

Agenda

Special Meeting of the Board of Directors of Yuima Municipal Water District

Tuesday, August 4, 2020 3:00 P.M.
34928 Valley Center Road, Pauma Valley, California

Roland Simpson, President
Don Broomell, Secretary / Treasurer
Richard Fontane, Director

Steve Wehr, Vice-President
Laney Villalobos, Director

IMPORTANT NOTICE: PER GOVERNOR NEWSOM'S EXECUTIVE ORDERS, THE ADGENDIZED MEETING WILL NOT BE HELD IN PERSON. THE DIRECTORS WILL BE PROVIDED TELEPHONIC OR ELECTRONIC ACCESS SEPARATELY. THE PUBLIC MAY ACCESS THE MEETING ELECTRONICALLY BY FOLLOWING THE INSTRUCTIONS INCLUDED AT THE END OF THIS AGENDA. PUBLIC COMMENTS MAY BE SUBMITTED VIA EMAIL BY 12:00 P.M. ON THE MEETINGDAY TO carmen@yuimamwd.com. SUBMISSIONS WILL BE READ ALLOWED AT THE PUBLIC COMMENT PERIOD, OR AT THE TIME THE ITEM IS DISCUSSED DURING ACTION / DISCUSSION, TO THE EXTENT THEY FIT WITHIN THE THREE-MINUTE LIMIT.

AGENDA TOPICS

3:00 p.m.

1. **Roll Call** - Determination of Quorum
 2. **Pledge of Allegiance**
 3. **Approval of Agenda(Gov. Code Sec. 54954.2(b))** – In accordance with Government Code Section 54954.2 (the Brown Act), additions/changes to the agenda generally require a determination by a two-thirds vote of the members of the board present at the meeting, or, if less than two-thirds of the members are present, a unanimous vote of those members present; that there is a need to take immediate action, and that the need for action came to the attention of the District subsequent to the agenda being posted.
 4. **Public Comment** – This is an opportunity for members of the public to address the Board on matters of interest within the Board’s jurisdiction that are not listed on the agenda. The Brown Act does not allow any discussion by the Board or staff on matters raised during public comment except; 1) to briefly respond to statements made or questions posed; 2) ask questions for clarification; 3) receive and file the matter; 4) if it is within staff’s authority, refer it to them for a reply; or 5) direct that it be placed on a future board agenda for a report or action. Inquiries pertaining to an item on the agenda will be received during deliberation on that agenda item. No action can be taken unless specifically listed on the agenda (Government Code §54954.3).
- I. **ACTION DISCUSSION**
1. **Solar Power Proposal Presentation**

Broomell

Simpson

Background: The Board again requested staff to research possible solar opportunities in an effort to save on future electric costs. Kenneth from Cosmic Solar has prepared a presentation regarding different options available to the district.

Recommendation: That the Board direct Staff as to the desired next steps regarding possible solar options.

CLOSED SESSION

CONFERENCE WITH LEGAL COUNCIL - SIGNIFICANT RISK OF EXPOSURE TO LITIGATION [Government Code Section 54956.9(d)(2): One case].

Jungreis

2. Proposed Resolution Awarding the Contract for the Development of the Groundwater Sustainability Plan for the Upper San Luis Rey GSA.

Simpson

Background: Due to the amount of time that has expired since the original proposals were received to develop the Groundwater Sustainability Plan the Board direct Staff to reject all prior submittals and to have all the three submitting consultants make revisions on their prior submittals to include any changes to costs or schedules. Only two of the three original submitting consultants resubmitted by the deadline. The proposals were provided to the GSA Executive Committee for review and the committee met on Thursday, July 30th to discuss their findings and recommendation. The GSA Executive Committee has recommended Geoscience Support Services, Inc. to the Yuima Board of Directors for an award of a Professional Services agreement regarding preparation and completion of a Groundwater Sustainability Plan.

Recommendation: That the board either reject all submittals and direct District staff to redistribute the RFQ, or approve the proposed resolution awarding the contract to Geoscience Support Services, Inc.

3. Proposed Resolution Requesting LAFCO to Take Proceedings for the Concurrent Annexation of Certain Territory to Yuima Municipal Water District and San Diego County Water Authority and Metropolitan Water District of Southern California.

Simpson

Background: At their June meeting, the San Diego County Water Authority accepted the terms and conditions set forth by the Metropolitan Water District for the Rancho Corrido annexation. The next step in the process is to submit an annexation application to LAFCO. This resolution is part of that application.

Recommendation: That, should the Board agree, they approve the resolution as presented.

II. ADJOURNMENT

NOTE: In compliance with the Americans with Disabilities Act, if special assistance is needed to participate in the Board meeting, please contact the General Manager at (760) 742-3704 at least 48 hours before the meeting to enable the District to make reasonable accommodations. The meeting begins at 3:00 p.m. The time listed for individual agenda items is an estimate only. Any writings or documents provided to a majority of the members of the Yuima Municipal Water District Board of Directors regarding any

item on this agenda will be made available for public inspection during normal business hours in the office of the General Manager located at 34928 Valley Center Road, Pauma Valley.

Directions for Board Meeting via Videoconference

If you would like to participate in the meeting please email Carmen Rodriguez at carmen@yuimamwd.com a password request by 2:00 p.m. on Tuesday, August 4, 2020.

Public Comments need to be received via email to carmen@yuimamwd.com by Tuesday, August 4, 2020 at 2:45 p.m. to

To download on your Phone.

1. Install the Zoom application (iPhone users to download through the App Store, Android users download through Google Play) on your phone.
2. Click on join Meeting
3. Enter Meeting Number – **760 742 3704**
4. *Please enter password – provided by Carmen Rodriguez at Yuima MWD*
5. Click the Join button

Using Zoom on your PC or laptop.

1. Please go to zoom.com
2. Click Join Meeting
3. Enter Meeting ID number- **760 742 3704**
4. *Please enter password – provided by Carmen Rodriguez at Yuima MWD*
5. Click the Join button



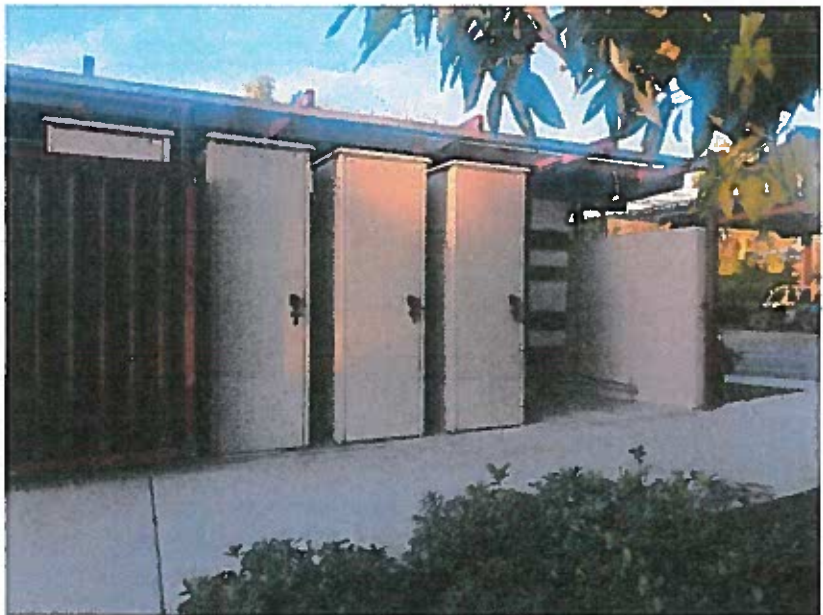
COSMIC SOLAR

Prepared For
YuimaMWD
(760) 742-3704
amy@yumaimwd.com

Yuima MWD - 5 sites 800 KW PV - No
ITC -

Prepared By
Ralph Ciarlanti III
(760) 845-2765
ralph@greenrealitiesllc.com

7/30/2020



1 Project Summary

Payment Options	Fam Fund	Cash Purchase
Total PPA Payments	\$4,649,971	-
End of Term Buyout Payment	-	-
Starting PPA Rate	\$0.105/kWh	-
Upfront Payment	-	\$3,634,748
Term	25 Years	-
30-Year Electric Bill Savings	-	\$13,858,918
30-Year IRR	-	12.48%
30-Year LCOE Utility	-	\$0.408
30-Year LCOE Utility & PV	-	\$0.321
30-Year LCOE PV	-	\$0.045
30-Year NPV	-	\$3,271,595
Total Payments	\$4,649,971	\$3,634,748
Rebates and Incentives	-	\$1,651,962
Net Payments	\$4,649,971	\$1,982,786
25-Year Electric Bill Savings	\$9,843,620	-
Electric Bill Savings Year 1	\$196,303	\$196,303
25-Year IRR	0%	-
25-Year LCOE Utility	\$0.34	-
25-Year LCOE Utility & PV	\$0.293	-
25-Year LCOE PV	\$0.126	-
25-Year NPV	\$2,277,393	-
Payback Period	-	8.4 Years
25-Year ROI	0%	-
Blended Savings Per kWh PV	\$0.074	\$0.074
PV Degradation Rate	0.6%	-

3.1 Fam Fund

Inputs and Key Financial Metrics

Total PPA Payments	\$4,649,971	Rebates and Incentives	\$0	25-Year LCOE PV	\$0.126
End of Term Buyout Payment	\$0	Net Payments	\$4,649,971	25-Year ROI	-
Payment Escalation Rate	1.5%	25-Year Electric Bill Savings	\$9,843,620	Blended Savings Per kWh PV	\$0.074
Starting PPA Rate	\$0.105	Electric Bill Savings Year 1	\$196,303	PV Degradation Rate	0.6%
Upfront Payment	\$0	25-Year IRR	-	Electricity Escalation Rate	6%
Term	25	25-Year LCOE Utility	\$0.34	Federal Income Tax Rate	0%
Total Payments	\$4,649,971	25-Year LCOE Utility & PV	\$0.293	State Income Tax Rate	0%

Years	PPA Payments	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-	-	-	-
1	-\$167,511	\$196,303	\$28,791	\$28,791
2	-\$169,004	\$205,667	\$36,663	\$65,454
3	-\$170,503	\$215,447	\$44,944	\$110,398
4	-\$172,010	\$225,662	\$53,652	\$164,050
5	-\$173,523	\$236,326	\$62,803	\$226,853
6	-\$175,043	\$247,458	\$72,414	\$299,267
7	-\$176,570	\$259,074	\$82,504	\$381,771
8	-\$178,103	\$271,194	\$93,091	\$474,862
9	-\$179,643	\$283,836	\$104,193	\$579,055
10	-\$181,188	\$297,018	\$115,830	\$694,885
11	-\$182,739	\$338,896	\$156,157	\$851,041
12	-\$184,297	\$354,906	\$170,610	\$1,021,651
13	-\$185,859	\$371,618	\$185,758	\$1,207,409
14	-\$187,428	\$389,057	\$201,629	\$1,409,038
15	-\$189,001	\$407,251	\$218,250	\$1,627,288
16	-\$190,579	\$426,227	\$235,648	\$1,862,936
17	-\$192,163	\$446,015	\$253,853	\$2,116,789
18	-\$193,751	\$466,643	\$272,893	\$2,389,681
19	-\$195,343	\$488,141	\$292,798	\$2,682,479
20	-\$196,939	\$510,538	\$313,599	\$2,996,078
21	-\$198,540	\$584,253	\$385,713	\$3,381,791
22	-\$200,144	\$611,565	\$411,422	\$3,793,213
23	-\$201,751	\$640,052	\$438,301	\$4,231,514
24	-\$203,362	\$669,755	\$466,393	\$4,697,907
25	-\$204,976	\$700,719	\$495,743	\$5,193,650
Totals:	-\$4,649,971	\$9,843,620	\$5,193,650	-

3.2 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$3,634,748	Payback Period	8.4 Years	Discount Rate	5%
10-Year IRR	3.23%	30-Year ROI	384.6%	Electricity Escalation Rate	6%
20-Year IRR	10.53%	Blended Savings Per kWh PV	\$0.074	Federal Income Tax Rate	0%
30-Year IRR	12.48%	PV Degradation Rate	0.6%	State Income Tax Rate	0%
30-Year NPV	\$3,271,595				

Years	Project Costs	O&M / Equipment Replacement	SGIP Incentive	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-\$3,634,748	-	\$851,105	-	-\$2,783,643	-\$2,783,643
1	-	-	\$292,106	\$196,303	\$488,409	-\$2,295,234
2	-	-	\$292,106	\$205,667	\$497,773	-\$1,797,461
3	-	-	\$181,688	\$215,447	\$397,136	-\$1,400,326
4	-	-	\$24,980	\$225,662	\$250,642	-\$1,149,684
5	-	-	\$9,976	\$236,326	\$246,302	-\$903,382
6	-	-	-	\$247,458	\$247,458	-\$655,924
7	-	-	-	\$259,074	\$259,074	-\$396,850
8	-	-	-	\$271,194	\$271,194	-\$125,656
9	-	-	-	\$283,836	\$283,836	\$158,180
10	-	-	-	\$297,018	\$297,018	\$455,198
11	-	-\$541,600	-	\$338,896	-\$202,704	\$252,494
12	-	-	-	\$354,906	\$354,906	\$607,400
13	-	-	-	\$371,618	\$371,618	\$979,017
14	-	-	-	\$389,057	\$389,057	\$1,368,074
15	-	-	-	\$407,251	\$407,251	\$1,775,325
16	-	-	-	\$426,227	\$426,227	\$2,201,552
17	-	-	-	\$446,015	\$446,015	\$2,647,568
18	-	-	-	\$466,643	\$466,643	\$3,114,211
19	-	-	-	\$488,141	\$488,141	\$3,602,352
20	-	-	-	\$510,538	\$510,538	\$4,112,890
21	-	-\$601,269	-	\$584,253	-\$17,016	\$4,095,874
22	-	-	-	\$611,565	\$611,565	\$4,707,439
23	-	-	-	\$640,052	\$640,052	\$5,347,491
24	-	-	-	\$669,755	\$669,755	\$6,017,247
25	-	-\$4,388	-	\$700,719	\$696,331	\$6,713,578
26	-	-\$4,520	-	\$732,987	\$728,467	\$7,442,045
27	-	-\$4,655	-	\$766,605	\$761,949	\$8,203,994
28	-	-\$4,795	-	\$801,618	\$796,823	\$9,000,817
29	-	-\$4,939	-	\$838,072	\$833,134	\$9,833,951
30	-	-\$5,087	-	\$876,016	\$870,929	\$10,704,880
Totals:	-\$3,634,748	-\$1,171,252	\$1,651,962	\$13,858,918	\$10,704,880	-



COSMIC SOLAR

Prepared For
YuimaMWD
(760) 742-3704
amy@yumaimwd.com



Yuima MWD - 5 sites 1.6MW PV - No
ITC

Prepared By
Ralph Ciarlanti III
(760) 845-2765
ralph@greenrealitiesllc.com

7/29/2020



1 Project Summary

Payment Options	Cash Purchase	Farm Fund
Upfront Payment	\$5,712,050	-
Total PPA Payments	-	\$8,616,969
End of Term Buyout Payment	-	-
Starting PPA Rate	-	\$0.105/kWh
Term	-	25 Years
25-Year Electric Bill Savings	-	\$13,293,334
25-Year IRR	-	29.35%
25-Year LCOE Utility	-	\$0.34
25-Year LCOE Utility & PV	-	\$0.294
25-Year LCOE PV	-	\$0.126
25-Year NPV	-	\$1,795,504
25-Year ROI	-	0%
PV Degradation Rate	-	0.6%
Total Payments	\$5,712,050	\$8,616,969
Rebates and Incentives	\$1,643,935	-
Net Payments	\$4,068,115	\$8,616,969
30-Year Electric Bill Savings	\$18,707,839	-
Electric Bill Savings Year 1	\$265,359	\$265,359
30-Year IRR	9.23%	-
30-Year LCOE Utility	\$0.408	-
30-Year LCOE Utility & PV	\$0.3	-
30-Year LCOE PV	\$0.05	-
30-Year NPV	\$3,227,707	-
Payback Period	12.7 Years	8.7 Years
Blended Savings Per kWh PV	\$0.063	\$0.063

3.1 Cash Purchase

Inputs and Key Financial Metrics

Total Project Costs	\$5,712,050	Payback Period	12.7 Years	Discount Rate	5%
10-Year IRR	-3.11%	30-Year ROI	275.6%	Electricity Escalation Rate	6%
20-Year IRR	6.56%	Blended Savings Per kWh PV	\$0.063	Federal Income Tax Rate	0%
30-Year IRR	9.23%	PV Degradation Rate	0.6%	State Income Tax Rate	0%
30-Year NPV	\$3,227,707				

