and to the contrary, the Oxnard Subbasin GSP concedes that "None of the model scenarios described in Section 2.4.5 successfully eliminated seawater intrusion in the LAS during the sustaining period, while the majority of the model scenarios resulted in net freshwater loss from the UAS to the Pacific Ocean."[2]

Moreover, even if the GSPs did include a determination that the proposed projects and management actions theoretically would achieve sustainability goals, reliance on these projects and actions is not supportable because they cannot be implemented without detrimental and irreversible consequences to the regional economy. The GSP relies almost entirely on the pumping allocation management action to achieve sustainability, but it is not reasonable or realistic to believe those drastic pumping reductions could actually be implemented. The GSPs do not acknowledge the severity of the economic impacts that would result from implementation of the management action.[3] Instead, this critical analysis is entirely and improperly deferred.[4]

The GSPs do not include, as required by SGMA, "[a] summary of the permitting and regulatory process required for each project and management action."[5] This omission is particularly problematic for the pumping reduction management action. For example, though adoption of the GSPs is exempt from the California Environmental Quality Act (CEQA),[6] implementation of the GSPs is not exempt. The implementation of drastic pumping restrictions proposed in the current GSPs would likely cause—and indeed is intended to cause—numerous changes in the physical environment, such as increases in surface water usage, changes in land use, loss of agricultural land and production and blight. Given CEQA's substantive obligation to mitigate these impacts below a level of significance, it is highly

[1] Cal. Code Regs., tit. 23, § 354.44, subd. (a); see also Wat. Code § 10727, subd. (a) ["A groundwater sustainability plan shall be developed and implemented . . . to meet the sustainability goal . . . ."].

[2] Oxnard Subbasin GSP, p. 2-74; see also, Pleasant Valley Basin GSP, p. 2-56 [similar].

[3] The GSPs do not include an estimation of costs associated with implementation of the management action as required by SGMA regulations. Cal. Code Regs., tit. 23, § 354.44, subd. (b)(8).

[4] Oxnard Subbasin GSP, p. 5-16-17; Pleasant Valley Basin GSP, p. 5-6.

[5] Cal. Code Regs., tit. 23, § 354.44, subd. (b)(3).

[6] Wat. Code, § 10728.6.

unlikely such a project could actually be approved. Further, given these severe impacts on the physical environment, and by not addressing this regulatory requirement of the management actions, the GSPs are mistaken in asserting that "reductions can be implemented within months of GSP adoption."[7] Indeed, all evidence indicates that the "primary management action proposed under this GSP"[8] is infeasible and cannot be implemented to the degree necessary to attain sustainability objectives without detrimental and irreversible consequences no region would or should undertake, and the GSPs include no evidence to the contrary.

While the City agrees that SGMA requires the GSPs to evaluate pumping restrictions as one component of a plan to achieve sustainability and to manage and use groundwater in a way that can be maintained throughout the life of the plan without causing undesirable results,[9] SGMA also requires the GSPs to propose management of recharge.[10] Since the proposed pumping restrictions are infeasible, and since the model simulations predict the GSPs proposed actions will not stop seawater intrusion in any event,[11] the small amount of recharge contributed by the proposed projects is insufficient. Oxnard believes it is imperative to develop projects that will add recharge to the basin. As the GSPs are currently written, the evidence shows they will not achieve the sustainability objectives that SGMA requires without dire secondary effects.

B. Drastic basin-wide pumping restrictions are not appropriate

In addition to being infeasible and unrealistic to implement, evidence and analysis in the GSPs indicate that drastic pumping reductions across the entire area covered by the GSPs is unnecessary to achieve the primary sustainability factor relating to seawater intrusion. At numerous locations across the basin, the GSPs found groundwater elevation is not correlated to increases in seawater intrusion.[12] In

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[7] Oxnard Subbasin GSP, p. 5-16; Pleasant Valley Basin GSP, p. 5-6.

[8] Oxnard Subbasin GSP, p. 5-14; Pleasant Valley Basin GSP, p. 5-4.

[9] Wat. Code, § 10721, subd. (v).

[10] Groundwater sustainability plans must include "[a] description of the management of groundwater extractions *and recharge* to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods." Cal. Code Regs., tit. 23, § 354.44, subd. (b)(9), italics added.

[11] Oxnard Subbasin GSP, p. 2-74; Pleasant Valley Basin GSP, p. 2-56.

[12] See, e.g., Oxnard Subbasin GSP, p. 2-31 ["The longterm increase in chloride concentration observed in this well suggests that groundwater elevations,

fact, only one region of the basin, Port Hueneme, was described as having a "direct link between the Pacific Ocean and the freshwater aquifers of the Oxnard Subbasin."[13] The City requests that the GSPs be revised to provide a schedule to model pumping reduction scenarios tailored to focus the benefits of reduced pumping, both spatially and temporally (since groundwater elevation and seawater intrusion have seasonal elements) while limiting the associated burdens, which will result in GSPs that can realistically be implemented to achieve sustainability. This approach will leverage the considerable work FCGMA has already completed and will bring the GSPs into compliance with SGMA while avoiding unnecessary and economically crippling basin-wide pumping reductions.

C. The GSPs inaccurately describe the City's GREAT Program and future plans

As the GSPs recognize, Oxnard and its ratepayers have led the region in developing and investing in forward-thinking, innovative water supply projects that will help City residents and the region by improving water supply and reliability. One of the most important of these projects so far is the GREAT Program, which uses the City's Advanced Water Purification Facility to ultimately provide 28,000 acre feet per year (AFY) of high quality local water. Unfortunately, the description of the GREAT Program as well as Oxnard's future plans for its expansion are not accurately represented in the GSPs. Project No. 1 is the first phase of the GREAT Program, which provides recycled water for non-potable irrigation uses. The GSPs incorrectly state Project No. 1 will be implemented in the future,[14] and further incorrectly suggest that there will be "additional water that is being purchased by FCGMA." In fact, FCGMA is not purchasing any water and there is no additional water available from Phase I of the GREAT Program because all such water is already accounted for.

The GSPs more egregiously mischaracterize the City's plans by assuming that product water from expansion of the GREAT Program would be supplied to the

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even when above sea level, are not limiting the increasing chloride concentrations. A similar trend is observed in Well 01S21W08L03S . . . ."]; 2-32 ["In spite of the low groundwater elevations in the historical record, the chloride concentration in the four nested wells 01N23W01C02S–01N23W01C05S (Figure 2-36) has not exceeded 55 mg/L since the wells were completed in 1990 . . . ."]; 2-33 [South Coast Region "does not typically experience direct seawater intrusion"].

[13] Oxnard Subbasin GSP, p. 2-32; Pleasant Valley Basin GSP, p. 2-41 ["In the Port Hueneme area, . . . the UAS and LAS are believed to have direct hydraulic connection with the Pacific Ocean . . . ."].

[14] Oxnard Subbasin GSP, p. 5-4; Pleasant Valley Basin GSP, p. 2-47.

United Water Conservation District Saticoy Spreading Grounds.[15] As Oxnard has repeatedly emphasized, supplying GREAT Program recycled water to the Saticoy Spreading Grounds *is not being considered or proposed* as part of the City's future plans. This project is not permitted, and because municipal supply wells are in close proximity to the spreading grounds, the City is informed that indirect potable reuse regulations would have to be amended to allow such permitting. This means that even if permitting were pursued, it would be on a very long time frame. Furthermore, the proposal in the GSPs does not allow Oxnard to control its own water resource, nor would prior proposals for such projects provide Oxnard's residents with a return on their investment, which was the intent of the GREAT Program. It is therefore unsupported and inappropriate for the GSPs to base any modeling or analysis on the false assumption that GREAT Program water would be used at the Saticoy Spreading Grounds. For the same reason, and to the extent that Projects 2 and 3 are even separate projects, the GSPs improperly assume in the description of Project No. 3 (Riverpark-Saticoy GRRP Recycled Water Project) that recycled water for this project will be supplied by the GREAT Program.[16] The City currently does not have a plan to supply recycled water for this project, so the GSPs should be changed accordingly.[17]

D. The GSPs should be revised to include projects that would significantly replenish the basin or protect against seawater intrusion

Oxnard views the revision of these GSPs as an opportunity for FCGMA to act boldly and innovatively in its leadership role bestowed by the Legislature. As set forth in SGMA, FCGMA is the exclusive agency with the responsibility to guide the region to groundwater sustainability. Using powers granted under SGMA, FCGMA has imposed and collected a sustainability fee since 2015 to fund its efforts in this regard; significant increases in this fee are currently being proposed by Agency staff. Oxnard implores FCGMA to use this role and these monetary resources to think beyond the groundwater pumping restriction powers the Agency has had at its disposal since 1983. This should not be the "primary management action" for the GSPs going forward.

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[15] Oxnard Subbasin GSP, p. 5-6; Pleasant Valley Basin GSP, p. 2-47.

[16] Oxnard Subbasin GSP, p. 5-8; Pleasant Valley Basin GSP, p. 2-47.

[17] The City has retained a consultant to research and prepare a comprehensive water business plan to advise the City on issues including but not limited to expansion of the GREAT Program and potential new uses for Oxnard's recycled water. This plan is expected to be completed around Spring 2020.

Creative solutions have been successfully implemented in other basins. Large-scale replenishment projects have been part of a program that has led to sustainable management of the Orange County Groundwater Basin, including the capture and recharge of tens of thousands of acre feet of storm water annually.[18] The Indian Wells Valley Groundwater Authority is reportedly considering a project to collaborate with the Los Angeles Department of Water and Power to develop a groundwater banking project.[19] Numerous basins have deployed seawater intrusion barrier wells to protect their basins against this threat to sustainability.[20] Such creative solutions allow these regions to responsibly stabilize their basins as required by SGMA while sustaining their developed and/or agricultural economies.

The GSPs also mention an additional potential management action based on the outcome of the Water Market Pilot Program.[21] The potential establishment of a water market program in not analyzed as a management action because the outcome of the pilot program will be evaluated first.[22] The Water Market Pilot Program, however, was only "open to agricultural operators."[23] The City fully supports programs like development of a water market, and encourages FCGMA to pursue them. However, Municipal and Industrial water users like Oxnard should be part of the water market as well or should be allowed to develop a parallel water market so that future water markets can provide maximum benefit for sustainability of the basin.

The City understands that the sustainability solutions for the Oxnard Subbasin and Pleasant Valley Basin will not be identical to those used in other basins, and we agree there needs to be a plan to develop a physical solution that works for our region. However, as previously explained, SGMA requires that this solution must

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[18] See Orange County Water District Groundwater Management Plan, 2015 Update, available at: <https://www.ocwd.com/media/3622/groundwatermanagementplan2015update_20150624.pdf>.

[19] Weston, *Banking water for LADWP? Kicinski talks groundwater with Rotary Club*, The Daily Independent (Jul. 27, 2019), available at: <https://www.ridgecrestca.com/news/20190727/banking-water-for-ladwp-kicinski-talks-groundwater-with-rotary-club>.

[20] See Orange County Water District Groundwater Management Plan, 2015 Update; West Basin Municipal Water District, Seawater Barriers, available at: <https://www.westbasin.org/water-supplies-groundwater/seawater-barriers>.

[21] Oxnard Subbasin GSP, p. 5-17; Pleasant Valley Basin GSP, p. 5-3.

[22] Oxnard Subbasin GSP, p. 5-18.

[23] Oxnard Subbasin GSP, p. 5-17.

include increased recharge, and the economy of this region is unsustainable if our groundwater management plans rely almost exclusively on pumping restrictions. It is incumbent on FCGMA to lead the region to a viable and effective plan for sustainable groundwater management, and the City pledges to support those efforts. Without such further action by FCGMA, the GSPs will not achieve their fundamental purpose under SGMA, and in the course of implementation, will cause significant damage to the region.

II. The GSPs should be based on reliable data and modeling

The City recognizes that SGMA requires FCGMA to develop the GSPs even in the face of some uncertainty and data gaps. Further, Oxnard appreciates that FCGMA has attempted to be transparent about the many areas of uncertainty underlying development of these GSPs[24] and has further attempted to make determinations of uncertainty as required by SGMA.[25] Unfortunately, the number and magnitude of data uncertainties are too great and undermine the effectiveness of the GSPs to a degree that compliance with SGMA is compromised.

The data and modeling problems with the GSPs are too numerous to catalogue here. For example, though increasing groundwater elevation appears to serve as the polestar for all analysis and decisions about the basin, the underlying groundwater elevation data is likely unreliable. Most of the data comes from production wells without any consideration of whether recent pumping in the subject well, or an adjacent well, has decreased the observed groundwater elevation because it may not have recovered from recent pumping. Moreover, to the extent data is biased by this problem, it would only make groundwater elevations seem lower on average than they may actually be. Similarly, there are also major reliability problems with the United Water Conservation District numerical groundwater flow model that has apparently been used to guide the vast majority of management decisions in the GSPs, including the estimated pumping reductions needed to achieve sustainable yield. The independent peer review of this model cautioned against using it to justify anything more than gradual reductions while efforts recommended to fix the model are undertaken.[26] Efforts needed to decrease model uncertainty include validation of prior calibration efforts with data that was "held back."[27]

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[24] The words "uncertain" or "uncertainty" appear 70 times in the Oxnard Subbasin GSP and 58 times in the Pleasant Valley Basin GSP.

[25] See, e.g., Cal. Code Regs., tit. 23, §§ 354.38, subd. (a), 354.44, subd. (d).

[26] Tartakovsky, Peer Review of the United Water Conservation District and Calleguas Municipal Water District Models for the Oxnard Subbasin, Pleasant Valley Basin, and Las Posas Valley Basin (March 2019), p. 15 ["The results of this peer review suggest that although the models indicate reductions are required to

The City is also concerned that uncertainties associated with the data and modeling were compounded and unreasonably magnified in setting measurable objectives and minimum thresholds – the regulatory groundwater elevation targets the City and all others will have to achieve. For example, the "starting point" for calculating minimum threshold groundwater elevations in the GSPs was "the lowest simulated value in either of the two simulations" from the (uncertain) model.[28] That lowest simulated value was then "rounded down to the nearest 5-foot interval," then that number was "raised by 2 feet to account for predicted sea level rise by 2070."[29] The lack of precision in this unsupported and unscientific approach is self-evident and concerning to the City of Oxnard since this does not provide a reasonable basis for calculating such important values. All of this is to the prejudice of Oxnard residents and ratepayers–as well as other regional residents and ratepayers–who must pay for expensive actions to achieve these highly uncertain groundwater elevations.

Another aspect of the GSPs that magnifies underlying uncertainties is the decision to use groundwater elevation "as a proxy for other sustainability indicators in establishing the minimum thresholds and measurable objectives."[30] While SGMA allows the use of groundwater elevation as a proxy for other sustainability indicators, in order to do so, the Agency must find, among other things, that "[s]ignificant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy."[31] These GSPs include no such finding of significant correlation, nor could any such finding be made for most of the basin since the GSPs indicate such a correlation is lacking, as explained in Section I(B) above. Therefore, the GSPs must be revised to ensure that these findings are included.

III. The GSPs do not include findings needed to exercise additional powers under SGMA

The GSPs both contemplate actions by FCGMA that would exceed the powers granted to the Agency under its enabling legislation. For example, the GSPs state

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the groundwater extraction rates, there is sufficient uncertainty in the model results to allow for gradual implementation of the reductions if data gaps are filled and the models are refined over the next five years."].

[27] Tartakovsky, p. 16.

[28] Oxnard Subbasin GSP, p. 3-14; Pleasant Valley Basin GSP, p. 3-15-16.

[29] Oxnard Subbasin GSP, p. 3-14; Pleasant Valley Basin GSP, p. 3-16.

[30] Oxnard Subbasin GSP, p. ES-5; Pleasant Valley Basin GSP, p. ES-6.

[31] Cal. Code Regs., tit. 23, § 354.36, subd. (b)(1).

that FCGMA intends to conduct a "review of the potential for implementing basin replenishment fees . . . ."[32] However, FCGMA can only invoke additional powers available under SGMA to groundwater sustainability agencies if "the governing board of the local agency makes a finding that the agency is unable to sustainably manage the basin without the prohibited authority."[33] The GSPs contain no such finding. Furthermore, in light of the almost total reliance of the GSPs on groundwater pumping reduction powers FCGMA has always had, the GSPs as currently drafted do not support such a finding. As we have said, we believe additional projects to replenish the basin must be developed to sustainably manage the basin. If the GSPs are revised as Oxnard is suggesting, they are more likely to support FCGMA's proposed exercise of additional powers under SGMA, though an express finding is still required.

IV. The proposed drastic pumping restrictions are inconsistent with local and State land use laws

In their current form, the GSPs do not analyze local and State land use laws and do not discuss important inconsistencies, as required by SGMA. As provided in Water Code section 10726.9, "A groundwater sustainability plan shall take into account the most recent planning assumptions stated in local general plans of jurisdictions overlying the basin." Regulations implementing SGMA also set forth numerous requirements regarding consideration and analysis of applicable land use laws. First, the GSPs are required to include a "summary of general plans and other land use plans governing the basin."[34] While the Oxnard Subbasin GSP mentions the City of Oxnard California 2030 General Plan in one cursory paragraph[35], it does not include an actual summary of the City's land use element as required by SGMA. Rather, Section 1.6.1 of the Oxnard Subbasin GSP, titled "General Plans," contains a three-page analysis on the Ventura County General Plan but lacks a corollary section on Oxnard's General Plan. As much of the land over the Oxnard Subbasin lies within the City of Oxnard, the City's General Plan is highly relevant and must be analyzed in this GSP. The City asks that the Oxnard Subbasin GSP be revised to correct this omission.

Of even greater concern is the fact that the Oxnard Subbasin GSP entirely ignores Oxnard's local land use laws in connection with the SGMA requirement to describe how implementation of the GSP "may affect the water supply assumptions of

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[32] Oxnard Subbasin GSP, p. 1-9; Pleasant Valley Basin GSP, p. 1-9.

[33] Wat. Code, § 10723, subd. (c)(3).

[34] Cal. Code Regs., tit. 23, § 354.8, subd. (f)(1).

[35] Oxnard Subbasin GSP, p. 1-39.

relevant land use plans . . . ."[36] The proposed 43 percent reduction in available groundwater is inconsistent with the water supply assumptions of Oxnard's land use plans. The City set forth its water supply assumptions in the Program Environmental Impact Report for its General Plan:

> Groundwater purchased from UWCD has historically made up approximately 25% of the City's water supply and the groundwater pumped from City wells another 25%. However, with the recent addition of the Blending Station No. 1 Desalter, the City intends to rely increasingly on local groundwater while fixing or reducing its imported water purchases.[37]

Plainly, implementation of the Oxnard Subbasin GSP will affect these assumptions in numerous important ways. As sustainable yield is currently drafted in the GSP, and assuming allocations proportionate to the 2005 to 2014 base period are used[38], the GSP would prevent the City from relying on groundwater for more than half of its water supply, and it also would not be able to reduce its imported water purchases. The fair consideration of these water supply assumptions would underscore the infeasibility of the pumping restrictions proposed in the GSPs. This is not a fundamental inconsistency between Oxnard's General Plan and SGMA; as explained in Section I(D) of this letter, creative solutions to basin management could yield a result in which the basin were brought into sustainable yield without requiring Oxnard and others to reduce pumping so significantly.

The GSPs also do not meaningfully consider the planning assumptions stated in Oxnard's General Plan and other local land use laws, as required by Water Code section 10726.9 and SGMA regulations. Given the large amount of the Oxnard Subbasin within the City's jurisdiction and the dramatic restrictions on groundwater pumping proposed in the GSPs, the requisite analysis should have been extensive. Instead, it is entirely absent. Oxnard's General Plan includes numerous goals and policies that will be undermined by the unnecessary overreliance on severe pumping restrictions. For example, the City's goals to

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[36] Cal. Code Regs., tit. 23, § 354.8, subd. (f)(3).

[37] City of Oxnard 2030 General Plan Program Environmental Report, Appx. B, p. 1 (attached hereto as Exhibit A).

[38] Found in the correlating FCGMA allocation ordinance, which has not yet been adopted, but which latest draft can be found at the FCGMA's website at http://www.fcgma.org/public-documents/board-of-directors-meetings.

promote Innovative Redevelopment,[39] Commercial Revitalization and Redevelopment, Establishment of Urban Villages, and Revitalization and Redevelopment[40] all require Oxnard to attract investment to the City. Oxnard's goals to encourage Business Expansion and to Attract New Business[41] will be frustrated if businesses do not believe Oxnard has the infrastructure and resources to justify business investment in the City. The Oxnard Subbasin GSP gives no consideration to the fact that the City's ability to achieve these goals and policies may be jeopardized if potential developers and other investors are dissuaded from investing in Oxnard because the GSPs forecast a 43 percent reduction in availability of the most economical water supply. Given the long time horizon for such development and investment, correction of these dire cutbacks in a future revision of the GSPs will not avert damage to the City and local economy that will begin immediately if the GSPs in their current forms are finalized.[42]

Not only is implementation of the GSPs inconsistent with local land use laws, it is also inconsistent with State land use laws imposed on local governments that will require creation of significant new housing in Ventura County. In implementing California's State Housing Law, the California Department of Housing and Community Development has determined the amount of housing that must be provided in various regions of the State and mandates that local governments like the City achieve those requirements through the Housing Element and Regional Housing Need Allocation (RHNA). The region covered by the Southern California Association of Governments is required to provide 1.3 million housing units, and the current methods to allocate that share would require Oxnard to provide from 9,412 to 12,111 housing units for the sixth cycle (October 2021 through October 2029).[43]

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[39] Although redevelopment agencies in California were abolished in 2011, the City continues to pursue the goal of redeveloping blighted properties even though tax increment financing is no longer available to help in this effort.

[40] City of Oxnard California 2030 General Plan Goals and Policies (available at <https://www.oxnard.org/wp-content/uploads/2017/06/Oxnard-2030-General-Plan-Amend-06.2017-SM.pdf>, Goals CD-3.3, CD-4.2, CD-7.1 and CD-9.2, respectively.

[41] City of Oxnard California 2030 General Plan Goals and Policies, Goals CD-17.6 and CD-18.1, respectively. City of Oxnard California 2030 General Plan Goals and Policies, Goals CD-6.1 and CD-6.2, respectively. Like all agriculture, these goals necessitate the availability of water at a reasonable price, and they will be undermined by the proposed management action in the GSPs. This, too, should have been meaningfully considered in the GSPs, but it was not.

[42] The City also has goals to preserve agricultural land uses and buffers.

[43] See City of Oxnard, Housing and Economic Development Committee Agenda Report (September 10, 2019) (attached hereto as Exhibit B).

The GSPs do not analyze or discuss the impact of their implementation on local governments' abilities to meet their RHNA requirements, though this is an applicable land use law that should have been considered as required by SGMA. Oxnard and other local governments will be unable to attract housing developers if groundwater pumping is significantly restricted such that sufficient water is not available or is prohibitively expensive.

Because the GSPs do not describe or consider the impact of the proposed drastic reduction of the City's groundwater supply on Oxnard's ability to provide housing as otherwise required by State law, the GSPs have overlooked another reason the pumping reduction based approach is not feasible. Oxnard and other cities in the region are undertaking major efforts to provide additional housing and combat homelessness. We ask that FCGMA consider our efforts to achieve these important goals and revise the GSPs as suggested herein so as not to undermine this important public work. These public policy objectives are compatible if the GSPs are revised, and both goals are critical for the future of the region.

V. Conclusion

We hope these comments are helpful in completing the draft GSP that must meet the requirements of SGMA. By preparing the Draft GSPs, FCGMA has done our region a great service by advancing the state of knowledge regarding our shared groundwater resources and proposing a basis to work forward toward a plan to sustainably manage our basin. The City asks that you carefully consider our comments and revise the GSPs to include concrete commitments to a schedule of actions designed to gather sufficient and accurate data. Further, the GSPs should be revised to include actions to enhance the numerical groundwater model and to develop realistic projects that can actually be implemented in the coming years. We suggest a path to success and sustainability instead of relying solely on a pumping restriction approach, which will undoubtedly lead only to undesirable results in our region.

Furthermore, until those revisions can be addressed within whatever timeline the FCGMA reasonably imposes on itself, the pumping reduction management action should be most conservatively implemented so as not to send the region into unnecessary shock. The Oxnard Subbasin GSP states that the sustainable yield of the Upper Aquifer System was calculated to be approximately 32,000 AFY, with an uncertainty of ± 4,100 to 6,000 AFY and the sustainable yield of the Lower Aquifer System was calculated to be approximately 7,000 AFY, with an uncertainty of ± 2,300 to 3,600 AFY.[44] The Pleasant Valley Basin GSP states that the sustainable yield of that basin was estimated to be approximately 11,600 AFY, with an

[44] Oxnard Subbasin GSP, p. ES-4.

uncertainty of ± 1,000 AFY.[45] Until all of the City's concerns are sufficiently addressed, the FCGMA should utilize an Oxnard Subbasin sustainable yield no lower than 48,600 AFY and a Pleasant Valley Basin sustainable yield no lower than 12,600 AFY. After addressing all concerns, should the FCGMA determine with certainty in a few years that these sustainable yields are lower—and all other options have been explored for replenishing the basin and protecting against seawater intrusion—the FCGMA can reduce the sustainable yields. To target lower sustainable yield amounts now would be premature, and given the dire impacts on the region, would also be irresponsible.

In addition to this cover letter, the City is submitting two attachments with specific proposed revisions and comments targeted at particular sections of the GSPs; we have also entered these more specific revisions into their appropriate sections' comment boxes on the FCGMA's website. Oxnard looks forward to continued collaboration with FCGMA to address all critical issues and bring the basin into sustainability. Please contact us if you have any questions.

Sincerely,

Alexander Nguyen
City Manager

Enclosures:

Exhibit A: City of Oxnard 2030 General Plan Program Environmental Report, Appx. B

Exhibit B: City of Oxnard, Housing and Economic Development Committee Agenda Report (September 10, 2019)

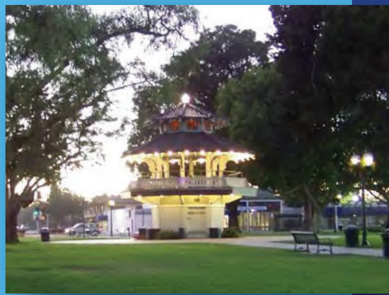
Attachment 1: Proposed Revisions for the Oxnard Subbasin GSP

Attachment 2: Comments regarding the Oxnard Subbasin GSP

3352500.1

[45] Pleasant Valley Basin GSP, p. ES-2.

EXHIBIT A



City of Oxnard 2030 General Plan

Program Environmental Report

SCH 2007041024

RECIRCULATED DRAFT

November 2009

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17 November 2009

Technical Memorandum

To: Matthew Winegar, Development Services Director

Via: Ken Ortega, Public Works Director

From: Meredith Clement, Kennedy/Jenks Consultants
Lauren Everett, Kennedy/Jenks Consultants

Subject: City of Oxnard, 2010 to 2030 Projections of Water Supply and Demand
K/J 0889026

This memorandum, provided for City review, includes a summary of projections for City water supplies and demands and how they were developed for the 2030 General Plan. Water supply assessments evaluate the water supplier's (the City) total, reasonably projected water supplies available during normal, single dry and multiple dry water years to the year 2030 and compare this to anticipated water demands for the same period. Because these evaluations consider all existing and anticipated supplies and demands through 2030, they are a planning-level overview of City water resources.

1.0 Water Supply Sources

The City's current water supply consists of: (1) United Water Conservation District (UWCD) pumped groundwater delivered to the City through the Oxnard – Hueneme Pipeline, (2) local groundwater pumped from City wells, and (3) imported surface water from the Calleguas Municipal Water District (CMWD). The City desalts a portion of its local groundwater supplies at its Blending Station No. 1 Desalter and blends these three sources to achieve an appropriate balance between water quality, quantity, and cost. Historically, the City's overall water supplies include an equal blend of low mineral content (softer) water (imported water and desalted groundwater), with the higher total dissolved solid (harder) content local groundwater. The detailed characteristics of each of these sources is described in the following paragraphs and summarized in Table 1.

1.1 UWCD and City Groundwater

Groundwater purchased from UWCD has historically made up approximately 25% of the City's water supply and the groundwater pumped from City wells another 25%. However, with the recent addition of the Blending Station No. 1 Desalter, the City intends to rely increasingly on local groundwater while fixing or reducing its imported water purchases. The City is capable of making this transition without compromise to its overall water quality because it can now desalt a portion of its local groundwater supplies. Local groundwater is generally pumped from the Oxnard Plain Groundwater Basin. A description of the local groundwater aquifers is provided in the City's 2005 Urban Water Management Plan (UWMP).

1.1.1 Fox Canyon Groundwater Management Agency

The Fox Canyon Groundwater Management Agency (GMA) has jurisdiction over groundwater pumping for all of the land which overlies the Fox Canyon Aquifer. This encompasses approximately 185 square miles and includes the Oxnard Plain Forebay and the Oxnard Plain Pressure Basins underlying most of the City. This region is not subject to a formal, judicially enforced adjudication. But the regulatory oversight of the GMA provides the functional equivalent water management controls which are normally associated with adjudicated basins.

The GMA monitors and controls pumping within the GMA boundaries. As a method of reducing overall demands on local groundwater supplies, the GMA has implemented a staged "cutback" policy, through which it has reduced M&I allocation in increments of 5%, over a period of 25 years. As of July 1, 2009, municipal and industrial (M&I) pumpers have had a total of 20% cutback in their historical allocations. A final 5% cutback (for a total of 25%) is likely to be implemented on January 1, 2010. The GMA does not prohibit pumping beyond the M&I allocations, however extractions beyond the pumping allocations are subject to a surcharge.

The GMA also allows pumpers to carryover unused allocation from year-to-year; that is, if a pumper utilizes less than its pumping allocation, it accrues conservation credits. Similarly, if "foreign water" (including recycled water) is used in-lieu of groundwater pumping and/or recharged into the local aquifers, additional credits (either conservation or storage credits) may be accrued.

The City has undertaken both types of programs in the past, with GMA approval. The City has managed its total GMA allocation to establish and maintain approximately 30,000 acre feet (AF) in GMA groundwater conservation credits. The City uses its groundwater credit "bank" conjunctively with its imported supplies. During periods when imported supplies are restricted or when other operational considerations warrant it, the City relies more heavily on local groundwater, using a portion of its accumulated credits. During other periods, the City will reduce its groundwater use below its historical allocation to build back up its credit "bank."

The City obtains additional GMA allocations when agricultural land is converted to urban uses. In other words, the GMA allocates 2 acre-feet per acre per year of new allocation to the City when the City takes over water service obligation to lands that convert from agricultural use to M&I uses. The 2 acre-feet per acre, per year allocation is treated as "historical allocation" and is subject to the GMA regulatory cutbacks described above. Therefore, as of January 2010, the actual allocation the City receives in an agricultural to urban land use conversion is 1.5 acre-feet per acre per year.

Finally, the City receives a GMA baseline allocation for land which transitioned to urban use, but which had no prior water use history prior to the conversion. The baseline allocation is assigned at 1 acre-foot per acre per year (GMA Ordinance 8.1 Section 5.6.1.1). Baseline allocation is not subject to GMA regulatory cutbacks.

The City has two existing allocation pools – one (a suballocation) held in trust through UWCD and the other is assigned directly to the City's own wells. Each of these allocations is discussed below.

1.1.2 Groundwater – City Wells

In 2005 the GMA passed Ordinance No. 8.1, also known as the "Ordinance Code." The main goal of the ordinance is to bring the basin to safe yield by 2010. The result of the Ordinance Code was that by year 2006 the City had the following allocations:

- 822.468 acre-feet per year (AFY) of GMA baseline allocation
- 8,415.984 AFY of historical allocation (after 15% reduction)
- 1,487.798 AFY of transferred allocation (after 15% reduction)

As of December 31, 2006 total City GMA groundwater allocation was 10,726.25 AFY.

Since 2006 there have been several events that have impacted local groundwater. Lower than average precipitation over the last few years, efforts to protect endangered species on the Santa Clara River, intensification of water use by agricultural pumpers, and difficulty with recharge at some groundwater basins have strained local groundwater resources. Both agricultural and municipal groundwater pumpers have implemented significant conservation measures and the GMA continues to refine its regulatory practices to maintain the long-term integrity of local groundwater resources.

As previously described, in 2009 historical allocations have been reduced by a cumulative 20%, and another 5% reduction is scheduled to go into effect in January 2010. For the purposes of water supply planning, it is assumed that the City's baseline allocation will remain at 822.468 AFY, but the historical and transferred allocation will be reduced. Total anticipated City groundwater allocation is assumed to be 8,380 AFY, with no additional future cutbacks.

A projection of water supply from City groundwater wells is provided in Table 1.