Years	Project Costs	O&M / Equipment Replacement	SGIP Incentive	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-\$5,712,050	-	\$851,105	-	-\$4,860,945	-\$4,860,945
1	-	-	\$289,782	\$265,359	\$555,142	-\$4,305,803
2	-	-	\$289,782	\$278,419	\$568,201	-\$3,737,603
3	-	-	\$181,520	\$292,090	\$473,610	-\$3,263,993
4	-	-	\$23,374	\$306,399	\$329,773	-\$2,934,219
5	-	-	\$8,371	\$321,374	\$329,745	-\$2,604,475
6	-	-	-	\$337,043	\$337,043	-\$2,267,432
7	-	-	-	\$353,435	\$353,435	-\$1,913,997
8	-	-	-	\$370,581	\$370,581	-\$1,543,416
9	-	-	-	\$388,512	\$388,512	-\$1,154,904
10	-	-	-	\$407,260	\$407,260	-\$747,644
11	-	-\$541,600	-	\$455,210	-\$86,390	-\$834,034
12	-	-	-	\$477,397	\$477,397	-\$356,637
13	-	-	-	\$500,607	\$500,607	\$143,971
14	-	-	-	\$524,884	\$524,884	\$668,855
15	-	-	-	\$550,272	\$550,272	\$1,219,127
16	-	-	-	\$576,817	\$576,817	\$1,795,944
17	-	-	-	\$604,566	\$604,566	\$2,400,510
18	-	-	-	\$633,569	\$633,569	\$3,034,079
19	-	-	-	\$663,876	\$663,876	\$3,697,955
20	-	-	-	\$695,538	\$695,538	\$4,393,493
21	-	-\$649,389	-	\$779,381	\$129,992	\$4,523,485
22	-	-	-	\$816,964	\$816,964	\$5,340,449
23	-	-	-	\$856,251	\$856,251	\$6,196,700
24	-	-	-	\$897,312	\$897,312	\$7,094,012
25	-	-\$8,156	-	\$940,217	\$932,061	\$8,026,074
26	-	-\$8,401	-	\$985,041	\$976,640	\$9,002,714
27	-	-\$8,653	-	\$1,031,859	\$1,023,206	\$10,025,920
28	-	-\$8,912	-	\$1,080,749	\$1,071,836	\$11,097,756
29	-	-\$9,180	-	\$1,131,790	\$1,122,611	\$12,220,367
30	-	-\$9,455	-	\$1,185,066	\$1,175,611	\$13,395,978
Totals:	-\$5,712,050	-\$1,243,745	\$1,643,935	\$18,707,839	\$13,395,978	-

3.2 Fam Fund

Inputs and Key Financial Metrics

Total PPA Payments	\$8,616,969	Rebates and Incentives	\$0	25-Year LCOE PV	\$0.126
End of Term Buyout Payment	\$0	Net Payments	\$8,616,969	25-Year ROI	-
Payment Escalation Rate	1.5%	25-Year Electric Bill Savings	\$13,293,334	Blended Savings Per kWh PV	\$0.063
Starting PPA Rate	\$0.105	Electric Bill Savings Year 1	\$265,359	PV Degradation Rate	0.6%
Upfront Payment	\$0	25-Year IRR	29.35%	Electricity Escalation Rate	6%
Term	25	25-Year LCOE Utility	\$0.34	Federal Income Tax Rate	0%
Total Payments	\$8,616,969	25-Year LCOE Utility & PV	\$0.294	State Income Tax Rate	0%

Years	PPA Payments	Electric Bill Savings	Total Cash Flow	Cumulative Cash Flow
Upfront	-	-	-	-
1	-\$310,419	\$265,359	-\$45,059	-\$45,059
2	-\$313,185	\$278,419	-\$34,766	-\$79,826
3	-\$315,964	\$292,090	-\$23,874	-\$103,700
4	-\$318,756	\$306,399	-\$12,357	-\$116,056
5	-\$321,560	\$321,374	-\$186	-\$116,242
6	-\$324,377	\$337,043	\$12,666	-\$103,577
7	-\$327,206	\$353,435	\$26,229	-\$77,348
8	-\$330,047	\$370,581	\$40,534	-\$36,814
9	-\$332,900	\$388,512	\$55,612	\$18,797
10	-\$335,764	\$407,260	\$71,497	\$90,294
11	-\$338,639	\$455,210	\$116,572	\$206,866
12	-\$341,524	\$477,397	\$135,873	\$342,739
13	-\$344,420	\$500,607	\$156,187	\$498,926
14	-\$347,326	\$524,884	\$177,558	\$676,483
15	-\$350,242	\$550,272	\$200,030	\$876,513
16	-\$353,167	\$576,817	\$223,650	\$1,100,163
17	-\$356,101	\$604,566	\$248,465	\$1,348,628
18	-\$359,044	\$633,569	\$274,525	\$1,623,154
19	-\$361,994	\$663,876	\$301,881	\$1,925,035
20	-\$364,953	\$695,538	\$330,585	\$2,255,620
21	-\$367,919	\$779,381	\$411,463	\$2,667,083
22	-\$370,891	\$816,964	\$446,073	\$3,113,156
23	-\$373,870	\$856,251	\$482,381	\$3,595,537
24	-\$376,855	\$897,312	\$520,457	\$4,115,994
25	-\$379,846	\$940,217	\$560,372	\$4,676,365
Totals:	-\$8,616,969	\$13,293,334	\$4,676,365	-

RESOLUTION NO. _____

**RESOLUTION OF THE BOARD OF DIRECTORS OF
YUIMA MUNICIPAL WATER DISTRICT
AWARDING CONTRACT FOR THE PREPARATION
AND COMPLETION OF A GROUNDWATER SUSTAINABILITY PLAN
(Geoscience Support Service, Inc.)**

WHEREAS, pursuant to notices heretofore given and published, revised Statement of Qualifications (SOQs) have been received for the preparation and completion of a Groundwater Sustainability Plan, and

WHEREAS, the SOQs received have been submitted to the Groundwater Sustainability Agency Executive Committee for analysis; and

WHEREAS, the Groundwater Sustainability Agency has provided the District with a recommendation based on their analysis; and

NOW, THEREFORE, BE IT RESOLVED AND ORDERED BY THE BOARD OF DIRECTORS OF YUIMA MUNICIPAL WATER DISTRICT, as follows:

1. That the proposal of Geoscience Support Services, Inc., (“Geoscience”) in an amount not to exceed \$907,699.00, for the preparation and completion of a Groundwater Sustainability Plan (“GSP”), is hereby accepted and approved in substantially the form attached as Exhibit A.
2. The appropriate officers of the District are hereby authorized and directed on behalf of the District to execute all contract documents and to do all things necessary to effectuate the contract, including making of clarifying revisions recommended by the District’s General Counsel prior to execution of the contract documents.

PASSED AND ADOPTED this 4th day of August, 2020 at a special meeting of the Board of Directors of YUIMA MUNICIPAL WATER DISTRICT by the following roll-call vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

Attest:

Roland Simpson, President

Don Broomell, Secretary / Treasurer

AGREEMENT NO. E-153

with

**GEOSCIENCES SUPPORT SERVICES, INC. FOR
PREPARATION OF A GROUNDWATER SUSTAINABILITY PLAN FOR THE UPPER
SAN LUIS REY VALLEY GROUNDWATER SUB-BASIN**

This Agreement (the "Agreement") is made and entered into as of August 4, 2020 ("Effective Date"), by and between Yuima Municipal Water District ("Yuima"), a Municipal Water District organized and operating under the Municipal Water District Act and Geosciences Support Services, Inc. ("Contractor").

**PART I
FUNDAMENTAL TERMS**

A. Location of Project: Upper San Luis Rey Valley Groundwater Sub-Basin, (the "Sub-Basin"), also referenced by the California Department of Water Resources as the SAN LUIS REY VALLEY - UPPER SAN LUIS REY VALLEY (Basin No. 9-007.01) in and around Pauma Valley, California.

B. Description of Services/Goods to be Provided: In compliance with directions from Yuima and in consultation with the Executive Team for the Upper San Luis Rey Valley GSA, complete a legally compliant Groundwater Sustainability Plan ("GSP") for the Sub-Basin, in accordance with PART IV, Scope of Services, included herein.

C. Term: Unless terminated earlier as set forth in this Agreement, Contractor's services shall commence on the Effective Date, and the term of this Agreement shall continue through its expiration on June 30, 2022.

D. Party Representatives:

D.1. YUIMA designates the following person/officer to act on Yuima's behalf: Amy Reeh, Interim General Manager.

D.2. Contractor designates the following person to act on Contractor's behalf: Brian Villalobos, Project Manager.

E. Notices: All notices and other writings required to be delivered under this Agreement to the parties shall be delivered at the addresses set forth in Part II ("General Provisions").

F. Attachments: This Agreement incorporates by reference the following Attachments to this Agreement:

- F.1. Part I: Fundamental Terms
- F.2. Part II: General Provisions
- F.3. Part III: Special Provisions
- F.4. Part IV: Scope of Services

F.5. Part V: Budget

G. Integration: This Agreement represents the entire understanding of Yuima and Contractor as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with regard to those matters covered by this Agreement. This Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements or understandings, if any, between the parties, and none shall be used to interpret this Agreement.

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first set forth above.

YUIMA MUNICIPAL WATER DISTRICT

GEOSCIENCES SUPPORT SERVICES, INC

By: _____
Amy Reeh, Interim General Manager

By: _____
Title: _____

By: _____
Roland Simpson, Board President

By: _____
Title: _____

Dated: _____

APPROVED AS TO FORM:

Contractor Information:

RUTAN & TUCKER, LLP

Address for Notices and Payments:
GEOSCIENCE
PO Box 220
Claremont, CA 91711

By: _____
Jeremy N. Jungreis, General Counsel

Attention: Brian Villalobos
Telephone: 909.451.6650
Facsimile No.: 909.451.6638

PART II
GENERAL PROVISIONS

SECTION ONE: SERVICES OF CONTRACTOR

1.1 Scope of Services. In compliance with all terms and conditions of this Agreement, Contractor shall provide the goods and/or services shown on Part IV hereto (“Scope of Services”), which may be referred to herein as the “services” or the “work.” If this Agreement is for the provision of goods, supplies, equipment or personal property, the terms “services” and “work” shall include the provision (and, if designated in the Scope of Services, the installation) of such goods, supplies, equipment or personal property.

1.2 Changes and Additions to Scope of Services. Yuima shall have the right at any time during the performance of the services, without invalidating this Agreement, to order extra work beyond that specified in the Scope of Services or make changes by altering, adding to, or deducting from said work. No such work shall be undertaken unless a written order is first given by Yuima to Contractor, incorporating therein any adjustment in (i) the Budget, and/or (ii) the time to perform this Agreement, which adjustments are subject to the written approval of the Contractor. It is expressly understood by Contractor that the provisions of this Section 1.2 shall not apply to services specifically set forth in the Scope of Services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the Scope of Services may be more costly or time consuming than Contractor anticipates and that Contractor shall not be entitled to additional compensation therefor.

1.3 Standard of Performance. Contractor agrees that all services shall be performed in a competent, professional, and satisfactory manner in accordance with the standards prevalent in the industry, and that all goods, materials, equipment or personal property included within the services herein shall be of good quality, fit for the purpose intended.

1.4 Performance to Satisfaction of Yuima. Contractor agrees to perform all work to the satisfaction of Yuima within the time specified. If Yuima reasonably determines that the work is not satisfactory, Yuima shall have the right to take appropriate action, including but not limited to: (i) meeting with Contractor to review the quality of the work and resolve matters of concern; (ii) requiring Contractor to repeat unsatisfactory work at no additional charge until it is satisfactory; (iii) suspending the delivery of work to Contractor for an indefinite time; (iv) withholding payment; and (v) terminating this Agreement as hereinafter set forth.

1.5 Instructions from Yuima. In the performance of this Agreement, Contractor shall report to and receive instructions from Yuima’s representative identified in Part I, or his or her designee. Tasks or services other than those specifically described in the Scope of Services shall not be performed without the prior written approval of the Yuima.

1.6 Familiarity with Work. By executing this Agreement, Contractor warrants that Contractor (i) has thoroughly investigated and considered the scope of services to be performed, (ii) has carefully considered how the services should be performed, and (iii) fully understands the facilities, difficulties, and restrictions attending performance of the services under the Agreement. If the services involve work upon any site, Contractor warrants that Contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the Contractor discover any conditions, including any latent or unknown conditions, which will materially affect the performance of the services hereunder, Contractor shall immediately inform the Yuima of such fact and shall not proceed except at Contractor's risk until written instructions are received from the Yuima's Representative.

1.7 Prohibition Against Subcontracting or Assignment. Contractor shall not contract with any other entity to perform in whole or in part the services required hereunder without the express written approval of Yuima, which is hereby provided for those subconsultants listed in Exhibit "C" to Part IV. In addition, neither the Agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated, or encumbered voluntarily or by operation of law, whether for the benefit of creditors or otherwise, without the prior express written approval of Yuima. In the event of any unapproved transfer, including any bankruptcy proceeding, Yuima may, in its sole and absolute discretion, void the Agreement. No approved transfer shall release any surety of Contractor of any liability hereunder without the express consent of Yuima.

1.8 Compensation. Contractor shall be compensated in accordance with the terms of Part V hereto ("Budget"). Included in the Budget are all ordinary and overhead expenses incurred by Contractor and its agents and employees, including meetings with Yuima representatives, and incidental costs incurred in performing under this Agreement. Contractor shall be compensated for actual costs incurred by subcontractors or other services, and no mark-up will be paid to contractor by Yuima. Unless otherwise specified in Part V, Yuima shall compensate Contractor on a time-and-materials basis at the rates listed in Part V upon successful completion of tasks identified in this Agreement. Contractor shall submit an invoice referencing this Agreement, the Work Order number, date and description of services performed, and the amount. Yuima shall pay the Contractor within 30 days of receipt of the invoice.

SECTION TWO: INSURANCE AND INDEMNIFICATION

2.0 Insurance – See attached Exhibit A to this Agreement.

2.1 Indemnification.

The parties mutually acknowledge that Yuima has retained Contractor to perform the services set forth in this Agreement based upon the special skills, expertise and experience of Contractor. Accordingly, in performing the services under this Agreement, Contractor shall use the skill and care that a highly specialized professional, with

expertise in the field, would use under similar circumstances. Further, the parties mutually agree that, to the extent that Contractor retains subcontractors or subcontractors to perform any portion of any of the tasks or services under this Agreement, Contractor has a duty to Yuima to ensure that the tasks and services performed by such subcontractors or subcontractors meet the same professional level, skill and expertise expected of Contractor.

2.2.1 Except as set forth in subdivision 2.2.2 or 2.2.3, Contractor shall indemnify, defend (with legal counsel acceptable to Yuima) and hold harmless Yuima and the Yuima Personnel from and against any and all actions, suits, claims, demands, judgments, attorneys fees, costs, damages to persons or property, losses, penalties, obligations, expenses or liabilities (“Claims”) that may be asserted or claimed by any person or entity arising out of Contractor’s performance of any tasks or services for or on behalf of Yuima, whether or not there is concurrent negligence on the part of Yuima and/or any Yuima Personnel, but excluding any Claims arising from the active negligence or willful misconduct of Yuima or any Yuima Personnel where the active negligence or willful misconduct is determined to be the actual and proximate cause of the alleged injury.

2.2.2 The provisions of this subdivision 2.2.2 apply only in the event that Contractor is a “design professional” within the meaning of California Civil Code section 2782.8(c). If Contractor is a “design professional” within the meaning of Section 2782.8(c), then, notwithstanding subdivision 2.2.1 above, to the fullest extent permitted by law (including, without limitation, Civil Code sections 2782 and 2782.6), Contractor shall defend (with legal counsel reasonably acceptable to Yuima), indemnify and hold harmless Yuima and Yuima Personnel from and against any Claim that arises out of, pertains to, or relates to, directly or indirectly, in whole or in part, the negligence, recklessness, or willful misconduct of Contractor, any subcontractor, subcontractor or any other person directly or indirectly employed by them, or any person that any of them control, arising out of Contractor’s performance of any task or service for or on behalf of Yuima under this Agreement. Such obligations to defend, hold harmless and indemnify Yuima or any Yuima Personnel shall not apply to the extent that such Claims are caused in part by the sole active negligence or willful misconduct of Yuima or such Yuima Personnel. To the extent Contractor has a duty to indemnify Yuima or any Yuima Personnel under this subdivision 2.2.2, Contractor shall be responsible for all incidental and consequential damages resulting directly or indirectly, in whole or in part, from Contractor’s negligence, recklessness or willful misconduct.

2.2.3 The provisions of this subdivision 2.2.3 apply only in the event that this Agreement is a “construction contract” within the meaning of Civil Code Section 2782(b) and 2783. If this Agreement is a “construction contract” within the meaning of those statutes, then notwithstanding subdivision 2.2.1 above, to the fullest extent permitted by law, Contractor shall indemnify, defend (with legal counsel acceptable to Yuima) and hold harmless Yuima and the Yuima Personnel from and against any and all Claims that may be asserted or claimed by any person or entity arising out of Contractor’s performance of any tasks or services for or on behalf of Yuima, whether or not there is

concurrent passive negligence on the part of Yuima and/or any Yuima Personnel, but excluding any Claims arising from the active negligence or willful misconduct of Yuima or any Yuima Personnel.

SECTION THREE: LEGAL RELATIONS AND RESPONSIBILITIES

3.1 Compliance with Laws. Contractor shall keep itself fully informed of all existing and future state and federal laws and all county, municipal and Yuima ordinances and regulations which in any manner affect those employed by it or in any way affect the performance of services pursuant to this Agreement. Contractor shall at all times observe and comply with all such laws, ordinances, and regulations and shall be responsible for the compliance of all work and services performed by or on behalf of Contractor. When applicable, Contractor shall not pay less than the prevailing wage, which rate is determined by the Director of Industrial Relations of the State of California.

3.2 Licenses, Permits, Fees and Assessments. Contractor shall obtain at its sole cost and expense all licenses, permits, and approvals that may be required by law for the performance of the services required by this Agreement. Contractor shall have the sole obligation to pay any fees, assessments, and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for Contractor's performance of the services required by this Agreement, and shall indemnify, defend, and hold harmless Yuima against any such fees, assessments, taxes, penalties, or interest levied, assessed, or imposed against Yuima thereunder.

3.3 Covenant Against Discrimination. Contractor covenants for itself, its heirs, executors, assigns, and all persons claiming under or through it, that there shall be no discrimination against any person on account of race, color, creed, religion, sex, marital status, national origin, or ancestry, in the performance of this Agreement. Contractor further covenants and agrees to comply with the terms of the Americans with Disabilities Act of 1990 (42 U.S.C. §12101 et seq.) as the same may be amended from time to time.