1.1.3 Groundwater – United Water Conservation District

UWCD currently provides a portion of the City's groundwater supply through its El Rio Wellfield and Oxnard-Hueneme (O-H) Pipeline System. This arrangement has been in operation since 1954, with the current contractual commitment formalized in the 1996 Water Supply Agreement for Delivery of Water through the Oxnard/Hueneme Pipeline. UWCD holds a pumping suballocation for all users (Contractors) of the O-H Pipeline, which includes the City, the Port Hueneme Water Agency (PHWA), and a number of small mutual water companies.

UWCD diverts Santa Clara River water at the Vern Freeman Diversion Dam southeast of Saticoy, provides some of the diverted water to agricultural irrigators on the Oxnard Plain, and delivers the rest to the Saticoy and El Rio Spreading Grounds. Water percolated in these spreading basins recharges the Oxnard Plain Forebay Basin. The UWCD El Rio Wellfield is optimally located to pump groundwater from the easily recharged Oxnard Plain Forebay Basin.

The City's groundwater suballocation of UWCD groundwater was historically 9,070 AFY, but this was cutback to 7,709 AFY in 2006 as a result of Ordinance No. 8.1. The final GMA cutback scheduled for January 2010 will reduce the City's suballocation from UWCD to 6,800 AFY.

UWCD also holds conservation credits accrued by the O-H contractors, including the City. Currently the City has approximately 7,000 AF of stored credits with UWCD (personal communication, Curtis Hopkins, August 2009).

Because the reductions in allocation are designed to bring the groundwater basins within safe yield, the City's groundwater suballocations are considered to be a reliable future water source.

A projection of water supply from UWCD is provided in Table 1.

1.1.4 Calleguas Municipal Water District (Imported)

The City annexed to CMWD in February of 1961. CMWD is a member agency of the Metropolitan Water District of Southern California (MWD) from which it purchases imported water through the State Water Project (SWP) from Northern California. CMWD receives treated water from MWD via the MWD West Valley Feeder and either stores the treated water in Lake Bard or the Las Posas Basin for later delivery or feeds the water directly to the Springville Reservoir near Camarillo. The City receives water from the Springville Reservoir through the City's Oxnard and Del Norte Conduits that feed the City's five (5) water blending stations

The imported water purchased from CMWD has historically comprised approximately 50% of the City's total water supply. Lower than average precipitation over the last several years, conveyance and storage deficiencies in the SWP system, and judicial decisions regarding endangered species in the Sacramento-San Joaquin Delta area have led to reduced SWP imported water deliveries. These reduced SWP deliveries led MWD, in mid-2009, to reduce water deliveries to its member agencies, including CMWD, and consequently retail water purveyors including the City of Oxnard. As the City of Oxnard and PHWA share the same CMWD turnout, the two agencies must reduce their usage of imported water by approximately 23% during the Fiscal Year 2009-2010 period, or face significant penalties by mid-2010. MWD applied the 23% reduction to the assumed base supply, using a baseline period between 2004 and 2006, and calculated City supply at 11,385 AFY. This reduction in supply is expected to remain in place until the constraints on MWD's supplies are relieved. The City is in negotiations with MWD to adjust upward this allocation to better reflect the typical imported water demand for the City.

1.1.5 Recycled Water

Currently, the City does not supply recycled water; however, this source is a component of the City's future water supplies.

The Oxnard Wastewater Treatment Plant (OWTP) currently produces approximately 22 million gallons per day (mgd) of secondary treated wastewater and discharges the effluent to the Pacific Ocean through an ocean outfall. In an effort to identify a project that could take advantage of the water reclamation potential from the OWTP, the City completed a Water Reclamation Master Plan in 1993. In response to recommendations included in the 1997 progress report titled "Oxnard Water Reclamation Project Initial Implementation Elements of the Water Reclamation Master Plan," and with input from CMWD, UWCD, and GMA, the City developed a water recycling program – the Groundwater Recovery Enhancement and Treatment (GREAT) Program.

In 2002, the City Council formally directed City staff to begin implementation of the GREAT Program, as further documented in the "GREAT Program Advanced Planning Study" (Kennedy/Jenks, 2002). Recycled water represents a new water supply that can be developed locally, reducing future reliance on imported water deliveries from northern California.

Since 2002, the City has certified a final environmental impact report and environmental impact statement for the GREAT Program, fully approved funding for the Phase 1 portion of the Program, along with acceptance of significant federal and state grants in support of the GREAT Program elements. The Blending Station No. 1 Desalter is the first completed major element of the GREAT Program.

Construction of the next major element of the GREAT Program -- the Advanced Water Purification Facility (AWPF) -- is scheduled to begin in December 2009. The AWPF, will treat secondary-treated wastewater from the OWTP using microfiltration, reverse osmosis and advanced oxidation, to produce purified recycled water. This highly treated, recycled water will be used for landscape irrigation, industrial processes, agricultural irrigation and future groundwater recharge.

Construction bidding for the AWPF began October 9, 2009 and will close December 2, 2009. The City Council is scheduled to issue tax exempt revenue bonds in late 2009 or early 2010 to fund a portion of the Phase I recycled water project. As noted, the City expects to start construction of the AWPF Phase I before the end of 2009. Requirements from a $20,000,000 Department of Interior, US Bureau of Reclamation grant received for the project require that the AWPF be completed and producing recycled water by September 30, 2011.

The AWPF is designed so that its capacity can be increased at relatively nominal incremental cost. In other words, the major facilities will be sized so that additional treatment capacity can be installed in modular components. Thus, the Phase 2 GREAT Program can be implemented much more quickly, at lower incremental costs, and with minor environmental review, in comparison to the Phase 1 element of the GREAT Program. The City intends to implement subsequent expansion(s) of the AWPF based on its then existing water supply and demand projections as they develop over the coming years. Subsequent phases of the AWPF will increase recycled water production from 6.25 mgd to as much as 26 mgd.

The City Council has also fully approved, and the City is in the final design of, the Recycled Water Backbone Pipeline Phase I. This pipeline and distribution project will deliver recycled water to customers along the Hueneme Road and Ventura Road corridors within the City, substituting recycled water for use of potable water where appropriate. The City expects to complete design work within the next few months and to start construction in early 2010. To meet the terms of the US Bureau of Reclamation grant, the Recycled Water Backbone Pipeline must also be completed by September 30, 2011.

Additional details on the City's proposed recycled water system are described in the City's Recycled Water Masterplan Phase I.

For the purposes of water supply projections it is assumed that the GREAT AWPF Phase 1 will produce 6.25 mgd (7,000 AFY net production) by year 2012 (personal communication, Thien Ng, September 2009). It is anticipated that recycled water infrastructure will serve 2,450 AFY of M&I demands by year 2012; approximately 2,700 AFY of recycled water supply would be delivered to City M&I by year 2013; 3,150 AFY by 2016; and 5,050 AFY by year 2020 (Recycled Water Master Plan 2009). Recycled water produced in excess of M&I recycled water demands will be used for irrigation of agricultural lands or groundwater recharge, in exchange for GMA groundwater credits.

The AWPF is conveniently located in close proximity to agricultural lands which could be easily served with recycled water. The infrastructure necessary to support groundwater recharge will also be located in the area nearby the AWPF and is expected to be in place by 2015.

The initial Phase 1 construction of the AWPF includes the completion of the main facility and infrastructure required for the future expansion of the facility's capacity. Additional treatment trains, or modules, can be added as needed, with significantly less comparative investment, to address future changes in water supply. The AWPF Phase 2A could be built as early as year 2015 and would supply an additional 7,000 AFY. AWPF Phase 2B is estimated to be complete by 2020, producing an additional 7,000 AFY. Dates for these AWPF expansions may be modified as water supply conditions change or circumstances require. AWPF Phase 2A and 2B may provide recycled water to M&I, agriculture, and groundwater recharge projects. Funding for AWPF Phase 2A and 2B will primarily be generated from fees paid by projects that increase water demands beyond the Phase I capacity of the GREAT Program. Future expansions of the AWPF, up to 25 mgd, will be undertaken by the City as needed.

A projection of water supply from the GREAT Program Phases 1 and 2 is provided in Table 1.

1.1.6 Other Projected City Water Supplies

The City has identified other potential water supplies in addition to those described above:

- Ferro Property Program. UWCD has approved, and is in the process of completing, the purchase of certain property located in the Oxnard Plain Forebay, which UWCD will convert into additional spreading basins. UWCD has approved a transfer agreement with the City through which the City will access additional local groundwater supplies. The City Council will consider this transfer agreement in December 2009. Through this program, the City will obtain 11,000 AF of groundwater credits. The City plans to use these transferred credits within the period 2010-2011. This program also provides the City with an additional access to 1,000 acre-feet per year of groundwater, through 2019 (a total of an additional 8,000 acre-feet) (personal communication, Tony Emmert, September 2009). The groundwater obtained through this program will be delivered through City wells and the O-H pipeline.

- Transferred Allocations. As described in section 1.1, it is estimated that the City will acquire 1.5 acre-feet per acre per year for agricultural lands that convert to M&I uses. The City has identified several areas that are in agriculture that are anticipated to undergo urban development including the Teal Club Specific Plan (SP) area, Sakioka Farms SP area, Camino Real Business Park, Jones Ranch SP, Ormond Beach North SP, and Ormond Beach South SP. Based on the potential conversion area and timing of development the City Planning Division has developed projections of transferred allocations. Water supply projections assume transfers of allocation of 525 AF per year from the Teal Club SP; 219 AF per year from the Sakioka Farms SP; 69 AF per year from the Camino Real SP; 145 AF per year from the Ormond Beach North SP; and 98 AF per year from the Jones Ranch SP by year 2015. This projection also assumes the transfer of an additional 260 AF per year from the Sakioka Farms SP; an additional 150 AF per year from the Jones Ranch SP; an additional 338 AF per year from the North Ormond Beach SP; and 231 AF per year from the Ormond Beach South SP by year 2020. This projection also assumes the transfer of an additional 332 AF per year from the Ormond Beach South SP and an additional 148 AF per year from the Sakioka Farms SP by year 2030.

- Transfer of 700 AF of GMA groundwater credits from PHWA to the City as part of the Three Party Water Supply Agreement, December 2002 (personal communication, Tony Emmert, August 2009, Calleguas Municipal Water District “Three Party Agreement” dated December 10, 2002 and “Purchase Order” dated January 1, 2003).

TABLE 1
PROJECTED ANNUAL WATER SUPPLIES AND CREDITS

	2010	2015	2020	2025	2030
ANNUAL SUPPLIES (acre feet per year)					
Groundwater-City Wells[(a)]	8,380	8,380	8,380	8,380	8,380
Brine Water Loss[(b)]	(2,100)	(4,200)	(6,300)	(8,400)	(8,400)
UWCD Allocation[(c)]	6,800	6,800	6,800	6,800	6,800
CMWD Allocation[(d)]	11,840	11,840	11,840	11,840	11,840
M&I Supplemental Water[(e)]	5,000	3,000	1,000	1,000	1,000
GREAT Program Recycled Water Phase 1 M&I[(f)]	0	2,700	5,050	5,050	5,050
GREAT Program Recycled Water Phase 1 Agriculture Use[(f)]	0	4,300	1,950	1,950	1,950
GREAT Program Recycled Water Phase 2[(g)]	0	7,000	14,000	14,000	14,000
Ferro Pit Program[(h)]	5,500	1,000	0	0	0
Transferred Allocations[(i)]	0	1,060	2,290	2,220	2,420
PHWA Program[(j)]	700	700	700	700	700
TOTAL ANNUAL SUPPLIES	**36,120**	**42,580**	**45,710**	**43,540**	**43,740**
GROUNDWATER BANKED CREDITS					
Fox Canyon GMA credits (k)	30,000	AF			
UWCD credits (k)	7,000	AF			
GREAT Program credits at 2,500 AFY minimum X 20 years (l)	50,000	AF			
SUBTOTAL	**87,000**	**AF**			

Notes: Values are rounded to the nearest 10 acre-feet.

a) Projection includes the existing cutbacks (Fox Canyon Groundwater Management Agency-GMA, up to 25 %) and no anticipated future cutbacks in City's allocation. Source: City Water Resources (personal communication, Curtis Hopkins, August 2009).
b) Brine Water Loss is the amount of brine reject water (approximately 20 % loss) associated with the City's potable water Desalters at Blending Stations No. 1 (BS1) (currently operating at 7.5 mgd product water capacity - 8,400 AFY) and future BS3. BS3 Phase 1 anticipated to be operating by 2013 (7.5 mgd product water capacity) and BS1 Phase 2 (15 mgd product water capacity) projected to be operating by 2017 (according to the City's Fiscal Year 2008-2009 Capital Improvement Plan). BS3 Phase 2 (15 mgd product water capacity) anticipated to be operating by 2021 (personal communication with City Water Division, Tony Emmert, August 2009). However, these dates may be modified as conditions change.
c) This assumes the most conservative availability of City's allocation from UWCD which includes a total of 6,800 AFY. Also assumes that the GMA implements the full 25% cutback by 2010; and no anticipated future GMA cutbacks. The City had approximately 7,000 AF of credits banked with UWCD (personal communication, Curtis Hopkins, August 2009).
d) MWD applied the 23% reduction to the assumed base supply, using a baseline period between 2004 and 2006, and calculated City supply at 11,385 AFY. However, the City's entitlement also includes sub allocations for P&G (2,800 AFY) and PHWA (3,262.5 AFY). The City is free to use any unused P&G and CMWD sub allocations. Program details provided by City Water Resources (2005 UWMP; personal communication, Tony Emmert, September 2009).
e) Through the M&I Supplemental Water Program, the City has received a total of 15,886.7 AF between the years 2005-2008 – approximately 4,000 AFY. However, UWCD may temporarily reduce or suspend deliveries of M&I Supplemental Water when Forebay groundwater levels drop below a certain threshold. For example, UWCD has tentatively suspended deliveries of M&I Supplemental water given the current conditions in the Forebay as of late 2009. Even though deliveries are suspended, M&I Supplemental water credits continue to accumulate. Once the suspended deliveries are reinitiated, it is expected that the accumulated credits will be made available in full in subsequent years. Based on current

information, the City anticipates 5,000 AF of M&I Supplemental Water will be available in 2010 and 0 AF in year 2011. As a conservative assumption, the City assumes that on average only 3,000 AFY of M&I Supplemental water credits will be available between the years 2012-2015. As the Camrosa Water District has a contractual first right of refusal of the Conejo Creek Diversion Project water, and has expressed plans to utilize most of this water within its district, the M&I Supplemental Water credits available will reduce to 1,000 AFY as the Camrosa non-potable water system infrastructure continues to develop. Based on the expected future expansion phases of the Camrosa system, this is projected to occur after year 2015.

f) GREAT AWPF Phase 1 (anticipated startup in 2010-2012) would produce a maximum of 6.25 mgd (7,000 AFY net production) (Source: UWMP, 2005; personal communication, Thien Ng, September 2009). Combined uses of recycled water from AWPF Phase 1 (M&I and agriculture) does not exceed 7,000 AFY from 2012-2030. City anticipates that recycled water infrastructure will serve 2,450 AFY M&I demands by year 2012; approximately 2,700 AFY of recycled water supply would be delivered to City M&I uses by 2013; 3,150 AFY by 2016; and 5,050 AFY by year 2020 (Recycled Water Master Plan 2009). City assumes water produced in excess of M&I recycled water demands will be used for agricultural uses and groundwater recharge. City assumes GMA will allow credits for 100% of recycled water used directly or for injection (groundwater recharge) (personal communication, Steve Bachman, August 2009). It is assumed infrastructure to allow groundwater recharge will be in place by year 2015.

g) This is a projected supply not previously utilized by the City. AWPF Phase 2A (anticipated 2015; based on 2009 Avoided Cost Model) would produce a maximum of an additional 7,000 AFY (net production). AWPF Phase 2B is anticipated to be operating by 2020 and produce a maximum of an additional 7,000 AFY (net production). Dates for these AWPF expansions may be modified as conditions change. AWPF Phase 2A and 2B may provide recycled water to M&I, agriculture, injection barrier, and groundwater recharge projects.

h) This is a projected supply not previously utilized by the City. Includes one-time transfer of 11,000 AF of groundwater credits to the City. City plans to use these transferred credits within the period 2010-2011. City will also obtain 1,000 AFY of credits from 2012-2019. Program details provided by City Water Resources (personal communication, Tony Emmert, September, 2009).

i) For agricultural property conversion - assume 1.5 acre-feet per acre per year. The credits depicted here are those used to meet demand and are not representative of the City's cumulative credit balance with the GMA. Transferred allocation values developed by City Planning Department (personal communication, Chris Williamson October 2009). Assumes transfers of 525 AF Teal Club SP; 219 AF Sakioka Farms SP; 69 AF Camino Real SP; 145 AF from the Ormond Beach North SP; and 98 AF Jones Ranch SP by year 2015. Assumes transfer of additional 260 AF Sakioka Farms SP; and additional 150 AF Jones Ranch SP; an additional 338 AF from the North Ormond Beach SP; and 231 AF Ormond Beach South SP by year 2020. Assumes additional 332 AF from Ormond Beach South SP and an additional 148 AF Sakioka Farms SP by year 2030.

j) Transfer of 700 AF of GMA groundwater Credits from PHWA to the City as part of the Three Party Water Supply Agreement, December 2002. Program details provided by City Water Resources (personal communication, Tony Emmert, August 2009).

k) The Credits depicted here are those used to meet demand and are not representative of the City's cumulative credit balance. Deliveries from the groundwater credits are shown only when there is insufficient supply to meet demand. At the end of 2008, the City had approximately 30,000 AF of groundwater credits with the GMA and 7,000 AF with UWCD. The groundwater credits are intended to be used to offset any reduced availability of imported water, or to mitigate unforeseen cutbacks, catastrophic events, facility failure, etc. The City can use these credits without GMA penalty. Program details provided by City Water Resources, personal communication, Tony Emmert, November 2009; personal communication, Curtis Hopkins, September 2009.

l) It is assumed future GREAT Program deliveries will be credited a minimum of 2,500 AFY starting in year 2015.

2.0 Water Demand Projections

A detailed water demand model was developed as part of the 2005 UWMP and includes: existing demand, demand from proposed buildout of the 2020 General Plan, unaccounted for water loss, potential increase in per-unit demand, and a contingency. The model also accounts for reductions in demand due to the increased use of recycled water and water conservation.

This model has been updated for buildout of the proposed 2030 General Plan Alternative B and to reflect recent changes in water supply and consumption, as accurately and as reasonably possible.

Components of demand are shown in Table 2 and discussed below:

- 2009 Baseline Demand. This is an estimate of total demand for the calendar year 2009. As a conservative basis, water demand by existing customers is anticipated to remain fairly stable through 2030. In all likelihood current customers will continue to implement best management practices, which should reduce overall per capita water consumption.

- Non-Revenue Water (i.e., Water Loss). Water losses come from authorized, unmetered sources such as fire fighting and main flushing, or unauthorized sources such as leakage, illegal connections, and inaccurate flow meters. Non-Revenue water is estimated to be about 6% of water demand.

- Ocean View System (formerly Ocean View Municipal Water District [OVMWD]) primarily serves agricultural customers along East Hueneme Road. As part of a Local Agency Formation Commission action, the OVMWD district dissolved and the existing customers were added to the City of Oxnard water service area as the Ocean View System (OVS). Existing users in the OVS service area along East Hueneme Road receive water from the City through the UWCD O-H Pipeline System and the OVS system. Parcels within the former OVMWD service area also obtain water from private wells and from the UWCD PTP System. OVS customers use approximately 1,337 AFY of UWCD O-H water delivered via the City, according to UWCD data (average calculated for fiscal years 1999-2008).

- PHWA purchases water from the City per the Three Party Agreement which specifies a PHWA suballocation of CMWD water of 3,262.5 AFY. PHWA's mean annual purchase from the City was 1,911 AF for period 1999-2008 (personal communication, Steve Hickox, September 2009; personal communication, David Birch, September 2009). The City of Port Hueneme, the largest PHWA member agency, has implemented a meter retrofit program which should substantially reduce water demand within the City. PHWA is also implementing other water management programs which may decrease its per capita water demands.

- Proctor & Gamble is a private user within the City of Oxnard which receives unblended imported water from the City through a special water service agreement. Current annual water demand for Proctor & Gamble is approximately 2,300 AFY for the period 2001-2008. Proctor & Gamble estimated future water demands are approximately 2,800 AFY, assumed to occur after year 2015. Source: personal communication, Dakota Corey, August 2009. Proctor & Gamble has also indicated its intent to implement certain water reuse and conservation practices, and consider the use of recycled water to offset some of its demands. For the purpose of this analysis, the City assumes Proctor & Gamble's overall water use will increase from 2,300 AFY to 2,800 AFY after 2015.

- Projected New Demand Increase for Development Projects Under Review. Annual increase in water demand has been based on development applications received and under review and/or permitted. New 2010 to 2030 water demand is based on the buildout of the 2030 General Plan, Alternative B. Year to year projected new development demand based on the July 2009 City Project List, 2030 General Plan Background Report (2006), Ventura Council of Governments Decapolis Report, and UCSB Forecast.

- Projected New Demand Increase of Unknown Projects. It is assumed that for any given timeframe, water demand could be 10% higher due to approved amendments to the 2030 General Plan.

- Demand Management Programs. In February 2008, Governor Schwarzenegger called for a 20 percent reduction in per capita water use statewide by 2020. The State Water Resources Control Board has released a draft statewide implementation plan for achieving this goal (Draft 20x2020 Water Conservation Plan, April 2009) which establishes regional baseline and target per capita water use values by State hydrologic region. The 2020 targeted daily per capita water use value established for the South Coast hydrologic region is 149 gallons per capita per day. The draft plan proposes a series of enforcement mechanisms and financial incentives to facilitate water conservation at the local level. The City is preparing a Conservation Master Plan, due by the end of 2009, which will identify potential demand management measures and potential demand reductions which will help the City meet the gallons per capita per day goals of the 20x2020 plan. The City anticipates a reduction in City-wide water demands of approximately 500 AFY for period 2010-2012, ramping up to 5% of demand from 2016-2020, and 10% reduction for period 2021-2030. Demand reductions recommended by City staff (personal communication, Tony Emmert and Dakota Corey, August-September 2009).

Table 2 shows the estimated annual water demand projections through the year 2030. On a day-to-day basis there will be variations, with higher demands typically during the summer and lower demands during the winter.

The water demand projections in Table 2 are conservative and likely overestimate demand. General Plans rarely reach buildout and are rarely amended so often as to produce a gain of 10 percent. Nevertheless, because of reduced reliability of water imports from the SWP the Oxnard City Council, at its January 15, 2008 and October 19, 2009 meetings, directed staff to require that all new projects defined as discretionary and not exempt from CEQA be water demand neutral to the City's water system. Project proponents can contribute water rights, water supplies, or financial or physical offsets to achieve water neutrality. Typical options open to project proponents include transfers of GMA groundwater allocations to the City through agricultural conversion, participation in expansions of the City's GREAT Program recycled water system through physical or financial contributions, and participation in water conservation projects that produce measurable sustainable water savings. Several projects have already complied with this requirement and several others are currently in negotiations with the City. Projects that are ministerial and/or exempt from CEQA, such as single family residential projects or business tenant improvements, are not subject to the water demand neutral requirement.

At the October 27, 2009 meeting the City Council directed that the following components be incorporated into a written City water demand neutral policy:

- Proposed projects should either contribute new water supplies or the financial or physical equivalent to offset the estimated project demand.

- The City will develop a menu of mitigation options that may include financial contribution toward the GREAT Program's recycled water facilities, financial contribution toward a City controlled water conservation project or program that would generate verifiable long-term water savings, or implementation of a developer initiated water conservation project or program that would generate verifiable long-term water savings.

TABLE 2
ANNUAL WATER DEMAND PROJECTIONS (AFY)

WATER DEMANDS	2010	2015	2020	2025	2030
BASELINE DEMAND					
2009 Revenue Metered Demand[a]	28,900	28,900	28,900	28,900	28,900
2009 Non-Revenue Water[b]	2,150	2,150	2,150	2,150	2,150
OVS (formerly OVMWD)[c]	1,340	1,340	1,340	1,340	1,340
PHWA[d]	1,910	1,910	1,910	1,910	1,910
Proctor and Gamble[e]	2,300	2,800	2,800	2,800	2,800
SUBTOTAL	36,600	37,100	37,100	37,100	37,100
POTENTIAL DEMAND					
Projected Buildout of the 2030 General Plan[f]	550	3,040	5,440	6,600	7,750
10% Contingency for General Plan Amendments[g]	50	300	550	650	750
SUBTOTAL[h]	600	3,340	5,990	7,250	8,500
DEMAND REDUCTION PROGRAMS					
Demand Management Programs Reduction[i]	(500)	(1,620)	(2,150)	(4,440)	(4,560)
SUBTOTAL	(500)	(1,620)	(2,150)	(4,440)	(4,560)
TOTAL DEMAND	**36,700**	**38,820**	**40,940**	**39,910**	**41,040**

Source: City Planning, 2009.
Notes: Values are rounded to the nearest 10 AF.
a) Baseline water demand for fiscal year 2009. Water demand by existing customers is anticipated to remain fairly stable through 2030. Baseline demand excludes annual demands for Proctor & Gamble, agricultural water for the OVS, and annual demands for PHWA. These three demands are summarized separately in this table. Data

provided by City Planning Department (personal communication, Chris Williamson, August 2009) and City Water Resources (personal communication, Dakota Corey and Tony Emmert, September 2009).

b) Non-revenue water = unaccounted-for water. Estimated at 6% of total demand (approximately 35,600 AFY x 6%). Source: personal communication, Dakota Corey, September 2009.

c) Based on available billing data, OVS customers have used approximately 1,337 AFY of UWCD O-H water delivered via the City.

d) PHWA purchases water from the City per the Three Party Agreement; Agreement specifies PHWA suballocation of CMWD water of 3,262.5 AFY. PHWA mean annual purchases from the City was 1,911 AF for period 1999-2008 (source: personal communication, Steve Hickox, September 2009; personal communication, David Birch, September 2009). PHWA will begin water demand management programs in 2009 which may decrease water demands.

e) Current annual water demand for Proctor & Gamble is approximately 2,300 AFY for the period 2001-2008. Proctor and Gamble estimated future water demands are approximately 2,800 AFY, assumed to occur after year 2015. Source: personal communication, Dakota Corey, August 2009.

f) Annual increase in water demand based on development applications received for known projects. New water demands also include 2030 General Plan buildout, infill, redevelopment, and densification. Values provided by City Planning Department (personal communication, Chris Williamson and Kathleen Mallory, August 2009) and based on the following sources: July 2009 City Project List, CA Department of Finance, 2030 General Plan Background Report (2006), Ventura Council of Governments data, and UCSB Forecast.

g) Annual increase in water demand for unknown projects. Can be as high as 10% of new demand for known projects. Source: personal communication, Ken Ortega, September 2009.

h) Cumulative total new demand based on the annual values for known and unknown projects.

i) City anticipates the reduction in City-wide water demands via implementing several demand management programs. Estimated reduction is approximately 500 AFY for period 2010-2012, 2% of demand in 2013, 3% of demand in 2014, 4% of demand in 2015, 5% of demand from 2016-2020, and 10 % reduction for period 2021-2030.

3.0 Water Supply and Demand Comparison

Tables 3 through 7 provide a comparison of the City's annual water supply and demands for normal, single dry, and multiple dry water years. The normal year scenario assumes the same supplies and demands presented in Tables 1 and 2. As the City's supplies in Table 1 are firm, no change in available supply is anticipated for the City in a single dry year. Demands are also assumed to remain the same for a single dry year. For a multiple dry year scenario, it was assumed that a 5% reduction in available supplies will occur between the years 2010 and 2015.

Tables 3 and 4 show that, under normal conditions for the period 2010 to 2014, the City will need to rely on a portion (up to 42%) of its bank of accumulated groundwater credits to meet anticipated demand. Once the GREAT Program recycled water system begins production and delivery of recycled water and consequently offsets potable demand or earns groundwater credits, the City will be able to replenish its groundwater credit bank. Both supply and demand have been conservatively estimated as supply estimates reflect the maximum anticipated cutbacks and demand estimates are also worst-case. Because the City requires that new development projects be water neutral, this requirement and the current economic conditions would tend to delay or cancel some anticipated development. As a result, water demand estimates are likely overstated and the draw on groundwater credits will be less than projected.

TABLE 3
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
NORMAL YEAR SCENARIO

	2010	2015	2020	2025	2030
Supply Totals	36,110	42,570	45,930	44,090	44,300
Demand Totals	36,700	38,800	40,920	39,920	41,080
Net Difference Supply vs. Demand	(590)	3,770	5,010	4,170	3,220
Groundwater Debit/Credit	(590)	0	0	0	0
Net Difference to Annual Supply	-2%	9%	11%	9%	7%
Net Difference to Annual Demand	-2%	10%	12%	10%	8%
Draw on Credit Bank	2%	0%	0%	0%	0%
Supply vs. Demand with Credits	0	3,770	5,010	4,170	3,220

Note: Values are rounded to the nearest 10 AF.

TABLE 4
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
NORMAL YEAR 2010 TO 2014 ANNUAL

	2010	2011	2012	2013	2014
Supply Totals	36,110	31,290	32,430	30,760	30,940
Demand Totals	36,700	37,240	37,780	38,540	38,680
Net Difference Supply vs. Demand	(590)	(5,950)	(5,350)	(7,780)	(7,740)
Groundwater Debit/Credit	(590)	(5,950)	(5,350)	(7,780)	(7,740)
Net Difference to Annual Supply	-2%	-19%	-16%	-25%	-25%
Net Difference to Annual Demand	-2%	-16%	-14%	-20%	-20%
Draw on Available Credit Bank	2%	16%	18%	30%	42%
Supply vs. Demand with Credits	0	0	0	0	0

Notes: Values are rounded to the nearest 10 AF.

As shown in Table 5, under a dry year scenario, like the normal year scenario, in year 2010, the City will also have to rely on a portion of its groundwater credits.

TABLE 5
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
DRY YEAR SCENARIO

	2010	2015	2020	2025	2030
Supply Totals	36,110	42,570	45,930	44,090	44,300
Demand Totals	36,700	38,800	40,920	39,920	41,080
Net Difference Supply vs. Demand	(590)	3,770	5,010	4,170	3,220
Groundwater Debit/Credit	(590)	0	0	0	0
Net Difference to Annual Supply	-2%	9%	11%	9%	7%
Net Difference to Annual Demand	-2%	10%	12%	10%	8%
Draw on Credit Bank	2%	0%	0%	0%	0%
Supply vs. Demand with Credits	0	3,770	5,010	4,170	3,220

Note: Values are rounded to the nearest 10 AF.

Tables 6 and 7 provide a comparison of supply and demand assuming a multiple dry year scenario. Table 6 provides projections for years 2010, 2015, 2020, 2025, and 2030. Table 7 provides projections for years 2010 through 2014, the more critical years in terms of supply. Tables 6 and 7 show that, under multiple dry year conditions for the period 2010 to 2014, the City will need to rely on a portion (up to 86%) of its bank of accumulated groundwater credits to meet anticipated demand.

TABLE 6
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
MULTIPLE DRY YEAR SCENARIO

	2010	2015	2020	2025	2030
Supply Totals	32,400	42,070	46,930	44,090	44,300
Demand Totals	36,700	38,800	40,920	39,920	41,080
Net Difference Supply vs. Demand	(4,300)	3,270	6,010	4,170	3,220
Groundwater Debit/Credit	4300	0	0	0	0
Net Difference to Annual Supply	-13%	8%	13%	9%	7%
Net Difference to Annual Demand	-12%	8%	15%	10%	8%
Draw on Available Credit Bank	12%	0%	0%	0%	0%
Supply vs. Demand with Credits	0	3,270	6,010	4,170	3,220

Note: Values are rounded to the nearest 10 AF.

TABLE 7
PROJECTED 2030 GENERAL PLAN BUILDOUT
WATER SUPPLY AND DEMAND COMPARISON:
MULTIPLE DRY YEAR 2010 TO 2014 SCENARIO

	2010	2011	2012	2013	2014
Supply Totals	34,300	29,730	30,810	29,220	29,390
Demand Totals	36,700	37,240	37,780	38,540	38,680
Net Difference Supply vs. Demand	(2,400)	(7,510)	(6,970)	(9,320)	(9,290)
Groundwater Debit/Credit	2,400	7,510	6,970	9,320	9,290
Net Difference to Annual Supply	-7%	-25%	-23%	-32%	-32%
Net Difference to Annual Demand	-7%	-20%	-18%	-24%	-24%
Draw on Available Credit Bank	6%	22%	26%	46%	86%
Supply vs. Demand with Credits	0	0	0	0	0

Notes: Values are rounded to the nearest 10 AF.

4.0 Summary and Findings

Tables 3 through 7 confirm the importance of increased water conservation and implementation of the GREAT Program in achieving a reliable water supply for buildout of the proposed 2030 General Plan Alternative B. During the period 2010 to 2014, the City may draw on a portion of its groundwater credit bank of approximately 37,000 AF as an interim supply until the GREAT Program Phase I is completed. Further, under dry and multiple dry year conditions, it is possible that during the years 2010 to 2014, the cumulative draw on the groundwater credits could nearly exhaust the currently available credits. Note that in Table 3 (Normal Year), Table 5 (Dry Year scenario), and Table 6 (Multiple Dry Year scenario) there is surplus annual water supply after year 2015, which will be used to restore the groundwater credit bank. As noted in this summary, and the City 2005 Urban Water Management Plan, the City has available additional tools to impose response measures to further reduce customer demand to mitigate the impacts of prolonged drought or water shortage conditions.

EXHIBIT B

CITY OF OXNARD CALIFORNIA

HOUSING AND ECONOMIC DEVELOPMENT COMMITTEE
AGENDA REPORT

REPORTS
AGENDA ITEM NO. D.1.

DATE: September 10, 2019

TO: Housing and Economic Development Committee

FROM: Jeffrey Lambert, Community Development Director, (805) 385-7882, jeffrey.lambert@oxnard.org

SUBJECT: Comment Letter to the Southern California Association of Governments (SCAG), Regarding Proposed 2021-2029 Regional Housing Needs Assessment (RHNA) Allocation Methodologies. (15/10/15)

RECOMMENDATION

That the Housing and Economic Development Committee:
1. Receive a report summarizing three SCAG-developed methodologies to determine upcoming housing allocations;
2. Deliberate and provide direction to City staff on issues and concerns pertaining to the methodology; and
3. Authorize the Mayor to submit the attached comment letter, as updated based upon comments received at the Committee meeting.

BACKGROUND

Since 1969, California has required that all cities and counties adopt a housing element as part of their General Plan guided by the eight-year Cycle Regional Housing Needs Assessment (RHNA) process. For Oxnard and Ventura County, the current RHNA "5th Cycle" period is 2013 to 2021. The Southern California Association of Governments (SCAG) began the "6th Housing Element Cycle" ("6th Cycle") covering the planning period of October 2021 through October 2029 in 2018 by requesting its 192 cities and six counties to update and correct population, employment, and housing projections and a range of geographic databases (General Plan, zoning, 2016 land use, infill sites "local input"). In mid-2018, City staff completed and submitted the City's local input work to SCAG. Staff also completed the RHNA Local Planning Factor Survey in early 2019 that included two factors unique to Ventura County: 1) agreements between a county and cities to direct growth to incorporated areas of the county ("Greenbelt Agreements"); and 2) county policies to preserve agricultural land. While a formal letter transmitting the City's input on the Local Planning Factors was not required, the County Board of Supervisors sent a letter to SCAG on July 23rd emphasizing same factors (Attachment A).

SCAG created three RHNA methodologies in the process of developing the 6th Cycle covering the planning period of October 2021 through October 2029. The methodology will determine how the final housing allocation will be distributed to local jurisdictions. The three distribution methodologies for the region's HCD allocation were conceptually discussed at the SCAG meeting on June 3, 2019. These methodologies were then refined and presented at SCAG's July 22, 2019 meeting. On August 2, 2019, SCAG advised that public comment on the final methodology was due by September 3, 2019. On August 14, 2019 SCAG notified cities that the comment deadline had been extended to September 13, 2019.

The California Department of Housing and Community Development (HCD) provided their Regional Housing Need determination for the SCAG region. HCD provided a total of 1,344,740 housing units that the six-county region must plan for in the October 2021 - October 2029 planning period. SCAG has 30 days following receipt of the HCD Regional Housing Need determination to either accept the number or file an objection, along with a basis consistent with state housing law.

SCAG Regional Council will select and/or revise a methodology, based on public comment, and forward it to the Department of Housing and Community Development (HCD). A final proposed methodology recommendation will go before the SCAG Regional Council for approval at its November 7 meeting. When approved, SCAG will use the approved methodology to calculate RHNA jurisdiction allocations by February, 2020. After an appeal period, the RHNA allocations will become final in August 2020 and the 2021-2029 Housing Elements are due one year later, by October 2021.

Once the housing element is certified, each jurisdiction is required to submit an Annual Progress Report (APR) on the progress in implementing their respective housing element goals, policies, and programs (Government Code Section 65400(2)). The APR tracks housing development by four income categories: very low (50% of Area Median Income - AMI), low (50-80% of AMI), moderate (80-120% of AMI), and above moderate (120%+ of AMI). The APR must be submitted to HCD and the Governor's Office of Planning and Research (OPR) by April 1 of each year covering the previous calendar year.

In 2017, the Governor's housing bill package created robust financial incentives along with punitive measures for cities that fail to construct or report on compliance in building affordable housing. If HCD finds that a jurisdiction does not comply with housing law by adopting a HCD-certified housing element, HCD may notify the Attorney General (AG) that the jurisdiction is in violation under Government Code § 65585(j). Jurisdictions that are not in compliance may not receive revenues from the SB 1 gas tax or the state's discretionary housing and transit funding and may be required to complete housing elements on a four-year Cycle rather than eight-year Cycle. In January 2019, the AG sued the City of Huntington Beach claiming the city became out of compliance when it approved two rezonings that together created a 400-affordable unit shortfall. How this lawsuit is resolved could foretell changes for affordable housing production in other California cities.

DISCUSSION

The RHNA utilizes counts of population, households (occupied housing units), vacant units, and total housing units (occupied plus vacant units). The RHNA process begins at the state level with population projections (compiled by the Department of Finance - DOF), which are then configured into households by the four income categories at the county level (by the HCD). SCAG requested Local Input from its 192 jurisdictions in terms of population, housing units, households projections.

As part of the Local Input process all Ventura County cities provided population and housing projections to SCAG through the year 2020, 2025, 2030, 2035, and 2045. Population and housing projections were used to assist SCAG in developing two of the RHNA methodology options (Options 1 and 3, further discussed below). Option 2 is largely based on each jurisdictions' share of the region's total 2019 population; it is not based on population and housing projections.

Table 1, below identifies the 5th Cycle Housing Unit Allocation by jurisdiction. In the 5th Cycle, while the City represented only approximately 25% of the total Ventura County population the City received approximately 38% of the SCAG distributed housing units (all income categories). As shown in Table 1, Options in the 6th Cycle consider population and households; so through the addition of housing units in the 5th Cycle the City continues to have a higher RHNA allocation in the 6th Cycle.

Table 1

Jurisdictions	5th RHNA Housing Unit Allocation - housing units	5th Cycle Percentage of County Allocation	2019 Population (DOF)	2030 Population Projections (Local Governments)	2021-2029 Local Input (Households) (SCAG)*
Camarillo	2,224	12%	69,880	74,388	641
Fillmore	694	4%	15,925	17,193	351
Moorpark	1,164	6%	37,020	41,079	652
Ojai	371	2%	7,769	7,766	34
Oxnard	7,301	38%	209,879	225,720	3,120
Port Hueneme	2	0%	23,526	22,336	86
Ventura	3,654	19%	108,170	115,853	1,552
Santa Paula	1,285	7%	30,779	33,295	499
Simi Valley	1,256	7%	127,716	131,395	1,304
Thousand Oaks	192	1%	129,557	136,244	1,510
Unincorporated	1,015	5%	96,377	100,240	558
TOTAL County	19,158		856,598	905,509	10,307
Oxnard % of County population	38.11%		24.5%	24.9%	30.3%

**Oxnard staff Local input was 3,120 units. However, through inclusion of vacant units the City's total projected need was 3,218 units pursuit to the SCAG data from Aug. 22nd.*

The City’s 2018 annual report submitted to HCD documented that the City constructed 5,244 of its total 7,301 housing units and with planned programs, AAHOP inventory, and ADU construction, the City is closely on target to meet 5th Cycle RHNA goals (July 2, 2019 - City Council 2013-2021 Mid-Cycle Housing Element 2018 Annual Progress Report).

Table F-1 Comparison of Site Capacity and the Regional Housing Need Allocation (2018)

	A	B	C	D = B+C	E	F	G	H=E-F-G
Income Group	RHNA	Units Built 2014-2018	U/C or Approved Projects	Total Progress	Remaining RHNA	AAHOP Inventory Capacity/ Vacant Land	Projected ADU Capacity Thru 2021	Surplus over Remaining RHNA Need
	Table D-1	Table D-2	Table D-3		Table D-4	Table S2-1 and Table S2-2		
Extremely Low Very Low	1,688	131	40	171	1,517	1,773	150	148
Low	1,160	671	231	902	258			
Moderate	1,351	375	850	1,225	126	250**	--	124
Above Moderate	3,102	408	2076	2,946	156	500**	--	344
Above Moderate DOF*		462						
	7,301	2,047	3,197	5,244	2,057	1,773	150	616

**DOF Reports E-5 2013 to 2018 calculate to 462 additional units, assumed to be above moderate.*
*** Downtown Code project anticipates 1,100 units. Lower income units listed in AAHOP inventory.*

THREE RHNA METHODOLOGY OPTIONS

On July 22, 2019, SCAG staff released conceptual descriptions of three RHNA methodologies to calculate a jurisdictions upcoming RHNA allocation (see Attachment B). The three options are described below.

Option 1 - Allocates total housing units based on current (or “existing”) and projected (or future) need. This is the only option that considers current or “existing” need in the RHNA process. Regional existing need is comprised of estimated housing units which would be needed to reduce overcrowding, reduce cost-burden, replace housing units lost due to fire and demolition, and reduce vacancy rates. This current or “existing” need is allocated to a jurisdiction. Option 1 considers these factors:

1. Future need based upon Local Input through year 2030, then adjusted to the year 2029.
2. Share of the region's population (70% of the total existing need to be distributed to the entire SCAG region to all jurisdictions based upon 2019 population).
3. Share of the region's population in high-quality transit areas (HQTAs, 20% of the existing need allocated to HQTA’s).
4. Recent new housing units permitted relative to the regional average (10% of the total SCAG allocation).
5. Applies a 110% social equity adjustment for existing need and a 150% social equity adjustment for future need.

Option 1 results in Oxnard having a higher RHNA allocation, relative to other cities, as we have relatively more overcrowding and cost-burdened households which are components of current or “existing” need. However, the 150% social equity adjustment for future need lowers our housing allocation as we have constructed a large number of affordable housing units. For an affluent community, Option 1 takes a jurisdictions allocation, and distributes “more” of the housing units to very low and low income categories to address that this jurisdiction may not have constructed these affordable units. This adds fairness to the allocation process.

Option 2 - Local Input is not a component of Option 2. This option allocates the combined current or “existing” and future housing needs based upon:
1. The jurisdiction’s share of the region's total population (80% of the total SCAG regional need, allocated based upon the jurisdictions share of the 2019 population)
2. The share of the region's population in HQTA’s (remaining 20% allocated to HQTA’s).
3. Social equity adjustment of 150% for projected or future need.

This approach takes a straight line approach based 80% on population share and 20% on access to transit (Metrolink stations). It does not take into account what affordable units have been built by a jurisdiction. This approach does not consider social equity or Local Input. Essentially, future growth is based off of 2019 population - the larger your population, the larger your RHNA allocation. Because this option considers no local input factors or unique land planning constraints in Ventura County, the City is not supportive of this approach. Further, since the City accepted a larger housing unit number in the 5th Cycle, this will result in a continued higher RHNA housing allocation in the 6th Cycle.

Option 3 - Allocates share of regional population growth with consideration to Local Input. This is a “bottom-up” process that relied upon City household projections for years 2020, 2030, 2035, and 2045 and submitted to SCAG. Option 3 uses 82.5% of projected local input growth from 2020-2030. In doing this, it helped determine the 6th Cycle RHNA allocation (2021-2029) housing need based on Oxnard’s projected household growth. Key components of Option 3 include:

1. Like Option 2, provides for a social equity adjustment of 150% of a City’s total RHNA allocation.
2. Considers Local Input and future need projections.
3. Does not consider HQTA’s, recent building activity, or separates out existing need from future need. Essentially the allocation is “rolled up” into one RHNA number.

While this option relies on Local Input, meaning Oxnard's General Plan buildout and envisioned growth projections through 2045, this process essentially compresses our planned and projected housing unit growth to the year 2045 (25 years) to an eight year housing element cycle (2021 - 2029). This option will result in an overall lower RHNA number as it does not consider over crowding as a component of existing need. Further, this option recognizes that the City has constructed affordable housing, and therefore, allocates more of the City’s RHNA allocation to the moderate and above moderate income categories.

As part of the 6th Cycle RHNA process, on August 2, 2019, SCAG released an excel table with only one input variable - “estimate of total regional need” for the SCAG region. For the 6th RHNA Cycle, State legislation requires that existing housing need (defined as overcrowding, low rental vacancy rates, and excessive cost-burden) be added to future need.

On August 22, 2019, HCD issued a SCAG allocation number of 1,344,740 units for the entire SCAG region. For reference, the 5th Cycle SCAG regional RHNA was 430,000 units. The 1,344,740 units allocated to the SCAG region will then be allocated to the six counties in the SCAG region, and further allocated down to the 192 cities. The next step will be for the RHNA Subcommittee (for which Mayor Pro Tem is a voting member) to recommend a RHNA methodology to the SCAG Regional Council. This methodology recommendation will occur on November 7th and then forwarded to HCD. For all cities including Ventura County, the total allocation depends upon the Option selected. Ventura County’s 6th Cycle RHNA number ranges from 42,751 (Option 1), to 49,055 (Option 2), to 31,499 (Option 3).

Utilizing the 1,344,740 unit SCAG allocation, Table 2 shows the RHNA allocations for each methodology (Options 1 to 3) for Ventura County’s 10 cities and the unincorporated areas.The current 5th Cycle (2013-2021) RHNA allocation and SCAG-derived Local Input (added households between 2021 and 2029 only) is provided for reference.

Table 2*

Jurisdiction	5TH RHNA 2013-2021 Housing Unit Allocation	2021-2029 Local Input (Households) (SCAG)	OPTION 1 Total Housing Units	OPTION 2 Total Housing Units	OPTION 3 Total Housing Units
Camarillo	2,224	641	2,893	4,066	1,660
Fillmore	694	351	874	894	997
Moorpark	1,164	652	1,930	2,254	1,155
Ojai	371	34	366	436	87
Oxnard	7,301	3,120	10,353	12,111	9,412
Port Hueneme	2	86	1,114	1,321	121
Ventura	3,654	1,552	5,227	6,265	5,899
Santa Paula	1,285	499	1,762	1,729	1,497
Simi Valley	1,256	1,304	6,538	7,290	3,581
Thousand Oaks	192	1,510	7,012	7,276	5,940
Unincorporated	1,015	558	4,682	5,413	1,150
TOTAL County	19,158	10,307	42,751	49,055	31,499
Oxnard % of	38.11%	30.3%	24.2%	24.7%	29.9%

County					

**IMPORTANT DISCLAIMER: This Estimate Tool is for illustrative purposes to evaluate the three methodology options and should not be interpreted as the RHNA allocation for any local jurisdiction. SCAG has not finalized its allocation methodology.*

Table 2 shows that Option 2 results in the largest RHNA allocation or 49,055 units countywide. Under each option, Oxnard's RHNA allocation is much higher than the current (5th) RHNA allocation of 7,301 units. Based upon the SCAG allocation released on August 22nd, under Option 3, even though this yields the lowest housing unit allocation to Oxnard (or 9,412 units), the City would be allocated close to 30 percent of the County's total RHNA (or 31,499) despite the fact that Oxnard represents approximately 25% of the total population of the County.

Attachment D provides a breakdown of each jurisdictions population in 2013 and 2019 and how their percentage of population relates to their percentage of the RHNA housing allocation for the 5th and 6th cycles. It is important to note that in the 5th Cycle, while the City represented only approximately 25% of the total Ventura County population the City received approximately 38% of the SCAG distributed housing units (all income categories). Options in the 6th Cycle consider population and households; so through the addition of housing units in the 5th Cycle the City continues to have a higher RHNA allocation in the 6th Cycle.

RECOMMENDATIONS

Staff recommends Option 3, with modifications. This recommendation is largely because this option includes Local Input, and a social equity adjustment of 150%, and does not include current or "existing" need. Staff recommends that the Housing and Economic Development Committee (HEDC) deliberate and provide input and authorize the Mayor to transmit the attached comment letter (Attachment C), with any necessary modifications the HEDC may have at the subject meeting, to SCAG by the public comment due date of September 13, 2019.

For Oxnard, the equity adjustment reduces the City's very low and low income allocation because the City already has a higher-than-county average of lower income households and has been constructing these units.

Staff recommends that Option 3 be modified to more closely reflect Oxnard's percentage of total County population. Oxnard is approximately 25% of the County based upon 2030 total Ventura County Local Input data (per SCAG), yet under Option 3, the total City 6th Cycle RHNA allocation represents approximately 29.9% of the total County RHNA allocation.

In addition, staff recommends that Option 3, or any subsequent methodology options, take into account Oxnard's efforts to build affordable housing relative to the overall County affordable housing obligation. During this 5th RHNA Cycle, Oxnard issued over 70 percent of the lower income affordable housing building permits; the City should be acknowledged for being a leader in constructing affordable housing and there should be an adjustment to Option 3 methodology to take this into consideration.

Considering that the City represents approximately 25% of the population in the County, it is recommended that the City's RHNA allocation for Option 3 be 7,875 units (vs. 9,412 units). 7,878 units represents 25% of the total Option 3 allocation to Ventura County or 31,499 units. Further, it is recommended that the allocation match the affordability distribution recommended by SCAG in their Aug. 22nd excel spreadsheet for Oxnard to account for social equity factors and the City's history of constructing affordable housing. Based on the current Option 3 methodology, and an adjustment for Oxnard's percentage of the county population, the City's 6th Cycle RHNA allocation would be:

RECOMMENDED 6th RHNA Cycle*	
Very low income units	1,653 units
Low income units	1,103 units
Moderate income units	1,418 units
Above moderate income units	3,701 units

**This number represents 25% of the total Option 3 allocation to Ventura County or 31,499 units and with the assumption the SCAG region continues to receive the 1,344,740 unit allocation.*

STRATEGIC PRIORITIES

This agenda item supports the Quality of Life strategy. The purpose of the Quality of Life strategy is to build relationships and create opportunities within the community for safe and vibrant neighborhoods, which will showcase the promising future of Oxnard. This item supports the following goals and objectives:

Goal 2. Address homelessness through the development and implementation of a multi-tiered strategy.

Objective 2a. Identify the City's homelessness mission and create a 5-year plan to address homelessness.

This agenda item supports the Economic Development strategy. The purpose of the Economic Development strategy is to develop and enhance Oxnard's business climate, promote the City's fiscal health, and support economic growth in a manner consistent with the City's unique character. This item supports the following goals and objectives:

Goal 1. Create vibrant and economically sustainable commercial, industrial and retail industries throughout the City.

Objective 1a. Focus available resources on a comprehensive effort to promote economic activity in Oxnard, including a marketing program that communicates the City's available resources and assets.

Goal 5. Revitalize Oxnard's downtown and pursue economic development opportunities.

Objective 5a. Develop a vision and plan (with timelines) for downtown revitalization to create a vibrant center for our community, emphasizing cultural arts, diversity and historic assets.

FINANCIAL IMPACT

Preparation and submission of the APR is required by State law. The State does not directly compensate the City for staff and consultant costs. Timely filing of the APR continues to qualify the City for a range of State grants and programs for which compliance with housing element law is a requirement.

Prepared by: Kathleen Mallory, Planning & Sustainability Manager, and Chris Williamson, Contract Planner

ATTACHMENTS

1. Attachment A - County Board of Supervisors July 2019 Comment Letter
2. Attachment B - Option Comparison
3. Attachment C - Comments on the Proposed 6th Cycle RHNA Methodology Letter from City of Oxnard
4. Attachment D- Summary Sheet RHNA Allocations and Populations for Jurisdictions of Ventura County
5. RHNA PPT HEDC 09.10.19

ATTACHMENT 1

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Attachment 1: Proposed Revisions for the Oxnard Subbasin GSP

Executive Summary Revisions

Page Number(s)	Section	Quote	Revision
ES-1, fn. 1	**Executive Summary**	*Sources of water high in chloride in the Oxnard Subbasin include modern-day seawater as well as non-marine brines and connate water in fine-grained sediments.*	Sources of water high in chloride in the Oxnard Subbasin include modern-day seawater as well as non-marine brines and connate brines in fine-grained sediments.
ES-8	**ES.5 Projects and Management Actions**	*Under this project, the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) Program's Advanced Water Purification Facility (AWPF) will provide the Subbasin with a source of reclaimed water that can be used for landscape irrigation, agricultural, industrial process water, and groundwater recharge*	Under this project, the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) Program's Advanced Water Purification Facility (AWPF) could provide the Subbasin with a source of reclaimed water that can be used for landscape irrigation, agricultural, industrial process water, and/ or groundwater recharge lieu of pumping, at full price, with no exchange of recycled water pumping allocations.

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Chapter 1 Revisions

Page Number(s)	Section	Quote	Revision
1-9	**1.2.6.2 GSP Implementation Budget**	*"form other GSAs in basin.."*	from other GSAs, in the basin
1-21, 1-22	**1.4.3 Operational Flexibility Limitations**	*"For the Oxnard Subbasin, water purveyors collectively draw from a combination of sources—including local surface water, groundwater, imports from the State Water Project (SWP), and increasingly, recycled water—which differ in terms of the volume available, area served, timing of peak availability, and reliability. Climate and regulatory constraints (e.g., water quality standards, water rights, and minimum environmental flows) have historically had a greater impact on the availability of surface water supplies, whereas groundwater sources with adequate water quality were historically limited only by the capacity of production wells accessing the aquifer, leading to pumping in excess of many basins' sustainable yield. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, groundwater extraction will be limited by minimum thresholds established for each sustainability indicator. FCGMA has exercised its authority to limit groundwater production since 1983, and thus has managed the basin to avoid critical overdraft. Sustainable management criteria adopted in this GSP may limit operational flexibility by further reducing allowable groundwater production."*	For the Oxnard Subbasin, water purveyors collectively draw from a combination of sources—including local surface water, groundwater, imports from the State Water Project (SWP), and increasingly, recycled water—which differ in terms of the volume available, area served, timing of peak availability, and reliability. Climate and regulatory constraints (e.g., water quality standards, water rights, and minimum environmental flows) have historically had a greater impact on the availability of surface water supplies. Groundwater sources with adequate water quality were historically limited only by the capacity of production wells accessing the aquifer, until 1991 when FCGMA initiated a groundwater allocation reduction system. With the passage of SGMA and the sustainable management criteria established in this GSP (Chapter 3), once adopted, groundwater extraction will be further limited by minimum thresholds established for each sustainability indicator. FCGMA has exercised its authority to limit groundwater production since 1983, and thus has managed the basin in an effort to avoid critical overdraft. Because in 2014 the State Department of Water Resources listed the Oxnard Subbasin as being in a state of Critical Overdraft, the sustainable management criteria adopted in this GSP may limit operational flexibility." NOTE: Operational flexibility will not be so limited once the FCGMA considers projects to significantly replenish, and protect against seawater intrusion in, the basin. See Oxnard letter section I(D).

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Page Number(s)	Section	Quote	Revision
1-22	**1.4.3 Operational Flexibility Limitations**	*Examples of projects that have increased operational flexibility within the Oxnard Plain include the City of Oxnard's Groundwater Recovery Enhancement and Treatment (GREAT) project, and the Oxnard–Hueneme (OH) Pipeline and the Freeman Diversion Project, both operated by UWCD (Table 1-11).*	**(**GREAT) Program
1-22	**1.4.3 Operational Flexibility Limitations**	*Despite the coordination of projects and programs within the Oxnard Subbasin, limits to operational flexibility remain. These limits include constraints imposed by interaction with other regulatory programs, including the federal Endangered Species Act and the Recycled Water Policy (2009, amended 2013) that was adopted by the State Water Resources Control Board.*	Despite the coordination of projects and programs within the Oxnard Subbasin, limits to operational flexibility remain. State law prohibits the direct potable use of recycled water. Also, these limits include constraints imposed by interaction with other regulatory programs, including the federal Endangered Species Act and the Recycled Water Policy (2009, amended 2013) that was adopted by the State Water Resources Control Board.
1-24	**1.5 Existing Conjunctive-Use Programs**	*Several of the projects and management actions identified in this GSP (Chapter 5) would build upon the GREAT program by expending the AWPF's capacity, increasing utilization of the recycled water in lieu of groundwater for irrigation, and connecting the recycled water delivery system to groundwater recharge facilities operated by UWCD.*	Several of the projects and management actions identified in this GSP (Chapter 5) would build upon the GREAT program by expanding the AWPF's capacity, increasing utilization of the recycled water in lieu of groundwater for irrigation. ~~, and connecting the recycled water delivery system to groundwater recharge facilities operated by UWCD.~~
1-24	**1.5 Existing Conjunctive-Use Programs**	*Reduced groundwater allocations may put increased pressure on water purveyors to use the maximum SWP allocations available, which are already highly limited by climate and competing demands.*	Reduced groundwater allocations may put increased pressure on water purveyors to use the maximum SWP allocations available, which are already very expensive and highly limited by climate and competing demands.

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Page Number(s)	Section	Quote	Revision
1-24	**1.5 Existing Conjunctive-Use Programs**	*Several of the projects and management actions identified in this GSP (Chapter 5) would build upon the GREAT program by expending the AWPF's capacity, increasing…*	Several of the projects and management actions identified in this GSP (Chapter 5) could build upon the GREAT program by expending the AWPF's capacity, increasing…
1-33	**1.6.2 Urban Water Management Plans**	*Potential UWCD projects to be implemented in the future include the Full Advanced Treatment Program, which would entail a collaborative agreement between the City of Oxnard and several agricultural entities to deliver recycled water from the City of Oxnard's AWPF through UWCD's Pumping Trough Pipeline and the Pleasant Valley Pipeline for agricultural users in the Oxnard Plain.*	**Remove entirely from document.**
1-35	**1.6.2 Urban Water Management Plans**	*Oxnard's water supplies include imported water from CMWD, groundwater from UWCD, and groundwater produced from local wells.*	Oxnard's water supplies include imported water from CMWD, groundwater pumped by UWCD as part of a supply agreement negotiated in 1996, and groundwater produced from local wells.
1-36	**1.6.2 Urban Water Management Plans**	*"Consumers of this recycled water include PVCWD and some agricultural operators. Potential consumers include PHWA and UWCD (City of Oxnard 2015)."*	**Remove entirely from document. There are many more potential customers than what are listed.**
1-37	**1.6.2 Urban Water Management Plans**	*Because the City of Oxnard is a coastal city partially dependent on groundwater extractions and UWCD supplies, its UWMP will be impacted by these GSP components.*	Because the City of Oxnard is a coastal city significantly dependent on groundwater extractions, its UWMP will be impacted by these GSP components."
1-42	**1.7 Well Permitting Policies and Procedures**	*The permitting agencies monitor and enforce these standards by requiring drilling contractors with a valid C-57 license to submit permit applications for the construction, modification,…*	The permitting agencies monitor and enforce these standards by requiring drilling contractors with the appropriate valid contractor's license to submit permit applications for the construction, modification,…

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Page Number(s)	Section	Quote	Revision
1-45	**1.8.2 Summary of Beneficial Uses and Users**	*Beneficial uses of groundwater from the Oxnard Subbasin include agricultural, M&I, urban, and environmental uses.*	Beneficial uses of groundwater from the Oxnard Subbasin include agricultural, M&I, and environmental uses.

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Chapter 2 Revisions

Page Number(s)	Section	Quote	Revision
2-27	**2.3.3 Seawater Intrusion**	*An elevated risk of seawater intrusion has been found to exist near Port Hueneme and Point Mugu due to the near shore presence of the groundwater–seawater contact in deeply incised submarine canyons (UWCD 2016a).*	An elevated risk of seawater intrusion has been found to exist near Port Hueneme and Point Mugu due to the near shore presence of the groundwater–seawater contact in deeply incised submarine canyons (UWCD 2016a). Due to this higher risk at Oxnard's coastal area, the City of Oxnard chose to cease pumping in that area and instead entered into the OH pipeline agreement with UWCD.
2-47	**2.4.1 Sources of Water**	*These municipal users may also receive imported water supplied by the CMWD.*	These municipal users also receive imported water supplied by the CMWD, which has been purchased in lieu of greater amounts of groundwater pumping.
2-47	**2.4.1 Sources of Water**	*UWCD's water source for the PTP and PVP consists primarily of surface water obtained at the Freeman Diversion, which may include State Water Project water from Lake Piru.*	UWCD's water source for the PTP and PVP consists primarily of surface water obtained at the Freeman Diversion, which may include State Water Project water from Lake Piru and Article 21 imported water.
2-49	**2.4.1.1 Surface Water**	*These diversions may include State Water Project water held at Lake Piru and then delivered to the UWCD via the Santa Clara River.*	These diversions may include State Water Project water held at Lake Piru and then delivered to the UWCD via the Santa Clara River and purchased imported water.
2-51	**Section 2.4.1.3 Recycled Water Supplies**	*However, the first phase of the GREAT program's Advanced Water Purification Facility (AWPF) was recently completed, which provides this supply to PVCWD and other growers on the southern part of the Oxnard Subbasin.*	However, the first phase of the GREAT program's Advanced Water Purification Facility (AWPF) was completed in 2015, which provides this supply to PVCWD and other growers on the southern part of the Oxnard Subbasin.
2-55	**2.4.2.1 Groundwater Pumping**	*Error! Reference source not found.*	**Revise to input the correct reference.**

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Chapter 3 Revisions

Page Number(s)	Section	Quote	Revision
3-2	**Section 3.2 Sustainability Goal**	*Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin, and the uncertainty in the estimated sustainable yield of the Subbasin.*	Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin, the greater economic effects on the basin as a whole, the interference with municipal water supply planning and rate setting, and the uncertainty in the estimated sustainable yield of the Subbasin.
3-2	**Section 3.2 Sustainability Goal**	*If production is reduced linearly between 2020 and 2040, the estimated groundwater production reduction necessary throughout the geographic extent of the Oxnard Subbasin over the first 5 years is approximately 4,500 AFY.*	If production is reduced linearly between 2020 and 2040, the estimated groundwater production reduction necessary throughout the geographic extent of the Oxnard Subbasin over the first 5 years is approximately 4,500 AF total (900 AFY).
3-4	**3.3.1 Chronic Lowering of Groundwater Levels**	*It is expected that there will be some landward migration of this front between 2020 and 2040 as the FCGMA Board and stakeholders in the Subbasin undertake the necessary projects and management actions toward achieving sustainability in 2040.*	It is expected that there will be some landward migration of this front between 2020 and 2040 as the FCGMA Board and stakeholders in the Subbasin undertake projects and management actions toward achieving sustainability in 2040.
3-5	**3.3.2 Reduction of Groundwater Storage**	*Numerical groundwater model simulations indicate that there has been approximately 101,000 acre-feet (AF) of storage loss in the Oxnard Subbasin over the 31 years from 1985 to 2015 (Section 2.3.2, Estimated Change in Storage; Appendix C).*	**Wrong reference of Appendix C. Revise with corresponding reference.**

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Page Number(s)	Section	Quote	Revision
3-10	**3.3.6 Depletions of Interconnected Surface Water**	*This unit is not currently considered a principal aquifer of the Oxnard Subbasin (Section 2.2.4, Principal Aquifers and Aquitards).*	**Wrong reference of Section 2.2.4. Revise with corresponding Section reference.**
3-14	**Section 3.4 Minimum Thresholds**	*It is important to remember that there are several sources of uncertainty in the model predictions. These sources of uncertainty include, but are not limited to, the prediction of future climate, future diversions from the Santa Clara River, and future groundwater production distribution in the Subbasin. The uncertainty in each of these factors is anticipated to decrease with time. As these factors are better understood, the minimum thresholds should be reassessed, and adjustments should be made, when warranted by the assessment.*	It is important to remember that there are several sources of uncertainty in the model predictions. These sources of uncertainty include, but are not limited to, the prediction of future climate, future diversions from the Santa Clara River, groundwater model assumptions and assigned values, and future groundwater production distribution in the Subbasin. The uncertainty in each of these factors is anticipated to decrease with time. As these factors are better understood, the minimum thresholds should be reassessed, and adjustments should be made, when warranted by the assessment.
3-17	**3.4.3 Seawater Intrusion**	*Such a reduction may impact the value of agricultural land, drive changes in crop types, result in temporary fallowing of agricultural acreage, and cause economic disruption to the regional economy.*	Such a reduction may impact the value of land, drive changes in crop types, result in temporary fallowing of agricultural acreage, impede development, raise water rates, and cause economic disruption to the regional economy.
3-29 to 3-32	***Table 3-1 and 3-2***	***The following wells;*** *02N21W07L06S 02N22W36E04S 02N22W23B07S 01N23W01C02S 02N22W36E05S 02N21W07L04S 02N22W23B04S 01N21W07J02S 02N22W23B05S 01N21W21H02S 02N22W23B06S 02N21W07L03S 02N22W36E03S 02N21W07L05S*	**Tables 3-1 and 3-2 do not match; the proposed minimum thresholds for the following wells are recorded differently between the two tables.**

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Chapter 4 Revisions

Page Number(s)	Section	Quote	Revision
4-4	**4.2.2 Surface Conditions Monitoring**	*These diversions are used to deliver surface water to agricultural users in lieu of groundwater production and are used for recharge, via UWCD's spreading grounds, to the groundwater aquifers in the Subbasin.*	These diversions are used to deliver surface water to agricultural users in conjunction with groundwater production used for recharge, via UWCD's spreading grounds, to the groundwater aquifers in the Subbasin.
4-13	**Section 4.6.1 Water Level Measurements: Spatial Data Gaps**	*A monitoring well in this area would help constrain groundwater gradients in the northwestern Subbasin.*	A monitoring well in this area would help constrain groundwater gradients in the northwestern area of the Subbasin.