3.4 Independent Contractor. Contractor shall perform all services required herein as an independent Contractor of Yuima and shall remain at all times as to Yuima a wholly independent Contractor. Yuima shall not in any way or for any purpose become or be deemed to be a partner of Contractor in its business or otherwise, or a joint venturer, or a member of any joint enterprise with Contractor. Contractor shall not at any time or in any manner represent that it or any of its agents or employees are agents or employees of Yuima. Neither Contractor nor any of Contractor's employees shall, at any time, or in any way, be entitled to any sick leave, vacation, retirement, or other fringe benefits from the Yuima; and neither Contractor nor any of its employees shall be paid by Yuima time and one-half for working in excess of forty (40) hours in any one week. Yuima is under no obligation to withhold State and Federal tax deductions from Contractor's compensation. Neither Contractor nor any of Contractor's employees shall be included in the competitive service, have any property right to any position, or any of the rights an employee may have in the event of termination of this Agreement.

3.5 Use of Patented Materials. Contractor shall assume all costs arising from the use of patented or copyrighted materials, including but not limited to equipment, devices, processes, and software programs, used or incorporated in the services or work performed by Contractor under this Agreement. Contractor shall indemnify, defend, and save the Yuima harmless from any and all suits, actions or proceedings of every nature for or on account of the use of any patented or copyrighted materials.

3.6 Proprietary Information. All proprietary information developed specifically for Yuima by Contractor in connection with, or resulting from, this Agreement, including but not limited to inventions, discoveries, improvements, copyrights, patents, maps, reports, textual material, or software programs, but not including Contractor's underlying materials, software, or know-how, shall be the sole and exclusive property of Yuima, and are confidential and shall not be made available to any person or entity without the prior written approval of Yuima. Contractor agrees that the compensation to be paid pursuant to this Agreement includes adequate and sufficient compensation for any proprietary information developed in connection with or resulting from the performance of Contractor's services under this Agreement. Contractor further understands and agrees that full disclosure of all proprietary information developed in connection with, or resulting from, the performance of services by Contractor under this Agreement shall be made to Yuima, and that Contractor shall do all things necessary and proper to perfect and maintain ownership of such proprietary information by Yuima.

3.7 Ownership of Data, Reports and Documents. The Contractor shall deliver to Yuima's representative identified in Part I, at the end of the project, notes and surveys made, all reports of tests made, studies, reports, plans, a copy of electronic and digital files, and other materials and documents which shall be the property of Yuima. The Contractor is not responsible to third parties of Yuima's use of data, reports and documents on other projects. Yuima may use or reuse the materials prepared by Contractor in any manner desired without additional compensation to Contractor. Any work performed by Contractor under this Agreement shall be the property of Yuima.

3.8 Retention of Funds. Contractor hereby authorizes Yuima to deduct from any amount payable to Contractor (whether arising out of this Agreement or otherwise) any amounts the payment of which may be in dispute hereunder or which are necessary to compensate Yuima for any losses, costs, liabilities, or damages suffered by Yuima, and all amounts for which Yuima may be liable to third parties, by reason of Contractor's negligent acts, errors, or omissions, or willful misconduct, in performing or failing to perform Contractor's obligations under this Agreement. Yuima in its sole and absolute discretion, may withhold from any payment due Contractor, without liability for interest, an amount sufficient to cover such claim or any resulting lien. The failure of Yuima to exercise such right to deduct or withhold shall not act as a waiver of Contractor's obligation to pay Yuima any sums Contractor owes Yuima.

3.9 Termination By Yuima. Yuima reserves the right to terminate this Agreement at any time, with or without cause, upon fourteen (14) days prior written notice to Contractor. Upon receipt of any notice of termination from Yuima, Contractor shall

immediately cease all services hereunder except such as may be specifically approved in writing by Yuima. Contractor shall be entitled to compensation for all services rendered prior to receipt of Yuima's notice of termination and for any services authorized in writing by Yuima thereafter. If termination is due to the failure of Contractor to fulfill its obligations under this Agreement, Yuima may take over the work and prosecute the same to completion by contract or otherwise, and Contractor shall be liable for the costs Yuima incurs in completion of the services required hereunder, including, but not limited to, costs incurred by Yuima in retaining a replacement Contractor, and similar expenses and costs incurred by Yuima as a result of Contractor's breach of the Agreement, including, but not limited to, compensation for increased staff time costs incurred by Yuima in completing the work.

3.10 Right to Stop Work; Termination By Contractor. Contractor shall have the right to stop work only if Yuima fails to timely make a payment required under the terms of the Budget. Contractor may terminate this Agreement only for cause, upon thirty (30) days' prior written notice to Yuima. Contractor shall immediately cease all services hereunder as of the date Contractor's notice of termination is sent to Yuima, except such services as may be specifically approved in writing by Yuima. Contractor shall be entitled to compensation for all services rendered prior to the date notice of termination is sent to Yuima and for any services authorized in writing by Yuima thereafter. If Contractor terminates this Agreement because of an error, omission, or a fault of Contractor, or Contractor's willful misconduct, the terms of Section 3.9 relating to Yuima's right to take over and finish the work and Contractor's liability therefor shall apply.

3.11 Waiver. No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing.

3.12 Legal Actions. Legal actions concerning any dispute, claim, or matter arising out of or in relation to this Agreement shall be instituted and maintained in the Superior Courts of the State of California in the County of San Diego, or in any other appropriate court with jurisdiction in such County, and Contractor agrees to submit to the jurisdiction of such court.

3.13 Rights and Remedies are Cumulative. The rights and remedies of the parties are cumulative and the exercise by either party of one or more of such rights or remedies shall not preclude the exercise by it, at the same or different times, of any other rights or remedies for the same default or any other default by the other party.

3.14 Attorneys' Fees. In any action between the parties hereto seeking enforcement of any of the terms or provisions of this Agreement or in connection with the performance of the work hereunder, the party prevailing in the final judgment in such action or proceeding, in addition to any other relief which may be granted, shall be entitled

to have and recover from the other party its reasonable costs and expenses, including but not limited to reasonable attorney's fees, expert witness fees and courts costs. If either party to this Agreement is required to initiate or defend litigation with a third party because of the violation of any term or provision of this Agreement by the other party, then the party so litigating shall be entitled to its reasonable attorney's fees and costs from the other party to this Agreement.

3.15 Force Majeure. The time period specified in this Agreement for performance of services shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of Yuima or Contractor, including but not restricted to acts of God or of the public enemy, unusually severe weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation and/or acts of any governmental agency, including Yuima, if the delaying party shall within ten (10) days of the commencement of such delay notify the other party in writing of the causes of the delay. If Contractor is the delaying party, Yuima shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of Yuima such delay is justified. Yuima's determination shall be final and conclusive upon the parties to this Agreement. In no event shall Contractor be entitled to recover damages against Yuima for any delay in the performance of this Agreement, however caused. Contractor's sole remedy shall be extension of this Agreement pursuant to this Section 3.15.

3.16 Non-liability of Yuima Officers and Employees. No officer, official, employee, agent, representative or volunteer of Yuima shall be personally liable to Contractor, or any successor in interest, in the event of any default or breach by Yuima, or for any amount which may become due to Contractor or its successor, or for breach of any obligation of the terms of this Agreement.

3.17 Conflict of Interest. No officer, official, employee, agent, representative or volunteer of Yuima shall have any financial interest, direct or indirect, in this Agreement, or participate in any decision relating to this Agreement which affects his or her financial interest or the financial interest of any corporation, partnership, or association in which he or she is interested, in violation of any Federal, State, or Yuima statute, ordinance, or regulation. The Contractor shall not employ any such person while this Agreement is in effect.

3.18 Compliance with California Unemployment Insurance Code Section 1088.8. If Contractor is a sole proprietor, then prior to signing the Agreement, Contractor shall provide to the Yuima a completed and signed Form W-9, Request for Taxpayer Identification Number and Certification. Contractor understands that pursuant to California Unemployment Insurance Code Section 1088.8, the Yuima will report the information from Form W-9 to the State of California Unemployment Development Department, and that the information may be used for the purposes of establishing, modifying, or enforcing child support obligations, including collections, or reported to the Franchise Tax Board for tax enforcement purposes.

Yuima Agreement No. E-153

SECTION FOUR: MISCELLANEOUS PROVISIONS

4.1 Records and Reports. Upon request by Yuima, Contractor shall prepare and submit to Yuima any reports concerning Contractor's performance of the services rendered under this Agreement. Yuima shall have access, upon reasonable notice, to the books and records of Contractor related to Contractor's performance of this Agreement. All drawings, documents, and other materials prepared by Contractor in the performance of this Agreement (i) shall be the property of Yuima and shall be delivered at no cost to Yuima upon request of Yuima or upon the termination of this Agreement, and (ii) are confidential and shall not be made available to any individual or entity without prior written approval of Yuima. Contractor shall keep and maintain all records and reports related to this Agreement for a period of three (3) years following termination of this Agreement, and Yuima shall have access to such records upon 48 hours notice.

4.2 Notices. Unless otherwise provided herein, all notices required to be delivered under this Agreement or under applicable law shall be personally delivered, or delivered by United States mail, prepaid, certified, return receipt requested, or by reputable document delivery service that provides a receipt showing date and time of delivery. Notices personally delivered or delivered by a document delivery service shall be effective upon receipt. Notices delivered by mail shall be effective at 5:00 p.m. on the second calendar day following dispatch. Notices to the Yuima shall be delivered to the following address, to the attention of the Yuima Representative set forth in Paragraph D.1 of the Fundamental Terms of this Agreement:

To Yuima: Yuima Municipal Water District
PO Box 177
Pauma Valley, CA 92061
Attn: General Manager

Invoices only shall be properly identified with the corresponding Agreement No. and may be sent via email to:

amy@yuimamwd.com

Notices to Contractor shall be delivered to the address set forth below Contractor's signature on Part I of this Agreement to the attention of Contractor's Representative set forth in Paragraph D.2 of the Fundamental Terms of this Agreement. Changes in the address to be used for receipt of notices shall be effected in accordance with this Section 4.2.

4.3 Construction and Amendment. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction which might otherwise apply. The headings of sections and paragraphs of this Agreement are for convenience or reference only and shall not be

construed to limit or extend the meaning of the terms, covenants and conditions of this Agreement. This Agreement may only be amended by the mutual consent of the parties by an instrument in writing.

4.4 Severability. Each provision of this Agreement shall be severable from the whole. If any provision of this Agreement shall be found contrary to law, the remainder of this Agreement shall continue in full force.

4.5 Authority. The person(s) executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement, such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

4.6 Special Provisions. Any additional or supplementary provisions or modifications or alterations of these General Provisions shall be set forth in Part III of this Agreement (“Special Provisions”).

4.7 Precedence. In the event of any discrepancy between Part I (“Fundamental Terms”), Part II (“General Provisions”), Part III (“Special Provisions”), Part IV (“Scope of Services”), and/or Part V (“Budget”), Part III shall take precedence and prevail over Parts I, II, IV and V; Part II shall take precedence and prevail over Parts I, IV and V; Part IV shall take precedence and prevail over Parts I and V; and Part V shall take precedence over Part I.

4.8 Yuima Contract Management Authority. The Yuima General Manager (or his or her duly authorized representative) shall have the authority to make approvals, issue interpretations, execute documents to implement or clarify this Agreement, waive provisions, and/or enter into certain amendments of this Agreement on behalf of Yuima so long as such actions do not result in any of the following: (a) an increase in the Budget set forth in Part V hereto, (b) a decrease in the scope of services without a corresponding reduction in the Budget, or (c) an increase in the risk of liability to Yuima. Such approvals, interpretations, waivers and/or amendments may include extensions of time to perform.

PART III
SPECIAL PROVISIONS

A. The Contractor shall comply with the Insurance Requirements of Exhibit A, added in its entirety.

DRAFT

PART IV
SCOPE OF SERVICES

A. Services shall be performed in accordance with Exhibit “B,” Yuima’s Request for Qualifications Dated July 13, 2020, and Exhibit “C”, Geoscience Revised Proposal dated July 27, 2020. To the extent of conflict between Exhibit B and Exhibit “C” on work required to be performed by Contractor, the requirements of Exhibit “B” shall prevail.

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PART V
BUDGET

A. Yuima shall compensate Contractor in accordance with Section 1.8 of this Agreement per the Contractor's Rates listed in Exhibit C, dated July 27, 2020, for a not to exceed contract amount of \$907,699.00.

DRAFT

INSURANCE REQUIREMENTS

FOR

AGREEMENT NO. E-153, GEOSCIENCES SUPPORT SERVICES, INC. FOR PREPARATION OF A GROUNDWATER SUSTAINABILITY PLAN FOR THE UPPER SAN LUIS REY VALLEY GROUNDWATER SUB-BASIN

The Contractor shall not commence work under this Contract until it has obtained the insurance required hereunder in a company or companies having an A.M. Best rating of A:VII and acceptable to Yuima, nor shall the Contractor allow any subcontractor to commence work on its subcontract until all insurance required herein of the Contractor has been obtained by such subcontractor.

The Contractor shall at the time of the execution of the Agreement present certificate(s) of insurance evidencing the coverage required by this agreement. Such evidence shall include a separate additional insured endorsement and other provisions required herein.

At least thirty (30) calendar days prior to the expiration of any such policy, a signed complete certificate of insurance, with all endorsements required herein, showing that such insurance coverage has been renewed or extended will be filed with Yuima.

At the time of contract document preparation, efforts were made to include all known insurance requirements which would take place during the contract. It is possible additional insurance requirements may be made by another agency or government entity to provide additional insurance not included here. At the direction of the agency/entity, the Contractor shall comply and satisfy the additional insurance requirements.

The Contractor shall procure and maintain for the duration of the contract, and for five (5) years thereafter, insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees, or subcontractors.

Coverage shall be at least as broad as the following:

1. General Liability – Commercial General Liability (CGL) – Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury, personal and advertising injury with limit of at least two million dollars (\$2,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to Yuima or the general aggregate limit shall be twice the required occurrence limit.

2. Automobile Liability – Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01) covering Symbol 1 (Any Auto) with limit of one million dollars (\$1,000,000) for bodily injury and property damage each accident.

3. Workers' Compensation Insurance – The Contractor shall provide Workers' Compensation coverage as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than \$1,000,000 per accident for bodily injury or disease.

Waiver of Subrogation (also known as Transfer of Rights of Recovery Against Others to Us) – The Contractor hereby agrees to waive rights of subrogation to obtain endorsement necessary to affect this Waiver of Subrogation in favor of Yuima, its directors, officers, employees, and authorized volunteers, for losses paid under the terms of this coverage which arise from work performed by the Named Insured for Yuima; this provision applies regardless of whether or not Yuima has received a Waiver of Subrogation from the insurer.

4. Builder's Risk is not required.
5. Contractor's Pollution Liability is not required.
6. Professional Liability (Errors and Omissions) The Contractor shall provide Professional Liability Insurance for the services provided acceptable to Yuima with limits of no less than 1,000,000 per occurrence or claim, and \$2,000,000 policy aggregate.

If the Contractor maintains broader coverage and/or higher limits than the minimums shown above, Yuima requires and shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum of insurance and coverage shall be available to Yuima.

Other Required Provisions – The Commercial General Liability policy and Contractor's Pollution (if necessary) are to contain, or be endorsed to contain, the following provisions:

1. Additional Insured Status – Yuima, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 10 11 85 or if not available, through the addition of **both** CG 20 10 10 01 and CG 20 37 10 01) with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations. General Liability coverage can be provided in the form of an endorsement to the Contractor's insurance.
2. Primary Coverage – For any claims related to this project, the Contractor's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to Yuima, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by Yuima, its directors, officers, employees, and authorized volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

Notice of Cancellation – Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to Yuima.

Acceptability of Insurers - The Contractor agrees that it will comply with such provisions before commencing work. All of the insurance shall be provided on policy forms and through companies satisfactory to Yuima. Yuima reserves the right to obtain complete, certified copies of all required insurance policies, including the policy declarations page with endorsement number. Failure to continually satisfy the insurance requirements is a material breach of contract.

Deductibles and Self-Insured Retentions – Insurance deductibles or self-insured retentions must be declared by the Contractor and approved by Yuima. At the election of Yuima, the Contractor shall either cause the insurer to reduce or eliminate such self-insured retentions as respects Yuima, its directors, officers, employees, and authorized volunteers or the Contractor shall provide a financial guarantee satisfactory to Yuima guaranteeing payment of losses and related investigations, claim administration, and defense expenses. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or Yuima.

Verification of Coverage – Evidence of Insurance – The Contractor shall furnish Yuima with copies of certificates and amendatory endorsements effecting coverage required by this Contract. All certificates and endorsements are to be received and approved by Yuima before work commences. However, failure to obtain the required documents prior to the working beginning shall not waive the Contractor’s obligation to provide them. Yuima reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration pages and Endorsement pages, required by these specifications, at any time. Failure to continually satisfy the insurance requirements is a material breach of contract.

Continuation of Coverage – The Contractor shall, upon demand of Yuima deliver evidence of coverage showing continuation of coverage for at least five years after completion of the project. Contractor further waives all rights of subrogation under this agreement. When any of the required coverages expire during the term of this agreement, the Contractor shall deliver the renewal certificate(s) including the General Liability Additional Insured endorsement and evidence of Waiver of Rights of Subrogation against Yuima (if Builder’s Risk Insurance is applicable) to Yuima at least ten days prior to the expiration date.

Subcontractors – In the event that the Contractor employs other contractors (subcontractors) as part of the work covered by this agreement, it shall be the Contractor’s responsibility to require and confirm that each subcontractor meets the minimum insurance requirements specified above (via as broad as ISO CG 20 38 04 13). The Contractor shall, upon demand of the District, deliver to Yuima copies of such policy or policies of insurance and the receipts for payment of premiums thereon.