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Chapter 5 Revisions

Page Number(s)	Section	Quote	Revision
5-1	**5.1 Introduction to Projects and Management Actions**	*As currently envisioned, the projects in this GSP would be implemented by the project proponent or sponsoring agency. However, FCGMA may opt to implement projects in the future as necessary to achieve sustainability in the Subbasin.*	As currently envisioned, the projects in this GSP would be implemented by the project proponent or sponsoring agency at its discretion and with full compensation. However, FCGMA may opt to implement its own additional projects in the future as necessary to achieve sustainability in the Subbasin.
5-2	**5.2.1 Description of Project No. 1**	*The AWPF is designed to initially treat approximately 8 to 9 million gallons per day (mgd) of secondary effluent from the Oxnard Wastewater Treatment Plant and produce 6.25 mgd of product water for reclaimed water uses. This is equivalent to 7,000 acre-feet per year (AFY) of product water that can be delivered through existing infrastructure. The AWPF is currently producing up to 4,600 AFY. Advanced purified water was first delivered to agricultural operators in 2016. The portion of the project that is being considered for inclusion in GSP is the additional water that is being purchased by FCGMA to reduce groundwater extractions for which no Recycled Water Pumping Allocation is issued.*	The AWPF is designed to initially treat approximately 8 to 9 million gallons per day (mgd) of secondary effluent from the Oxnard Wastewater Treatment Plant and produce 6.25 mgd of product water for reclaimed water uses. This is equivalent to 7,000 acre-feet per year (AFY) of product water that can be delivered through existing infrastructure. The AWPF is currently producing up to 4,600 AFY. Advanced purified water was first delivered to agricultural operators in 2016. By agreement and in accordance with FCGMA Resolution 13-02, the City receives Recycled Water Pumping Allocations at one acre-foot for each acre-foot of recycled water use that results in decreased groundwater pumping. The project that is being considered for inclusion in the GSP is to provide recycled water for landscape irrigation, agricultural, industrial process water and/ or groundwater recharge in lieu of pumping with FCGMA providing payment in exchange of recycled water pumping allocations.
5-4	**5.2.4 Timetable for Implementation of Project No. 1**	*The City of Oxnard receives a Recycled Water Pumping Allocation for delivered water used by farmers in lieu of groundwater production. Implementation*	The City of Oxnard receives payment plus a Recycled Water Pumping Allocation for delivered water used by farmers in lieu of groundwater production. Implementation

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Page Number(s)	Section	Quote	Revision
5-4	**5.2.6 Economic Factors and Funding Sources for Project No. 1**	*The cost of the water produced by the GREAT Program AWPF Project is approximately $3,100 per AF.*	**Remove from Document**
5-5	**5.3.2 Relationship of Project No. 2 to Sustainability Criteria**	*GREAT Program AWPF Expansion Project water was included in future groundwater modeling scenarios to examine the impact that the project will have on the sustainability criteria. This project was incorporated in the modeling along with the GREAT Program AWPF Project (see Section 5.2, Project No. 1 – GREAT Program Advanced Water Purification Facility) and the temporary fallowing of agricultural land (see Section 5.6). Therefore, the relationship between the impact of this project alone and the sustainability indicators has not been quantified. Rather, the potential effect of this project in the context of all of three of these projects is presented in this discussion.*	**Remove Section 5.3.2 from Document.**
5-8	**5.4.2 Relationship of Project No. 3 to Sustainability Criteria**	*The RiverPark–Saticoy GRRP Recycled Water Project is the same as the GREAT Program AWPF Expansion Project, as incorporated into the numerical groundwater model simulations, because the RiverPark–Saticoy GRRP Recycled Water Project simply provides the infrastructure to convey the water. It does not provide additional water to the Subbasin beyond what was modeled for the GREAT Program AWPF project.*	The RiverPark–Saticoy GRRP Recycled Water Project-simply provides the infrastructure to convey the water and is dependent upon the GREAT Program AWPF Expansion Project. This was incorporated into the numerical groundwater model simulations. It does not provide additional water to the Subbasin beyond what was modeled for the GREAT Program AWPF project.

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Page Number(s)	Section	Quote	Revision
5-17	**5.9 Management Action No. 3**	*5.9 MANAGEMENT ACTION NO. 3 – WATER MARKET PILOT PROGRAM*	*5.8 MANAGEMENT ACTION NO. 2 – WATER MARKET PILOT PROGRAM*

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ATTACHMENT 2

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Attachment 2: Comments regarding the Oxnard Subbasin GSP

Page Number(s)	**Section** / *Associated Quote*	**Comment**
ES-9	**ES.5 Projects and Management Actions /** *A comprehensive water allocation system for groundwater users in the Subbasin is under development by the FCGMA . . .*	There has been considerable discussion between groundwater users and FCGMA staff about the system being developed. Until the allocation system is finalized, the equitable application or the impacts of Management Action No. 1 cannot be thoroughly assessed and commented on by groundwater pumpers in the FCGMA.
1-2	**1.1 Purpose of the Groundwater Sustainability Plan /** *Depletions of interconnected surface water have not occurred historically in the Subbasin, because the Groundwater-Dependent Ecosystems (GDEs) in the Subbasin are supported by shallow groundwater flows that are generally separated and disconnected from the primary groundwater aquifers.*	This statement contradicts the following statement made in Section 3.4.6 (See Page 3-19): "*The selected groundwater elevations are anticipated to protect against depletion of interconnected surface water, because historical groundwater elevations in the semi-perched aquifer have maintained the documented and potential GDEs in the Subbasin . . .*"
1-2	**1.1 Purpose of the Groundwater Sustainability Plan /** *The purpose of this GSP is to define the conditions under which the groundwater resources of the entire Oxnard Subbasin . . . will be managed sustainably in the future.*	The City understands and assumes that the GSP is not self-executing and that it does not alter existing rights, including water rights, nor does it modify or supersede prior actions or approvals by FCGMA. For example, the City understands that existing allocation ordinances and conjunctive use programs are not modified by approval of the GSP and can only be changed by future FCGMA action on those specific programs. Accordingly, Oxnard has not commented on the effect of the GSP on any such existing rights or prior FCGMA actions or approvals. If we are mistaken about the non-self-executing nature of the GSP, we ask that FCGMA specify what rights, programs, actions or approvals are affected. We would also note that in such event, insufficient notice has been provided to allow meaningful public comment.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
1-7	**1.2.6.2 GSP Implementation Budget** / *The primary costs associated with implementing the GSP…*	The GSP must include quantitative estimates of the cost of implementation, including costs of implementation that may be imposed on parties other than FCGMA. The qualitative discussion does not fulfill the requirements of Cal. Code Regs., tit. 23, § 354.6, subd. (e).
1-8	**1.2.6.2 Data Gap Analysis and Priorities**	The recommendation to address the potential for anomalous data obtained from agricultural production wells with pressure transducers is flawed. The use of pressure transducers may provide a higher volume of water level measurement, but this volume of data does not necessarily address well recovery and the measurement of static water levels. According to DWR Groundwater Elevation Monitoring Guidelines (page 14), the measurement of water level must not be conducted within 24 hours after cessation of pumping. Monitoring must be tied to well pump operation for meaningful measurements.
1-8	**1.2.6.2 Basin Optimization Studies, Groundwater Modeling, and Project Feasibility** / *During the initial 5-year period after the GSP is adopted, FCGMA will explore opportunities to optimize basin management*	See cover letter.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
1-9	**1.2.6.2 GSP Implementation Budget - Basin Optimization Studies, Groundwater Modeling, and Project Feasibility** / *In addition, it is anticipated that basin optimization studies will be undertaken in the initial 5-year period after the GSP is implemented adopted…*	The statement is not clear as to intent. Revise narrative to clarify whether "implemented" or "adopted" is the intended enabling event.
1-10	**1.2.6.3 Funding Sources** / *Under SGMA, its enabling legislation, FCGMA gained additional authority to impose regulatory fees and replenishment fees*	See cover letter.
1-25 to 1-26 1-39	**1.6 Land Use Elements or Topic Categories of Applicable General Plans**	See cover letter for concerns regarding Section.
1-31	**1.6.2 Urban Water Management Plans** / *Groundwater supply assumptions made by urban water suppliers in their 2015 UWMPs will be superseded by the groundwater allocation reduction management actions discussed in Chapter 5 of this GSP.*	SGMA does not authorize FCGMA to supersede local land use powers. Wat. Code, § 10726.8, subd. (f) ["Nothing in this chapter or a groundwater sustainability plan shall be interpreted as superseding the land use authority of cities and counties, including the city or county general plan, within the overlying basin."
1-24	**1.5 Existing Conjunctive-Use Programs: City of Oxnard Advanced Water Purification Facility**	The GMA conjunctive use program does not restrict the use of allocation with the exception of a City of Oxnard program. GMA resolution 2013-02 limits the use of Forebay pumping based on Forebay available storage volume. This is an unfair practice, which the City of Oxnard finds objectionable.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
1-25	**1.6 Land Use Elements or Topic Categories of Applicable General Plans** / *There are no agricultural water management plans applicable to the Oxnard Subbasin because none of the water purveyors serve more than 25,000 irrigated acres within the Subbasin (excluding recycled water deliveries).*	Please provide clarification as to the intent of this sentence.
1-33	**1.6.2 Urban Water Management Plans**	See cover letter.
1-39	**1.6.3 Additional Plan Summaries – City of Oxnard General Plan**	See cover letter.
1-40 to 1-41	**1.6.3 Additional Plan Summaries.** / *In recognition and acknowledgment of the limits on FCGMA to regulate the federal government, any such allocation shall be directly assigned to the federal agency and shall not be subject to the requirements of any allocation ordinance, including but not limited to allocation carryovers, borrowing, transfers, reductions and/or variances and fees.*	The description of Federal Reserved Water Rights (FRWR) in the GSP overstates the extent of federal law preemption. While it is true that FRWR are determined as provided under federal law, the text in the GSP does not acknowledge the importance of Congress' waiver of sovereign immunity in passing the McCarran Amendment. (43 U.S.C. § 666.) "[T]he McCarran Amendment was motivated in large part by the recognition of the interconnection of water rights among claimants to a common water source and the desire to avoid piecemeal adjudication of such rights." *United States v. State of Oregon* (9th Cir. 1994) 44 F.3d 758, 769.) The regulation of FRWR under California statutory law is appropriate under the McCarran Amendment and statements to the contrary should be removed from the GSP.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
1-45	***Section 1.8.2 Summary of Beneficial Uses and Users – Surface Water Users***	The section on beneficial uses and users should include a subsection to address water import and water importers serving the Oxnard Subbasin as the import of water reduces the amount of groundwater that must be pumped from the Subbasin.
1-61	**Table 1-9**	No data was provided for Oxnard in 2015. Please provide corresponding data in table.
1-75	**Figure 1-2**	Northern boundary between Oxnard Subbasin and Mound Subbasin should reflect most recent boundary changes accepted by DWR in February 2019.
2-26	**2.3.2 Estimated Change in Storage /** *In the UAS, the average annual change in freshwater storage is a loss of approximately 6,600 AFY, which is more than two times greater than the total average annual change in storage for the UAS (2,800 AFY), including seawater intrusion (Figure 2-24, Oxnard Subbasin Annual Change in Storage Without Coastal Flux).*	It appears that Figure 2-24 should be titled "With Coastal Flux" not without coastal flux because it includes seawater intrusion.

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2-26	**2.3.2 Estimated Change in Storage** / *Annual change in storage is not strongly correlated to groundwater pumping in the Oxnard Plain (R2 < 0.5). In contrast, artificial groundwater recharge at the UWCD spreading grounds is correlated with change in storage (R2 > 0.8; see Figures 2-22 and 2-23).*	The Oxnard Subbasin GSP reflects the reduction in groundwater pumping as the main objective/goal for the Subbasin. If there is not a strong correlation between groundwater pumping and change in storage why is there not more focus set on recharging the Subbasin in the GSP?
2-29	**2.3.3.2 Current Extent of Seawater Intrusion** / *Although this section focuses on areas that are known to be susceptible to seawater intrusion, the precise extent of current seawater intrusion impacts is difficult to separate from the areas that are impacted by release of saline water from connate brines.*	The Oxnard Subbasin GSP states that the FCGMA cannot differentiate between seawater intrusion and sedimentary rock leeching. If the saline problem stems from the latter, under-pumping will make it worse. Effort should be put into identifying the difference.
2-30	**Section 2.3.3.3 Historical Progression of Seawater Intrusion**	Additional paragraph should be included into section; In 1953, a bond issue was presented to the electors within UWCD to provide funds for the construction of one dam and the Lower River distribution system, including a pipeline to the Oxnard-Port Hueneme area. Simultaneous with the bond issue, UWCD entered into contracts with water users on the Oxnard Plain area for the construction of this pipeline. The City of Oxnard was the predominant user, and it contracted with UWCD in order to move the City's pumping from the seawater intrusion front to the Montalvo Forebay. The voters authorized the bond-issue, and thereafter, the Santa Felicia Dam on Piru Creek and the Lower River Distribution System authorized by the bond issue were completed. The lower river distribution system, often called the Oxnard/Hueneme (O/H) Pipeline, was constructed during the forty year life of the original water delivery agreements. In 1994, the City of Port Hueneme and the Channel Islands Beach Community Services District created a joint powers agency, known as the Port Hueneme Water Agency (PHWA), which would later include also Naval Construction Battalion Center Port Hueneme and Naval Air Warfare Center Point Mugu. The PHWA likewise contracted to utilize the O/H Pipeline to move PHWA's pumping from the seawater intrusion front inland to the Forebay in order to reduce

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		seawater intrusion in the Oxnard Plain Basin."
2-33/2-34	**Section 2.3.4 Groundwater Quality**	Additional narrative should be provided addressing the State Department of Drinking Water's requirements for potable water: Nitrate max contaminant level (MCL) is 10 ppm Sulfate secondary MCL is 500 ppm Boron notification level (unregulated) is 1 ppm
2-42	**2.3.6 Groundwater /** *The UWCD model reports stream leakage from the Santa Clara River and Calleguas Creek into the underlying semi-perched aquifer. Numbers from the model represent net stream leakage and do not necessarily indicate direct connection between surface water bodies and groundwater in the semi-perched aquifer.*	This statement contradicts the following statements made in Section 3 (See Page 3-19): "*The selected groundwater elevations are anticipated to protect against depletion of interconnected surface water, because historical groundwater elevations in the semi-perched aquifer have maintained the documented and potential GDEs in the Subbasin . . .*"
2-48	**Section 2.4.1.1 Surface Water**	Additional narrative addressing Article 21 water should be included in section. This water is unallocated State Water Project water made available to State Water Project contractors on a limited interim interruptible basis. The FCGMA has already invested funds to purchase this water, which should be acknowledged in the GSP.
2-51	**Section 2.4.1.2 Imported Water Supplies** / *As discussed in Section 2.4.1.1, Surface Water, the UWCD-diverted surface water from the Santa Clara River may include State Water Project water used for groundwater recharge in UWCD spreading basins or water directly delivered to water users by either the PVP or the PTP.*	Additional reference and incorporation of Article 21 water should be added into section. Under the May, 2019 FCGMA approval, excess unallocated water is planned to be purchased and delivered via the Santa Clara River and diverted from the Freeman Diversion to recharge facilities in the Oxnard Forebay by United Water Conservation District (UWCD).

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
2-52	**2.4.1.4 Percolation of Precipitation** / *Much of the rain that falls in the Oxnard Subbasin quickly returns to the atmosphere via evaporation, or runs off to creeks, storm drains, and ultimately the ocean; the remainder percolates into the soil where it is subject to evapotranspiration (ET), soil absorption, or for plant use.*	Evapotranspiration depends on what the farmers are growing. This should be subject to change dependent on numerous factors.
2-55	**2.4.2.1 Groundwater Pumping** / *Available data indicate that during the calendar year 2015, a total of 80,814 AF (Table 2-14) of groundwater was extracted from the Oxnard Subbasin, of which, about 69% was for agricultural use (55,973 AF), 30% was for M&I use (24,648 AF), and about 0.2% was for domestic use (193 AF).*	Clarify that the roughly 70-30 split noted was related to a year when Emergency Ordinance E was in effect, when M&I pumping was restricted a second time (after being restricted once before) though Agricultural extraction was not restricted; thus, this split of water is not indicative of the proportionate use as between these groups. This should be expressly stated in the GSP.
2-58	**2.4.3.3 Current (2015) Groundwater Conditions**	This is no longer the current year. Update to reflect more current year or revise section.
2-62	**Section 2.4.5 Projected Future Water Budget and Sustainable Yield**	Specific to model scenarios with a different percentage of reduction in pumping between UAS and LAS. It is assumed that these scenarios are conceptual in nature for the exercise of bracketing sustainable yield estimates. It does not appear probable that the FCGMA can reduce pumping differentially from wells in the LAS without projects to replace their supply since the FCGMA dictated the replacement of UAS wells with LAS wells in the 1980's and early 1990's.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
2-62	**Section 2.4.5 Projected Future Water Budget and Sustainable Yield** / *The sustainable yield was determined from the model scenarios that did not result in a net flux of seawater into either the UAS or the LAS in Oxnard Subbasin, within the level of the model uncertainty, during the 30-year sustaining period (Figure 2-63, Coastal Flux from the UWCD Model Scenarios).*	None of the model scenarios resulted in no net flux of seawater into either the UAS or LAS in the Subbasin as reflected in Figure 2-63. Provide clarification on which model scenario was projected to be the objective outcome.
2-62	**Section 2.4.5 Projected Future Water Budget and Sustainable Yield**	Only 6 of the 8 modeled scenarios are provided in bullet points. Additional modeled scenarios in Section 2.4.5.7 should be included.
2-63	**2.4.5 Projected Future Water Budget and Sustainable Yield** / *The 1930 to 1979 50-year period with the 2070 DWR climate-change factor was found to be the most conservative and was used for the comparison with the other modeling simulations conducted.*	Because the most conservative period was used for analysis, the FCGMA Board should keep this in mind when implementing initial pumping reduction management strategy.
2-64	**2.4.5.1 Future Baseli ne Model Simulation** / *No projects currently under development were identified in the Oxnard Subbasin, but two projects under development in the PVB were incorporated into the future baseline simulation because these projects affect inflows to the Oxnard Subbasin. The two projects in PVB are the City of Camarillo's North Pleasant Valley Desalter (desalination) Project and Conejo Creek Diversion deliveries to Pleasant Valley County Water District.*	The Conejo Creek Diversion project is no longer under construction, but rather is in operation. Please revise and update narrative in the GSP.

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2-65, 2-66	***2.4.*5.2 Future Baseline With Projects Model Simulation /** ***…**expansion of the GREAT program to increase groundwater recharge by 4,500 AFY in the Saticoy Spreading Grounds…* *Because the projects that were incorporated into the Future Baseline With Projects Scenario included reduction of approximately 500 AFY from temporary fallowing in Oxnard, and deliveries of recycled water from the GREAT program, the groundwater extractions in the LAS decreased by approximately 4,000 AFY, relative to the Future Baseline Scenario.*	The City of Oxnard has no intention of utilizing recycled water produced by the GREAT Program for the purpose noted. References to the use of GREAT Program water for Saticoy Spreading Grounds and related basin recharge should be removed from model simulation and narrative. See cover letter.
2-66	**2.4.5.2 Future Baseline With Projects Model Simulation** / *It should be noted that these wells were selected for modeling purposes only and use of these wells in the model simulations was not intended to represent any planned pumping restrictions or limitations on these wells.*	Update narrative to clarify that the projects (i.e., GREAT Program projects) were included for modeling purposes only, and that the inclusion of the City's projects in either narrative or modelling in the GSP does not constitute a binding commitment on the part of the City of Oxnard.
2-74	**2.4.5.9 Estimates of Future Sustainable Yield** / *None of the model scenarios described in Section 2.4.5 successfully eliminated seawater intrusion in the LAS during the sustaining period, while the majority of the model scenarios resulted in net freshwater loss from the UAS to the Pacific Ocean. Therefore, none of the direct model scenarios was used to determine the sustainable yield of the Oxnard Subbasin. Instead, the relationship between seawater flux and groundwater production from each of the model scenarios was used to predict the quantity of groundwater production that would result in no net seawater intrusion over the sustaining period in either the UAS or the LAS.*	This paragraph indicates that a no loss scenario relative to freshwater impacts was not achievable in the direct modelling of the Subbasin. This calls into question the viability of the model scenarios, as well as the approach chosen to predict no net seawater intrusion groundwater production scenarios.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
3-2	**3.2 Sustainability Goal** / *In order to achieve the sustainability goal, groundwater production will need to be reduced relative to historical groundwater production rates. At the same time, groundwater production inland from the coast may be allowed to increase as infrastructure is developed to convey inland production to agricultural users on the coast.*	The wording of this section is vague. Please revise to clarify intent as well as mechanism by which differential increases in production and infrastructure expansion may be contemplated.
3-2	***3.2 Sustainability Goal*** / *Proposed reductions in groundwater production must take into account both the potential economic disruption to the agricultural industry in the Subbasin*	Proposed reductions in groundwater production will affect a vast variety of stakeholders not limited to the agricultural industry. Reductions could affect ratepayers of the City of Oxnard, M&I, and more.
3-2	**3.2 Sustainability Goal** / *During the first 5 years following GSP adoption, it is anticipated that the combined groundwater production from both the UAS and the LAS will begin to be reduced toward the estimated sustainable yield*	It is unclear how the current observed groundwater production rate will be reduced toward sustainable yield. Revise section to clarify the regulatory mechanism that will compel the reduction in production to currently contemplated sustainable yield levels in the first 5 years following GSP adoption.
3-4	**3.3.1 Chronic Lowering of Groundwater Levels** / *One factor that contributed to the recovery of water levels following periods of drought was the amount of surface water that was diverted from the Santa Clara River and infiltrated through spreading basins to recharge the aquifers.*	Revise section to address the mandatory reductions in the most recent drought, where M&I users were limited in pumping by Emergency Ordinance E on top of prior pumping restrictions. These reductions were likely a key factor in the recovery of aquifer elevations, as opposed to ephemeral diversions associated with the Santa Clara River.
3-4	**3.3.1 Chronic Lowering of Groundwater Levels** / *Based on the sustainability goals for the Oxnard Subbasin, the criterion used to define undesirable results for chronic lowering of groundwater levels is landward migration of the 2015 saline water impact front during the sustaining period from 2040 through 2069.*	Revise section and narrative discussion of undesirable results related to saline impact and associated sustainability criteria. The discussion acknowledges both the effects of the 2015 saline water impact front, as well as elevated chloride concentrations associated with naturally occurring source unrelated to seawater intrusion. It is unclear how differentiation between elevated chloride concentrations from the different sources will be accomplished and meaningful monitoring of sustainability criteria will occur.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
3-4	**3.3.1 Chronic Lowering of Groundwater Levels** / *One factor that contributed to the recovery of water levels following periods of drought was the amount of surface water that was diverted from the Santa Clara River and infiltrated through spreading basins to recharge the aquifers. Surface-water flows are available during wetter-than-average precipitation periods. These surface-water diversions and spreading are controlled by the United Water Conservation District (UWCD), which anticipates maintaining the historical volume of water diverted from the Santa Clara River over the next 50 years (UWCD 2018).*	In the presence of heightened regulatory pressure associated with diversions due to lower Santa Clara River GDE's and other environmental factors noted in the GSP, it is unreasonable to conclude that the historical volume of diversions may be assumed to continue. Additionally, diversions associated with high flows in the Santa Clara River are related to hydrologic events that are inherently ephemeral in nature. Thus the contribution of diversions to aquifer recharge should be considered incidental in nature.
3-6	**3.3.3 Seawater Intrusion** / *Significant and unreasonable seawater intrusion is an undesirable result that is present or likely to occur in the Oxnard Subbasin. Seawater intrusion is the primary sustainability indicator in the Oxnard Subbasin.*	Seawater intrusion and related elevated chloride concentrations are noted as the primary sustainability indicator in the Oxnard Subbasin. Other sources of elevated chloride concentrations are discussed; however, further study, mapping and narrative of specific sources of connate water related to fine-grained lagoonal deposits should be conducted. This information will inform the process of evaluation of future chloride measurements in the saline water impact area.
3-7	**3.3.3 Seawater Intrusion/** *The connate water is released as groundwater head in the aquifer declines and fine-grained deposits compress.*	Clarify if "compress" should be revised to "expand."
3-8	**3.3.4.2 Nitrate**	Nitrate concentrations are noted as resulting in significant and unreasonable impacts to beneficial uses; however, ensuing discussion is weak in relation to actionable solutions. Merely stipulating historical contributions of nitrates as the source of elevated concentrations above WQOs and BMOs in the Forebay is not a sufficient acknowledgement of the observed issue. Further discussion of current practice and recommendations regarding restrictions on the continued nitrate loading related to agricultural operations should be included to address practices

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		that perpetuate this undesirable result.
3-9	**3.3.4.2 Nitrate** / *UWCD currently anticipates maintaining and potentially increasing surface-water recharge from the Santa Clara River in the future.*	Surface water diversions and related potential for recharge are likely to be reduced in the future due to environmental and regulatory restrictions identified elsewhere in the document. As noted previously, the contribution of recharge water related to diversions from the Santa Clara River are ephemeral in nature and limited in their ability to meaningfully dilute nitrate concentrations in the Forebay. Related sections of narrative should be revised accordingly.
3-9	**3.3.4.2 Nitrate** / *Rather, nitrate concentrations above WQOs and BMOs in the Forebay are likely a legacy of historical septic discharges and historical agricultural fertilizer application practices.*	The contribution of septic systems has been on the decline for some time as septic to sewer conversions have become more common, and often mandated, by the RWQCB and local agencies. The observed nitrate loading continues with on-going agricultural operations, and while practices related to fertilizer application and constituents may be changing, an acknowledgement of their role in the observed issues should be included in narrative and mitigation measures should be stipulated.
3-12	**3.3.7 Defining Subbasin-Wide Undesirable Results** / *Undesirable results are defined in three ways for the UAS in the Oxnard Subbasin. The first is based on the total number of wells, independent of management area or aquifer. Under this definition, the UAS will be determined to be experiencing undesirable results if, in any single monitoring event, water levels in six of the 15 key wells are below their respective minimum thresholds*	The number of hydrographs for UAS wells noted in Figures 3-7a and 3-7b reflect only 14 wells.

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3-14	**3.4 Minimum Thresholds /** *In general, the simulated groundwater elevations in the model scenario with projects were close to those in the scenario without projects, with any observed difference between the two limited to less than approximately 10 feet (Figures 3-6 through 3-11, Key Well Hydrographs).*	This statement does not recognize the difference between the scenarios as significant; however, 5 to 10 feet higher water level elevations along the coast is potentially significant. In addition, the statement does not recognize that the impacts to groundwater users without the projects is likely greater.
3-14	***3.4 Minimum Thresholds /*** *The lowest simulated value was then rounded down to the nearest 5-foot interval to further account for uncertainty in the future simulated groundwater elevations. The rounded groundwater elevation was then raised by 2 feet to account for predicted sea level rise by 2070.*	Clarify the rationale for rounding down 5 feet. This rounding is significant in comparison to the projected minimum thresholds for water levels. This appears contrary to SGMA's "reasonable margin of safety was established for each measureable objective." This is more than a 50% difference in minimum threshold change for some of the selected key wells. For example, Well 01N23W01C05S proposes a minimum thresholds of 7 ft msl from the 1.2 ft msl measured data in Table 3-1. The rounding of 2-5 feet appears to reflect a difference; if this is rounded by 5 feet, the difference is 80%.
3-17	**3.4.3 Seawater Intrusion /** *Such a reduction may impact the value of agricultural land, drive changes in crop types, result in temporary fallowing of agricultural acreage, and cause economic disruption to the regional economy.*	Such a reduction would impact not only on the value of Agricultural land but all land. Also, further impacts of reduction would be impeding business and development and raising water rates.
3-17	**3.4.4 Degraded Water Quality /** *For these concentrations, the recharge source water should be of the highest quality possible to maintain or improve future groundwater quality (Section 3.3.4, Degraded Water Quality).*	The term "highest quality possible" is undefined in the context of existing RWQCB and DDW requirements for water quality. As the sources of degraded water quality have previously been discussed, the source of such "highest quality" should be identified and discussed.
4-1	**4.1 MONITORING NETWORK OBJECTIVES**	Chapter 4 of the GSP addresses the proposed monitoring of progress towards sustainability goals, as well as measuring against minimum thresholds established. Such monitoring of groundwater elevations is a critical consideration in what will

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		ultimately be a regulatory function of the monitoring network. The section narrative, together with the tabulated well network, indicate the presence of a significant number of agricultural production wells. Groundwater monitoring standards are written to address measurements and sampling related to dedicated monitoring wells, and these standards illustrate the limitations and potential error associated with utilizing data from production wells. While the inclusion of production wells in the State's CASGEM program was a result of the required well network established by Senate Bill 6 in 2009, it has been understood that the data would be used for informational purposes to monitor trends in groundwater levels basin-wide. The transition from the use of the monitoring network from informational to regulatory purposes requires the rigorous evaluation of the existing network, together with an understanding of the incompatibility of production wells with a regulatory monitoring system. The last paragraph of Section 4.1 notes the need for additional monitoring wells to better represent conditions in the aquifers than production wells. The City recommends that all production wells be replaced by dedicated monitoring wells to both provide adequate spacial coverage, as well as evaluating existing and proposed dedicated monitoring wells for the potential effects of adjacent agricultural production wells.
4-2	**4.2.2 Surface Conditions Monitoring /** *These diversions are used to deliver surface water to agricultural users in lieu of groundwater production and are used for recharge, via UWCD's spreading grounds, to the groundwater aquifers in the Subbasin.*	Diversions do not represent a sustainable source of alterative water and should not use 'in-lieu' terminology.