Additional Clarifications:

- General Liability and/or Automobile Liability coverage shall include mobile equipment.
- All insurance terms provided by the Contractor for this contract are subject to approval and acceptance by Yuima.

- Yuima, its directors, officers, employees, authorized volunteers, shall be named, by separate endorsement, as additional insureds on each policy.
- Contract Name and/or Contract Number shall be indicated on each insurance certificate.

**REVISED REQUEST FOR
QUALIFICATIONS (RFQ)
GROUNDWATER SUSTAINABILITY PLAN (GSP)
FOR
SAN LUIS REY VALLEY GROUNDWATER BASIN
SAN DIEGO COUNTY, CALIFORNIA**

REVISION DATE: July 13, 2020

RFQ Issued: March 27, 2019

Pre-Submittal Meeting: April 14, 2019, 1:00 p.m.

Initial RFQ Submission Deadline: 4:30 p.m., May 15, 2019

Yuima Municipal Water District

34928 Valley Center Road

Pauma Valley, CA 92061-0177 (760) 742-3704

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iv. Project Experience (Maximum: 5 pages).....	4
v. Project Approach (Maximum: 20 pages).....	4
vi. References (Maximum: 2 pages)	5
vii. Conflict of Interest (No page limit).....	5
viii. Fee Schedule (No page limit).....	6
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FIGURES

- I Upper San Luis Rey Valley Groundwater Sub-Basin

1. BACKGROUND

On September 14, 2014, the Governor of California signed into law California Senate Bills 1168 and 1319, and California Assembly Bill (AB) 1739 (collectively, the "Sustainable Groundwater Management Act", or "SGMA"). In accordance with SGMA, the County of San Diego (County), Pauma Valley Community Services District (Pauma Valley CSD), Upper San Luis Rey Resource Conservation District (USLRRCD), and Yuima Municipal Water District (Yuima MWD) formed a multi-agency Groundwater Sustainability Agency (GSA) for those portions of the San Luis Rey Valley Groundwater Basin required to be managed per SGMA. As required by SGMA, the objective of the GSA will be to prepare a Groundwater Sustainability Plan (GSP) that will address and provide a roadmap to reach groundwater sustainability in the Upper San Luis Rey Valley Subbasin (Basin No. 9-7.001) ("Basin") within 20 years.

Per SGMA (e.g., Water Code, § 10727.2) and the Emergency Regulations for GSPs and Alternatives¹ (Emergency Regulations) approved by the California Water Commission on May 18, 2016, the GSP must include a physical description of the Basin, including groundwater levels, groundwater quality, subsidence, and information on groundwater and surface water interaction; data on historical and projected water demands and supplies as well as other pertinent information. In addition, the GSP must identify the specific projects and management actions that the local governments and water supply agencies will evaluate for implementation over the planning and implementation horizon, as needed, to prevent undesirable results; measurable objectives for monitoring GSP effectiveness; data monitoring, management and reporting provisions; and the milestones for GSP implementation.

GSPs are prepared by GSAs and submitted to the California Department of Water Resources (DWR) for approval. A GSP for the Upper San Luis Rey Valley Groundwater Sub-Basin (Basin No. 9-7.001) (See Figure 1) must be adopted and submitted to DWR by January 31, 2022.

2. BASIN INFORMATION

According to DWR's *California's Groundwater: Bulletin 118 (Bulletin 118)*, the medium-priority Basin (Number 9-7, which has been divided by DWR into Sub-Basins 9-7.001 and .002.) extends from the confluence of the San Luis Rey River and Paradise Creek continuing downstream through four valleys (Pauma, Pala, Bonsall and Mission) and ending at the Pacific Ocean in the City of Oceanside (Figure 1). Based on prior decisions by the State of California for the San Luis Rey Valley Groundwater Basin, the groundwater in the Mission, Bonsall, and Pala Subbasins, located downstream of Frey Creek, have been determined to be a subterranean stream flowing through known and definite channels. SGMA specifically excludes subterranean streams from its requirements, though impacts on surface waters of groundwater extraction will need to be evaluated in the GSP. The "Pauma Subbasin" extends from the confluence of the SLR River and Paradise Creek to the Agua Tibia Narrows near the confluence of the SLR River and Frey Creek. The "Pala Subbasin" extends from the Agua Tibia Narrows to Monserate Narrows.

During August, 2018 the Legislature passed, and the Governor subsequently signed, AB 1944, which redefined the boundaries of the San Luis Rey groundwater basins to become just the Upper Subbasin and the Lower Subbasin, with the boundary between the two being the Monserate Narrows immediately East of Interstate 15. In addition to complying with SGMA and the Emergency Regulations, the implementation measures of the GSP will need to meet the needs of the local agencies and other groundwater users in the Upper Subbasin of the Basin, including Tribal entities. The consultant will also be required to provide support for comprehensive stakeholder involvement which will include regularly scheduled public meetings to aid in developing the GSP.

3. REQUEST FOR QUALIFICATIONS

This RFQ is being issued by the Yuima MWD to retain professional consulting services, appropriately licensed by the State of California (Emergency Regulations Section 354.12), to prepare a GSP for the Upper San Luis Rey Valley Groundwater Sub-Basin. It is anticipated that the contract which will be developed with the chosen consulting team will only allow work to be performed following the issuance of Task Orders or Notices to Proceed by Yuima. It is anticipated that the initial Task Order will be issued shortly following contract execution and will call for the consultant to perform the tasks necessary to complete the Data Development phase of the overall GSP. Subsequent task orders will be issued for the consultant to perform the additional tasks necessary to complete the development of the final GSP.

Yuima MWD will not pay for any costs incurred in preparation and submission of the qualifications, or in anticipation of a contract.

4. QUALIFICATIONS SUBMISSION DEADLINE

Revised Submittals shall be emailed to Amy Reeh at the following email address before 4:30 pm July 27, 2020.

Amy @yuimamwd.com

Submittals shall be clearly marked as follows:

Revised Qualifications for Preparation of a Groundwater Sustainability Plan for the Upper San Luis Rey Valley Groundwater Sub-Basin of the San Luis Rey Valley Groundwater Basin.

No late submission will be accepted for any reason. No exceptions will be allowed.

5. QUALIFICATION SUBMITTAL REQUIREMENTS

Each revised submittal shall be limited to the maximum number of pages listed for each section. Qualifications shall be submitted via email to Amy Reeh at amy@yuimamwd.com.

i. Cover Letter (Maximum: 1 page)

Include in the cover letter, the office location where the project will be managed, and the name, title and location of the project manager.

ii. Revised Statement of Qualifications (Maximum: 5 pages)

Provide a summary demonstrating the offeror's and any subconsultants unique qualifications necessary to prepare a GSP and provide services and support related to any other SGMA needs of stakeholders within the Upper San Luis Rey Groundwater Sub-Basin. The revised summary needs to respond to the changes in the RFQ but otherwise need not be revised by the Consultant.

iii. Project Team (Maximum: 2 pages per resume, No section page limit)

Include an organization chart illustrating the key project team members, the firms they are affiliated with, and the role each will serve on the project; clearly identify the name and title of the proposed project manager; provide a brief resume demonstrating qualifications for successfully completing this work for each key project team member, their office location, and a brief summary for each proposed sub-consultant firm. The final contract will include a commitment of time and participation by the key staff identified by the consultant to be important to the objectives of the GSP for the study area. There is no requirement to revise the Project Team component unless the Consultant desires to update their proposed team from the last submission.

iv. Project Experience (Maximum: 5 pages)

Include a description for at least five projects that demonstrate the qualifications of the firm to prepare a GSP for the Basin. Responding firms should specifically describe which GSAs they are currently under contract to perform work for, any other SGMA-related work, and/or groundwater management experience that would be pertinent to prepare a GSP for the Basin. Indicate the key project team members for each project or SGMA related experience described. There is no requirement to revise the Project Experience component unless the Consultant desires to update their experience from the last submission.

v. Project Approach (Maximum: 20 pages)

Provide a description of the proposed tasks that will be required or recommended to complete a legally compliant GSP for the Basin. Identify those tasks that will involve significant input and participation from stakeholders/public and those tasks that will require significant decisions from the Upper San Luis Rey Executive Team (“Executive Team”)¹ Describe the

¹ The Executive Team is composed of appointed representatives from the three members of the Upper San Luis Rey GSA, Yuima, Pauma Valley CSD, and the Upper San Luis Rey Resource Conservation District. Representatives of the San Luis Rey Indian Water Authority, Valley Center Municipal Water District, Pauma Municipal Water

proposed approach for implementing SGMA and the Emergency Regulations with respect to preparing the GSP. Describe projects and management actions (“PMA”) milestones, appropriate deliverables, and important decisions to be made by the Executive Team that will be necessary to complete a GSP for the Basin. Include a project schedule/Gantt chart. The target completion date for the GSP is December 31, 2021.

Drawing upon GSPs or approved alternatives that have already been prepared in California, including but not limited to plans in the Central Valley, Ventura County, Borrego Springs, and other pertinent locations where GSPs or alternatives have already been submitted to DWR, the consultant will be required to recommend a suite of PMAs that can potentially be taken by the GSA to ensure the Upper San Luis Rey Valley Sub-Basin achieves sustainability by the conclusion of the SGMA implementation period of twenty years. The Consultant will also be required to recommend sustainability projects and appropriate enforcement mechanisms in the GSP where undesirable results are identified by the GSA.,. The Consultant should also demonstrate qualifications to recommend funding strategies for incorporation into the GSP that will ensure the GSA has a consistent and adequate source of funding to support future GSA activities and implementation of PMAs. The selected consultant is expected to demonstrate a clear understanding of the jurisdictional complexities, asserted water rights, unique geologic and hydrogeological characteristics of the entire San Luis Rey Valley Basin, state requirements and stakeholder concerns specific to the Pala and Pauma Subbasins (Upper Subbasin).

The Project approach must also include a description of how the GSP will satisfy all of the requirements of the grants that Yuima currently administers for development of a GSP within the Sub-Basin.

Portions of the La Jolla, Pala, Pauma, and Rincon Tribes are located within the Upper Subbasin. The San Pasqual Tribe is also located in the vicinity of the Upper Subbasin. The GSP and GSA will need to consider and respect federally reserved water rights to groundwater as part of the management of the Basin. A confidentiality agreement between the consultant and tribes (as well as other pumpers) may be required in order to ensure the consultant can obtain pumping, well elevation, and other data to complete the GSP,

Time is of the Essence: The ability of the consultant to execute on preparation of the GSP quickly, without substantial time to get up to speed, for development and completion of the GSP, utilizing approaches submitted by GSAs in other critically over drafted basins, will be a significant factor in determining the best qualified consultant to prepare the GSP.

vi. References (Maximum: 2 pages)

Provide contact names and phone numbers for at least three (3) references for similar projects that the Proposer has performed related services within the last five years. Please include a brief description of the services provided, the duration of the project, the

District, and Rainbow Municipal Water District have also been invited to join the Executive Team in an ex officio capacity.

completion status of the projects, the total contracted fee for the project, and the agency contact name, title, phone number, and email. The consultant may update references but is not required to do so.

vii. Conflict of Interest

Provide a discussion of any potential conflicts of interest the firm may have in performing this work for the GSA and any work currently being done or previously performed for any of the stakeholders, water rights holders, or land owners in the San Luis Rey Basin. Stakeholders are defined as all governmental and Tribal interests within the San Luis Rey Valley Groundwater Basin, as well as any major landowner or business within said area.

viii. Fee Schedule and Cost Proposal (No page limit)

Include a fee schedule listing the billing rates for all classifications of personnel and sub-consultants that may be assigned to the project. Be advised that the fee schedule shall be included as an attachment to any contract that may result from this selection process, and, therefore, the fee schedule should reflect billing rates that will remain in effect through January 31, 2022. A total cost proposal must also be submitted based upon the submitted fee schedule which provides the total estimated cost for the proposing consultant to complete the GSP in compliance with the requirements identified herein.

All work associated with the preparation of the GSP and other tasks assigned by Yuima MWD shall be performed on a time and materials basis with a Cost Not to Exceed provision, which shall be negotiated with the successful consultant and included in the Executed Agreement for the subject work under individual Task Orders to be reviewed and approved by Yuima MWD. All work shall be completed to the satisfaction of Yuima MWD and the Executive Team within the time periods allocated for each Task Order and within the budget assigned to each Task Order.

6. QUALIFICATION REVIEW AND SELECTION PROCESS

Consistent with the amended MOU, Yuima MWD and the Executive Team will select a GSP consultant based upon their determination of who is best qualified to perform the work in a timely and cost-effective manner.

7. SCHEDULE

A fully executed agreement with the selected firm(s) is anticipated by July 31, 2020.

8. CONTACT INFORMATION

All comments and questions regarding this RFQ shall be made in writing via email or U.S. Mail to Yuima MWD at:

amy@yuimamwd.com

Yuima Municipal Water District
P.O. Box 177
Pauma Valley, CA 92061-0177

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SGWP Grant and IRWM DACI Grant Tasks Comparison

IRWM DACI Grant			SGWP Grant		
Task	Title	Activities	Task	Title	Activities
4.1	Project Management		Cat A	Grant Administration	
		Quarterly progress reports and invoices, and Needs Assessment Project Management and Grant Administration to be done by Yuima Staff.			Manage grant agreement; Submit invoices; Quarterly progress reports. Includes administrative responsibilities associated with the Project such as coordinating with DWR, partnering agencies, and consultants/contractors. Project Management and Grant Administration to be done by Yuima Staff
4.2	DAC Outreach		Cat B	GSP Development	
4.2a	Community Outreach – GSP	Quarterly stakeholder outreach and community engagement activities during GSP preparation; Prepare background materials on SGMA implementation and GSP process; outreach and Executive Team meetings held with local agencies and public to discuss GSP components; consensus approach to necessary projects and management actions	1	Monitoring Program and Data Management System	Evaluate existing monitoring network; recommendations on expanding network; develop an ongoing monitoring program to including water level monitoring and water quality sampling throughout GSP implementation phase; develop a data management system to store and report information relevant to the GSP and basin monitoring
			2	Water Level and Quality Data – Pala Subbasin	Conduct water level monitoring and groundwater quality sampling of wells in areas where pumping and water-level decline are greatest in the Pala Subbasin; includes aquifer testing on wells and evaluation of aquifer parameters
4.3	Planning				
4.3a	Existing Data Compilation and Assessment	Collection and assessment of data, including reports, plans, studies, models, well information, basin condition, pumping records, groundwater elevation, water quality, stream gauging, precipitation, water rights summary, water demand, etc.; prepare tech memo	3	Groundwater Sustainability Plan (GSP) Development	Prepare Draft GSP that meets SGMA regulations and DWR requirements, including, but not limited to, the sections outlined below.
4.3b	Water Level and Quality Data	Conduct quarterly water level monitoring and semi-annual water sampling/analysis of wells in groundwater monitoring network in Pauma Subbasin	3.1	Plan Introduction	Purpose of GSP; Summarize Sustainability Goal; Admin/Agency Info; GSP organization
4.3c	Water Budget	Develop hydrogeologic flow model/water budget for Subbasins to simulate current conditions in groundwater system regarding water levels and water quality for model to predict future impacts; forms basis for understanding sustainable use of basin	3.2	Plan Area	Describe geographical and jurisdictional areas and other features, including, water resources monitoring/management program; general and land use plans; additional GSP element; communication section how GSP may change water demands; etc.
			3.3	Basin Setting – Pala Subbasin	Analyze current and historical groundwater conditions, including groundwater elevation data, estimate of groundwater storage, groundwater quality issues. Develop and analyze water budget for current, historical and future conditions of the Pala Subbasin; provide information on Management areas. Combine the Pala Subbasin information with the Pauma Subbasin for inclusion in GSP
			3.4	Hydrogeologic Conceptual Model	Create a hydrogeologic conceptual model for both the Pala and Pauma Subbasins to include in GSP; develop the hydrogeologic flow model to simulate current conditions and future impacts to the groundwater system regarding water levels and water quality; model will consider both surface and groundwater data and run predictive simulations to determine effects of recharge and extraction on levels and quality along with implementation measures detailed in GSP; prepare an assessment of sustainable management that will detail proposed projects and management action necessary to bring the SLR Basin into sustainability

IRWM DACI Grant			SGWP Grant		
Task	Title	Activities	Task	Title	Activities
			3.5	Sustainable Management Criteria	Identify and evaluate Sustainability Management Criteria based on hydrogeologic conceptual model, groundwater conditions and water budgets. Include: Sustainability Goals, Measurable Objectives; Minimum Thresholds; Undesirable Results; Monitoring Network
			3.6	Projects and Management Actions to Achieve Sustainability Goal	Develop and analyze projects and management actions to achieve sustainability goal. Include: identified projects and management actions, management scenarios, project schedule and time accrual of expected benefits, and cost estimates and plan to meet costs
			3.7	GSP Implementation	Prepare and plan for GSP implementation. Include: Estimate of GSP implementation costs, schedule for implementation, annual reporting; and process for required periodic evaluations
			3.8	Groundwater Sustainability Plan	Prepare Draft GSP utilizing data and results obtained from modeling and basin analysis that identifies activities and recommended implementation measures needed to meet groundwater sustainability requirement in the SLR Basin. Distribute Draft GSP to appropriate parties for review/comment prior to finalizing; collect/evaluate comment, provide responses to comments, and incorporate revisions into the Final GSP.



**Revised Statement of Qualifications for
Groundwater Sustainability Plan
for San Luis Rey Valley Groundwater Basin**

Prepared For:
Yuima Municipal Water District

July 27, 2020

GEOSCIENCE
PO Box 220
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The First Name in Groundwater

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July 27, 2020

SLR Working Group
c/o Amy Reeh
Yuima Municipal Water District
34928 Valley Center Road
Pauma Valley, CA 92061-0177

RE: Qualifications for Preparation of a Groundwater Sustainability Plan for the San Luis Rey Valley Groundwater Basin

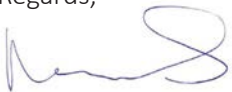
Dear Ms. Reeh and members of the GSA,

Thank you for the opportunity to provide a revised scope of work and cost proposal to complete the Upper San Luis Rey Groundwater Sustainability Plan. In reviewing the stakeholders and key issues in the basin it became apparent that members of the Upper San Luis Rey Valley GSA have accomplished a lot by working together to create a Groundwater Sustainability Plan (GSP). Our approach will build upon the work already completed and maximize the investment that all members of the SLR Workgroup members are making to sustainably manage groundwater resources in the Pala and Pauma valleys.

Our project team selected based on a careful consideration of your strategic objectives. We feel that they are uniquely qualified to partner with you on this effort. Many of our team members have worked in your Basin and understand your issues and concerns presented by this GSP effort. We also provided recommended and optional tasks that while not required to develop a compliant GSP, would improve project efficiency and help GSA members to get more from the time and resources spent with this effort.

If you have any questions or need any additional information, please feel free to contact our project manager, Brian Villalobos, PG, CHG, CEG at (909) 451-6650, or via email at bvillalobos@geoscience-water.com. We look forward to the opportunity to partner with you and all of the SLR Workgroup members and staff to complete this project.

Regards,



Mark Williams, PhD, PE
Vice President



Brian Villalobos, PG, CHG, CEG
Project Manager/Principal Geohydrologist



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Statement of Qualifications

For more than 40 years, Geoscience has focused on only one thing: groundwater. We were one of the first firms in the State to focus solely on groundwater modeling, studies, and production wells. Over the past 40 years we have completed **more than 2,000 groundwater studies, and more than 1,000 production well designs and/or rehabilitation projects.**

We have completed all studies required in a GSP including basin-wide sustainable management studies, safe yield, solute transport, well siting studies, and others. We are currently completing and/or supporting GSPs for other agencies and are under contract with the Department of Water Resources to peer review models developed for GSPs.

We have completed sustainable yield and similar studies in the Pauma and Pala Valleys—enabling us to build on previous work to efficiently complete a comprehensive GSP. Our strength lies in our more than four decades of experience completing each component required in a GSP, and our ability to gain consensus among multiple stakeholders, each with competing interests.

Because of our focus on groundwater modeling, we have continuously provided each of the services requested in the RFQ for the past four decades. **Our team has completed 12 studies in the San Luis Rey Groundwater Basin,** including sustainable yield studies in the Pala and Pauma Valleys in 1993. We are currently helping other districts sustainably manage their groundwater resources, including Rancho California Water District and the City of Oceanside (immediately north and south east of the project area, respectively).

Team Member Qualifications

We have developed a team of local and experienced firms to help complete the project. Virtually all of our

Geoscience Team Experience

25+

Groundwater Management Plans and Plan Components—*our familiarity makes us an ideal partner to help you meet SGMA guidelines and sustainably manage groundwater resources*

2,000+

Groundwater Basin Studies Completed by our Team—*help you identify detailed and comprehensive solutions to groundwater issues*

12

Studies completed in the Upper San Luis Rey Groundwater Basin by our team—*familiarity with the local hydrogeology, stakeholders, and complex jurisdictional divisions will help expedite data collection and GSP development*

20

Groundwater Monitoring Networks Developed and Gap Analyses Completed in the past five years—*partner with you to identify and acquire needed information to manage your groundwater basin*

120+

The Number of Stakeholders on a Single Project Involving Federally-reserved water rights—*our experience on projects with Federally-reserved water rights can help prevent issues and gain project acceptance*

subconsultant partners have experience in the region and in the San Luis Rey River Valley.

SCS Engineers

SCS is an employee-owned environmental consulting and construction firm that designs and implements sustainable environmental solutions. They have a long history serving clients in the San Diego area; including local Native American Tribes, local water districts, and the County of San Diego. As a full service provider, they study challenges and design solutions; remediate, build and operate environmental and energy projects and systems; and monitor a wide range of environmental control systems. Their core capabilities include hydrogeology, hazardous waste management, site remediation, and regulatory compliance for air, water, and soil.

SCS has provided groundwater consulting services and studies for the Pala, Pauma, Rincon, and La Jolla Tribes. Their pre-existing relationships and successful serving of the needs of each tribe will continue to help build trust and encourage participation. Additionally, SCS Engineers' lead hydrogeologist assigned to the project, Chuck Houser, CHG, completed extensive research on the valley's geology, providing our team with a unique and in depth perspective of the region and its hydrogeology.

Because of SCS's in-depth experience in, and close proximity to the valley, they will support our team by completing data collection, developing a monitoring program, and collecting additional field data.

HELIX Environmental

HELIX Environmental Planning, Inc. (HELIX)—an employee-owned company with headquarters in San Diego County (La Mesa) and additional offices in North San Diego (Carlsbad), Orange, Riverside, and Sacramento counties—has been providing environmental consulting services since 1991. With 26 years of experience providing environmental services in the San Diego region, HELIX has become intimately familiar with the local environment; County and other agency regulations, and personnel in the community and agencies that influence the success of proposed programs and projects.

HELIX has also established excellent working relationships with the Native American community, having conducted extensive archaeological monitoring for numerous public infrastructure and biological mitigation projects in the County, including along the San Luis Rey River. Six of HELIX's biologists are formally approved by the County to provide technical analysis related to biological resources and HELIX's biology staff has collectively completed thousands of biological inventories. This experience includes numerous surveys and biology reports for projects located in all areas of the County and also includes extensive experience

"Thank you (HELIX) for all your hard work. If not for your team's high quality work and effort, it would be difficult (if not impossible) to meet the expedited time-lines."

- Environmental Coordinator, County of San Diego

with mapping vegetation communities in accordance with both the Oberbauer modified Holland Code and the Sawyer Keeler Wolf vegetation classifications. They also have experience and certifications to assess protected and endangered species including the Arroyo Toad.

HELIX will perform desk-top environmental reviews to support the GSP.



HELIX has experience providing environmental assessments in the San Luis Rey Watershed, and has provided assessments for Arroyo Toad habitat in other watersheds in California

Participation by Design

Participation by Design was recently founded by Lewis Michaelson after working for Katz & Associates for more than 18 years. Although cooperation and consensus are preferred when developing a GSP, there are naturally competing interests and potential conflicts which inevitably arise. Having a professional experienced in conflict management and prevention, such as Lewis Michaelson, lead stakeholder engagement efforts will be essential to the project's success.

Lewis will work in conjunction with Katz & Associates to manage stakeholder engagement and implement the GSP Stakeholder Engagement Plan.

Katz & Associates

Katz & Associates, Inc. (K&A) is a full-service communications firm specializing in public involvement strategy development and implementation for government agencies and programs. From their San Diego office, they offer a diverse team of public affairs professionals with expertise in all forms of communications, including public participation, community relations, environmental communication, risk communication, stakeholder research and analysis, facilitation, citizen advisory committees, consensus building, social media, media relations, public information and education, coalition management, and website maintenance and support.

K&A was established in 1986 and maintains offices in San Francisco, Los Angeles, and San Diego. With over 40 employees, almost all of their business is with government organizations including municipalities and water districts—in face, more than 60 percent of their business is in the water industry.

K&A has worked in almost every community in San Diego County implementing public outreach campaigns and implementing hundreds of local projects on behalf of the City of San Diego, other local cities, the County, and various government agencies. K&A will work in conjunction with Lewis Michaelson of Participation by Design and our team to support stakeholder engagement efforts including implementing the GSP Stakeholder Engagement Plan.

John Robinson Consulting

John Robinson Consulting, Inc. is a general consulting firm that specializes in management consulting for special districts, water districts, and municipal clients, John

Robinson, the firm’s principal, has more than 20 years of experience in water resources planning, water permitting (WDR/WRR), recycled water regulations, recycled water customer conversions and water system funding.

Because John Robinson Consulting has multi-disciplinary experience in water engineering, funding, permitting, and legal issues, they can help provide ordinance and permitting recommendations that are defensible and withstand scrutiny.

John Robinson will lead ordinance and permitting reviews and support rate study efforts for the project.

Raftelis

Raftelis has a unique focus on the utility and public sector. They understand how these organizations operate from top to bottom and the unique challenges they face. The staff at Raftelis not only includes industry-leading consultants, but also former utility and municipal leaders with decades of hands-on experience. Their experts sit on national finance and management committees, helping to set industry standards for utility rate setting, finance, management, and operations. Their experience and expertise will allow the SLR Working Group to be confident that their recommendations are insightful and founded on sound industry principles. Raftelis was founded in 1993 and has experience supporting multiple GSP efforts including GSPs in San Diego County.

Raftelis will assess funding options for GSP implementation, and if needed, can complete rate studies to help justify fees to implement the GSP.

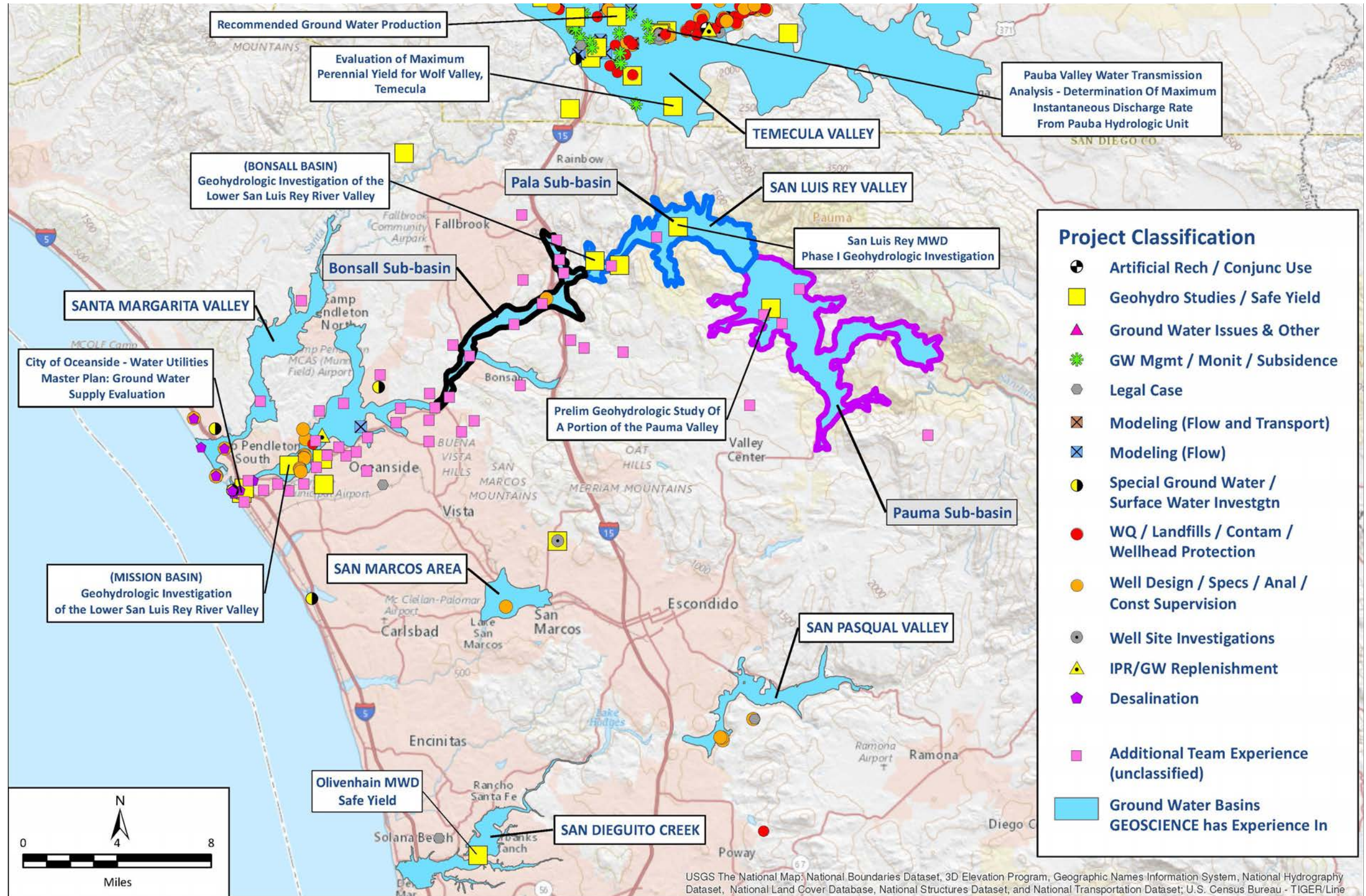
Team Roles

The following table summarizes each team members role and unique contribution to this project.

Additional Experience

Members of our team have completed projects in the San Luis Rey River Valley and surrounding areas. The following page contains a map of projects completed by our team, followed by a table listing additional experience with projects that share common elements to this GSP.

Team Member	Role	Benefit
Geoscience	Prime Consultant, Hydrogeology, Groundwater Studies, and Modeling	Expertise in groundwater modeling—accurate studies and models
SCS Engineers	Data Collection, Monitoring Well Network, Field Data Collection	Experience with basin stakeholders—streamline data collection
HELIX Environmental	Environmental Desktop Review	Experience with sensitive and endangered species in the area—identify issues before they impact the project
Participation by Design	Communication and Outreach Lead	Specialize in conflict resolution—help avoid and/or mitigate conflicts and opposition
Katz & Associates	Communication and Outreach Support	Experience with water projects in San Diego County—help build consensus and reduce potential opposition
John Robinson Consulting	Ordinance and permitting reviews	Identify ordinance and permits required for GSP implementation early—avoid project delays
Raftelis	Funding Assessment	Experience with other GSPs and water Districts—identify GSP implementation funding that’s defensible



Local Experience:

Our team has completed dozens of projects in the San Luis Rey River Valley Basin (illustrated above). In 1993, Geoscience completed a water balance and safe yield study for the Pauma and Pala Valleys therefore completing the water budget portion of the GSP will be an update of previous work conducted by our team. Additionally Geoscience recently completed several groundwater studies including geohydrologic investigations in the Bonsall and Mission Subbasins. Because we have much of the data needed to consider the impact on the lower groundwater basin, we can potentially reduce the time and resources needed to complete the assessment. Nearly all of our subconsultant team members have completed projects for the county and/or the GSP stakeholders including the Pala, Pauma, Rincon, and La Jolla Tribes.

Similar Projects

In addition to the projects provided in the Project Experience Section, we have worked on more than 17 projects within the past five years that include a GSP or studies required to complete a GSP. The table below lists some of our recent projects and their relevancy to a GSP.



Depth of Experience

Geoscience has completed each of the studies required for a Groundwater Sustainability Plan. Enabling us to provide you with work products that are defensible and will meet SGMA requirements.

Project and Client	Groundwater Management Plan Components	Basin Scale Groundwater Studies	Develop, Apply, and/or Review Groundwater Flow Models	MODFLOW based Groundwater Modeling	Data Gap Assessment and Monitoring Network Installation	Assess Groundwater Use on Streamflow/ Groundwater Dependent Ecosystems	Collaborate with Groundwater Management Stakeholders	Hydrogeologic Characterization Studies to Assess Supply, Quality, Recharge and Related Programs	Prepare Technical Reports
Arlington Basin Groundwater Sustainability Plan, Western Municipal Water District*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Groundwater Supply and Brine Management Program, Olivenhain Municipal Water District*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mission Basin Water Supply, City of Oceanside*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Upper Santa Ana River Valley Integrated Model, San Bernardino Valley Municipal Water District*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Antelope Valley Groundwater Adjudication, Los Angeles County	✓	✓	✓	✓	✓	✓	✓	✓	✓
Yucaipa Basin Safe Yield, San Bernardino Valley Municipal Water District	✓	✓	✓	✓	✓	✓	✓	✓	✓
Streamflow Model, Rancho California Water District*	✓	✓	✓	✓	✓	✓	✓	✓	✓
Annual Groundwater Audit, Rancho California Water District	✓	✓	✓	✓	✓	✓	✓	✓	✓
Paso Robles Basin Groundwater Model, San Luis Obispo County	✓	✓	✓	✓	✓	✓	✓	✓	✓
TDS and Nitrate Flow Model, San Bernardino Valley Municipal Water District	✓	✓	✓	✓	✓	✓	✓	✓	✓
Downstream Surface Water Impacts, Riverside Public Utilities	✓	✓	✓	✓	✓	✓	✓	✓	✓
Well Rehabilitation and Groundwater Modeling Program, Riverside Public Utilities	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chino Basin Desalter Expansion, Chino Basin Desalter Authority	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monterey Peninsula Water Supply Project, Cal AM Water	✓	✓	✓	✓	✓	✓	✓	✓	✓
West Coast Basin Barrier Project Model Update, West Basin Municipal Water District	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alamitos Barrier Improvement Project, Orange County Water District	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pismo Beach Groundwater Model, City of Pismo Beach	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Project described in the Project Experience section of this proposal



Project Team

We developed our team to address stakeholder needs and the issues inherent to completing this GSP.

Accurate and Defensible Data and Studies

Developing a GSP that serves as a tool to sustainably manage future water supply requires accurate data and models that can accurately predict future conditions. With more than 40 years of experience delivering focused groundwater consulting, Geoscience can provide accurate data and studies that are defensible and provide sufficient data to make informed management decisions.

Stakeholder Engagement

Because of the numerous stakeholders in the basin, we have included Katz & Associates and Participation by Design on our team to lead stakeholder engagement efforts. Participation by Design specializes in conflict prevention and resolution, and Katz & Associates has decades of experience supporting water projects in San Diego County. Together, they will help engage stakeholders throughout the GSP process to help gain consensus and project support.