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Page Number(s)	Section / *Associated Quote*	Comment
4-2	**Section 4.2.1 Groundwater Monitoring**	The last paragraph on page 4-2 notes that the existing monitoring network is sufficient and that evaluation of the current network confirms this. Based on established DWR standards, this is an incorrect statement, as the network utilizes data derived from production wells, which are inherently prone to error. Please revise section narrative to clarify the need for removal of agricultural production wells from the network, and the replacement of these with properly designed and sited monitoring wells.
4-5	**4.3.1 Chronic Lowering of Groundwater Levels** *To monitor conditions related to chronic lowering of groundwater levels, the groundwater monitoring network must be structured to accomplish the following:* • *Track short-term, seasonal, and long-term trends in water elevation.* • *Demonstrate groundwater elevations in mid-March and mid-October for each primary aquifer or aquifer system.* • *Record groundwater elevations in key wells in which minimum thresholds and measurable objectives have been identified to track progress toward the sustainability goals for the Subbasin.*	The reliance on groundwater elevations to track all progress toward sustainability in the Subbasin should require all key wells to be instrumented with pressure transducers for measurement accuracy and a higher temporal resolution in the data.
4-5	**4.3.1 Chronic Lowering of Groundwater Levels /** *The Subbasin monitoring well density for groundwater elevations varies by aquifer (Tables 4-3 and 4-4). Of the primary aquifers in the Subbasin identified in Chapter 2, Basin Setting, the Grimes Canyon Aquifer has the lowest density of active wells in which groundwater elevations can be measured.*	Revise narrative to include discussion of production wells and monitoring wells in the network, and clarify referenced standards.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
4-5	**4.3.1 Chronic Lowering of Groundwater Levels** / *There is no definitive rule for the density of groundwater monitoring points needed in a basin; however, for comparison, the monitoring well density recommended by CASGEM Groundwater Elevation Monitoring Guidelines ranges from 1 to 10 wells per 100 square miles (DWR 2010).*	The reference document (*DWR Groundwater Elevation Monitoring Guidelines- December 2010*) utilizes USGS methodology that is written for monitoring, not production wells (page 8). Additionally, guidelines require that measurements from production wells should not be made for 24 hours after cessation of pumping due to well recovery considerations (page 14). This is a significant area of concern for how data will be collected and utilized.
4-7	**4.3.2 Reduction of Groundwater Storage** / *The current network of wells is capable of documenting changes to both sustainability indicators.*	This does not correspond with response to groundwater elevations.
4-8	**4.3.3 Seawater Intrusion** / *Groundwater samples will continue to be collected and analyzed for total dissolved solids (TDS) and chloride in order to assess trends in groundwater quality related to seawater intrusion. The network of existing wells is capable of providing an adequate assessment of groundwater quality trends for these constituents.*	Additional concern about nitrates should be included in the water quality constituents.
4-11	**4.4.1 Groundwater Elevation Monitoring Schedule** /*Short-term trends in groundwater elevation are currently, and will continue to be, monitored using transducers that are operated and maintained by UWCD.*	According to the GSP 'The United Water Conservation District (UWCD) collects groundwater elevation data from more than 100 monitoring and agricultural wells in the Subbasin … Pressure transducers have been installed in 65 of these wells." . Clarify that this monitoring is not all inclusive but rather limited to a limited number of monitoring wells.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
4-12	**4.5 Protocols for Data Collection and Monitoring**	Additional narrative should be provided to include how that collected data is utilized to support sustainability indicators, including determination/location of seawater intrusion contours, determination of storage volume, etc.
4-12	**4.5 Protocols for Data Collection and Monitoring** / *If the pump housing is warm, the water level that is entered into the database is qualified with a Questionable Measurement Code, indicating recent pumping.*	According to Monitoring Protocols Best Management Practices (BMPs) produced by DWR, measurements from production wells should not be made for 24 hours after cessation of pumping due to well recovery considerations. The condition of the pump housing only indicates recent pump activity and does serve as an indicator of whether the pump has operated in the past 24 hours.
5-2	**5.2.1 Description of Project No. 1** / *The AWPF provides the City of Oxnard with a source of reclaimed water that can be used for landscape irrigation, agricultural, industrial process water, and groundwater recharge.*	See cover letter.
5-4	**5.2.6 Economic Factors and Funding Sources for Project No. 1**	See cover letter.
5-5 to 5-6	**5.3 Project No. GREAT Program Advanced Water Purification Facility Expansion Project**	See cover letter.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
5-5	**5.3.2 Relationship of Project No. 2 to Sustainability Criteria /** *GREAT Program AWPF Expansion Project water was included in future groundwater modeling scenarios to examine the impact that the project will have on the sustainability criteria. This project was incorporated in the modeling along with the GREAT Program AWPF Project (see Section 5.2, Project No. 1 – GREAT Program Advanced Water Purification Facility) and the temporary fallowing of agricultural land (see Section 5.6). Therefore, the relationship between the impact of this project alone and the sustainability indicators has not been quantified. Rather, the potential effect of this project in the context of all of three of these projects is presented in this discussion.*	See cover letter.
5-7	**5.3.6 Economic Factors and Funding Sources for Project No. 2 /** *Under one potential expansion scenario, the facility upgrades are anticipated to cost approximately $16,600,000 (FCGMA 2018). Under this scenario, the water produced by the facility would cost approximately $1,900 per AF. Operations and maintenance costs for the expanded AWPF would be approximately $440 per AF.*	See cover letter.
5-8	**5.4.2 Relationship of Project No. 3 to Sustainability Criteria /** *The RiverPark–Saticoy GRRP Recycled Water Project is the same as the GREAT Program AWPF Expansion Project, as incorporated into the numerical groundwater model simulations, because the RiverPark–Saticoy GRRP Recycled Water Project simply provides the infrastructure to convey the water. It does not provide additional water to the Subbasin beyond what was modeled for the GREAT Program AWPF project.*	See cover letter.

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Page Number(s)	**Section** / *Associated Quote*	**Comment**
5-9	**5.4.4 Timetable for Implementation of Project No. 3** / *UWCD estimates that the RiverPark–Saticoy GRRP Recycled Water Project could be implemented in 18 to 24 months. The project is already in the preliminary design phase and a draft initial study/mitigated negative declaration has been prepared.*	See cover letter.
5-10	**5.4.6 Economic Factors and Funding Sources for Project No. 3** / *UWCD proposes funding assistance from FCGMA for the capital cost of the project, which is estimated to be $6.4 million, with an annual operations and maintenance cost of approximately $5 million to $7.5 million. The resulting water cost would be approximately $1,000 to $1,500 per AF.*	See cover letter.
5-14	***5.7 Management Action No. 1 – Reduction in Groundwater Production***	Projects that will be implemented to increase or maintain groundwater production at the presently reduced historical levels during the process of achieving sustainable yield have not been identified. The GSP has effectively framed the range of the sustainable groundwater resource under existing conditions but lacks a road map as to how the FCGMA plans to achieve sustainability without significantly impacting all groundwater users. If the groundwater allocation system to achieve Management Action No. 1 were included in the GSP, the stakeholders could understand the potential magnitude and timing of water supply projects that will need to be developed to lessen the impacts on groundwater users.

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Page Number(s)	Section / *Associated Quote*	Comment
5-18	**5.9 Management Action No. 3 – Water Market Pilot Program** / *Analysis of the Water Market Pilot Program will be conducted and its suitability for incorporation as a management action for the Subbasin will be determined after the pilot program is completed in July 2019.*	A Water Market for municipal and industrial groundwater users is necessary for coordination and conjunctive use of water resources amongst this category of groundwater pumpers.

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September 23, 2019

Mr. Jeff Pratt, P.E., Executive Officer
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, California 93009-1610

Subject: Comment letter on the July 2019 Draft Groundwater Sustainability Plan for the Oxnard Subbasin and Pleasant Valley Basin

Dear Mr. Pratt:

Calleguas Municipal Water District (Calleguas) respectfully submits this letter to the Fox Canyon Groundwater Management Agency ("Agency") to comment on the July 2019 Draft Groundwater Sustainability Plan for the Oxnard Subbasin (Oxnard GSP) and Pleasant Valley Basin (PV GSP). Calleguas thanks Agency staff for their efforts in preparing those GSPs. Incorporated in this letter is Calleguas' comment letter submitted previously to the Agency on April 2, 2018.

After reviewing the most recent draft GSPs, Calleguas' concern continues to be the lack of consideration and analysis as to how the Agency intends to protect Calleguas' water stored in the Oxnard Subbasin and Pleasant Valley Basin pursuant to Agency-approved in-lieu credit programs. Calleguas' stored water is for public use during interruptions of imported water deliveries resulting from emergencies such as earthquakes, other natural disasters, or terrorism as well as planned infrastructure maintenance.

Including Calleguas' imported water in any GSP water calculation is incorrect because only Calleguas has the right to its stored water, whether Calleguas stored that water through direct injection or in accordance with the Agency-approved in-lieu credit programs. The Agency has recognized the importance of Calleguas storing imported water in the basins as "essential to meet seasonal and dry year demands and provide protection from other potential water supply emergencies" as stated in its Resolution 1993-2, adopted on October 27, 1993. By adopting Resolution 1993-2, the Agency legally obligated itself to protect Calleguas' stored water and "employ its powers to protect injected and percolated foreign water for the various purposes of those agencies, cities and individuals who have injected and percolated water in accordance with the Fox Canyon Management Agency regulations and, within the boundaries of the Fox Canyon Groundwater Management Agency." (Resolution 1993-2 of the Fox Canyon Groundwater Management Agency To Support and Protect Injected and Percolated Water, passed and adopted by the Fox Canyon GMA Board on October 27, 1993.)

Any calculation or analysis related to the sustainable yield, sustainable goal, water budget, minimum thresholds, and measurable objectives in the Oxnard GSP and PV GSP that includes Calleguas' stored water is not consistent with SGMA, California water rights law, or Agency adopted action.

We appreciate the Agency Board's consideration of these comments. If you have any questions about Calleguas' comments, please contact me at (805) 579-7138 or tgoff@calleguas.com.

Sincerely,

Anthony Goff
General Manager

cc: Eugene West, Chair, Fox Canyon Groundwater Management Agency Board of Directors
Department of Water Resources

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April 2, 2018

Keely Royas, Clerk of the Board
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009

Subject: Comments on November 2017 Preliminary Draft Groundwater Sustainability Plans for the Oxnard Subbasin and Pleasant Valley Basin

Dear Ms. Royas:

Calleguas Municipal Water District (Calleguas) appreciates this opportunity to provide comments to the Fox Canyon Groundwater Management Agency (FCGMA) on the Preliminary Draft Groundwater Sustainability Plans for the Oxnard Subbasin and Pleasant Valley Basin, dated November 2017 (Oxnard PDGSP and PV PDGSP). The importance of developing GSPs that are based on best available science, address existing rights, incorporate existing FCGMA policies, approvals, and agreements, and seek to address stakeholder concerns cannot be overstated.

As the FCGMA is aware, Calleguas has participated in various FCGMA-approved storage programs in the Oxnard Subbasin and Pleasant Valley Basin. These storage programs are summarized below.

In-Lieu Storage Programs

These storage programs stored water through in-lieu methods by delivering imported water to pumpers for use instead of pumping. The FCGMA approved participation in the in-lieu water storage and associated credit and exchange programs between Calleguas and each of following pumpers on the dates listed below.

Basin	Pumper	FCGMA Board Approval
Pleasant Valley	Pleasant Valley Mutual Water Company	March 26, 1997
Pleasant Valley	City of Camarillo	July 24, 1996
Oxnard	Port Hueneme Water Agency	September 25, 1996
Oxnard	City of Oxnard	September 25, 1996

For each acre-foot of imported water delivered, an acre-foot of storage credit was transferred from the pumper to Calleguas. The FCGMA Board required that the extraction rate and location of pumping of storage credits earned pursuant to these programs be subject to approval of the Agency Coordinator or Agency Executive Officer.

Calleguas stored water under these programs between 1995 and 1997. To date, Calleguas has not extracted any of the water stored in the Oxnard Subbasin and Pleasant Valley Basin. The volume of water stored under these programs is 16,260 acre-feet. This storage remains part of Calleguas' long-term emergency water supply portfolio and may be pumped in the future.

Supplemental M&I Water Program (also an in-lieu storage program)

The FCGMA approved the Supplemental M&I Water Program on May 28, 2003. This program provided for recycled water produced by the City of Thousand Oaks' Hill Canyon Wastewater Treatment Plant to be diverted at the Conejo Creek Diversion and delivered to Pleasant Valley County Water District (PVCWD) for use in lieu of pumping. For each acre-foot of such recycled water delivered, an acre-foot of storage credits was transferred from PVCWD to Calleguas. Subsequently, Calleguas would transfer storage credits to United Water Conservation District (United) to be pumped in the Forebay area of the Oxnard Subbasin for delivery to customers of United's O-H system.

The rules adopted by the FCGMA Board for redemption of storage credits associated with the Supplemental M&I Water Program specify that the water may only be extracted from the Forebay area when groundwater levels in key wells are above certain minimum elevations. In addition, extraction of this water is set at a lower priority than extraction for certain other purposes.

Calleguas stored water under this program between 2002 and 2014 and transferred storage credits to United between 2004 and 2011. United extracted a portion of the previously stored water between 2005 and 2012. All storage credit transfers were documented by joint request letters to the FCGMA signed by PVCWD, Calleguas, and/or United, as appropriate. Calleguas currently has 33,935.28 acre-feet of credits in storage pursuant to this program. Of the total currently in storage, 10,481.91 acre-feet were transferred to United and remain unpumped and 23,453.37 acre-feet have not yet been transferred to United. This storage remains part of Calleguas' long-term emergency water supply portfolio and may be pumped in the future.

Credit Transfers Associated with the Port Hueneme Water Agency Annexation to Calleguas

On July 24, 1996, the FCGMA approved the transfer of allocations and credits from the City of Port Hueneme, U.S. Naval Construction Battalion Center, Naval Air Weapons Station Point Mugu, and Channel Island Beach Community Services District to the newly formed Port Hueneme Water Agency (PHWA) and then from PHWA to United and Calleguas. The FCGMA approval required that Calleguas obtain pre-approval of the location of point of extraction of credits and rate of extraction from the Agency Coordinator. From 1998 to 2003, PHWA transferred 700 acre-feet of credits to Calleguas annually.

On December 10, 2002, Calleguas, PHWA, and the City of Oxnard entered into an agreement, entitled "Three Party Water Supply Agreement" that provided for Calleguas to transfer 2,400 acre-feet of these credits to the City of Oxnard and that as of 2004, the annual transfer of 700 acre-feet would be from PHWA to the City of Oxnard. As a result, Calleguas retains 1,800 acre-feet of conservation credits pursuant to this program. None of the conservation credits have been extracted by Calleguas. This storage remains part of Calleguas' long-term emergency water supply portfolio and may be pumped in the future.

Current Status

Today, approximately 660,000 people rely on Calleguas for three-quarters of their water supply. Due to the geographic location of its service area, Calleguas typically receives exclusively SWP water, with the ability to receive no more than 15% of its supplies from the Colorado River. The SWP supply flows through over 500 miles of reservoirs, aqueducts, and pumping facilities to Castaic Lake, then through Metropolitan pipelines and a treatment plant to Calleguas' connection in Chatsworth. Calleguas delivers the water through a tunnel in the Santa Susana Pass and pipelines in Simi Valley. There is little redundancy in this supply infrastructure and it traverses many seismically active areas. For this reason, Calleguas must be ready for an unplanned outage that could occur at any time and last several months. Together with Calleguas' Lake Bard and the Las Posas ASR Project, stored water in the Oxnard Subbasin and Pleasant Valley basin is an important emergency water supply for three-quarters of the population of Ventura County.

Oxnard Subbasin and Pleasant Valley Basin PDGSP Comments

Calleguas understands that FCGMA released the PDGSPs to facilitate stakeholder engagement and input into development of a final GSP. Calleguas appreciates FCGMA's effort to facilitate stakeholder engagement at this juncture in the GSP development process. At the time of release, FCGMA emphasized that the PDGSPs are preliminary drafts and that some sections are not complete and the final GSPs that will ultimately be adopted by the Board of Directors may be significantly revised. Later, comments made during the January 3, 2018 FCGMA Board of Directors meeting indicated that FCGMA considers PDGSP Sections 1 and 2.1 through 2.3 to be substantially complete, despite numerous placeholders on key issues. At this time, it was also suggested that the remaining sections are to be considered working drafts, subject to considerable change. Calleguas has chosen not to provide detailed comments on these GSPs at this time but reserves the right to provide comments on future GSP drafts.

Calleguas' high-level comments are provided below. Calleguas strongly encourages the FCGMA to consider the comments provided in this letter as work continues on the GSPs.

1. **The LPVB PDGSP should be updated to comprehensively address Calleguas' FCGMA Board-approved storage programs and associated water rights.** Calleguas' In-Lieu, Supplemental M&I, and PHWA storage programs are FCGMA Board-approved projects that Calleguas has made significant investments to develop and are key elements of the emergency water supply for a majority of Ventura County residents. While Calleguas' storage programs are mentioned in the Oxnard Subbasin and Pleasant Valley Basin PDGSP, the plan does not fully incorporate these programs as existing water resource management programs (Section 1.2.3).

2. **Text concerning Calleguas' Urban Water Management Plan (Section 1.2.6.2) should be revised based on Calleguas' Comments on the LPVB PDGSP.** Please see Comment Nos. 12 and 13 from Calleguas LPVB PDGSP comment letter dated April 2, 2018.

If you have any questions about Calleguas' comments, please contact me at (805) 579-7115 or smulligan@calleguas.com.

Sincerely,

Susan B. Mulligan

Susan B. Mulligan
General Manager

cc: Department of Water Resources
Eugene West, Chair, Fox Canyon Groundwater Management Agency Board of Directors

State of California – Natural Resources Agency
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September 23, 2019

Via Electronic Mail and Online Submission

Mr. Arne Anselm
Deputy Director
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009-1610
FCGMA@ventura.org

Dear Mr. Arne Anselm:

Subject: COMMENTS ON OXNARD SUBBASIN DRAFT GROUNDWATER SUSTAINABILITY PLAN

The California Department of Fish and Wildlife (Department) Region 5 South Coast Region is providing comments on the Fox Canyon Groundwater Management Agency's (GSA) Oxnard Subbasin (Subbasin) Draft Groundwater Sustainability Plan (GSP) prepared pursuant to the Sustainable Groundwater Management Act (SGMA). As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of GSPs under SGMA represents a new era of California groundwater management. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems and species depend on groundwater and interconnected surface waters. SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to Groundwater Sustainability Plans:

- Groundwater Sustainability Plans must **identify and consider impacts to groundwater dependent ecosystems** [23 CCR § 354.16(g) and Water Code § 10727.4(l)];

- Groundwater Sustainability Agencies must **consider all beneficial uses and users of groundwater**, including environmental users of groundwater [Water Code §10723.2 (e)]; and Groundwater Sustainability Plans must **identify and consider potential effects on all beneficial uses and users of groundwater** [23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3)];

- Groundwater Sustainability Plans must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water** [23 CCR § 354.22 *et seq*. and Water Code §§ 10721(x)(6) and 10727.2(b)] and describe monitoring networks that can identify adverse impacts to beneficial uses of interconnected surface waters [23 CCR § 354.34(c)(6)(D)]; and,

- Groundwater Sustainability Plans must **account for groundwater extraction for all Water Use Sectors** including managed wetlands, managed recharge, and native vegetation [23 CCR §§ 351(al) and 354.18(b)(3)].

Accordingly, the Department values SGMA groundwater planning that carefully considers and protects groundwater dependent ecosystems and fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.

COMMENT OVERVIEW

The Department is writing to support ecosystem preservation in compliance with SGMA and its implementing regulations based on Department expertise and best available information and science.

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. Under *Environmental Law Foundation v. State Water Resources Control Board* (2018), 26 Cal. App. 5th 844, the state and subdivisions of the state must consider public trust uses when permitting extractions of groundwater hydrologically connected to navigable waterways, including those authorized under SGMA GSPs. Accordingly, the Department recommends that the GSA address these deficiencies before submitting the GSP to the Department of Water Resources (DWR).

COMMENTS AND RECOMMENDATIONS

The Department comments are as follows:

1. **Comment #1** (Basin Setting, Interconnected Surface Water Systems, starting pp 1-2): The method identifying and the narrative describing the basin's interconnected surface water conditions lack specifics.

   a. *Issue*: According to the GSP, "depletion of interconnected surface water have not occurred historically in the Subbasin, because the Groundwater-Dependent Ecosystems (GDEs) in the Subbasin are supported by shallow groundwater flows that are generally separated and disconnected from the primary groundwater aquifers" (pp 1-2). The interconnected surface water conditions modeling/narrative lacks estimations of the quantity and timing of streamflow depletions as specified in 23 CCR § 354.16(f).
   b. *Recommendation*: The Department recommends identifying the estimated quality and timing of streamflow depletions in the Subbasin. If this information is not available, identify an expeditious path to estimating these values.

2. **Comment #2** (Basin Setting, 2.3.7 Groundwater-Dependent Ecosystems, starting pp 2-25): 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*: According to the GSP (pp 2-42), "groundwater elevation data for the semi-perched aquifer in the Subbasin are extremely limited, with no monitoring sites near enough to surface water bodies to establish the extent of the connection between these surface water bodies and underlying groundwater (Figure 2-50, Groundwater Elevation Contours in the Semi-Perched Aquifer, October 2-29, 2015, and Figure 2-51, Groundwater Elevation Contours in the Semi-Perched Aquifer, October 2-29, 2015)". The GSP also states that "groundwater elevation data in the vicinity of these units will be required in order to confirm whether or not the habitat is supported by groundwater" (pp 2-43).
   b. *Recommendations*: To improve identification of GDEs, including interconnected surface waters, in the GSP, the Department recommends the GSA consider:
      i. The installation of shallow groundwater monitoring wells near potential GDEs and interconnected surface waters, potentially pairing multiple-completion wells with additional streamflow gauges. This will facilitate an improved understanding of surface water-groundwater interconnectivity.
      ii. Re-evaluating sustainable management criteria based on an improved understanding of GDEs and interconnected surface waters. In addition, the re-evaluation shall also be based on undesirable results for environmental beneficial users of groundwater and interconnected surface waters.

3. **Comment #3** (2.3.7 Groundwater-Dependent Ecosystems, starting pp 2-43; 4.2.1 Groundwater Monitoring, starting pp 4-2): Shallow groundwater monitoring wells are lacking.

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)]. The GSP identifies potential GDEs in the following drainages: Lower Santa Clara River, McGrath Lake, Ormond Beach, Revlon Slough, Lower Calleguas Creek, and Mugu Lagoon. Few monitoring wells are near interconnected surface waters or concentrations of GDEs; therefore, there are few data points on shallow groundwater level and semi-perched aquifer 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*: The Department recommends designing groundwater monitoring criteria that reflect a 'Critically Overdrafted' subbasin (DWR 2016) designation. The criteria must seek to improve current groundwater conditions rather than allowing for aquifer depletions to sustain over the next two decades. As previously addressed in Comment #2bi, the Department recommends the installation of shallow groundwater monitoring wells near potential GDEs and interconnected surface waters, potentially pairing multiple-completion wells with additional streamflow gauges. This will facilitate an improved understanding of surface water-groundwater interconnectivity and subsurface recharge channels.

CONCLUSION

In conclusion, though the Oxnard Subbasin GSP identifies GDEs as environmental users, the GSP lacks robust analysis of groundwater management impacts on GDEs and fish and wildlife beneficial users of groundwater and interconnected surface waters. The Department recommends that Oxnard Subbasin's Fox Canyon Groundwater Management Agency address the above comments before GSP submission to DWR. If these comments are not integrated, the Department may recommend to DWR an 'incomplete' or 'inadequate' plan determination based on the following regulatory criteria for plan evaluations:

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science. [23 CCR § 355.4(b)(1)] (See Comment #2, 3)
2. The GSP does not identify reasonable measures and schedules to eliminate data gaps. [23 CCR § 355.4(b)(2)] (See Comment #1, 2, 3)

The Department appreciates the opportunity to provide comments on the Subbasin Draft GSP. Please contact Mary Ngo, Senior Environmental Scientist (Specialist), at (562) 342-2140 or Mary.Ngo@wildlife.ca.gov with any questions.

Sincerely,

FOR Erinn Wilson
Environmental Program Manager, South Coast Region 5

Enclosures (Literature Cited)

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Literature Cited

Department of Water Resources. (DWR) 2016. Bulletin 118. Interim Update 2016. California's Groundwater: Working Toward Sustainability. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/Statewide-Reports/Bulletin_118_Interim_Update_2016.pdf

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September 23, 2019

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VIA ELECTRONIC MAIL

Board of Directors
Fox Canyon Groundwater Management Agency
c/o Mr. Jeff Pratt - Executive Officer
800 S. Victoria Avenue
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Email: fcgma-gsp@ventura.org

Re: Groundwater Sustainability Plans for the Oxnard Subbasin and Pleasant Valley Basin

Dear Chair West and Members of the Board:

The OPV Coalition and Oxnard/PV Ag Owners, Inc. (together, "OPV") have engaged O'Melveny & Myers LLP to provide comments on the Fox Canyon Groundwater Management Agency's ("GMA") Groundwater Sustainability Plan for the Oxnard Subbasin and Groundwater Sustainability Plan for the Pleasant Valley Basin released in July 2019 (individually, "Oxnard Plan" and "Pleasant Valley Plan"; together, "Plans"). Please accept this consolidated comment letter for both Plans.

OPV has two fundamental concerns respecting the Plans. The first is that the sustainable management criteria set forth in Section 3 of both Plans improperly and unnecessarily limits the sustainable yield of the Oxnard Subbasin and Pleasant Valley Basin (together, "the Basins"), and as a consequence, will unnecessarily restrict the cumulative quantity of groundwater available to support local water users and the regional economy. OPV's second concern pertains to how the pumping allocations and demand management (rampdown) criteria will be determined. The Plans, of course, do not establish the allocations or the rampdown criteria. We understand the GMA staff intend to present an allocation ordinance to the Board at its October meeting applying substantially the same approach applied in the draft ordinance discussed at its June 26, 2019 board meeting. As discussed further below, we respectfully urge the GMA to postpone such determination and instead embrace a stakeholder-driven process to address these critical issues. Specifically, we recommend that the Plans expressly describe a structured and facilitated process to seek stakeholder consensus on allocations and rampdown before the GMA revisits the issues by ordinance. When convenient, we request a meeting with the GMA's counsel to discuss opportunities to collaboratively resolve the issues presented herein.

I. OPV Represents Growers Committed to Collaborative Solutions in the Basins

The OPV Coalition is an association formed by some of the largest and most long-standing agricultural entities and landowners in the Basins. These include Duda Farm Fresh Foods, Inc.; Gladstone Land; AMS Craig, LLC; Arnold Ranch; and Reiter Affiliated Companies. Oxnard/PV Ag Owners, Inc. is a mutual benefit corporation whose members farm 23,000 acres in the Basins, close to 75 percent of the Basins' irrigable farmland. Together, OPV is responsible for a significant portion of the nation's food production.

OPV and its growers have participated in good faith in the GMA's groundwater management efforts for years. Rather than recounting this history in full, we direct you to the following correspondence to the GMA, incorporated herein by reference:

- David B. Cosgrove of Rutan and Tucker, LLP to GMA Board of Directors and its referenced correspondence (June 26, 2019) ("Cosgrove Letter")
- Craig Parton of Price, Postel & Parma LLP to GMA Board of Directors (March 30, 2018) ("Parton Letter")

OPV representatives have attended stakeholder workshops and GMA board meetings, provided comments on previous drafts of the Plans, and employed Dr. Steven Bachman to participate in the GMA's Technical Advisory Group. Further, at the GMA's request, OPV organized stakeholders to negotiate an allocation and replenishment plan for the Basin, which culminated in a whitepaper issued in February 2018. *See* Groundwater Pumping Allocation and Replenishment Plan Recommendations for the Oxnard Plain and Pleasant Valley Basins, Version 2 (February 7, 2018) ("OPV Allocation Proposal"). The effort took three years, but OPV's program obtained support from approximately 85 percent of the agricultural community as well as the cities of Oxnard and Port Hueneme; the Channel Islands Beach Community District; United Water Conservation District; Pleasant Valley County Water District; the U.S. Navy; and The Nature Conservancy. Notwithstanding these substantial efforts and broad coalition of support, the GMA's allocation proposal, as presented in its June 26, 2019 draft ordinance, starkly deviate from the OPV Allocation Proposal with respect to several critical issues, including how allocations are set.

II. The Plans Improperly Constrain the Sustainable Yield of the Basins and as a Result Are Vulnerable to Legal Challenge

As Dr. Bachman explains in his report ("Bachman Report"), which is attached hereto and incorporated herein by reference, the GMA has selected an improper basis for establishing sustainable management criteria and sustainable yield in the Basins. All agree that seawater intrusion is the primary undesirable result that must be avoided. The GMA, however, has used modeling of its favored strategies to define the scope of the problem rather than using a proper diagnosis of the problem to guide the appropriate strategies. This approach is backward and cannot survive scrutiny.

A rational approach to sustainability criteria for seawater intrusion would start with a determination of groundwater elevations at coastal monitoring wells necessary to prevent seawater intrusion, thereby establishing hydraulic equilibrium (on average) between fresh water and seawater. *See* Bachman Report at 1-3. From that determination, the GMA could establish minimum thresholds and measurable objectives based on those elevations. With such criteria determined, the GMA could then run model simulations to determine which projects and management actions best (and most cost-effectively) achieve those minimum thresholds and measurable objectives.[1] *Id.* Such an approach is consistent with the logical progression of basin activities set forth in the SGMA Best Management Practices, which order planning ahead of identification of management actions. *See* Sustainable Management Criteria BMP, Modeling BMP 10 fig. 1 (2016).

Rather than follow this logical approach, the GMA just simulated how groundwater levels responded to its favored projects and set criteria based on that simulation.[2] Oxnard Plan at 3-13, 3-14. The GMA skipped the planning step and went directly to the project selection step.

This approach produces two critical problems. First, the Plans' strategies, as modeled, fail to stop seawater intrusion within the lower aquifer by 2040. Oxnard Plan at 2-247. Second, the modeled scenarios show a potential annual loss (waste) of more than 4,000 AFY of freshwater into the ocean in the upper aquifer. *Id*. Had the Plans proceeded logically, and first established groundwater levels that would produce necessary hydraulic head at coastal monitoring wells, the Plans could then select projects and management actions that would avoid further seawater intrusion through maintenance of coastal groundwater elevations without wasting thousands of acre-feet from the upper aquifer system. *See* Bachman Report at 1, 3-4.

As an additional error, the Plans set minimum thresholds for seawater intrusion at *inland* wells rather than at existing monitoring wells adjacent to the coast that are the proper locations for monitoring groundwater elevations adequate to prevent seawater intrusion. *Id.* at 3, 6.

Because of this error:

- Minimum thresholds are set at the wrong location and at considerably higher groundwater elevation levels than if they were calculated based on the groundwater elevations at coastal monitoring wells necessary to prevent seawater intrusion. *See id.* Such minimum thresholds set higher than necessary to avoid undesirable results violate the SGMA guidelines. 23 C.C.R. § 354.28(a).

- Measurable objectives are not set to the Plans' own criterion: the "water level at which there is neither seawater flow into nor freshwater flow out of the [aquifers]." Oxnard Plan at 3-20. None of the simulations produce that equilibrium. *Id.* at 2-247. Consequently, if

[1] The GMA has proposed several groundwater management projects that should have been included in the modeling: installing barrier wells, injecting treated river water into overdrafted basins, increasing diversions from the Santa Clara River, and shifting pumping to the Northwest Oxnard Plain. *See* GMA's 2007 Update to the Fox Canyon Groundwater Management Plan at iv (2007). The City of Oxnard proposed that desalination might become a viable future supply. *See* City of Oxnard Urban Water Management Plan at 41 (2015).

[2] The Plans' modeled projects are demand reductions and recharge and delivery from the City of Oxnard's Groundwater Recovery Enhancement and Treatment program.

the Basins operate as modeled in the Plans, there will be a significant and unreasonable waste of groundwater in contravention of the constitutional requirement that water be put to maximum beneficial use and not wasted. (Cal. Const. Art. X, § 2; *Erickson v. Queen Valley Ranch Co*., 99 Cal. Rptr. 446, 450 (Ct. App. 1971); (Constitutional provision "declares the state's policy to achieve maximum beneficial use of water and prevention of waste, unreasonable use and unreasonable method of use.").

- Sustainable yield cannot be determined from the Plans. The simulations either flush fresh water into the ocean or cause seawater intrusion, whereas sustainable yield requires optimization. Oxnard Plan at 2-247; Bachman Report at 8. In addition, the Plans never articulate or provide supporting documentation as to how the sustainable yield estimate in each Plan is derived from the model simulations, meaning that there is no way for reviewing experts like Dr. Bachman (or a reviewing court) to determine that those estimates are factually supported.

The Plans also fail to comport with other modeling requirements. DWR requires GSP models to "be responsive to changes in agricultural practices" in agricultural basins. Modeling BMP 23 (2016). In addition, models must be capable of capturing groundwater dynamics and must include inputs relevant to aquifer systems. *Id*. at 4, 13. This should logically include capturing reasonable variations in pumping due to precipitation or other factors. The GMA model, however, uses average pumping from 2015 to 2017 to model a static pumping rate of 68,000 acre-feet for both aquifers.[3] Oxnard Plan at 2-62. Consequently, the Plans' minimum thresholds do not reflect actual pumping behavior because the pumping variability is masked by an average number. By failing to account for pumping variability, the Plans' approach introduces the risk that groundwater elevations could drop below minimum thresholds in drought cycles—triggering cutbacks and other management actions—even where those levels are not actually permitting seawater intrusion. Bachman Report at 8-9.

Both TAG and Dr. Bachman previously raised these concerns with the GMA and its consultants. *See* Parton Letter at 4-7 (explaining history of TAG's comments and criticisms of the Plans and their development process); Memorandum from Dr. Steven Bachman to the GMA at 1, 3-4 (February 4, 2019). If left uncorrected, the Plans will be vulnerable to legal challenge pursuant to Water Code section 10726.6(e). *See Cal. Ass'n for Health Servs. at Home v. State Dep't of Health Care*, 138 Cal. Rptr. 3d 889, 899 (Ct. App. 2012) (court must invalidate agency action that is arbitrary or capricious, or where the agency fails to demonstrate a rational connection between evidence and the action chosen). To avoid the prospect of successful legal challenge, the GMA should amend the Plans in accordance with Dr. Bachman's recommendations.