Environmental Issues

In visiting the site on multiple occasions, our team noted a substantial Arroyo Toad habitat within the Rincon reservation. Because of the potential impacts to observed protected and endangered species in the project area, we included HELIX Environmental Planning on our team to help assess groundwater dependent ecosystems and potential environmental impacts from proposed projects and management actions. HELIX has experience completing environmental assessments along the San Luis Rey River, including assessments for Arroyo Toad.

Our Team by the Numbers

4

Of the five tribes near the GSP project area have worked with our team member, SCS Engineering—our team’s pre-existing relationships can help expedite data collection and help address stakeholder concerns

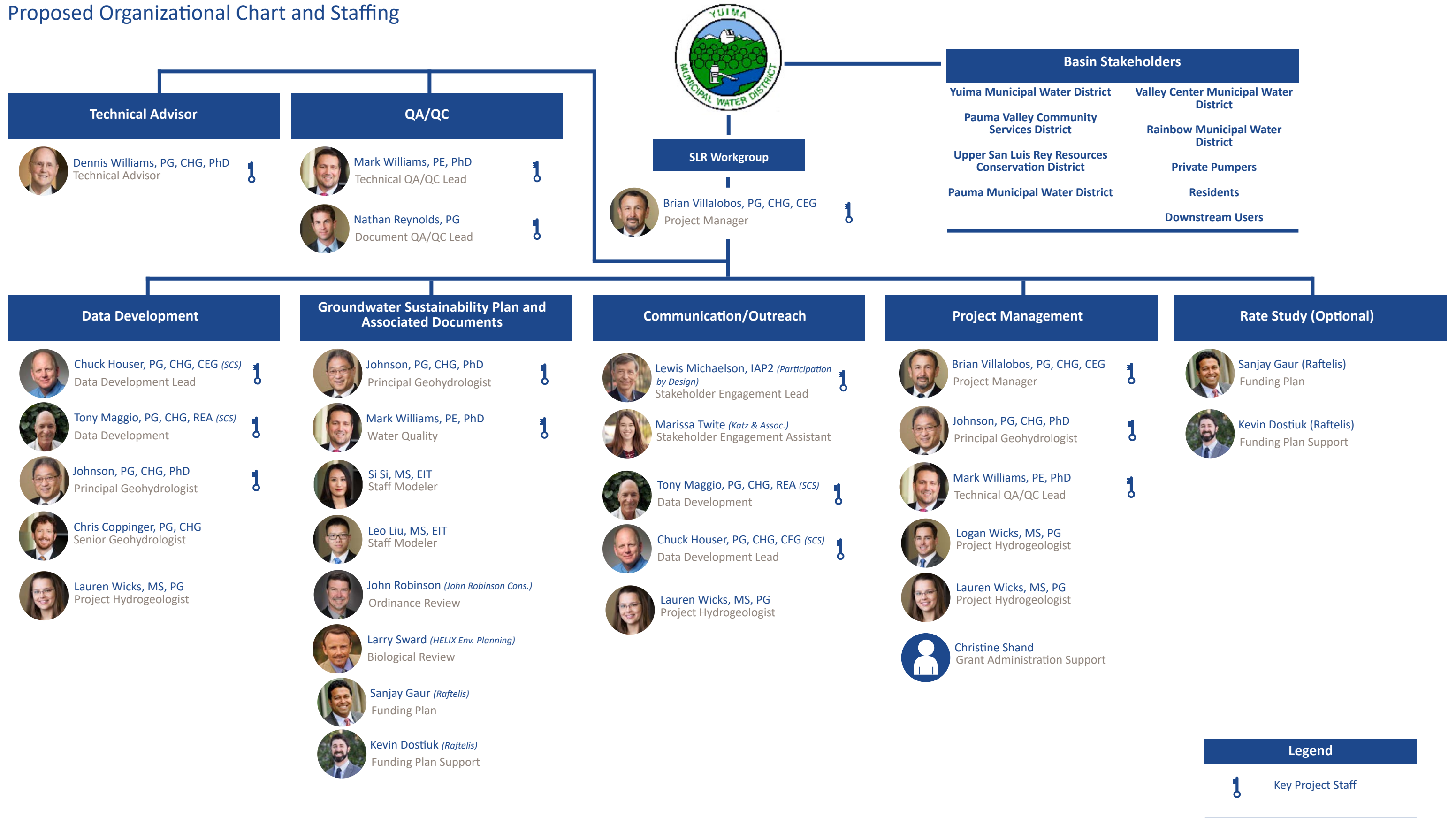
12

Studies completed in the Upper San Luis Rey Groundwater Basin by our team—familiarity with the local hydrogeology, stakeholders, and complex jurisdictional divisions will help expedite data collection and GSP development

Implementation Funding Sources

Funding sources and potentially new local ordinances may be necessary to implement the GSP. To help identify potential funding sources and ordinances we have teamed with John Robinson Consulting. John Robinson specializes in helping water agencies to identify sources of funding, complete rate studies, and assess potential ordinances.

Proposed Organizational Chart and Staffing



Legend

Key Project Staff



Brian Villalobos, PG, CHG, CEG Principal Geohydrologist/Project Manager

Years of Experience: 29
Years with Geoscience: 10

Education:

BS, Geology, California State University, Los Angeles

Professional Registrations:

California Professional Geologist
(No. 4153)

Certified California Hydrogeologist
(No. 794)

California Certified Engineering Geologist (No. 1298)

Status:

Full-time employee

What Brian brings to the project...

- Brian has worked heavily in refining the hydrogeologic conceptual model of the lower basin and is well acquainted with the data—help provide a comprehensive GSP efficiently and cost-effectively
- 29+ years of sustainable groundwater resource studies and reports—work with you to efficiently complete a thorough and defensible GSP
- Specializes in groundwater recharge and water reuse—identify options to improve basin sustainability



29+
Years of experience in groundwater studies for basin characterization and management

Brian has more than 29 years of professional experience in geohydrology and environmental geology throughout the Southern California region. His specific areas of expertise are in hydrogeologic investigations to support groundwater sustainability and determine safe yield, water budgets, indirect potable reuse and groundwater recharge. He has studied and modeled Groundwater Basins across the State and has led efforts to develop studies and reports that are required to complete a GSP, including, monitoring well networks, sustainable yield, water budgets and more. He currently serves several cities and water districts to sustainably manage their groundwater resources, including the city of Oceanside, Olivenhain Municipal Water District, Rancho California Water District, Elsinore Valley Municipal Water District, San Bernardino Valley Municipal Water District, and others. Brian is currently leading efforts to develop a GSP for the Arlington Subbasin in Riverside.

Selected Project Experience

Western Municipal Water District: Riverside-Arlington Basin Groundwater Sustainability Plan

Brian is leading efforts to develop a GSP for the Riverside-Arlington Basin. The Basin is classified by DWR as a medium priority basin and is one of the district's primary sources of local water supply. Brian and our team are working in conjunction with the district to complete all studies and investigations necessary to complete a compliant GSP. Specific activities include supporting grant administration and stakeholder engagement, assessing and developing a data management system, reviewing monitoring networks and providing recommendations, and defining the plan area.

Olivenhain Municipal Water District: Groundwater Supply and Brine Management Program

To reduce independence on imported water, Brian is leading our team's efforts to determine the safe yield and increment water available in the San Dieguito basin; and determine locations for well fields, treatment facilities, pipelines, and brine discharge facilities. Currently our team is collecting data, completing a hydrological investigation and updating the current groundwater model. We are also developing preliminary well designs, recommending brine management activities, supporting community outreach, and completing desk-top environmental reviews.

City of Oceanside/RMC: Mission Basin Model Update and Evaluation of Indirect Potable Reuse

Brian developed a geologic and hydrologic conceptual model and a groundwater flow and solute transport model for a 22 square mile area covering the entire Mission Groundwater Basin near Oceanside California. The model is being used to site and evaluate potential movement of recycled water from proposed injection sites.

San Bernardino Valley Municipal Water District and Partners: Determination of the Usable Capacity and Safe Yield for each Sub-basin within the Yucaipa Basin Area

Brian led efforts to reevaluate sub-basin boundaries in the Yucaipa Groundwater Basin to assess the “safe yield” and storage capacity of each sub-basin. He developed a watershed model of the Yucaipa Valley to determine water balance terms previously not calculated. The “safe yield” was calculated using three separate methods to validate values and compared to historical calculations performed by other parties.

Yucaipa Valley Water District: Recycled Water Use Evaluation using the Gateway Sub-basin Focused Groundwater Model

Brian managed efforts to develop a geologic and hydrologic conceptual model and a groundwater flow and solute transport model for a 10 square mile area of the Gateway sub-basin and portions of five additional sub-basins. The model is being used to evaluate potential movement of recycled water from the Wilson Creek Spreading Basin.

San Bernardino County: Active Recharge Project from Tributaries of the Santa Ana River

Brian led our team to develop a watershed model to estimate potential stormwater capture from 13 tributary Creeks to the Santa Ana River in the San Bernardino Valley. The project included preparing conceptual designs for stormwater capture facilities and estimating potential new conservation water added to the ground water system from urban run-off capture.

Riverside County: Hydrogeologic Evaluation of the Riverside Aquifer Storage and Recovery Project

Brian identified available Santa Ana River surface flows to use in On-Channel and Off-Channel recharge basins and evaluated recharge impacts on the ground water surface.

Riverside County: Evaluation of Potential Locations for Ground Water Recharge at the East and West Dam Sites, Diamond Valley Lake

Brian assessed water quality and water level trends and other considerations to evaluate impacts from proposed recharge scenarios.

San Bernardino Valley Municipal Water District: Recharge Investigation of the Yucaipa Groundwater Basin

Brian led efforts to complete a hydrogeologic investigation at eleven potential sites within the Yucaipa Groundwater Basin for potential artificial recharge. Recommendations for subsequent phases of investigation were provided for each site.

City of Moreno Valley: Ground Water Basin Assessment for the Box Springs Mutual Water Company Service Area Rezoning

Brian helped evaluate available long-term water supplies from the San Jacinto Ground Water Basin to support future City development plans.

City of Banning: Update of Safe Yield Estimates for the Banning Ground Water Storage Unit

Brian assessed current data and re-evaluated safe yield estimates for the ground water basin as a potential source of water supply for a proposed future development.

City of Banning: 2010 Urban Water Management Plan

Brian prepared the City of Banning 2010 Urban Water Management Plan (UWMP) to comply with the Urban Water Management Planning Act requiring urban water suppliers to assess the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple-dry years. Amendments to the UWMP since the 2005 UWMP include the Water Conservation Act of 2009 or 20x2020 Plan, to reduce per capita water use by 20% by December 31, 2020.

Castaic Lake Water Agency: Santa Clara River Valley Salt and Nutrient Management Plan

Brian led efforts to determine ambient water quality conditions and develop a plan to confirm that water management practices were consistent with the agency’s water quality objectives. The completed plan provided a framework to protect groundwater and improve groundwater resource sustainability. Brian led our team to develop a monitoring plan, and evaluate the effect that proposed projects would have on groundwater quality.



Johnson Yeh, PhD, PG, CHG
Principal Modeler

Years of Experience: 28
Years with Geoscience: 28

Education:

BS, Geology, National Taiwan University

MS, Geology, National Taiwan University

PhD, Sedimentology, University of Southern California

Professional Registrations:

California Professional Geologist (No. 6371)

Certified California Hydrogeologist (No. 422)

Status:

Full-time employee

For more than 28 years, Johnson has managed ground water modeling efforts, hydrogeologic investigations, ground water basin and water quality studies, and artificial recharge projects. He provides project management and technical direction for hydrogeologic investigations, groundwater models, and artificial recharge projects. Johnson performs detailed statistical analysis of various types of data and has been the lead modeler on many high profile projects—in fact, he was instrumental in helping to resolve one of the largest groundwater rights cases in California, and developed models that helped a water district client to successfully avoid costly litigation. Johnson teaches a graduate level ground water modeling course at the University of Southern California and his experience and knowledge will enable him to develop detailed and thorough groundwater models that will help inform future groundwater sustainability strategies and projects.

Selected Project Experience

Western Municipal Water District: Riverside-Arlington Basin Groundwater Sustainability Plan

Johnson is overseeing modeling efforts to develop a GSP for the Riverside-Arlington Basin. The Basin is classified by DWR as a medium priority basin and is one of the district’s primary sources of local water supply. Johnson is working in conjunction with our team and the district to complete all models necessary to complete a compliant GSP.

San Bernardino Valley Municipal Water District: Santa Ana River Integrated Model

Johnson is leading our team in an effort to use existing groundwater and surface water models to develop an integrated groundwater model for the upper Santa Ana River. The resulting Upper SAR Integrated Model (or Integrated SAR Model), will be used to determine what factors may contribute to declines SAR flows, and assess cumulative effects on SAR surface flows and groundwater levels.

Rancho California Water District: Surface and Ground Water Model of the Murrieta-Temecula Ground Water Basin

Johnson was the lead modeler to create an Integrated Ground Water and Streamflow Model of RCWD. Johnson worked with a technical panel that included, RCWD, USGS, U.S. Marines, Camp Pendleton, Stetson Engineers, Santa Margarita Watermaster, and Geoscience. The technical was formed to avoid litigation between RCWD and the Camp Pendleton Marine Base. Johnson is responsible for preparation of the model and analysis of the results.

What Johnson brings to the project...

- Extensive water modeling experience—can develop accurate models with sufficient detail to inform future groundwater sustainability strategies
- Experienced with controversial and high-profile projects—help develop a GSP that is defensible and can withstand scrutiny
- Understands how to combine multiple models and data sources—provide a clear picture of the current groundwater conditions and allow for accurate predictions and estimates
- Collaborates with the USGS to develop and update groundwater models using MODFLOW



28
Years of groundwater modeling experience

City of Pismo Beach/WSC Inc.: Regional Groundwater Sustainability Project (RGSP)

The RGSP is a regional recycled water project that will help reduce the risk of seawater intrusion and help improve sustainability for the region's water supply. Johnson is leading efforts to evaluate existing characterization studies, groundwater models, and water quality data. He is also constructing and calibrating an expanded groundwater model to evaluate injection and extracting scenarios, and conduct an anti-degradation analysis.

Yucaipa Valley Water District: Recycled Water Use Evaluation using the Gateway Sub-basin Focused Groundwater Model

Johnson was the senior modeler overseeing the construction of a groundwater model used to predict the impacts of recycled water spreading on groundwater quality and to downstream municipal wells.

Western Municipal Water District: Impact of Recharge on Contaminant Plumes and Modeling

Johnson was the project manager and lead ground water modeler to assess and model the area around the Riverside-Corona Feeder, to show the potential future impact of an initial operation scenario on the ground water levels and ground water quality in the San Bernardino Basin Area.

Jurupa Community Services District: Chino Basin Artificial Recharge Evaluation

Johnson led modeling efforts to modify a previously established groundwater flow model of the Chino Basin to incorporate solute transport and assess the impact of artificial recharge operations planned by the Chino Basin Watermaster on Nitrate and TDS concentrations in the southern Chino Basin.

Santa Ana Watershed Project Authority: Chino Desalter System Projects

Johnson developed a detailed analysis of the Chino Ground Water Basin that included a three-dimensional numerical ground water flow model (MODFLOW). A separate analysis was also conducted to assess potential water quality changes in project and existing wells as a result of the project.

San Bernardino Valley Municipal Water District: Remediation Strategies for Ground Water Contamination

Johnson was the project manager and lead ground water modeler to refine previous USGS models to better understand, analyze, and evaluate remediation alternatives related to ground water contamination problems.

California American Water, Monterey Peninsula Water Supply Project (MPWSP)

Johnson led efforts to update a three-dimensional variable density flow and solute transport model for the North Marina Area in 2008 and constructed a focused groundwater model near the CEMEX gravel plant in Marina, CA. Johnson helped revise and update the Salinas Valley Integrated Surface Water and Ground Water Model (SVIGSM) which are currently being used to evaluate local and regional impacts on groundwater levels and quality from MPSWP operations.



Dennis Williams, PhD, PG, CHG Technical Advisor

Years of Experience: 45+
Years with Geoscience: 40

Education:

BS, Geology, University of Redlands

MS, Groundwater Hydrology, New Mexico
Institute of Mining and Technology

PHD, Hydrology, New Mexico Institute of
Mining and Technology

Professional Registrations:

California Professional Geologist (No. 461)

**Certified California Hydrogeologist
(No. 139)**

**Certified Groundwater Hydrogeologist
(American Institute of Hydrogeology,
No. 355)**

Status:

Full-time employee

What Dennis brings to the project...

- Worldwide reputation in groundwater modeling—identify new ideas and perspectives to improve groundwater sustainability
- Experienced Technical problem solver—help maximize recharge and production well performance strategies
- Daily interaction with staff on projects—help keep project schedule and budget on-track
- Experienced in groundwater litigation support and with contentious projects—provide deliverables that withstand scrutiny and can help gain consensus



50+
**Dennis has authored more
than 50 publications**

Dennis Williams, is the founder and president of Geoscience. He has more than 45 years of experience in ground water hydrology and has directed more than 2,000 hydrogeologic investigations and groundwater models, and overseen design and construction for more than 1,000 deep large-scale water supply wells. Dennis has been a consultant to the United Nations and several foreign governments, is a research professor at the University of Southern California's Civil and Environmental Engineering Department, and has taught graduate level courses in hydrogeology and ground water modeling since 1980. He has authored more than 50 publications on ground water and wells and was the principal author of the Handbook of Ground Water Development (John Wiley & Sons, 1990), chief reviewer for the American Society of Civil Engineers (ASCE) Hydraulics of Wells (2014), and author of Ch 13 (Slant Wells) in the book Intakes and Outfalls for Sea Water Reverse Osmosis Desalination Facilities (Springer 2015). Dennis has been on the forefront of groundwater sustainability for the past 47 years and has helped develop some of the methods and studies used to determine sustainable yield and water budgets. His depth of experience will enable him to identify and address key issues to sustainably manage groundwater resources.