III. The Plans Should Commit the GMA to a Specified Settlement Process for Resolving the Critical Allocation and Rampdown Issues

[3] Although the GMA specifies the 2015-17 time frame, the Plans do not provide actual pumping data. To support the conclusions concerning the sustainable yield and sustainability criteria, this data must be set forth in the Plans.

Both Plans provide that the "primary management action . . . is a Reduction in Groundwater Production." Oxnard Plan at 5-14; Pleasant Valley Plan at 5-4. Although demand management should not be the exclusive tool applied to address seawater intrusion in the Oxnard Basin,[4] OPV agrees that assignment of allocations and rampdown are necessary.[5] The GMA surely appreciates the controversy that these issues entail. It would benefit all parties to settle the allocation/rampdown issue through compromise rather than a comprehensive groundwater adjudication (Code of Civ. Proc. § 830 *et seq.*) like that underway in the neighboring Las Posas Basin.[6] Such a settlement will only occur if the various stakeholders, holding diverse interests and opinions, reach substantial agreement on an allocation plan. For this reason, OPV respectfully urges the GMA to initiate a comprehensive, structured, and facilitated settlement process shortly after adoption of the Plans. We further recommend that the GMA amend the Plans to commit to such a process, specifically including a description of the process, defined scope, and schedule for completion of negotiations.

The retention of a professional facilitator with experience guiding multi-party negotiations over natural resource conflicts could greatly enhance the potential for success. Organizations such as the Consensus Building Institute and Kearnes & West employ facilitators with such requisite expertise. Such a process could build from the substantial consensus reflected in the OPV Allocation Proposal. Emergency Ordinance E would remain in effect throughout negotiations, continuing the demand reduction it has realized year over year since its inception.

IV. The Approach Taken in the GMA Draft Ordinance Is Inconsistent with the Common Law and Is Unacceptable to OPV Members

We are mindful that there remains significant disagreement concerning allocation approaches. Although some support the GMA's prior draft allocation ordinance, its approach—as OPV has already explained, *see* Cosgrove Letter at 1—fails to follow the common law, is unacceptable to OPV members, and risks litigation. We now understand the GMA staff intends to present an allocation ordinance to the Board for consideration at its October meeting, presumptively applying a similar approach to that set forth in the earlier draft ordinance. We respectfully urge the GMA to postpone that ordinance in favor of the facilitated approach described above. If the GMA intends to adopt an allocation ordinance similar to the prior draft, several legal and equitable infirmities will result, which are briefly discussed below.

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[4] GMA, *supra* note 1.

[5] Allocations facilitate demand reduction, groundwater markets, and the assignment of financial burdens for developing new sources of supply.

[6] Although the GMA's enabling act authorizes it to restrict pumping and SGMA authorizes the GMA (as a groundwater sustainability agency) to develop groundwater allocations, allocations and correlated pumping restrictions must adhere to common law water rights principles. *See* Wat. Code §§ 10720.5, 10726.4(a)(2), 10726.8(b); *City of Barstow v. Mojave Water Agency*, 99 Cal. Rptr. 2d 294, 306 (Cal. 2000). Thus, an allocation scheme that does not adhere to common law water-rights principles is likely to be challenged.

The prior draft allocation ordinance's use of a distant historical base period of 2005-2014 produces dramatic windfalls for some users at the expense of others. It particularly disfavors long-time growers of lower-water-demand crops and pumpers who assisted in groundwater management by voluntarily using surface supplies during the base period. In some circumstances, those who have maintained low-use crops, such as citrus, are destined to receive less than half the amount per acre than those with high-use crops, such as turf farms, would receive. Surface-water recipients may receive even less—with no assurance that such supplies will be available in future years, and despite the fact that they paid for those supplies. In addition, surface water recipients still retain common law groundwater rights. *See* Wat. Code § 1005.1 *et seq.* (preserving groundwater rights when an alternative supply is substituted).

Those with windfalls under the regime may even reduce use through conservation or transition to lower-demand crops and sell their surplus water back to those with inadequate supplies. Thus, the allocation approach set forth in the earlier ordinance is, in essence, an unjustified wealth transfer among users.

Such radically disparate, outdated allocations are inequitable and, ultimately, legally infirm. Equity is an important element of any allocation regime—particularly so with respect to allocations among landowners holding correlative overlying rights. Achieving equity requires consideration of a number of factors, including current need; historical use cannot be the sole proxy for allocation. *Tehachapi-Cummings Cty. Water Dist. v. Armstrong*, 122 Cal. Rptr. 918, 924-25 (Ct. App. 1975) (each owner's proportionate share is not predicated on past use over a specified time period); *see also Prather v. Hobe*rg, 24 Cal. 2d 549, 560 (Cal. 1944) (when allocating limited supplies among holders of correlative rights [riparian and overlying rights], "[t]he apportionment should be measured in the 'manner best calculated to a reasonable result,' and the court may adopt any standard of measurement 'that is reasonable on the facts to secure equality'").[7] The exclusive reliance on a historical base period stretching back almost 15 years, which rewards those with historically higher use and prejudices those that conserved water over this period, is also inconsistent with fundamental aspects of water policy that encourage reasonable and beneficial use of water, avoidance of waste, and the preservation of groundwater rights for those that have undertaken efforts to conserve water. (Cal. Const. Art. X, § 2; Wat. Code § 1005.1.).

The OPV Allocation Proposal would be far more equitable and legally supportable. It initially allocates water by each user's relative percentage of recent use. Proposal at B9. The burden of reduction would be shared among all water users and starts from a position of current need. The OPV approach reflects an equitable compromise between the interests of growers of higher- and lower-demand crops, and more accurately reflects current irrigation practices.

While OPV favors the proposal that it developed with broad user support, it appreciates that some disagree with that proposal. In the interest of facilitating dialogue and avoiding premature litigation, OPV urges a return to negotiations with the assistance of a professional facilitator.

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[7] SAMUEL C. WIEL, WATER RIGHTS IN THE WESTERN STATES, Vol. 1 § 751 (3d ed. 1979).

The equitable principles reflected in the OPV proposal are important issues for discussion, but OPV remains willing to discuss additional ideas for a fair resolution of this important issue.

V. Conclusion

OPV has several significant technical, legal, and equitable concerns with the approach taken in the draft Plans and the anticipated allocation ordinance, but wishes to remain a collaborative partner with the GMA and other water users in transitioning the Basins to a more sustainable future. All Basin stakeholders should have the opportunity to work together to achieve that result.

Sincerely,

Russell McGlothlin

O'MELVENY & MYERS LLP

Technical Analysis of
Groundwater Sustainability Plans for the Oxnard Plain and Pleasant Valley Subbasins, July 2019

Steven Bachman, PhD

September, 2019

INTRODUCTION

The primary goal of the GSPs for the Oxnard Plain and Pleasant Valley subbasins is that seawater intrusion be contained to 2015 areas. I agree that prevention of further seawater intrusion is the appropriate goal. The priority of basin pumpers is that this goal be achieved in the most efficient manner and with the least disruption to the agricultural economy of Ventura County. This technical analysis addresses concerns about whether actions considered in the current GSPs actually prevent all seawater intrusion and whether projects and sustainability criteria are appropriate means to efficiently do this.

EXECUTIVE SUMMARY

The GSPs for the Oxnard Plain and Pleasant Valley subbasins are fundamentally flawed in the approach taken to set sustainability criteria and in the management strategies to prevent seawater intrusion. Instead of a typical method of determining conditions that would prevent seawater intrusion, then testing strategies in a groundwater model that would satisfy these conditions, the GSPs have done this backwards. Instead, the GSPs use a small set of management strategies in a groundwater model to determine the conditions necessary to prevent seawater intrusion. These are not the method that have been used historically in the Oxnard Plain, Santa Maria, and Seaside basins. Of additional concern is that the modeled management strategies do not prevent seawater intrusion in all aquifers, a primary goal of the GSPs, but at the same time allow thousands of acre-feet per year of discharge of fresh water to the ocean from other aquifers.

The first significant problem with the backwards approach used in the GSPs is that the sustainability criteria (Minimum Thresholds and Measurable Objectives) are determined by the modeling results from the small number of solutions tested, rather than on well-known criteria to prevent seawater intrusion. The second significant problem is that the solutions used in the modeling are not the same ones that were shown to be the most effective in previous work by United Water Conservation District. The third significant problem is that the solutions do not prevent all seawater intrusion.

The GSP sustainability criteria require high groundwater elevations in interior areas, with an offshore gradient. At the coastline, it is appropriate to require groundwater elevations that prevent further seawater intrusion, but other areas of the State have solved seawater intrusion in other ways than a strong offshore gradient in inland area (Orange and LA counties have solved the problem with barrier projects that do not require offshore gradients in inland areas). If the Measurable Objectives and Minimum Thresholds are set in inland areas rather than at the coast, future projects may be precluded from consideration. The GSP needs this flexibility of meeting coastal standards without precluding other approaches in management.

TECHNICAL ANALYSIS

The Oxnard Plain and Pleasant Valley GSPs are flawed in a number of ways. These flaws are not cosmetic – they result in sustainable yields that are too low and Measurable Objectives and Minimum Thresholds that will be difficult to meet in the future. The added costs and restrictions caused by implementation of the GSPs will be significant and disruptive. The main flaws are outlined below, with a further discussion following.

1. Sustainability criteria should be based on 1) groundwater elevations at the coastline that prevent seawater intrusion and 2) water quality standards near the front edge of the current location of seawater intrusion;
2. The current method of determining sustainability is based on modeling simulations rather than on measured conditions that would prevent undesirable results;
3. Model simulations to determine sustainability have not been optimized, with GSP simulations indicating an average of thousands of acre-feet per year of discharge of fresh water into the ocean;
4. Projects considered in model simulations in the GSPs did not include projects considered by United Water Conservation District in their simulations that resulted in higher sustainable yield and less discharge of fresh water to the ocean;
5. Sustainable yield is based on simulations with these large discharges of fresh water to the ocean in the Upper Aquifer and continued seawater intrusion in the Lower Aquifer;
6. Measurable Objectives are not set according to criteria delineated in GSPs;
7. Model simulations used a single pumping rate for wells, rather than the documented pumping patterns that vary considerably between wet and dry years. This resulted in Minimum Thresholds determined from the model that were unrealistically high in elevation;
8. The recommended ramp-down in pumping over the first five years is based on the flawed sustainable yield discussed above.

1. <u>Sustainability criteria should be based on 1) groundwater elevations at the coastline that prevent seawater intrusion and 2) water quality standards at the front of the current location of seawater intrusion</u>: The common criteria to prevent seawater intrusion is that groundwater elevations at the coastline be at sufficient height to prevent seawater moving from offshore areas on to the land. These groundwater elevations are several feet above sea level, depending

upon the aquifer. These groundwater elevations provide a gradient between the coastal wells and the offshore outcrops of the aquifers that prevent landward movement of seawater. It is when the coastal groundwater elevations drop below these required elevations that seawater intrusion occurs. The Fox Canyon GMA previously used such coastal criteria on the Oxnard Plain[1] as criteria to prevent seawater intrusion.

To ensure that seawater that is already in some coastal areas does not progress farther inland, criteria based on water quality are the most straight-forward approach. In fact, the guidance for seawater intrusion criteria include, "The minimum threshold metric for **seawater intrusion** shall be the location of a chloride isocontour."[2] Thus, we are suggesting that coastal groundwater elevations be paired with water quality criteria to properly assess future sustainability.

<u>2. Method of determining sustainability is based on modeling simulations rather than measured conditions that would prevent undesirable results</u>: The main undesirable result in Oxnard Plain and Pleasant Valley is seawater intrusion. There is a series of nested USGS monitoring wells along the coast that have provided groundwater elevation data since the early 1990s. Historically, the metric to prevent seawater intrusion was to maintain high enough coastal groundwater elevations on average through wet and dry cycles[3]. In the GSP Technical Advisory Group, of which I am a member, there was significant discussion of whether to use groundwater elevations just at coastal wells or instead a coastal groundwater gradient. There was no discussion by TAG members of using modeled groundwater elevations as sustainability criteria. There was never a satisfactory explanation to TAG about why the GSP criteria were based on model results rather than coastal groundwater elevation criteria.

Monitoring wells at the coastline have been used on the Oxnard Plain for years to determine whether conditions exist for seawater intrusion. It is inexplicable that the GSPs do not use this method to set sustainability goals for seawater intrusion. Inland wells are simply not in the appropriate location.

Instead of using groundwater elevations in coastal USGS monitoring wells as sustainability metrics, the GSPs use a more convoluted method. Model simulations were constructed using United Water Conservation District's regional groundwater model, with a small set of projects and pumping reductions implemented. These model simulations were then subjected to second-order processing (particle tracking) to approximate how particles at the landward edge of the current seawater intrusion would move through time. This use of particle tracking assumes that seawater moves only according to groundwater gradients. This assumption is not correct, because other processes, such as dilution, dispersion, and sedimentary patterns, also affect seawater movement. It is not clear what error this assumption introduces into the

[1] Fox Canyon GMA, 2007, Update to Groundwater Management Plan.
[2] California Department of Water Resources, 2017, Best Management Practices for the Sustainable Management of Groundwater, p. 10.
[3] E.g., Fox Canyon GMA, 2007, Update to Groundwater Management Plan.

sustainability criteria and sustainable yield.

<u>3. Model simulations to determine sustainability have not been optimized, with GSP simulations indicating an average of thousands of acre-feet per year of discharge of fresh water into the ocean</u>: The GSPs considered a few solutions with varying selected projects and pumping reductions. These include use of recycled water and fallowing of agricultural fields. However, there apparently was not an attempt to optimize these projects and pumping reductions that would result in both no net seawater intrusion and no net fresh groundwater lost to the ocean. In fact, as illustrated below (Figure 1), the solutions resulted in continued seawater intrusion in the Lower Aquifer at the same time that there were thousands of acre-feet per year of fresh water discharged into the ocean. Seawater intrusion is not solved for the Lower Aquifer.

The solutions on which GSP results and sustainability criteria are based do not solve the seawater problem, as long as there continues to be seawater intrusion in the Lower Aquifer. These solutions are not sustainable because undesirable results continue to occur in the subbasins. It is thus not possible to determine the sustainable yield of the subbasins when none of the model runs prevent seawater intrusion.

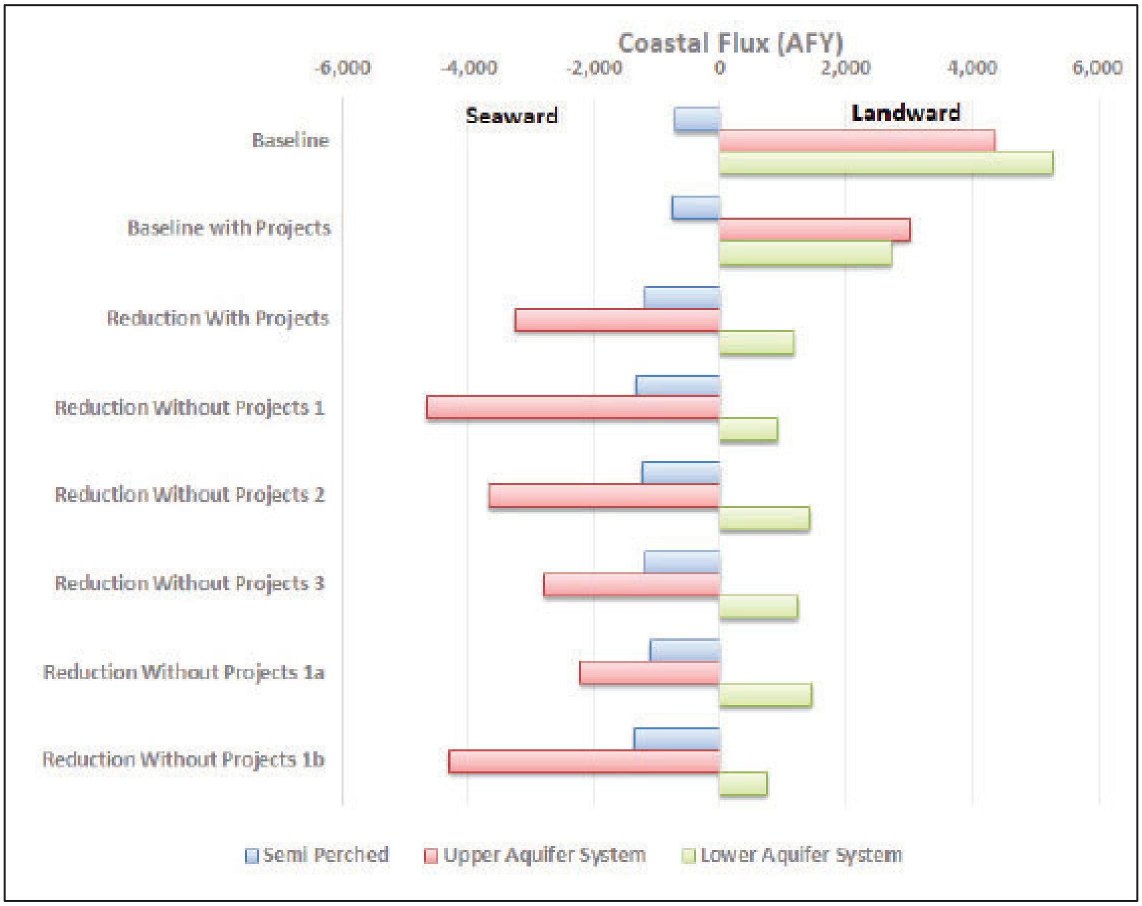

Figure 1. Coastal flux with different projects and pumping reductions (Oxnard Plain GSP, Figure 2-63). Seaward intrusion is towards the right, fresh water to the ocean is towards the left. The red columns are for the Upper Aquifer, indicating discharge of fresh water to the ocean under all solutions with pumping reductions. The green columns are for the Lower Aquifer, indicating continued seawater intrusion under all modeled solutions.

4. <u>Projects considered in model simulations in the GSPs did not include projects considered by United Water Conservation District in their simulations that resulted in higher sustainable yield and less discharge of fresh water to the ocean</u>: With the objective of eliminating seawater intrusion in the most efficient and cost-effective method, it is important that solutions be considered that meet this objective. The solutions used in the GSP modeling require severe pumping reductions, yet do not eliminate the undesirable result of continued seawater intrusion. During the GSP process, United Water Conservation District independently used their groundwater model to perform a number of model simulations to determine the types of projects that could help prevent seawater intrusion[4]. Projects such as a seawater barrier or in-lieu deliveries to pumpers near the coast are not only logical projects used in Ventura County

[4] United Water Conservation District, 2017, Preliminary Evaluation of Impacts of Potential Groundwater Sustainability Indicators on Future Groundwater Extraction Rates – Oxnard Plain and Pleasant Valley Groundwater Basins, Open File Report 2017-2, 68 p.

and elsewhere, but they were more successful in reducing seawater intrusion than the projects included in the GSPs[5].

These United Water model simulations included: 1) Uniform pumping reductions in Oxnard Plain and Pleasant Valley subbasins, 2) pumping reductions largely in the Lower Aquifer, 3) management area at coast with no pumping, 4) no coastal pumping and reduced Pleasant Valley pumping, and 5) no coastal pumping and increased inland pumping. Replacement water for the area with no pumping would come from new wells and infrastructure to move water to where it is needed, a strategy that has been in place on the Oxnard Plain and Pleasant Valley for decades. United Water has also modeled separately a seawater barrier pumping and desalting project[6], which functions similarly to an injection barrier. It is inexplicable why United Water's projects weren't used, especially since the GSP scenarios didn't prevent seawater intrusion and United's did.

An unintended consequence of excluding important projects from the GSP modeling may be the inability to get timely grant funding for these projects in the future.

Other good examples of successful strategies to prevent seawater intrusion are in Orange and LA counties. Injection barriers in those coastal locations prevent seawater intrusion and meet the criteria of coastal groundwater elevations somewhat above sea level. However, interior areas landward of the coast may have groundwater elevations below sea level, as long as coastal groundwater elevations are maintained. Both Figure 2 and Figure 3 are in inland areas of the Oxnard Plain, where groundwater elevations could potentially be much lower with the right projects. Thus, these inland areas are not the correct location to have sustainability criteria for seawater intrusion.

[5] United Water Conservation District, 2017, ibid.

[6] United Water Conservation District, 2014, South Oxnard Plain Brackish Water Treatment Feasibility Study, 66p.

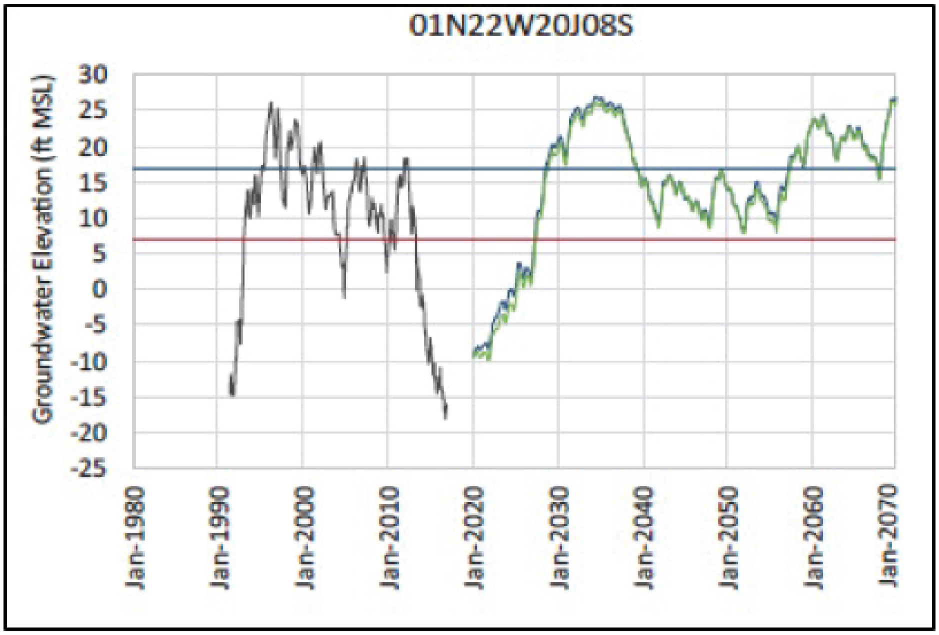

Figure 2. GSP sustainability criteria shown at USGS inland well 20J8 (Oxnard Plain GSP, Figure 3-6a). The left of the chart are measured data, the right indicates modeled data. The lower horizontal line is the Minimum Threshold, the upper horizontal line is the Measurable Objective.

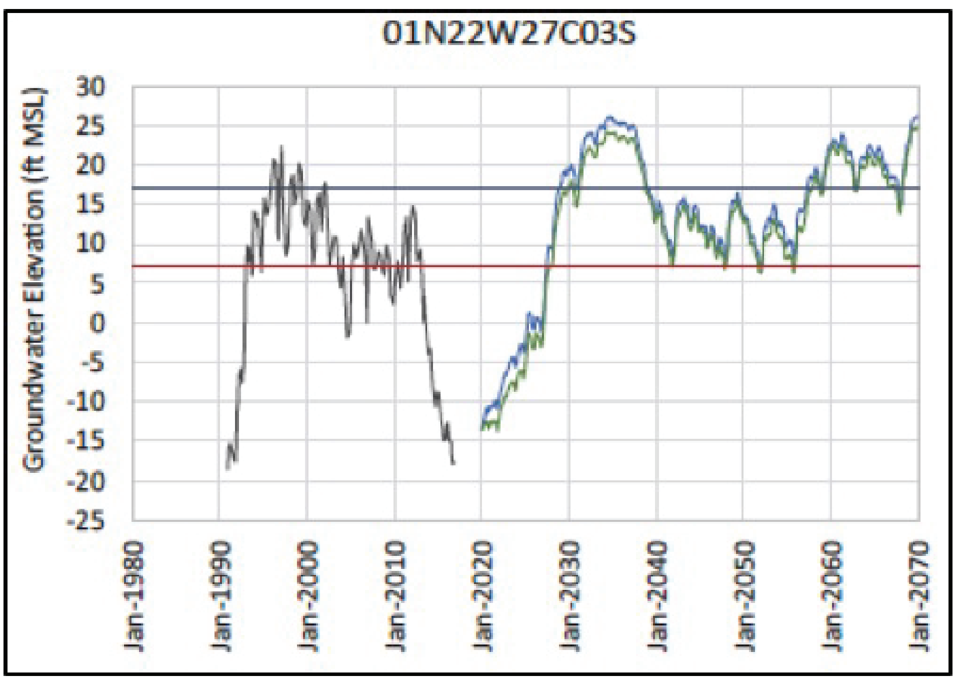

Figure 3. GSP sustainability criteria shown at USGS inland well 27C3 (Oxnard Plain GSP, Figure 3-6b). The left of the chart are measured data, the right indicates modeled data. The lower horizontal line is the Minimum Threshold, the upper horizontal line is the Measurable Objective.

5. Sustainable yield is based on simulations with these large discharges of fresh water to the ocean in the Upper Aquifer and continued seawater intrusion in the Lower Aquifer: The sustainable yield was calculated based on modeling of a small set of solutions involving projects and pumping reductions. As discussed in #3 above, none of these solutions resulted in sustainability because there continued to be seawater intrusion in the Lower Aquifer and large discharges of fresh water to the ocean in the Upper Aquifer.

Calculating a sustainable yield based on solutions that do not meet sustainability criteria is not possible – it just can't be done that way. The GSP appears to extrapolate the unsuccessful strategies to determine sustainable yield. No graph or further explanation of the technique used in the GSP were presented. Because groundwater modeling gives non-linear results from one set of projects/pumping reductions to another, it is not clear how this extrapolation could be accurately accomplished.

As discussed in item #4 above, there is a larger set of projects and management strategies that optimize sustainability against costs and economic disruption. These optimized projects and strategies result in elimination of undesirable results, at the same time increasing the sustainable yield over that proposed by the GSPs. This can be done by focusing on projects and reductions near the coast, where the undesirable results are occurring.

6. Measurable Objectives are not set according to criteria delineated in GSPs: The Oxnard Plain GSP states that "the measurable objective is the water level at which there is neither seawater flow into nor freshwater flow out of the UAS or LAS"[7]. As discussed in #3 above, there were no model simulations that met the criteria so stated. Because none of the modeled solutions met the objectives of preventing seawater intrusion, modeled groundwater elevations cannot then be used to set Measurable Objectives – if those Measurable Objectives were met, there would continue to be seawater intrusion.

7. Model simulations used a single pumping rate for wells, rather than the documented pumping patterns that vary considerably between wet and dry years. This resulted in Minimum Thresholds determined from the model that were unrealistically high in elevation: The previous USGS groundwater model on the Oxnard Plain and Pleasant Valley and the United Water modeling of sustainable strategies discussed in #4 above, varied pumping for wet, average, and dry years. In contrast, the GSP model simulations used to determine sustainability had the same average pumping for all modeled years[8], whether they were wet or dry.

Fox Canyon GMA pumping records indicate that, logically, there is more pumping in dry years and less pumping in wet years. For example, during the period 1990 to 2017, Oxnard Plain pumping totals ranged from a low of 61,400 AFY to a high of 104,800 AFY. The effect of this improper assumption is that there is less of a year-by-year change in modeled groundwater

[7] Oxnard Plain GSP, p. 3-20.
[8] Oxnard Plain GSP, p. 2-63.

elevations than in actual groundwater elevations (the highs and lows are more subdued with no change in pumping).

Because Minimum Thresholds were developed from these subdued model results, these thresholds are set at a higher elevation than they would be if pumping followed climatic cycles and groundwater elevations had more annual swings in amplitude. In practice, future groundwater elevations would be at risk of regularly going below the Minimum Thresholds during dry years even if Measurable Objectives were met. Such violating of Minimum Thresholds would cause unnecessary alarm even though there are no undesirable results, and may lead to further unnecessary reductions in the sustainable yield of the basins. If the pumping is adjusted each year for wet and dry conditions, there would be more-appropriate (and lower elevation) Minimum Thresholds.

It is not clear if the 2015-17 pumping numbers used in the GSP and the modeling runs are correct. The FCGMA provided pumping records by well to the OPV Ag Owners Assoc. for the entire history of reported pumping. Those numbers averaged 74,000 AFY for the Oxnard Plain during 2015-17, rather than the 68,000 AFY used in the GSP.[9] Those numbers also average 16,660 AFY for Pleasant Valley, rather than the 14,000 AFY used in the GSP.[10]

8. <u>The recommended ramp-down in pumping over the first five years is based on the flawed sustainable yield discussed above</u>: The GSPs stated that "the exact reductions that will be implemented in the Subbasin over the next 5 years will be determined by the FCGMA Board based on the data collected and analyzed for this GSP"[11]. The GSP analysis indicated a sustainable yield that is likely to be the basis of calculated the pumping ramp-down for the first 5 years. However, this number is based on an incomplete analysis, with model simulations not optimized to incorporate viable projects, and with significant fresh water flowing to the ocean. Thus, the GSPs may result in an immediate, unnecessary effect on basin pumpers if the ramp-down is calculated from the flawed sustainable yield calculation.

RECOMMENDATIONS

The GSPs should be modified to substitute coastal groundwater elevations that prevent landward movement of seawater for Measurable Objectives and eliminate those inland Objectives that are currently based on incomplete modeling results that did not solve future seawater intrusion. Pumping should be varied by wet, normal, and dry years and Minimum Thresholds should be set accordingly. As required in the DWR BMPs, a chloride isochore should be the Minimum Threshold near the front of the current seawater intrusion. Modeling should only be used to examine the effectiveness of future management strategies in meeting sustainability criteria, and a larger list of management strategies should be used (including those modeled by United Water). Pumping should be varied by wet, average, and dry years

[9] Oxnard Plain GSP, p. 2-63.
[10] Ibid.
[11] Oxnard Plain GSP, p. 5-15.

rather than using the same pumping each year. The sustainable yield should be based on the optimized management strategies from the longer list discussed above. The optimized management strategies should prevent the continued undesirable result of seawater intrusion.

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MEMORANDUM

To: Rob Saperstein, Brownstein Hyatt Farber and Schreck (BHFS)
From: Anthony Brown, **aquilogic**, Inc.
Tom Parker, **aquilogic**, Inc.
Date: September 23, 2019
Project: 018-07

Subject: **Fox Canyon Groundwater Management Agency**
Comments on Draft Groundwater Sustainability Plans (GSPs) for the Oxnard Plain (OPB) and Pleasant Valley (PVB) Groundwater Sub-basins

1. INTRODUCTION

Aquilogic, Inc. (**aquilogic**) has been retained by Brownstein Hyatt Farber and Schreck (BHFS), on behalf of their clients Pleasant Valley County Water District (PVCWD) and Guadalasca Mutual Water Company (GMWC), to provide consulting support related to the Sustainable Groundwater Management Act (SGMA) as it applies to the Oxnard Plain Groundwater Sub-basin (OPB) and Pleasant Valley Groundwater Sub-basin (PVB), referred to herein collectively as the Basins (see **Figure 1**). The geographic extents of OPB and PVB are defined within California Department of Water Resources (DWR) Bulletin 118 - California's Groundwater (DWR, 2016)[1].

As part of our assignment, we have been asked to review the draft Groundwater Sustainability Plans (GSPs) for OPB and PVB prepared by the Fox Canyon Groundwater Management Agency (FCGMA). FCGMA is the Groundwater Sustainability Agency (GSA) for the OPB, PVB, and Las Posas Valley Groundwater Sub-basin (LPVB).

It is assumed that any reader of this memorandum is familiar with the Basins and their setting, SGMA, and the contents of the GSPs for the Basins. If not, we would encourage the reader to review the GSPs. In addition, some basic background information that may assist the reader is provided in **Section 4** of this memorandum.

Please note that a list of acronyms and abbreviations are provided for reference at the end of this memorandum. In addition, a bibliography of materials reviewed in developing this memorandum, beyond the GSPs for the Basins, is also provided at the end of this memorandum.

[1] California Department of Water Resources (DWR), 2016. California's Groundwater, Working Toward Sustainability. Bulletin 118, Interim Update 2016. DWR, December 22, 2016.

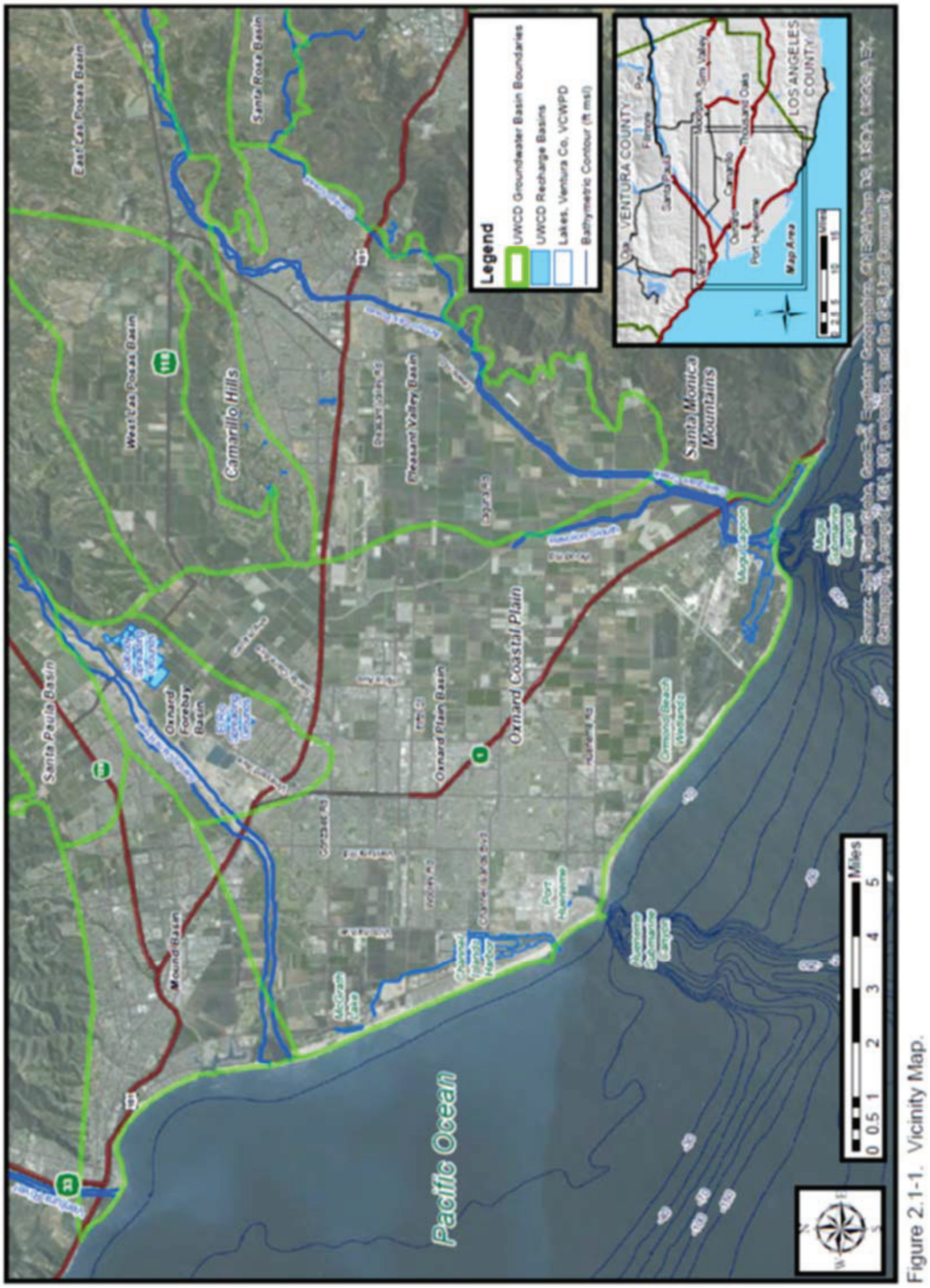

Figure 1. Groundwater Basin Boundaries (Figure 2.1-1 from UWCD, 2017)[2]

[2] UWCD, 2017. Preliminary evaluation of impacts of potential groundwater sustainability indicators on future groundwater extraction rates – Oxnard Plain and Pleasant Valley groundwater basins. Open-file report 2017-02, April 2017

2. MAJOR CONCERNS AND REQUIRED IMPROVEMENTS TO GSPs

In our professional opinion, the GSPs require meaningful improvements in critical areas. Without these improvements, it is uncertain that implementation of the GSPs, as currently written, would result in effective and sustainable groundwater management that considers the needs of all beneficial users in the Basins. Specifically, these improvements are necessary so that the GSPs provide a robust framework for reliable, effective, and considered groundwater management programs and policies.

We understand that the development of GSPs for the Basins is a substantial endeavor, especially given the technical complexity of the Basins, the requirements for a GSP contained within SGMA and the Water Code, the best management practices (BMPs) for GSP development prepared by the DWR, and the socio-economic importance of groundwater in Ventura County, amongst other considerations. We appreciate the time and effort the FCGMA and its consultants have expended in developing the GSPs. Based on our review, the following major items must be addressed before the GSPs can be relied upon to develop effective groundwater management programs and policies:

1. Limited Understanding of the Problem(s) Challenging Sustainability
2. Insufficient Evaluation of Effective Projects and Management Actions
3. Over-reliance on a Deficient Groundwater Modeling

2.1 Improved Understanding of the Problem(s) Challenging Sustainability

Throughout the GSPs, saline intrusion is identified as the significant, unreasonable, and undesirable result that will control sustainable groundwater management in the Basins. Saline intrusion certainly impacts localized, coastal areas within the OPB, but saline intrusion may not be the defining problem for the PVB. Nevertheless, to address a localized, coastal problem, the GSPs present a management action - reductions in groundwater pumping - that is to be applied to the entire OPB and PVB (and West Las Posas Management Area [WLPMA] of the Las Posas Valley Basin [LPVB]).

The GSP must identify and evaluate management actions and projects that are more focused on problem locations. As a precursor to such an evaluation, the causes and locations of saline intrusion must be better characterized. In the absence of such an improved understanding, the imposition of basin-wide, blanket reductions in groundwater production may impose unnecessary hardship without producing demonstrable positive results.

The GSPs lay out an approach to address a problem (i.e., saline intrusion), which is presumed to be prevalent and controlling for both the OPB and PVB. In fact, the presence, extent and cause(s) of the saline intrusion are not well understood. The GSPs recognize (Section 3.3.3) that saline intrusion is present in some coastal areas of the OPB. The GSP's also acknowledge that the saline intrusion is likely resulting from more than one cause; that is, seawater intrusion, upwelling of brackish groundwater from deeper sediments, release of connate water from fine-grained sediments, and percolation of shallow, brackish groundwater may all be contributing factors to the overall saline intrusion.

However, the predominant GSP management strategies are all geared toward ameliorating a presumed saline intrusion problem as if the intrusion uniformly threatened the entire coastal margin of the OPB. To the extent the saline intrusion problem is adequately characterized, the data demonstrates that the intrusion is geographically isolated between the Point Mugu and Port Hueneme areas (specified in the Draft GSP as the "Saline Intrusion Management Area"), and not the entire coastal extent of the OPB. Crucial data must be obtained so saline intrusion can be adequately characterized and, based on this improved understanding, a coherent set of management practices and policies be developed to achieve sustainability. Without such an understanding, it is unlikely that any presumed management strategy would be successful.

The following aspects of the saline intrusion must be more fully characterized before a successful management program can be implemented:

- The magnitude, extent, and geochemical character of each respective source contributing to the saline intrusion
- The exact locations and mechanisms (i.e., hydrogeologic flowpaths) by which the sources contribute to saline intrusion in the Upper Aquifer System (UAS) and Lower Aquifer System (LAS) (the dynamics are likely different for the UAS versus the LAS)
- The rates (velocity and volumetric flow) at which each source contributes to the overall saline intrusion
- The factors that exacerbate or could negate the contribution of each source to the overall saline intrusion
- The respective contributions from these sources to the overall saline intrusion

Understanding the nature of the sources, how they impact the UAS and LAS, their contribution, and what factors exacerbate or could negate their contribution are critical factors that must be understood to develop an effective solution to the problem.

Simply put - it is nearly impossible to develop a solution when you don't understand the problem.

2.2 Insufficient Evaluation of Effective Projects and Management Actions

The GSPs present a limited number of policies and projects (Section 5) that may help address saline intrusion and rely almost entirely on one management action - reductions in groundwater pumping. This blanket, simplistic approach to achieve sustainability presumes that the saline intrusion problem is uniform across the entire coast and results from sweater intrusion alone. However, the saline intrusion is geographically focused and results from several sources via complex mechanisms. The approach is certain to impose hardships on the region, perhaps unnecessarily, and may not be successful. In fact, none of the simulations performed using the three-dimensional (3D) groundwater flow model (UWCD)[3] demonstrated that saline intrusion in the LAS was prevented (see later discussion).

As noted above, an improved understanding of saline intrusion is needed. Until the actual saline intrusion problem is adequately characterized, the GSPs must identify a broader suite of projects and management actions that may help address the problem. A whole range of more effective strategies and projects that have been implemented in other coastal basins in California must be considered. It is likely that one or more of these alternative strategies can more effectively address saline intrusion, and material reductions in groundwater production can be avoided.

2.3 Over-Reliance on Deficient Groundwater Modeling

As their technical foundation, the GSPs rely almost entirely on the three-dimensional (3D) groundwater flow model for the OPB, PVB, and WLPMA developed by United Water Conservation District (UWCD)[4]. The 3D groundwater flow model was used almost exclusively for the following:

- evaluating undesirable results
- establishing sustainable yield
- setting sustainable management criteria (SMC), measurable objectives (MOs), and minimum thresholds (MTs)
- evaluating management actions and projects

The 3D groundwater flow model is a facsimile of the real world, and not an empirical measure of that world. There are important technical inadequacies and flaws associated with the current construct of the 3D groundwater flow model. These have been documented in more detail in a letter from various technical experts (including aquilogic) to FCGMA, dated February 28, 2019. The 3D groundwater flow model may eventually be a useful tool in helping evaluate

[3] United Water Conservation District, 2018, Ventura Regional Groundwater Flow Model and Updated Hydrogeologic Conceptual Model: Oxnard Plain, Oxnard Forebay, Pleasant Valley, West Las Posas, and Mound Basins, United Water Conservation District Open-File Report 2018-02, July

[4] United Water Conservation District, 2018, Ventura Regional Groundwater Flow Model and Updated Hydrogeologic Conceptual Model: Oxnard Plain, Oxnard Forebay, Pleasant Valley, West Las Posas, and Mound Basins, United Water Conservation District Open-File Report 2018-02, July

management actions and policy choices, but it is not yet a reliable tool. Nevertheless, the GSPs rely entirely on modeling results to support or derive key elements of their content.

For example, various pumping and project scenarios were simulated using the 3D groundwater flow model to develop MT's, MO's (see Section 4.1.1 herein) and to evaluate potential reductions in basin-wide pumping to achieve sustainability. However, the 3D groundwater flow model never simulated a circumstance where saline intrusion in the LAS and fresh groundwater outflow to the Pacific Ocean in the UAS were prevented (see Section 4.1.5 herein). Instead of pausing and questioning the adequacy of the 3D groundwater flow model, the GSPs rely on these flawed simulations to extrapolate or "take a guess" at what reductions in groundwater pumping would address the saline intrusion problem (see Section 4.1.8). The need to guess suggests that: (1) saline intrusion is not well understood (see Sections 2.1 and 4.1.4 herein), (2) the model is not effectively simulating actual hydrogeologic conditions, (3) reductions in pumping will not address saline intrusion (see Section 4.1.1 herein), and/or (4) the underlying assumptions in the GSP are incorrect. The net result is the model is flawed and the management actions derived from the model are not designed to succeed.

3. BACKGROUND

The following information is provided to those unfamiliar with the Basins, SGMA, and the GSPs.

FCGMA was created under State Assembly Bill No. 2995, which was passed by the California Legislature and approved by the Governor in September 1982. FCGMA was established to manage groundwater within most of OPB, PVB, and LPVB (see **Figure 1** herein). One of the critical elements of their mandate was to prevent the degradation of groundwater that results from seawater intrusion along the coast; that is, adjacent to OPB.

In September 2014, the State of California adopted SGMA. Based on the California Statewide Groundwater Elevation Monitoring (CASGEM) System, the California Department of Water Resources (DWR) has designated OPB and PVB as high-priority basins subject to conditions of critical overdraft. As such, under SGMA, GSPs must be submitted for these Basins to DWR by January 2020.

On July 16, 2019, FCGMA released the draft GSPs. A 60-Day public comment began after the July 24, 2019 FCGMA Board meeting. Any party may submit comments on the GSPs to FCGMA by September 23, 2019. It should be noted that a further opportunity to comment will be provided by DWR after they receive the GSPs in January 2020.

3.1 Hydro-Stratigraphy

There are three main aquifer systems within the Basins: Shallow Aquifer System, UAS, and LAS.

3.1.1 OPB

Within the OPB, the SAS includes localized, semi-perched groundwater within recent river-deposited sands and gravels interbedded with minor silt and clay. In general, this semi-perched aquifer tends to be oriented along the Santa Clara River. There is limited groundwater production from this semi-perched aquifer. Currently, the aquifer receives enhanced recharge at percolation basins adjacent to the Santa Clara River.

Underlying the semi-perched aquifer is a clay layer that separates the semi-perched aquifer from the UAS below. The thickness of the clay cap is approximately 160 feet adjacent to the Pacific Ocean. Although the clay cap functions as an aquitard, water can migrate vertically through the clay cap under conditions of differential head. The clay cap is absent in the Forebay area allowing enhanced recharge in this area.

The UAS in the OPB includes the following named aquifers:

- The Oxnard Aquifer - a laterally continuous layer of non-marine recent alluvium found beneath the entire OPB and extending several miles off-shore, where it is exposed in the walls of the Hueneme and Mugu submarine canyons.
- The Mugu Aquifer - laterally extensive deposits throughout the OPB representing the basal deposits of older alluvium and extending off-shore beneath the Oxnard Aquifer.

A low-permeability clay deposit that ranges in thickness from 10 to 100 feet separates the Mugu Aquifer from the overlying Oxnard Aquifer throughout much of the OPB.

Prior to the 1970s, groundwater production in the OPB was focused in the UAS; however, since that time, pumping rates in the UAS have been reduced to control seawater intrusion in the UAS (see later discussion).

The LAS in the OPB includes the Hueneme Aquifer, Fox Canyon Aquifer (FCA), and Grimes Canyon Aquifers (GCA). The Hueneme Aquifer is a localized aquifer comprised of a series of lenticular silts, sands, and gravels in the Upper San Pedro Formation. This aquifer is present in the northern part of the OPB but is absent to the south of Hueneme Road. Within the OPB, the Hueneme Aquifer is up to 1,150 feet thick, extends several miles offshore, and is exposed in the Hueneme and Mugu submarine canyons. Where the Hueneme Aquifer is locally present in the OPB, there is groundwater production from water-supply wells screened solely in this aquifer.

The FCA and GCA are laterally continuous, highly transmissive sands that underlie most of the OPB. Since the 1970s, some groundwater production has been switched from the UAS to the LAS within the OPB, with a focus on the FCA. However, across the OPB (and some areas of the PVB), many water supply wells are completed across both the UAS and LAS.

3.1.2 PVB

There is shallow, perched groundwater within PVB, but this groundwater is localized and well yields are low. In addition, the UAS in the PVB is variable in its extent (i.e., discontinuous) with an abundance of fine-grained sediments. Therefore, there has been limited groundwater production from the UAS in the PVB. In the PVB, the LAS includes the San Pedro Formation, FCA, and GCA. The LAS is the first highly transmissive, widespread aquifer system (with depth), and most water-supply wells in PVB are screened in the LAS.

3.2 Groundwater Production

Historical groundwater production within PVB and OPB is presented in each respective GSP (see Section 2.4 of each GSP). The following long-term factors have, and will continue to, influence groundwater production in the Basins:

1. the expansion and subsequent contraction (urbanization) of agricultural lands
2. the impact of saline intrusion
3. the depth of groundwater extraction
4. enhanced recharge
5. the impact of extended droughts
6. the urbanization of Ventura County.

Groundwater production within the Basins began in the 19th Century as the natural landscape was converted to agricultural lands. Groundwater production increased in the 20th Century, predominantly within the UAS in OPB and later within the LAS in PVB. This increased production lowered groundwater levels in the UAS in OPB to below mean sea level (MSL).

The decline in groundwater levels in the UAS below MSL resulted in saline intrusion into the fresh groundwaters along the coast in OPB. This intrusion was predominantly within the UAS, as historical groundwater production in OPB was primarily from the UAS. By the 1970s, it was recognized that the groundwater resources of the Basins were threatened by saline intrusion. As noted in Section 3.0 above, the FCGMA was created in 1982 to manage the groundwater resources in the Basins and LPVB.

In response to this observed saline intrusion, the FCGMA and regional stakeholders advocated a regional groundwater management strategy of moving some of the groundwater production in OPB from the UAS to the LAS. In addition, recharge to the semi-perched aquifer and underlying UAS was enhanced with the construction of spreading grounds/percolation basins (e.g., the Saticoy ponds) by UWCD. The absence of the clay cap between the semi-perched aquifer and Oxnard Aquifer in the Forebay Area facilitates enhanced recharge in this area. Some recharge in this area also reaches the LAS. The natural recharge along the Santa Clara River and enhanced recharge adjacent to the river at percolation basins has likely minimized saline intrusion north of Port Hueneme.

As groundwater production in the LAS in OPB increased, groundwater levels in the LAS in the Basins fell below MSL. The decline in groundwater levels in the LAS below MSL resulted in saline intrusion into the fresh groundwaters in the LAS along the coast in OPB. Saline intrusion in the LAS is not uniform along the coast. As noted, saline intrusion is minimized north of Port Hueneme, likely the result of natural and enhanced recharge. Further, between Port Hueneme and Point Mugu, saline intrusion into the LAS has been most pronounced along infilled, historic (geologic not recorded time), subterranean drainage channels. These channels extend offshore as submarine canyons and likely provide preferential pathways for the inward migration of seawater.

In addition to seawater intrusion, the lowering of groundwater levels in the LAS, likely reversed vertical hydraulic gradients. This resulted in upwelling of deeper, brackish, connate groundwater into the LAS. This upwelling is focused in areas where there is increased hydrologic communication between deeper, connate groundwater and the overlying LAS. This likely occurs in areas where fluvial erosion along defined, historic (geologic time) channels removed or reworked finer-grained sediments that separate the deeper connate groundwater from the overlying aquifers. That is, the upwelling, like seawater intrusion, is most pronounced along infilled, historic (geologic time), subterranean drainage channels.

Water supplies in the OPB and PVB come from both surface water and groundwater sources. During wet years, surface water supplies are plentiful, direct precipitation irrigates vegetation and crops, less groundwater is pumped, and more natural and enhanced groundwater recharge occurs. Conversely, in dry years, surface water supplies are limited, and less groundwater recharge occurs. To offset this shortfall in direct precipitation and surface water deliveries, groundwater production increases. With increased production, groundwater in storage decreases.

California experienced an extended drought between 2008 and 2016. During this period, groundwater levels throughout the Basins have declined due to decreased recharge and increased or sustained groundwater production. These conditions occurred across the entire State and prompted the passage of SGMA.

Looking forward, the effects of climate change are uncertain; however, there is the potential that more extreme weather patterns may occur with extended drought periods punctuated by very wet years. Groundwater management needs to consider these potential effects, notably, how to take advantage of the wet years to offset acceptable groundwater storage loss during extended drought periods.

Finally, the conversion from agricultural land to an urban landscape has accelerated in Ventura County since 1980. This urbanization will likely continue.

Ventura County is not the only area of California to experience the impact of these factors on groundwater production. Most notably, the coastal plain of Los Angeles experienced seawater intrusion and rapid urbanization in the 1930s through 1950s. To address seawater intrusion, amongst other things, the Water Replenishment District of Southern California (WRD) has developed programs targeted to manage the potential harmful impacts of seawater intrusion, including the construction of the Alamitos and Dominguez barriers in 1966 and 1971, respectively. More recently, Orange County experienced seawater intrusion and rapid urbanization in the 1970s and 1980s. The Orange County Water District (OCWD) began to address seawater intrusion in 1975 with the construction of the Talbert Barrier and Water Factory 21. How these areas preserved groundwater production while mitigating seawater intrusion can provide some guidance for Ventura County (see later discussion).

4. BROAD, CONCEPTUAL SHORTCOMINGS WITH THE GSPs

Beyond the concerns noted herein in **Section 2**, we have identified the following broad, conceptual issues with the GSPs:

4.1 The Over-reliance on Groundwater Modeling

As noted, the 3D groundwater flow model for the OPB, PVB and WLPMA was developed by UWCD[5]. Development of a properly functioning 3D groundwater flow model of the Basins is important. However, the 3D groundwater flow model for the Basins, like all groundwater models, is a facsimile of reality – a computer simulation of real groundwater conditions. Like any facsimile, the 3D groundwater flow model is not perfect, and it has technical limitations and deficiencies in its structure, hydraulic parameter discretization, calibration, and ability to simulate certain hydrogeologic conditions (e.g., upwelling of connate groundwater). Recognizing these limitations is especially important with the UWCD model.

4.1.1 Use of the Model Alone to Set SMC and Other Considerations

No groundwater management plan should rely solely on a groundwater model – a facsimile, a simulation, an approximation. Rather, a management plan, such as a GSP, should be based on empirical data, and the modeling then used to support the analysis of such data. The model can also be used to simulate future-looking, what-if, groundwater management scenarios and strategies, and compare the relative outcomes from these simulations. However, the 3D

[5] United Water Conservation District, 2018, Ventura Regional Groundwater Flow Model and Updated Hydrogeologic Conceptual Model: Oxnard Plain, Oxnard Forebay, Pleasant Valley, West Las Posas, and Mound Basins, United Water Conservation District Open-File Report 2018-02, July

groundwater flow model is the principal technical foundation for the GSPs; that is, the model is the primary tool used to establish critical aspects of the GSPs, such as the evaluation of undesirable results, establishment of sustainable yields, SMC, MOs/MTs, identification of data-gaps, and evaluation of management actions and projects. Accepted professional practice would rely on actual, historical data to establish and evaluate critical parameters, and then the 3D groundwater flow model could be used to evaluate these decisions and compare the effectiveness of future groundwater management strategies.

4.1.2 Assumption that Inland Pumping has a Direct Impact on Saline Intrusion

The degree of hydrologic continuity between the Basins and between inland areas and the coast, and the degree of impact that inland pumping has on saline intrusion, have not been fully characterized and are open to interpretation. The GSPs and the 3D groundwater flow model ignore the complex, heterogeneous nature of the various hydro-stratigraphic units (HSUs) in the Basins. The GSP assumes that the communication (i.e., groundwater flow) between the Basins is essentially unimpeded and pumping inland has a direct effect on saline intrusion. This inaccurate assumption is built into the structure (i.e., layering sequence and hydraulic parameter discretization) of the 3D groundwater flow model, when the empirical data clearly indicates such homogeneous conditions do not exist in reality. As a result, the 3D groundwater flow model is constructed so that there is unimpeded hydrologic continuity within the LAS and between aquifer systems and the Pacific Ocean, contrary to the known physical conditions.

Of note, and even though the 3D model assumes the existence of overly simplistic aquifer conditions, no model simulation could clearly link variations in pumping in the basins on saline intrusion. That is, the model simulations do not demonstrate that pumping in PVB, in isolation, actually contributes to saline intrusion. The GSPs ignore these 3D groundwater flow model outcomes and, instead, simply assume that inland pumping has an impact on saline intrusion. In reality, it is unclear whether reductions in groundwater pumping in PVB are even necessary to ameliorate a saline intrusion, especially given the current characterization of the intrusion. In addition, given the limited understanding of saline intrusion and the homogeneity in major HSUs in the model, the 3D groundwater flow model is not yet refined sufficiently to provide a useful tool in evaluating the effectiveness of reductions in pumping in the OPB.

4.1.3 Use of a Fixed Pumping Rate from a Drought Period

The 3D groundwater flow model uses a fixed pumping rate for a drought year (2015-2017) for all future pumping scenarios, as opposed to repeating a representative hydrologic cycle (e.g., 1985-2015) for future years. This is conceptually incorrect, and does not reflect accepted professional practice, as pumping rates vary considerably from year to year in the Basins, depending on climatic conditions and the availability of surface water. The imposition of constant pumping (from a drought year) does not permit any evaluation of certain groundwater management options and does not reflect known, actual conditions - we know pumping varies from year to year. Accurate evaluation of management practices has to reflect known conditions; that is, allowing increased pumping (and loss of groundwater storage) in dry years, and decreased pumping and replenishment of lost storage in wet years (see later discussion).

4.1.4 Failure to Simulate Sources of Saline Impacts

Based on analysis by the USGS (Izbicki et al, 1992[6]; 1996a[7]; 2005a[8]), brackish groundwater in the LAS results from upwelling of brackish, connate groundwater from underlying strata with sediments of marine/lagoon origin, rather than just from seawater intrusion. In addition, the release of brackish, connate waters from fine-grained strata within the UAS and LAS, and the percolation of brackish, perched groundwater into the UAS likely also contribute to the saline impacts. The other sources of saline impact, notably the upwelling of connate groundwater, are not simulated within the 3D groundwater flow model. Thus, it is impossible to quantify the respective contributions of seawater, deeper groundwater, connate groundwater, and brackish, perched groundwater that lead to degraded groundwater quality along the coast and what is solely described in the GSPs as "seawater intrusion". Given this, the assumption that inland pumping has caused the saline intrusion cannot be confirmed. Rather, the degradation of water quality along the coast may be largely the result of pumping proximate to the coastline that has created lower groundwater levels in the LAS, reversed vertical hydraulic gradients, and allowed upwelling of deeper, brackish groundwater.

4.1.5 Failure to Simulate Sustainable Groundwater Conditions

The GSPs do not include a model simulation of actual "sustainable" groundwater conditions. There is no model simulation run that includes the pumping reductions required in the GSPs and demonstrates sustainability (i.e., there is no further saline intrusion). Rather, the GSPs extrapolate existing, supposedly non-sustainable, simulations to establish a sustainable yield. There is no technical foundation for the extrapolated value, and it can best be viewed as "an educated guess". Hence, the GSPs adopt wide margins of error around the estimated sustainable yield. The 3D groundwater flow model has not demonstrated a predictive scenario where cessation of saline intrusion within the LAS or a cessation of groundwater discharge out

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[6] Izbicki, J.A., 1992. Sources of chloride in groundwater of the Oxnard Plain, California, in Prince K.R. and Johnson, A.I., eds., Regional aquifer systems of the United States-Aquifers of the Far West: American Water Resources Association Monograph Series, no. 16, p. 5-

[7] Izbicki, J.A., 1996a, Source, Movement, and Age of Groundwater Water in a Coastal California Aquifer. U.S. Geological Survey Fact Sheet 126-96. July.

[8] Izbicki, J.A., Christensen, A.H., Newhouse, M.W., Aiken, G.R., 2005a. Inorganic Isotopic and organic composition of high chloride water from wells in a coastal southern California aquifer. Applied Geochemistry 20 (2005) p. 1496-1517.

to the ocean in the UAS. This indicates that the 3D groundwater flow model is flawed, and the management actions are misguided.

4.1.6 Absence of an Empirical Water Budget and Storage Loss Analysis

The 3D groundwater flow model has been used as the principle foundation for evaluating undesirable results, establishing SMC, MOs and MTs, and identifying data-gaps. As noted, the GSPs should have relied more on an analysis of actual empirical data. Of note, there is no empirical water budget presented in the GSPs based on actual data. There is no analysis of empirical data to quantify water budget components (e.g., recharge, discharge). In addition, there is no storage loss or other analysis (e.g., Hill hydrograph regression analysis) using actual groundwater level data to establish a total safe yield. Accepted professional practice dictates that these foundational analyses, based on empirical data, provide a better technical platform for the GSPs.

4.1.7 Adoption of a Baseline Period that May Not be Representative

The GSPs use a baseline hydrologic period from 1985 to 2015. However, they present no analysis to demonstrate that such a period is representative of longer-term hydrologic conditions throughout the entire data record (i.e., more than 100 years). For example, the 1985 to 2015 period includes the severe drought years from 2011 to 2015 suggesting that precipitation and recharge during this period may be lower than the long-term average and the pattern of wet versus dry years in this period may also not be representative. Again, this foundational empirical analysis should set the proper platform for the development of the GSPs.

4.1.8 Setting Arbitrary MOs/MTs

Within the GSP for the OPB, it appears that some MOs and MTs have been arbitrarily set at MSL. This has been done on the assumption that such groundwater levels will prevent seawater intrusion. However, in some of these areas, groundwater levels (as MOs and MTs) below MSL could be sustained if levels closer to the coast were maintained at MSL. That is, groundwater levels immediately adjacent to the coast could be maintained at or above MSL to essentially provide a hydraulic dam to seawater intrusion. Groundwater levels could be lower than MSL behind the dam and groundwater pumping maintained at higher levels than suggested as sustainable within the GSP.

4.1.9 Pumping Reductions May Not Achieve Sustainability

Seawater intrusion at the coast is the primary significant and undesirable result identified in the GSPs. The principal objective of the GSPs is to achieve groundwater sustainability by preventing further saline intrusion by 2040. However, given the limitations in the 3D groundwater flow model and the over-dependence of the GSPs on the modeling (as described above), it is uncertain that the pumping reductions required in the GSPs will achieve the principal objective. Most importantly, it is not certain that reductions in inland pumping will prevent saline intrusion, or whether such reductions are the best and most cost-effective means to do so. Such a simplistic, heavy-handed, blanket approach may not be able to address what is a complex (and poorly understood) problem, and other approaches may be more successful. To that end, there may be management actions and projects that would meet the objective and allow groundwater pumping to continue at higher rates than what the GSPs indicate are "sustainable". For example, actions and projects focused right at the coast may preserve groundwater pumping further inland (see later discussion).

4.2 A Lack of Focus on the Coast

The GSPs require inland pumping reductions to resolve an issue that exists at the coast. Greater emphasis and analysis within the GSPs, notably the OPB GSP, should have been focused at the coast – the area where the primary significant and unreasonable undesirable result (i.e., saline intrusion) occurs. The GSPs should have explored in much greater detail how actions right at the coast could address saline intrusion. Some of these actions are described below.

4.2.1 Need for a Better Understanding of Saline Intrusion

There is a need for a better understanding of the current location, extent, and rate of saline intrusion in all aquifers, before sustainable yield, SMC, MOs, and MTs are set, and pumping reductions imposed. There is also a need for a better understanding of the location, nature, and rate of connate water upwelling in areas proximate to the coast. In addition, there is a need for a better understanding of the contribution to saline conditions from of brackish, connate water released from fine-grained layers into the LAS, and percolation of brackish, perched groundwater into the UAS.

4.2.2 Lack of Management Actions and Projects at the Coast

The GSPs lack any detailed evaluation of management actions and projects at the coast that could prevent further seawater intrusion. Such actions may prove better and more cost-effective than blanket pumping reductions across the Basins. Examples of such actions or projects include the following:

- A cessation of pumping immediately proximate to the coast and the delivery of in-lieu water to those facing pumping cessation
- The construction of a coastal seawater intrusion barrier, perhaps focused in areas with preferential intrusion (i.e., buried relic channels)
- The use of treated, diverted storm flows to recharge groundwater

- The pumping, treatment, and beneficial use of brackish groundwater as part of a barrier project

It should be noted that a failure to include some of the above in the GSPs might impact grant funding to study such options.

4.3 The Imposition of MTs that Limit Storage

4.3.1 Restrictions on Groundwater Management Options

The GSPs fail to recognize that higher groundwater levels, as MOs and MTs, would limit the ability to bank groundwater storage in wet years. This restricts future groundwater management options, such as allowing increased pumping (and groundwater level drawdown) in dry years to create storage space and then replenishing the space in wet years.

4.3.2 The Wasting of Water

The maintenance of consistent MOs and MTs under all climatic conditions will result in water being wasted during wet years. Without the ability to replenish/bank during wet years, surface water will simply flow to the ocean and be lost. The imposition of artificially high MOs and MTs would be a breach of the Article X, Section 2 of the California Constitution which requires that all waters of the State be put to maximum and reasonable beneficial use, and not be wasted.

4.3.3 No Analysis of Other Enhanced Recharge Options

The GSPs provide no detailed analysis of how recharge could be enhanced along rivers/creeks and adjacent spreading grounds other than the Santa Clara River. Natural and enhanced recharge at and near the Santa Clara River has likely minimized saline intrusion north of Port Hueneme. However, saline intrusion is predominantly located between Port Hueneme and Point Mugu, and recharge at the Forebay Area has limited effect on this part of the coast.

Similar to the Forebay Area in OPB, shallow permeable sediments directly overlie the UAS and a small portion of the FCA in the northerly part of PVB. This condition would allow for additional enhanced recharge at, and adjacent to, Arroyo Las Posas, Calleguas Creek, and Conejo Creek in PVB (e.g., stream bed maintenance, Arundo removal, additional percolation basins), particularly in wet years. However, discharges at upstream locations in the Eastern Las Posas Management Area (ELPMA) of the LPVB have degraded groundwater quality in this area of PVB. Enhanced recharge in this area of PVB would need to consider these water quality conditions and the operation of the North PVB Desalter.