Selected Project Experience

Western Municipal Water District: Riverside-Arlington Basin Groundwater Sustainability Plan

Dennis is providing executive oversight and technical support to our team as we develop a GSP for the Riverside-Arlington Basin. The Basin is classified by DWR as a medium priority basin and is one of the district's primary sources of local water supply. Dennis is working in conjunction with our team and the district to review and provide technical input on all sections needed to complete a compliant GSP.

San Bernardino Valley Municipal Water District: Santa Ana River Integrated Model

Dennis is providing executive oversight to our team in an effort to use existing groundwater and surface water models to develop an integrated watershed model for the upper Santa Ana River. The resulting Upper SAR Integrated Model (or Integrated SAR Model), will be used to determine what factors may contribute to declines SAR flows, and assess cumulative effects on SAR surface flows and groundwater levels. This is a multi-agency effort and includes Riverside Public Utilities and surrounding water districts.

Rancho California Water District: Streamflow Model

Dennis led efforts to develop a streamflow model to help resolve water-right controversies (including Federally-reserved water rights) between the District, located in the upper part of the watershed, and the Camp Pendleton Marine Corps Base, located in the lower part of the watershed. The model helped the parties arrive at a consensus, avoiding costly litigation. The model is currently used as one of the District's groundwater management tools to evaluate proposed groundwater management schemes on a basin-wide level.



Mark Williams, PhD, PE
 Technical QA/QC Lead / Water Quality Technical Advisor

Years of Experience: 20
Years with Geoscience: 5

Education:

BS, Geology, University of Colorado, Boulder

MS, Civil Engineering, University of Southern California

PHD, Civil Engineering, University of California

Professional Registrations:

California Professional Civil Engineer (No. 68138)

Status:

Full-time employee

For more than 20 years, Mark has focused on municipal water quality. Mark has served in various capacities in numerous studies focusing on water quality investigations and oversees the Quality Assurance procedures and practices for all of Geoscience’s water quality investigations. Mark served as an Engineer for eight years in the Water Quality Division of the Metropolitan Water District of Southern California, where he was involved in Metropolitan’s Desalination Research Innovation Partnership to manage inland desalination, and worked on a range of water quality projects including studies on nitrates, NDMA, perchlorate, and bromate in municipal water supplies.

Mark’s expertise in water quality, will help our team account for nitrates and other constituents of concern to help accurately identify water quality trends.

Selected Project Experience

Rancho California Water District (RCWD): VDC Recharge Basin Pilot Testing

Mark helped RCWD complete recharge facility pilot testing to comply with health department permits. He conducted tracer testing and virus removal testing to determine ground water residence times and log-removal credit for artificial recharge basins.

Rancho California Water District: Lower VDC Recharge Test Plan

Mark helped develop a preliminary test plant for recycled water recharge in the lower VDC area. He also developed tracer testing procedures to establish horizontal and vertical ground water travel times.

San Bernardino Valley Municipal Water District: Impacts of Imported Water on Basin Objectives

Mark established the impact of recharging east-branch State Project water on salinity basin objectives in the San Bernardino area.

Metropolitan Water District: Seasonal Water Quality Effects of State Project Water on disinfection By-Products

Mark evaluated the seasonal effects of water quality on forming chlorine by-products in organics in east-branch state project water and Colorado River Water imported water supplies.

Shallow Ground Water Quality in the Vicinity of Mills Treatment Plant

Mark provided technical support and expert opinion in litigation on shallow groundwater and impacts from nearby septic tanks based on levels of endocrine disrupting compounds found in groundwater.

What Mark brings to the project...

- Water quality expertise—provide new ideas and perspectives
- Quality Assurance/Quality Control focus—receive a quality project minimizing re-work and potential change-orders
- Daily interaction with staff on well projects—help keep project schedule and budget on-track



20+
Water quality publications and studies authored by Mark including studies on salt and nitrate in groundwater



20+
Years of experience



Nathan Reynolds, PG
Document QA/QC Lead

Years of Experience: 15
Years with Geoscience: 14

Education:

BS, Geophysics, University of California, Riverside

Professional Registrations:

California Professional Geologist (No. 9384)

Status:

Full-time employee

What Nathan brings to the project...

- Experience with both monitoring and groundwater studies—help verify data to develop groundwater models and studies that reflect basin conditions

Nathan has 15 years of experience completing hydrogeologic investigations, ground water quality studies, artificial recharge projects, water well test drilling programs, and inspection for a variety of drilling projects.

Selected Project Experience

California American Water: Monterey Peninsula Water Supply Project

The Monterey Peninsula Water Supply Project (MPWSP) is a multifaceted project to improve water supply and reliability to the Monterey Peninsula. Nathan is providing weekly and quarterly monitoring and water quality testing for the slant wells that feed into the desalination plant. Drilled at an angle, the well pull ocean water from beneath the ocean floor, protecting ocean wildlife and improving feed water quality.

Elsinore Valley Municipal Water District: Hydrogeologic Study of the Warm Springs Groundwater Basin

Nathan helped develop a HSPF model based upon the available precipitation data, land use, and soil types. Our team then calibrated the HSPF model with adjacent or nearby streamflow gages and quantify the Warm Springs Basin groundwater storage capacity and safe yield.

Mojave Water Agency: Salt and Nutrient Loading Model

Nathan helped develop a salt and nutrient balance model using a system dynamic approach to support the Salt and Nutrient Management Plan (SNMP) for the agency.

Olivenhain Municipal Water District: San Dieguito Valley Brackish Groundwater Desalination Study

Nathan supported modeling efforts to study brackish groundwater desalination feasibility and location. He helped collect data, complete a hydrogeologic investigation, and performed well field and raw water collection.

San Bernardino Valley Municipal Water District: Bunker Hill Basin Conjunctive Use Project

Nathan help evaluate extraction well and spreading ground locations for the Bunker Hill conjunctive use project. He helped determine locations, potential well capacities, and updated modeling assumptions for baseline conditions.

City of Huntington Beach: Well 1 Replacement

Nathan performed well destruction and replacement for the City of Huntington Beach. He supported design efforts for well casing, screen, filter pack, and annular seal. During construction, he attended field meetings and worked with the contractor to inspect conductor bore hole drilling, casing installation, and the sanitary seal. He also sampled and logged soil cuttings, inspected aquifer zone testing for yield and water quality, and performed mechanical grading analyses. Once constructed, Nathan inspected final development by pumping and surging and aquifer pumping tests.



Chris Coppinger, PG, CHG
Senior Geohydrologist

Years of Experience: 14
Years with Geoscience: 13

Education:

BS, Geology, College of William & Mary

Professional Registrations:

California Professional Geologist (No. 9093)
Certified California Hydrogeologist (No. 1040)

Status:

Full-time employee

What Chris brings to the project...

- 14 years of well design and inspection experience—increase project efficiency
- Experience with supply, injection, water banking, and monitoring wells—identify and resolve issues
- Experience on multiple-well projects—help manage schedule and budget and identify project efficiencies



39

The number of clients Chris has worked with to design and install groundwater wells

Chris has 14 years of professional experience in ground water and well investigations for numerous municipal and private clients. His expertise includes ground water basin evaluations, well siting investigations, and artificial recharge and conjunctive use studies. He also manages a number of well drilling and rehabilitation activities including coordinating with project stakeholders. Chris’ experience with artificial recharge and monitoring well studies can help develop effective monitoring well networks to provide accurate data groundwater models and studies.

Selected Project Experience

Rancho California Water District: Municipal Supply Well Replacement

Chris was the project manager overseeing DWSAP report preparation, preliminary design report development, demolition/construction plan development, and preparing technical specifications to install nine new production wells. The project was divided into several design and construction management contracts. Chris provided well design, technical specifications, helped prepare bid packages, developed engineer’s estimates, and coordinated permitting. Drilling phase work included analyzing zone test data, preparing multiple design options (focusing on producing maximum volume or lowest risk of contamination), and testing following well completion.

City of Riverside: Well Rehabilitation and Groundwater Monitoring Program

Chris managed efforts to compile and review historical well data for 60 potable water supply wells owned and operated by the city. The project developed a well ranking system to prioritize well rehabilitation and repair. To complete the assessment, Chris reviewed video surveys, driller’s logs, construction information, historical pumping, performance, ground water elevations, and past rehabilitation/redevelopment measures. Chris helped develop a priority ranking matrix for well rehabilitations/replacement that included the well’s estimated remaining useful life , and estimated rehabilitation costs over five, ten and twenty years. At the conclusion of the review Chris developed presentations and attended project workshops to present and discuss findings to key project personnel.

California Water Service Company: Groundwater Supply Study

Chris developed a strategy to maximize groundwater production to fully utilize pumping allotment across two adjudicated basins. He compiled and reviewed historical pumping and water level data in district wells, and located data from other nearby wells. Chris then developed rehabilitation schedules, long term average flow rates, and provided areas to target for future well siting.

Confidential Client: Deep Completion Monitoring Well Network

Chris worked closely with Orange County Water District and California Division of Oil Gas and Geothermal Resources to site, drill, and install deep (up to 1,400 ft) monitoring wells. The wells are currently monitored monthly to determine if water-flood injection stimulated oil production is affecting groundwater gradient and quality in the upper aquifers.

City of Banning: Rehabilitation of Well NP-1

Chris reviewed and evaluated video survey, production and pumping performance, hydrographs, water quality data, and side wall scraping results for Well NP 1. He helped prepare technical rehabilitation specifications that included well casing and screen cleaning by brushing, dispersing agent application, airlifting and swabbing, pumping and surging, aquifer pump tests, flowmeter survey, post-development video survey, and final well disinfection.

City of Tustin: Rehabilitation of 17th Street Well No. 4

Chris performed field inspection during pre- and post-redevelopment video surveys, mechanical redevelopment steps, and well performance tests. Rehabilitation efforts included initial cleaning of well casing and screen by brushing, airlifting and swabbing, pumping and surging, step drawdown and constant rate pumping tests, and chemical treatment. He also helped develop methodology for locating sand producing zones and provided field inspection during patching.

Southern California Edison: Rehabilitation of Quarry Seawater Source Wells and Cottonwood Area Wells, Santa Catalina Island

Chris reviewed data necessary to develop detailed technical specifications for well rehabilitation, including review of downhole video surveys to determine the physical condition and types of encrustation visible on the intake areas (i.e., screen interval) for each well. He provided contractor bid support for the well rehabilitation work, which included answering contractor requests for information, and providing support for interaction between client and contractor. Chris also performed field inspection services during the rehabilitation process, which included cleaning of well casing and screen by brushing, application of biocide and dispersing agents, airlifting and swabbing, pumping and surging, aquifer pump tests, post-development video survey, and final well disinfection. At the conclusion of the project, Chris helped prepare draft and final summary reports.

Big Bear Area Regional Wastewater Agency: Bear Valley Ground Water Replenishment Study

Chris helped collect water quality samples for sulfur hexafluoride (SF6) analysis used for seepage velocity calculations in the spreading basin test site.

Beaumont Cherry Valley Water District: Noble Creek Artificial Recharge Facility

Chris performed well construction supervision for tasks such as bore-hole drilling, geophysical logging, installation of cement seal, casing inspection and installation, filter pack installation, air lift and swabbing, pump development, and down-hole video logging. He also performed various pump tests analyses and water quality sampling.

City of Riverside: 2015 Well Rehabilitation

Upon completion of the Well Rehabilitation and Groundwater Monitoring Program, the city selected 4 wells for rehabilitation. Chris led efforts to, repair, rehabilitate, and return to service, a well drilled in 1927. He also provided recommendations to modify existing technical specifications to allow needed repairs, and oversaw field inspection during repair. All wells were successfully rehabilitated with two achieving major increases in efficiency.

Alamitos Barrier Improvement Project – Los Angeles / Orange Counties, CA, Orange County Water District

This project will construct 17 new injection wells, four nested monitoring wells, and two (2) piezometers. The injection wells will serve to increase the capacity and effectiveness of the existing seawater barrier system. Chris maintained effective control of project scope, schedule, and budget while providing construction management services.

Riverside Public Utilities: Supply Well Replacement and Destruction

As the project manager, Chris was responsible for preparing demolition/construction plans and technical specifications to install two new production wells as part of a land swap agreement between a commercial client and Riverside Public Utility Agency. Chris helped the design engineer prepare bid packages, engineer's estimates, and permit applications. Chris also supported bid evaluation efforts, managed construction and destruction schedule, designed replacement wells that doubled specific capacity over existing wells and met water quality objectives.

Riverside Public Utilities: Supply Well Replacement and Destruction

Chris prepared demolition/construction plans and technical specifications to install a new production wells as part of a land swap agreement between a commercial client and Riverside Public Utility Agency. The project includes removing 10 existing wells with complex permitting jurisdictions in addition to constructing the replacement well.



Logan Wicks, MS, PG Project Manager

Years of Experience: 13
Years with Geoscience: 5

Education:

BS, Geology, Cal Poly Pomona

BS, Biology, Cal Poly Pomona

MS Geology, Cal Poly Pomona

Professional Registrations:

California Professional Geologist (No. 9580)

HAZWOPPER 40 Hour

Status:

Full-time employee

What Logan brings to the project...

- Experience and familiarity with groundwater recharge and injection well design

Logan has over 13 years of professional experience on more than 27 municipal direct or alternative supply wells and has completed more than 70 well field assessments and groundwater studies. As a Project Geohydrologist for Geoscience, Logan provides oversight for multiple projects involving: well siting, design, construction and deconstruction, permitting (county, state and local agencies), He also is proficient in interpretation of pump tests, well productions analysis, drilling issues, and well rehabilitations. As a project manager, Logan pulls from his years of experience in the field to recognize potential project issues early to mitigate and navigate the project to success. He leads his team and external contractors to keep the project on schedule and within budget by maintaining open communication with all levels of management. Logan excels at understanding the client's specific needs for a project and their long-term goals. By understanding the short- and long-term goals, he has helped many clients find lasting solutions that reduce future costs while delivering a successful project.

Selected Project Experience

Rancho California Water District, Replacement of Nine Municipal Wells, Temecula, CA, 2013 – Ongoing

As one of the Project Managers, Logan assisted in leading efforts to prepare large reports and plans to install nine new production wells that would replace failing supply wells. Since 2013, eight wells have been completed, one

was abandoned due to water quality issues, the last two were completed early 2019. Our team provided well design, technical specifications, and helped the assigned district engineer to prepare bid packages. Our drilling phase work included zone testing, data analysis, and preparing multiple design options for water quality and production rates.

Logan helped complete an annual assessment of ground surface movement and aquifer compression and rebound using extensometer, global positioning system, and production data. He was the lead hydrogeologist responsible for all onsite well deconstruction observation and replacement well construction including full time supervision of conductor borehole drilling, conductor casing install, pilot borehole drilling, geophysical logging, and casing install for three new wells. He helped design and oversaw installation and development for the replacement wells.

Privileged Client, Three New Wells – San Bernardino, CA 2019 – Ongoing

Logan sited, designed, and managed efforts to drill, construct, test and equip three new groundwater wells simultaneously for the client. Logan prepared technical specifications, and all final design letters for all three wells. The new wells produced better than most wells in the area due to final designs and pumping development program. Due to the three wells performance, the Client would like our team to design and construct more in the near future.

City of Oceanside, Indirect Potable Reuse Feasibility Study, Oceanside, CA, 2015

Logan provided technical support on a project that evaluated the best locations for both injection and surface spreading (basin infiltration). Phase I work included background data research and groundwater model update and recalibration. Phase II involved validation of the updated model by conducting a field study involving drilling three sonic boreholes, hydropunch water quality sampling, running geophysical logs in each borehole and backfilling. The boreholes were sited in locations of data gaps and to evaluate alluvial and aquitard thickness, K-values of the aquifer, and groundwater quality. Phase II also included various geophysical resistivity surveys along areas where drilling would be difficult to do. These resistivity surveys were then correlated to the boreholes and used for another model update. Phase III used the fully updated model to run various scenarios for the best location and type of recharge in the basin (spreading or injection). This work lead to the City of Oceanside receiving a grant to design and construct three new injection wells for their IPR project Pure Water Oceanside currently in Design Phase.

City of Oceanside, USBR Grant Feasibility Study for New Extraction Wells, Oceanside, CA, 2018

Logan managed a team of our modelers for a feasibility study that evaluated the best locations for new extraction wells for the City's desalter facility. Using the current model Logan and team ran various scenarios for the best locations for up to three new wells to help bring their desalter facility

to near full capacity. His work with this study led to the City receiving a grant to design and construct up to three new extraction wells and is currently out to bid.

Michael Baker International, Replacement of One Municipal Well and Destruction of 10 Wells – San Bernardino, CA 2017 – Ongoing

Logan Managed field efforts to prepare demolition and construction plans and wrote technical specifications to install one new production well as part of a land swap agreement between a commercial client and Riverside Public Utility Agency. Project also included demolishing 10 existing wells with complex permitting jurisdictions and construction of a replacement well. Because of our success on a previous project the client and the City of Riverside hired our team again to complete the additional scope.

West Valley Water District - Bunker Hill Well Siting Evaluation San Bernardino, CA, 2020 - Ongoing

Logan is leading efforts to site a production well in an area near known plumes, other production wells, river channel, and a highly industrial populated area. The District would like the well sited as close to their future main line to help lower additional infrastructure costs. He and his team used an in house GIS analysis tool to help locate potential sites suitable for up to two wells near their future mainline.