4.4 A Lack of Defined Management Actions and Projects to Achieve Sustainability

The GSPs propose an imposition of reductions in groundwater production as the primary means to achieve sustainability. As stated, this approach is overly simplistic, may not achieve the principal objective of the GSPs, and may not be the best and most cost-effective means to achieve sustainability. Further, this sustainability through scarcity approach limits groundwater use, and the resulting economic activity and societal benefits. The GSPs should focus more on management actions and projects that could be implemented to achieve sustainability while preserving inland pumping and the resulting benefits.

4.4.1 Potential Projects to Achieve Sustainability

The GSPs present no assessment of the feasibility of developing alternative water sources (e.g., storm water, wastewater, brackish groundwater, oil-field produced water, bedrock aquifers). Again, the GSPs focus on reductions and scarcity rather than creating new water. With increasing demand for water and increasing water price, and the declining cost of treatment, such alternative sources are now becoming viable. The following are some examples of where alternative sources are now being used as part of an overall, diversified, water supply portfolio:

- The Santa Monica Water Infrastructure Improvement Project (SWIIP) where storm water is being diverted, treated, and used for purple-pipe irrigation and planned groundwater recharge and indirect potable reuse (IPR).
- The OCWD Groundwater Replenishment System (GWRS) where almost the entire wastewater flow in the coastal plain (>200,000 acre-feet per year [AFY]) is diverted, treated, and used for groundwater recharge for a seawater intrusion barrier and IPR.
- The WRD Groundwater Recharge Improvement Project (GRIP) where 20,000 AFY of wastewater is diverted, treated, and used for groundwater recharge for IPR.
- The Westside District Water Authority (WDWA) Brackish Groundwater and Oil-field Produced Water (BOF Water) project where up to 50,000 AFY of brackish groundwater and up to 10,000 AFY of oil-field produced waters will be treated and put to beneficial use in a groundwater basin subject to critical overdraft.
- The Indian Wells Valley Brackish Groundwater project where up to 10,000 AFY of brackish groundwater will be treated and put to beneficial use in a groundwater basin subject to critical overdraft.
- Development of groundwater in bedrock aquifers outside a groundwater basin (as defined in DWR Bulletin 118)[9] to provide a supplemental water supply for beneficial use.

[9] California Department of Water Resources (DWR), 2016. California's Groundwater, Working Toward Sustainability. Bulletin 118, Interim Update 2016. DWR, December 22, 2016

In addition to these treatment or water development projects, the GSPs should examine a prohibition of groundwater pumping for some finite distance inland from the coast between Port Hueneme and Point Mugu, and the delivery of in-lieu water to these areas to offset the loss of groundwater pumping.

4.4.2 No Project to Directly Address Saline Intrusion at the Coast

The GSPs only present a limited number of proposed projects in Chapter 5. Many of these projects are simply refinements or expansions of current projects. These projects focus on treating a limited additional volume of wastewater, expanding enhanced recharge along the Santa Clara River, or fallowing agricultural land. As noted, recharge in the Forebay Area will have limited direct impact on saline intrusion between Port Hueneme and Point Mugu. Further, only if additional recharge, treated wastewater, and fallowed land can be used to offset pumping along the coast, and in-lieu water delivered to these areas, will they help address saline intrusion.

The projects presented could generate about 17,000 AFY in supplemental recharge to the Basins. Only some, but not all, of these projects were simulated using the 3D groundwater model. The projects simulated generate about 4,500 AFY of supplemental recharge and 500 AFY of reduced pumping through fallowing. However, only 1,000 AFY of additional groundwater pumping could be sustained in the OPB with these simulated projects; that is, 40,000 AFY versus 39,000 AFY (Section 3.4 of the GSPs). Clearly, the additional recharge had limited benefit to groundwater pumping.

More importantly, no projects are presented that focus on an improved understanding of saline intrusion, especially seawater and deeper, brackish groundwater, and more effective means to directly managing the saline intrusion (e.g., a coastal barrier). This is a major deficiency in GSPs whose principal objective is to achieve sustainability by preventing further saline intrusion along the coast.

4.4.3 Lack of a Plan

The GSPs present a limited set of possible projects that may be implemented. However, the projects are not clearly woven into an overall plan to achieve sustainability. Further, the GSPs fail to include more critical projects, such as cessation of coastal pumping and delivery of in-lieu water or the construction of a coastal barrier system to control saline migration. The existing projects in the GSPs, along with those that should have been included in the GSPs, should be evaluated, prioritized, and then woven into an overall "plan" to achieve sustainability.

4.5 The Need for Collaboration

4.5.1 Establishing a Technical Advisory Committee

The FCGMA has a technical advisory group (TAG). The TAG, along with technical consultants supporting the water rights litigation in LPVB, have provided input that has led to changes in the GSP for the LPVB. However, the TAG has provided less input in the GSPs for OPB and PVB. Given the different issues within the LPVB versus the OPB/PVB, it may be advisable to have separate technical advisory committees (TACs) for LPVB and OPB/PVB. The TAC for OPB/PVB should be specifically tasked with the following over the next five-years:

- Addressing the deficiencies and technical issues with the current GSPs
- Improving the understanding of saline intrusion
- Improving the 3D groundwater model
- Continuing the monitoring and assessment of potential undesirable results
- Developing more robust estimates of sustainable yield
- Establishing better SMC, MOs/MTs
- Evaluating the feasibility of projects to achieve sustainability
- Developing a defined plan that incorporates specific projects and management actions to achieve sustainability
- Prepare the 5-year update to the GSP for submittal in 2025
- Preparing scopes of work for consultants to support the work of the TAC

4.5.2 Research on Other Areas

Other areas of the State have successfully responded to saline intrusion conditions (e.g., coastal plains of Los Angeles and Orange Counties). FCGMA and the TAC should evaluate how, between 1970 and 1990, OCWD addressed seawater intrusion while maintaining groundwater production, and then later enhanced groundwater recharge to achieve sustainability (e.g., coastal seawater barriers, recharge basins, river-bed management, Water Factory 21, replenishment with imported water, and GWRS).

4.6 How the North PVB Desalter is Addressed

It is unclear if the 4,500 AFY pumped as part of the North PVB Desalter reduces the sustainable yield for PVB. The GSP needs to clarify how pumping for this project will be classified. The project should be considered a mitigation project for an undesirable result (poor water quality). As such, it should be excluded from any sustainable yield allocation.

5. SPECIFIC COMMENTS ON THE PVB GSP

Specific Comment 1. The PVB sustainable yield number in the GSP (11,600 AFY plus minus 1,000 AFY in the Executive Summary) has no technical justification.

The numbers in the GSP are impossible to ratify based on the data provided. The GSP should provide technical justification for the 11,600 AFY sustainable yield and 1,000 AFY uncertainty.

> Section 2.4.5.9 Page 154 *"None of the model scenarios described in Section 2.4.5 successfully eliminated seawater intrusion in the LAS of the Oxnard Subbasin during the sustaining period, while the majority of the model scenarios resulted in net freshwater loss from the UAS to the Pacific Ocean. Therefore, none of the direct model scenarios was used to determine the sustainable yield of the PVB. Instead, the relationship between seawater flux and groundwater production from each of the model scenarios was used to predict the quantity of groundwater production that would result in no net seawater intrusion over the sustaining period in either the UAS or the LAS. In order to provide separate estimates for the two aquifer systems, independent relationships between groundwater production and seawater intrusion were developed for the UAS and the LAS. It was possible to develop relationships for each aquifer within the UAS and the LAS, but in general wells in the Oxnard Subbasin are screened in multiple aquifers in each aquifer system. Therefore, for management purposes, the sustainable yield estimates were developed for the aquifer systems rather than for independent aquifers.*
>
> *Based on the scenarios presented in Section 2.4.5 and the uncertainty analysis discussed in Section 2.4.5.8, the PVB sustainable yield for the older alluvium and the LAS was estimated to be 11,600 AFY plus or minus 1,200 AFY. Using the ratio of Shallow Alluvial Aquifer pumping to LAS pumping, this produces an estimate of 4,400 AFY for the Shallow Alluvial Aquifer and 7,200 AFY for the LAS."*

Section 2.4.4. on Page 140 first introduces a sustainable yield value of 11,600 AFY with no explanation. There is no explanation in Section 2.4.5 until Page 153 Section 2.4.5.8

> "*The Oxnard Subbasin uncertainty analysis was used to interpolate the uncertainty for the PVB. This was done by using the uncertainty estimate for the Oxnard Subbasin and the ratio of model pumping in the PVB to the total model pumping for the three model basins: the Oxnard Subbasin, the PVB, and the WLPMA. This produced an uncertainty in PVB pumping of plus or minus 1,200 AFY for both the Shallow Alluvial Aquifer and the LAS.*"

This methodology is unclear and cannot be verified. The 1,200 AFY uncertainty changes to 1,000 AFY later and in the Executive Summary for no apparent reason.

This situation was further confused in the GSP Workshop on August 21, 2019 where it was noted for PVB that pumping after 2040 would be 10,500 AFY (with 4,500 AFY of this potentially being from the North PVB desalter project).

Specific Comment 2. The ratio of sustainable yield numbers for the UAS and LAS has no basis.

The GSP should describe the rationale for the current ratio of sustainable yield in the UAS to the LAS.

> *"Using the ratio of Shallow Alluvial Aquifer pumping to LAS pumping, this produces an estimate of 4,400 AFY for the Shallow Alluvial Aquifer and 7,200 AFY for the LAS."*

The derivation of this ratio is unknown. On Page 178/360, Table 2-10, the 1985 to 2015 average is presented as follows:

Pumping UAS	Pumping LAS	Pumping Semi-Perched	Total Pumping
7,645 AF	7,813 AF	214 AF	15,671 AF

Therefore, the ratio of 4,400 AFY for the UAS to 7,200 AFY for the LAS as suggested in the GSP does not match the current pumping ratio. Verification of the defined ratio is required because: (a) all the 3D groundwater model scenarios show that saline intrusion continues in the LAS (See Figure 2-44 on Page 267/360); and (b) concerns that over-pumping the LAS reverses vertical gradients and facilitates the upwelling of brackish, connate groundwater from deeper strata (note that saline water is present at depth in the Grimes Canyon Aquifer and it is interpreted that this impact is from deeper strata).

The ratio used in the GSP is conceptually flawed.

Specific Comment 3. The MOs and MTs for PVB have no empirical or rational basis.

MO's and MT's should be derived to prevent loss of storage in PVB that would be significant and unreasonable. Current MTs and MOs are set based on some extrapolated and inferred (i.e., purely theoretical) effect on seawater intrusion at the coast.

P288. 3.4 Minimum Thresholds

Pleasant Valley Pumping Depression Management Area (PVPDMA)

> *"For wells within the PVPDMA, the minimum thresholds are based on the lowest simulated groundwater elevation after 2040 for the two model simulations in which net seawater intrusion was minimized. To account for some of the uncertainty in the simulated future groundwater elevations, the lowest simulated value in either of the two*

> *simulations was used as starting point for selecting the minimum thresholds. The lowest simulated value was then rounded down to the nearest 5-foot interval to further account for uncertainty in the future simulated groundwater elevations.*
>
> *For Well 02N20W19M05S, which is located in the NPVMA in an area of the PVB that is extensively faulted and distant from the Oxnard Subbasin, the minimum threshold is based on the lowest simulated groundwater elevation from all of the future simulations investigated. This elevation was selected as the minimum threshold because the water level in this well is heavily influenced by groundwater production from the planned North Pleasant Valley Desalter project in the area."*

P 293 Measurable Objectives

> *"Therefore, the measurable objectives for the PVB were selected based on the median groundwater elevation between 2040 and 2070, simulated for each well, in model simulations that prevented net landward migration of the 2015 saline water impact front in the Oxnard Subbasin. The median groundwater elevation was rounded down to the nearest 5-foot interval to account for uncertainty in the model simulated future groundwater elevations. In order to account for future sea level rise, the rounded groundwater elevations were increased by 2 feet."*

The proposed MTs and MOs are derived from the 3D groundwater model. A pumping rate of 14,000 AFY was used for PVB in the future model simulations. It is understood that the 14,000 AFY future baseline pumping rate is the average of 2015 to 2017 pumping – a drought period. However, the GSP assumes that this 14,000 AFY average rate of pumping is representative of the long-term average (as it is used as the future baseline condition). There are no data in the GSP to support this number.

The use of constant groundwater extraction rates introduces serious errors into the future model scenarios. Notably, these scenarios over-estimate pumping in the future because not every year will be a drought year. Setting a constant rate for pumping in the model is unrealistic in a basin where groundwater pumping changes year to year based on the availability of surface water.

The groundwater modelling has not been verified by other methods such as measuring change in storage from groundwater elevations. The baseline hydrologic period 1985 – 2015 has not been justified as being representative. While groundwater elevations are an established method of preventing storage loss, they are a crude tool for preventing saline intrusion, especially at a distance from the coast in PVB.

Specific Comment 4. The PVB GSP does not contain a program of initial pumping allocations, area-specific reductions or final sustainable yield.

The GSP should define pumping reductions for specific areas of PVB, rather than applying basin-wide, blanket reductions. Such discrete, area-specific reductions may be lower overall than blanket, basin-wide reductions and still achieve sustainability. Given that, pumping reductions should be delayed while a more discrete pumping reduction program is evaluated.

In terms of ramping down production, it is noted on page 275 Section 3.2:

> *"The estimated sustainable yield of the PVB is approximately 11,600 acre-feet per year (AFY), with an uncertainty estimate of ±1,000 AFY (see Section 2.4.4, Uncertainties in the Water Budget). The average 2015 groundwater production rate was approximately 13,200 AFY. The difference between the upper estimate of the sustainable yield, 12,600 AFY, and the 2015 production rate is 600 AFY. If production is reduced linearly between 2020 and 2040, the estimated groundwater production reduction necessary throughout the geographic extent of the PVB over the first 5 years is approximately 150 AFY."*

On Page 177 groundwater production is noted as 17,849 AFY in 2015, not 13,600 AFY. A 150 AFY reduction over 5 years means a 750 AFY reduction, not a 600 AFY reduction.

3.3.1 Management Actions on Page 357:

> *"The exact reductions that will be implemented in the PVB over the next 5 years will be determined by the FCGMA Board based on the data collected and analyzed for this GSP. These reductions will be evaluated based on the potential paths to reaching sustainability discussed in Chapter 3."*

Setting sustainable pumping rates appears to be arbitrary. Various pumping reductions (5%, 10%, or 25%) are suggested to "work" if they are applied to the 3D groundwater model on a basin-wide level. However, none of the 3D groundwater model scenarios prevented saline intrusion in the LAS. A more detailed assessment of pumping rate reductions may determine that some areas require less reduction (e.g., inland), while other areas may require an increased reduction (e.g., at the coast) while still meeting the principal objective of the GSP – achieving sustainability by preventing further seawater intrusion.

No allocations of initial, baseline pumping, subsequent reductions, or final sustainable yield are provided in the GSP.

Specific Comment 5. The GSP is focused on preventing saline intrusion by reducing groundwater pumping. However, there are alternative strategies to control saline intrusion (e.g., coastal injection barriers, push-pull barriers). Simply reducing pumping, which may have large and long-term adverse socio-economic consequences, may not be the best and most cost-effective option.

Alternative saline management strategies should be evaluated and cost estimates developed. These strategies and their costs can then be compared to the cost implications of just reducing groundwater production in PVB (and more importantly, OPB).

Alternative strategies for managing saline intrusion include injection barriers and push-pull barriers. With much more focused monitoring (geophysics and/or additional wells) and an alternative remediation scheme, the advancing saline plume could potentially be managed without resorting to blanket, basin-wide pumping reductions. Such a "project" may be a more cost-effective way of arriving at a sustainable solution, and yet it has not been considered.

All of the five proposed projects in Chapter 5 are either refinements of current projects or simple projects such as fallowing. No projects focusing on understanding and closely managing saline intrusion are presented in the GSP. This seems anomalous when the principal objective of this GSP is to achieve groundwater sustainability by preventing further seawater intrusion. In fact, the menu does not contain a project that would directly achieve, or help to achieve, the principal objective of the GSP. In general, Chapter 5 is simply a "menu" of possible projects. It is not a "plan" that combines pumping reductions, management actions, and projects that, when taken together, will achieve groundwater sustainability in PVB

SPECIFIC COMMENTS ON THE OPB GSP

Specific Comment 6. The sustainable yield number in the GSP has no technical justification.

Technical justification for the selection of sustainable yield should be provided in the GSP (see Comment 1 for PVB).

Page 186/550 2.4.5.9

> *"None of the model scenarios described in Section 2.4.5 successfully eliminated seawater intrusion in the LAS during the sustaining period, while the majority of the model scenarios resulted in net freshwater loss from the UAS to the Pacific Ocean. Therefore, none of the direct model scenarios was used to determine the sustainable yield of the Oxnard Subbasin. Instead, the relationship between seawater flux and groundwater production from each of the model scenarios was used to predict the quantity of groundwater production that would result in no net seawater intrusion over the sustaining period in either the UAS or the LAS. In order to provide separate estimates for*

the two aquifer systems, independent relationships between groundwater production and seawater intrusion were developed for the UAS and LAS. It was possible to develop relationships for each aquifer within the UAS and LAS, but in general wells in the Oxnard Subbasin are screened in multiple aquifers in each aquifer system. Therefore, for management purposes, the sustainable yield estimates were developed for the aquifer systems rather than for independent aquifers.

The sustainable yield of the UAS was calculated to be approximately 32,000 AFY for both the entire model period and the sustaining period. The uncertainty in the estimated sustainable yield for the UAS is lower if only the sustaining period is used. For the entire model period, the uncertainty in the sustainable yield is approximately ± 6,000 AFY, whereas for the sustainable period the uncertainty in the sustainable yield is approximately ± 4,100 AFY. Consequently, this analysis suggests that the sustainable yield of the UAS may be as high as 38,000 AFY or as low as 26,000 AFY.

The sustainable yield of the LAS was calculated to be approximately 7,000 AFY for both the entire model period and the sustaining period. The uncertainty in the estimated sustainable yield for the LAS is lower if the entire model period is used. For the entire model period, the uncertainty in the sustainable yield of the LAS is approximately ± 2,300 AFY, whereas for the sustainable period the uncertainty in the sustainable yield is approximately ± 3,600 AFY. Consequently, this analysis suggests that the sustainable yield of the LAS may be as high as 10,600 AFY or as low as 3,400 AFY."

There is no explanation of the relationship between seawater flux and sustainable groundwater production.

Section 3.2 P406 has a different estimate:

"The estimated sustainable yield of the Subbasin is 42,000 acre-feet per year (AFY) with an uncertainty estimate of ±9,000 AFY (see Section 2.4.4, General Uncertainties in the Water Budget)"

Specific Comment 7. Empirical data should be used to derive MT's and MO's, not a flawed 3D model.

Historical, empirical data should be used to derive MO's and MT's in light of limitations with the 3D groundwater flow model.

Minimum Thresholds. P418 Section 3.4

"The minimum threshold groundwater elevations selected to protect against net seawater intrusion in the UAS and LAS are based on the lowest simulated groundwater

> *elevation after 2040 for the two model simulations in which net seawater intrusion was minimized."*

Measurable Objective. p425 Section 3.5

> *"Therefore, the measurable objectives were selected based on the median groundwater elevation between 2040 and 2070, simulated for each well, in model simulations that prevented net landward migration of the 2015 saline water impact front after 2040'*
>
> *Pp 426. 'Two sets of interim milestones were determined for the key wells in the Subbasin (Table 3-2). The first set of interim milestones was calculated using linear interpolation between the fall 2015 low groundwater elevation and measurable objective (Figure 3-12, Interim Milestones for Dry and Average Conditions – Linear Interpolation). The second set was calculated using linear interpolation between the fall 2015 low groundwater elevation and the minimum threshold (Figure 3-12)."*

None of the model simulations prevented landward migration of the saline impact front in the LAS. Setting MTs and MO's based on flawed modelling appears misguided.

Comment 8. MT's for some key wells in the OPB must be re-evaluated.

Some key well MT's must be reevaluated because they are set based on model simulations at groundwater elevations higher than has occurred during the historic conditions. Examples of this are shown with wells:

- 01N21W32Q05S, 01N21W32Q07S on Figure 3-7a in the Mugu Aquifer (Minimum Threshold at sea level),
- 01N21W32Q04S (Minimum Threshold -23 ft below sea level) 01N22W26K03S (Minimum Threshold -23 ft below sea level), both on Figure 3-9a in the Fox Canyon aquifer,
- 01N21W32Q02S and 01N21W32Q03S (Minimum Thresholds -20 ft below sea level), both on Figure 3-10 in the Grimes Canyon Aquifer.

The fundamental concern is that groundwater levels have not been above the proposed MT during historic conditions. The MTs are based on model scenarios that do not eliminate seawater intrusion in the LAS, and may not reflect any natural or achievable condition.

ACRONYMS

AFY	acre-feet/year
Basins	OPB and PVB collectively
BMPs	Best Management Practices
BOF Water	Brackish Groundwater and Oil-field Produced Water

DPWM	Distributed Parameter Watershed Model
DWR	California Department of Water Resources
ELPMA	East Las Posas Management Area
FCA	Fox Canyon Aquifer
FCGMA	Fox Canyon Groundwater Management Agency
GCA	Grimes Canyon Aquifer
GWRS	Groundwater Replenishment System
HSU	Hydro-stratigraphic Unit
IPR	Indirect potable reuse
LAS	Lower Aquifer System
LPVB	Las Posas Valley Groundwater Basin
MO	Measurable Objective
MSL	Mean Sea Level
MT	Minimum Threshold
MWD	Metropolitan Water District of Southern California
NPV	Northern Pleasant Valley
OCWD	Orange County Water District
OPB	Oxnard Plain Groundwater Basin
PVB	Pleasant Valley Groundwater Basin
PVP	Pleasant Valley Pipeline
SMC	Sustainable Management Criteria
SWIIP	Santa Monica Water Infrastructure Improvement Project
TAC	Technical Advisory Committee
UAS	Upper Aquifer System
UWCD	United Water Conservation District
VCWD	Ventura County Water Works Districts
WDWA	Westside District Water Authority
WLPMA	West Las Posas Management Area
WRD	Water Replenishment District of Southern California

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September 23, 2019

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VIA ELECTRONIC MAIL

Chair and Members of the Board
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, California 93009-1610

Re: Fox Canyon Groundwater Management Agency: Comments on Draft Groundwater Sustainability Plan for the Oxnard Plain and Pleasant Valley Basins

To the Chair and Members of the Board:

Please accept these comments on behalf of Pleasant Valley County Water District and Guadalasca Mutual Water Company on the Draft Groundwater Sustainability Plans (GSPs) for the Pleasant Valley and Oxnard Plain Groundwater Basins.

As explained in much more detail in the attached memorandum, the GSPs must be improved in two important areas before the final GSPs can provide a reliable foundation upon which sound groundwater management programs and policies can be derived. As drafted, the data and analysis contained in the draft GSPs does not provide substantial evidence to support the technical conclusions and proposed future management actions.

The fundamental deficiencies originate from two analytic problems:

1. **Incompletely and inaccurately characterizing the undesirable result – saline intrusion.** It is nearly impossible to develop a solution when you don't understand the problem. The controlling undesirable condition – saline intrusion in certain areas near the coast – is not well understood. In response to what appears to be a localized problem, present in very specific areas along the Oxnard Plain Basin coastal margin, the GSPs present a management action -- reductions in groundwater pumping -- that is to be applied to the entire OPB and PVB (and West Las Posas Management Area). Without adequate characterization of the causes and locations of saline intrusion, and improvement to methods that can be used to evaluate the effectiveness of proposed management policies (see below), broad reductions in pumping impose unnecessary hardship without producing demonstrable positive impacts.

   In fact, the presence, extent and cause(s) of the saline intrusion are not well understood. The GSPs recognize (Section 3.3.3) the saline intrusion is present in some coastal areas of the OPB. The GSPs also acknowledge that the saline intrusion is likely resulting from more than one cause – that is, seawater intrusion, upwelling of brackish groundwater from deeper sediments, release of connate water from fine-grained sediments, and percolation of shallow, brackish groundwater may all be contributing factors.

However, the predominant GSP management strategies are all geared toward ameliorating a presumed seawater intrusion "problem" that threatens the entire coastal margin of the OPB. To the extent the saline intrusion problem is adequately characterized, the data demonstrates the intrusion is geographically isolated between the Point Mugu and Port Hueneme areas (specified in the Draft GSP as the Saline Intrusion Management Area), and not the entire coastal extend of the OPB. Crucial data must be obtained so the saline intrusion problem can be understood adequately to develop a coherent set of management tools and policies to achieve sustainability. Instead, the current GSPs embody policies and programs that are designed to solve a problem that does not or may not exist.

2. **Developing thresholds and strategies from deficient computerized modeling instead of rigorous analysis of empirical data.** As their technical foundation, the GSPs rely almost entirely on the three-dimensional (3D) groundwater flow model for the OPB, PVB, and WLPMA developed by United Water Conservation District. The 3D groundwater model was used almost exclusively to evaluate undesirable results, establish sustainable yield, set sustainable management criteria, measurable objectives (MO's), and minimum thresholds (MT's), and evaluate management actions and projects. There are important technical inadequacies and flaws associated with the current construct of 3D groundwater flow model that materially undermine the integrity of the Draft GSPs.

   For example, the model does not simulate groundwater conditions that comport with the measured physical data (e.g., groundwater elevations) for large areas, which is the basic function of a groundwater model. Given the magnitude of these discrepancies, the model cannot credibly be used in the GSPs. Many of the conclusions (especially the Draft GSPs estimates of the sustainable yield) are based on modeling of future conditions. The assumptions built into those model runs are based on incorrect assumptions (e.g., that in wet years, pumping from the Basin will be the same as in dry years) and on speculation (best guesses of aquifer yield). In either case, there is not substantial evidence for the assumptions that led to the development of sustainable yield, which is the heart of the Draft GSPs.

   Various pumping and project scenarios were simulated using the 3D groundwater flow model to develop MT's, MO's and to evaluate potential reductions in basin-wide pumping to achieve sustainability. However, the 3D groundwater flow model never simulated a circumstance where saline intrusion in the Lower Aquifer System and fresh groundwater outflow to the Pacific Ocean in the Upper Aquifer System were prevented. Instead of pausing and questioning the adequacy of the 3D groundwater model, the GSPs rely on these flawed simulations to extrapolate or "take a guess" at what reductions in groundwater pumping would address the problem. The need to guess suggests that: (1) saline intrusion is not well understood, (2) the model is not effectively simulating actual hydrogeologic conditions, (3) reductions in pumping will not address saline intrusion, and/or (4) the underlying assumptions in the GSPs are incorrect. The net result is that the model is flawed, and the management actions derived from the model lack substantial evidence to support them.

These and related concerns with the Draft GSPs are discussed in more detail in the attached memorandum and analysis completed by Aquilogic. We look forward to working with the GMA and its stakeholders in developing well-conceived GSPs for the OPB and PVB.

Best Regards,

Robert J. Saperstein

ROBS:CKM

19771489

September 23, 2019

Mr. Kimball Loeb, Groundwater Manager
Fox Canyon Groundwater Management Agency
L#1610, Ventura, CA 93009

Subject: **General Comments On Draft GSPs for Oxnard Subbasin, Pleasant Valley Basin, and Las Posas Valley Basin, dated July 2019**

Dear Mr. Loeb;

United Water Conservation District (United) appreciated the opportunity to review the July 2019 drafts of Fox Canyon Groundwater Management Agency's (FCGMA) *Groundwater Sustainability Plan for the Oxnard Subbasin*, *Groundwater Sustainability Plan for the Pleasant Valley Basin*, and *Groundwater Sustainability Plan for the Las Posas Valley Basin* (the Draft GSPs), prepared by your consultant, Dudek, and approved for release by the FCGMA for public review in July 2019.

United staff provided their section-specific comments on each GSP using the online comment-submittal tools available on the FCGMA web site, as requested by Dudek's representative at your July 2019 Board of Directors meeting. During our review of each GSP, United staff focused on substantive issues, rather than spelling, style, or format of the document (except where such issues were likely to lead the reader to an incorrect or ambiguous conclusion). We trust that Dudek's technical editors or FCGMA's staff will find and correct any remaining typographical errors or formatting issues in the next draft of the document. On the substantive issues we raise in our comments, revising the GSPs where recommended and preparing written responses to provide additional information as appropriate, will ultimately produce "final" GSPs that are more likely to meet stakeholder and California Department of Water Resources (DWR) expectations.

United staff also wanted to provide more general comments regarding their overall impressions of the GSPs, but felt that the online submission tool was not well suited to conveying "big-picture" issues. Therefore, our general comments are provided as follows in this letter, which we hope the FCGMA will consider along with our section-specific comments as you finalize the GSPs:

1. **The descriptions of hydrogeologic conditions in each basin are, in general, well written and appropriately detailed to convey the important aspects of groundwater flow in the region as relevant to sustainable groundwater management.** We have some suggestions and questions regarding some of the details, which are included in the comments we submitted using your online comment-submission tool, but our overall impression of the background information described in Sections 1 and 2 of each GSP is positive. We noted that your consultant took our comments on the November 2017 Preliminary Draft version of the GSPs to heart and made significant changes to Section 2, resulting in a greatly improved "Basin Setting" description.
2. **We are pleased that the FCGMA used the best available tools—the groundwater models developed by United and Calleguas MWD—to forecast impacts of different minimum**

thresholds and potential future water-supply alternatives. Although groundwater models are just approximations of complex natural systems, and should be frequently re-evaluated/improved, the United and Calleguas models were subjected to multiple reviews before being used to support the GSPs and are considered acceptable for their intended use by several objective modeling experts.

3. **The sustainable yield estimates and overall sustainability goals for the basins are consistent with previous work dating back to the 1950s.** Although the Draft GSPs rely on DWR's new approach to evaluating and achieving sustainable groundwater yield, United has been working since the 1950s to increase artificial recharge and optimize conjunctive use projects in the Oxnard and Pleasant Valley areas to mitigate seawater intrusion. And the FCGMA has been in existence since the 1980s with a similar charge, but with the power to limit groundwater production. We believe the overall conclusions of the GSPs should not be a surprise to anyone—that pumping exceeds the present supply in the Oxnard Subbasin and Pleasant Valley Basin. The GSPs provide an opportunity for our community to develop a comprehensive solution to seawater intrusion and other groundwater concerns that we've all known about for decades. We hope the GSPs can be finalized in a manner that is acceptable to most, if not all, stakeholders.

4. **The weakest aspect of the GSPs is the proposed pathway to sustainability. We are concerned about the brevity of the "Projects and Management Actions" section of each GSP, and that the vague language regarding when and how projects and management actions (e.g., "Reductions in Groundwater Production") might be implemented to achieve sustainability will satisfy neither the local stakeholders nor DWR reviewers.** At present, sustainable yield in each basin appears that it will largely be achieved through reductions in groundwater pumping since so few new water-supply projects and concepts are mentioned in each GSP. Yet the description in each GSP for "Management Action No. 1—Reduction in Groundwater Production" includes statements like:

   > *"The exact reductions that will be implemented over the next 5 years will be determined by the FCGMA Board based on the data collected and analyzed for this GSP. These reductions will be evaluated based on the potential paths to reaching sustainability discussed in Chapter 3."*

   And,

   > *"…any reduction implemented by the FCGMA Board over the initial 5-year period after the GSP is adopted will be evaluated and may be changed as warranted by future conditions in the Basin."*

   And finally,

   > *"Potential economic impacts to stakeholders will be considered in the decision process for selecting future groundwater production rates and reductions necessary to meet the sustainability goal for the Subbasin."*

   Shouldn't the "exact reductions" and their "potential economic impacts to stakeholders" be described in the GSPs, at least for some initial period? If not, how will DWR be able to evaluate whether the plans can achieve the sustainability goals? How can local stakeholders participate in GSP development if the most important element of the GSPs—the specific steps (and timeline) for achieving sustainability—is not included in each plan? Will either stakeholders or the DWR be satisfied with the FCGMA Board of Directors promising to make decisions about projects and pumping reductions using an as-yet undefined process?

   At the very least, we feel the final draft GSPs submitted to DWR would be more likely to be accepted if they included a better description of the process that the FCGMA Board will use to determine "exact reductions" in pumping over the next 5 years, evaluate those reductions in the future, and consider economic impacts to stakeholders. However, we're not sure such descriptions would satisfy stakeholders and DWR. Better yet would be if the final draft GSPs included the specifics regarding management actions (timing and magnitude) and their impacts (on both sustainability and economics), with an opportunity for review and vetting by stakeholders.

If you would like additional input on any of our suggestions, please do not hesitate to contact John Lindquist or myself at 805-525-4431.

Sincerely,
United Water Conservation District

Dan Detmer
Supervising Hydrogeologist

Cc: Mauricio Guardado (United)
Bob Siemak (United)
John Lindquist (United)