West Valley Water District: Sentinel Well 1 Construction

Logan performed site field supervision, field work, on site supervision during reaming, caliper logging, casing installation, and assisted with NPDES discharge requirements.

Orange County Water District: Los Alamitos Barrier Improvement Project

Logan was part of a team of hydrogeologists responsible for full time observation of conductor borehole drilling, conductor casing install, pilot borehole drilling, geophysical logging, and casing install of Injection wells and Monitoring wells. 17 Injection wells, 4 clustered Monitoring wells and 2 Piezometers make up the project. Responsible for contacting OCWD, Jensen Drilling and Mahaffey while drilling.

City of Huntington Beach: Well 1 Replacement

Logan performed well destruction and replacement for the City of Huntington Beach. He supported design efforts for well casing, screen, filter pack, and annular seal. During construction, he attended field meetings and worked with the contractor to inspect conductor bore hole drilling, casing installation, and the sanitary seal. He also sampled and logged soil cuttings, inspected aquifer zone testing for yield and water quality, and performed mechanical grading analyses. Once constructed, Logan inspected final development by pumping and surging and aquifer pumping tests.

Pico Water District, Well Number 11, Rivera, CA, 2017

Logan oversaw efforts to drafted technical plans and specifications, perform contractor bid assistance, and support permitting with regulatory agencies. Site selection for the project was challenging because of economic feasibility considerations. Working with the district Logan and our team successfully found solutions to integrate the

new well into the existing system and meet the project completion dates and production goals set for early 2018.

Elsinore Valley Municipal Water District, Multiple Projects, Lake Elsinore, CA, 2016 – Ongoing

As part of an on-call contract, Logan led field efforts to rehabilitate six existing wells ranging in depth from 105 ft to 1,700 ft. Our team performed an initial site assessment, developed well designs, and oversaw production well construction. Currently, Logan is assisting the district with a feasibility study

Bellflower-Somerset Mutual Water Company, Leahy Avenue Well, Bellflower, CA, 2017 – 2018

Due to permitting issues this project was delayed for several years, Logan helped manage schedule and budget to get the project back on track and completed. The project successfully met the new schedule and budget and produces more than 3,500 gpm, with a specific capacity of 60 gpm/ft—meeting and surpassing project goals.

Olivenhain Municipal Water District: San Dieguito Valley Brackish Groundwater Desalination Study Del Mar, CA, 2019 - Ongoing

Logan supported modeling efforts to study brackish groundwater desalination feasibility and location. He helped collect data, complete a hydrogeologic investigation, and performed well field and raw water collection. He also led efforts to drill construct and test a test supply well for the study. Due to the area and nearby residents, construction was difficult. He acted and supported the District in efforts to talk to the community and answer any and all questions they may have. He also designed a Noise Mitigation Program for the construction activities to comply with local noise ordinance to help keep the project on schedule and budget.

City of Lakewood: New Well No. 28 design and Technical Specifications Lakewood, CA, 2020 - Ongoing

Logan helped lead efforts to develop the technical specifications for the City of Lakewood Well 28 Project. He drafted the preliminary design and construction sheets for the design phase. In this area the wells typically make sand and the City wanted minimum sand, so the design was crucial. The new well just finished completion and production and sand are above and beyond the City's expectations.

GHD/SCWD - Design of Subsurface Intakes Study, Doheny Beach CA 2018 – Ongoing

Logan was part of a team that led an investigation in the feasibility and suitability of subsurface intakes at Doheny Beach. His investigation involved geophysical surveys of the ocean floor and near shore land surface. Performing exploration drilling along the shore to help correlate geophysical surveys, and preliminary design of subsurface intakes at locations identified in the study. They study concluded that subsurface intakes slant wells in particular would be best suited at this location to supply water for a future desalination plant due to the unique on- and off-shore geology identified. The work of this project led to him assisting in the EIR and final design phases for the project.



Lauren Wicks, MS, PG
Project Geohydrologist

Years of Experience: 7
Years with Geoscience: 6

Education:

BS, Geology, Cal Poly Pomona

BS, Integrated Earth Studies, Cal Poly Pomona

MS, Hydrology, University of Idaho

Professional Registrations:

California Professional Geologist (No. 9531)

Status:

Full-time employee



What Lauren brings to the project...

- Experience supporting groundwater models, sustainable yield studies, and calculating water budgets—help provide more accurate and thorough models and studies to inform options to improve basin sustainability
- Detail oriented—help provide accurate data and high-quality deliverables



Lauren has experience with groundwater and environmental investigations performed for numerous municipalities, state agencies, and private clients throughout California. She performs groundwater flow and transport modeling, hydrogeologic investigations, groundwater basin and water quality studies, artificial recharge projects, and has experience in GIS mapping, watershed management, database development and management. Lauren can support your team by developing accurate and complete written reports and documents, and by performing quality reviews on data.

Selected Project Experience

San Bernardino Valley Municipal Water District: Santa Ana River Integrated Model

Lauren is working with our team to use existing groundwater and surface water models to develop an integrated watershed model for the upper Santa Ana River. The resulting Upper SAR Integrated Model (or Integrated SAR Model), will be used to determine what factors may contribute to declines SAR flows, and assess cumulative effects on SAR surface flows and groundwater levels.

San Bernardino Municipal Water District: Joint Groundwater Model for the Rialto-Colton Groundwater Basin

Lauren prepared a technical memorandum comparing previous groundwater models of the Rialto-Colton area and identifying the strengths and weaknesses of each and helped with subsequent reports regarding model construction and calibration. She helped compile a well database with locations, construction information, lithologic information and water level/water quality data availability. Support for modeling and reporting activities, and assisted with the preparation of technical memoranda summarizing model construction, calibration, and predictive scenarios.

Rancho California Water District: Surface and Ground Water Model of the Murrieta-Temecula Ground Water Basin

Lauren helped evaluate and report on a systematic model update and refinement process.

Riverside Public Utilities: North Orange Well Field Evaluation, Well Siting, and Non-Potable Water Supply Assessment

Lauren helped interpret model results and prepared a technical memorandum summarizing the impacts of new potable and non-potable wells on the current North Orange well field wells.

Chino Basin Desalter Authority: Chino Basin Ground Water Model Update

Lauren helped refine the Chino Basin Ground Water Model to evaluate impacts from proposed CDA wells. She also compiled data, updated model files, created model datasets, and calibrated the groundwater model.

Western Municipal Water District: TDS and Nitrate Lumped-Parameter Model for the Riverside and Arlington Groundwater Basins

Lauren helped create a lumped-parameter model to meet monitoring and reporting requirements of the groundwater basins and assess compliance under various scenarios. She also helped prepare various technical memorandums throughout the modeling process.

East Valley Water District: Wastewater Reclamation Plant Engineering Report

Lauren helped produce technical memorandums summarizing the predicted impacts of recharging recycled water at various recharge sites as part of the proposed Sterling Natural Resource Center. The analysis included determining the amount of underflow available as diluent water, and calculating travel times for recycled water recharge and recycled water contribution at nearby production wells.

Rancho California Water District: Santa margarita River Watershed Groundwater Model Runs & Evaluation

Lauren helped conduct GSFLOW, soluble transport, and sustainable yield model runs to prepare a groundwater model plan.



Si Si, MS, EIT
Staff Modeler

Years of Experience: 6
Years with Geoscience: 5

Education:

BS, Environmental Science, Ocean University of China

MS, Environmental Engineering, University of Southern California

Professional Registrations:

Engineer-in-Training

Status:

Full-time employee



What Si brings to the project...

- Experience supporting groundwater models, sustainable yield studies, and calculating water budgets—help provide more accurate and thorough models and studies to inform options to improve basin sustainability



Si Si has more than five years of experience in groundwater and environmental investigations performed for numerous municipalities, state agencies, and private clients throughout California. She regularly performs ground water flow and solute transport modeling, hydrogeologic investigations, ground water basin and water quality studies, watershed modeling and management, groundwater waste discharge permitting, GIS mapping, and database development and management.

Selected Project Experience

Western Municipal Water District: Riverside-Arlington Basin Groundwater Sustainability Plan

Si is supporting modeling efforts to develop a GSP for the Riverside-Arlington Basin. The Basin is classified by DWR as a medium priority basin and is one of the district's primary sources of local water supply. Si is working with our team and the district to complete all models necessary to complete a compliant GSP.

City of Oceanside: Feasibility of Seawater Desalination in the Mission Narrows

Si incorporated two previous developed models, the Mission Basin Model and the Camp Pendleton Desalination Groundwater Model, the Oceanside Harbor Groundwater Flow Model was developed to assess desalination impacts on coastal and inland areas. Used SEAWAT solute transport

model for predictive scenarios to evaluate percentage of ocean water pumped during the Project, in terms of the concentration of TDS, and salinity changes at various locations in the model area.

San Bernardino Valley Municipal Water District: Santa Ana River Integrated Model

Si is supporting our team in an effort to use existing groundwater and surface water models to develop an integrated watershed model for the upper Santa Ana River. The resulting Upper SAR Integrated Model (or Integrated SAR Model), will be used to determine what factors may contribute to declines SAR flows, and assess cumulative effects on SAR surface flows and groundwater levels.

County of San Luis Obispo : Paso Robles Modeling

Si performed water balance analysis on HSPF watershed simulated outflow results and prepared input data package for a Groundwater Flow Model.

City of San Bernardino: US EPA Model

Si prepared the SBBA HSPF watershed model input data and run model; prepared recharge packages regarding stream bed percolation, mountain front runoff and areal recharge for Groundwater Flow Model based on water balance analysis from HSPF.

Elsinore Valley Municipal Water District: Hydrogeologic Study of the Warm Springs Groundwater Basin

Si developed HSPF model based upon the available data of precipitation, land use and soil types, calibrated HSPF model with adjacent or nearby streamflow gages, quantify the groundwater storage and safe yield of the Warm Springs Basin.

California American Water: Monterey Peninsula Water Supply Project

Si, prepared cross-sections based on well logs, revised NMGWM and CEMEX Model layers, calculated and summarized hydraulic conductivity from grading analysis in CEMEX and Moss Landing Sites, mapped soil size distribution in dune sand aquifer and 180-foot aquifer equivalent, prepared weekly/monthly monitoring reports for Test Slant Well and surrounding monitoring wells, analyzed groundwater elevation changes and calibrated CEMEX focused groundwater model, calculated slant well feed-water supply, impacts and mitigation approaches.

Yucaipa Valley Water District: Recycled Water Use Evaluation - Gateway Subbasin of Yucaipa GW Basin

Si developed focused groundwater model for the unconsolidated sediments of the Gateway Subbasin and solute transport model MT3DMS, evaluated the effects, including travel times and percent contribution, of recharging recycled water at the Wilson Creek Spreading Basin under various recharge scenarios.



Leo Liu, MS, EIT
Staff Modeler

Years of Experience: 6
Years with Geoscience: 5

Education:

BS, Environmental Engineering, Tianjin Institute of Urban Construction, China

MS, Environmental Engineering, University of Southern California

Professional Registrations:

Engineer-in-Training

Status:

Full-time employee

What Leo brings to the project...

- Experience supporting groundwater models, sustainable yield studies, and calculating water budgets—help provide more accurate and thorough models and studies to inform options to improve basin sustainability

Leo has more than five years of experience with ground water and environmental investigations performed for numerous municipalities, state agencies, and private clients throughout California. He routinely performs ground water flow and solute transport modeling, hydrogeologic investigations, ground water basin and water quality studies, watershed modeling and management, artificial recharge projects, and has experience in GIS applications, database development and management, and well design.

Selected Project Experience

Western Municipal Water District: Riverside-Arlington Basin Groundwater Sustainability Plan

Leo is supporting modeling efforts to develop a GSP for the Riverside-Arlington Basin. The Basin is classified by DWR as a medium priority basin and is one of the district’s primary sources of local water supply. Leo is working with our team and the district to complete all models necessary to complete a compliant GSP.

San Bernardino Valley Municipal Water District: Santa Ana River Integrated Model

Leo is supporting efforts to use existing groundwater and surface water models to develop an integrated watershed model for the upper Santa Ana River. The resulting Upper SAR Integrated Model (or Integrated SAR Model), will be

used to determine what factors may contribute to declines SAR flows, and assess cumulative effects on SAR surface flows and groundwater levels.

San Bernardino Valley Municipal Water District: Yucaipa Groundwater Basin Annual Storage Change Calculation

Leo measured ground water level and collected pumping, spreading data, and climatological data annually. He also digitized water level data from 2005 to 2013 for the Yucaipa area using GIS software. Leo then used groundwater elevation contours from each year to calculate groundwater storage capacity.

City of San Bernardino: US EPA Model

Leo prepared the SBBA HSPF watershed model input data including land use, channel type and evapotranspiration data and run model.

San Bernardino Valley Municipal Water District: Rialto Colton Model

Leo collected and digitized water data from 1945, and 2011 using GIS software. He calculated the water budget including underflow from Lytle Basin, underflow from Bunker Hill Basin, artificial recharge of imported water, unengaged runoff and subsurface inflow from the San Gabriel Mountains and Badlands, stream bed percolation from the Santa Ana River and Warm Creek, groundwater pumping, and evapotranspiration.

Los Angeles County: Raymond Basin Ground Water Flow Model

Leo performed a regression analysis on Arroyo Seco spreading based on annual and monthly flow data from City of Pasadena, Devils’ Gate Dam, and precipitation.

Castaic Lake Water Agency: Santa Clara River Valley East Sub-basin Salt and Nutrient Management Plan

Leo developed and calibrated for the salt loading model for the period from 2001 to 2011. He provided assistant with determining surface water, groundwater and salt balance and incorporating proposed mitigation projects for the salt and nutrient management plant. Leo then ran predictive model runs for the period of 2012 through 2035, and analyzed modeling results under No Project, Single Project and, All Project conditions.

Western Municipal Water District: TDS and Nitrate Lumped-Parameter Model for the Riverside and Arlington Groundwater Basins

Leo updated Groundwater Flow Model input packages to incorporate recharge and discharge components (i.e., flux terms) measured during the period from January 1965 through December 2007. He developed a lumped-parameter model for the period from 1965 to 2007 and calibrated through varying the anthropogenic return flow mass loading and initial TDS and nitrate concentration. Leo then developed and ran predictive model runs for the period of 2015 through 2034 under four different scenarios.



Chuck Houser, PG, CHG, CEG Data Collection Lead - SCS Engineers

Years of Experience: 33

Education:

BS, Geological Sciences, San Diego State University

MS, Geological Sciences, San Diego State University

Professional Registrations:

California Professional Geologist (No. 5781)

California Certified Hydrogeologist (No. 945)

California Certified Engineering Geologist (No. 2206)

What Chuck brings to the project...

- Experience completing groundwater studies in the Pauma and Pala Valleys for the county and local tribes—help the address issues during GSP development and streamline data collection with basin stakeholders

Chuck has 32 years of experience as conducting groundwater monitoring, groundwater resource studies, fault investigations, and geological mapping. He has direct experience completing projects for the County of San Diego and groundwater resource studies within the Pauma Valley.

Selected Project Experience

Confidential Client: Indian Reservation Water Resources Study

Chuck was the principal investigator for a water resource study within an Indian reservation in northern San Diego County. The study evaluated existing water resources and identified new resources. To complete the study, Chuck reviewed data, completed field mapping, and performed geophysical surveys of the area. The project area had several challenging geological structures including a major Southern California fault zone. However, despite the challenges, Chuck was able to identify several favorable locations to drill exploratory test wells.

City of San Marcos: Drinking Water Source Assessment

SCS is conducting a study of the San Marcos Creek Valley to understand how the lake water levels, surface water flows, and groundwater are interacting and affecting water quality. Mr. Houser conducted long-term groundwater

monitoring using submerged pressure transducers in groundwater wells. Groundwater samples from quarterly sampling events were analyzed for nutrients, and hydraulic conductivity was calculated from data generated by performing pump tests on selected wells. The data, along with nutrient levels in the creek valley groundwater, were analyzed to determine how these water sources interact and affect overall water quality.

County of San Diego: Pala Landfill Facility Assessments

For the Pala Landfill Facility on the Pala Indian Reservation in San Diego County, CA, Mr. Houser assessed the fill cells and possible groundwater impacts.

City of San Marcos: San Marcos Creek Water Quality Study

SCS is conducting a study of the San Marcos Creek Valley to understand how the lake water levels, surface water flows, and groundwater are interacting and affecting water quality. Mr. Houser conducted long-term groundwater monitoring using submerged pressure transducers in groundwater wells. Groundwater samples from quarterly sampling events were analyzed for nutrients, and hydraulic conductivity was calculated from data generated by performing pump tests on selected wells. The data, along with nutrient levels in the creek valley groundwater, were analyzed to determine how these water sources interact and affect overall water quality.

County of San Diego Landfill Site Feasibility Studies

To plan for proposed landfill sites, Mr. Houser conducted research and field work for feasibility studies at six proposed sites. Fieldwork included excavation of exploratory trenches for the purpose of assessing soil and rock conditions, and installation and sampling of shallow (up to 30 feet deep) and deep (up to 500 feet deep) groundwater monitoring wells for the purpose of assessing baseline groundwater conditions.

Jacumba Community Services District: Groundwater Resource Development

For groundwater resource development in Jacumba, CA, Mr. Houser conducted hydrogeological research; completed geological mapping of approximately 3 square miles; installed test wells at multiple sites; and oversaw the drilling and installation of two approximately 500-foot-deep municipal groundwater supply wells.

Guatay Mutual Benefits Corporation: Water Source Assessment and Well Development

Guatay Mutual Benefits Corporation (GMBC) applied for a grant to develop and improve their groundwater resource in the community. To support the grant application, Mr. Houser conducted field and aerial photo research. He evaluated multiple potential well locations and existing groundwater production data for the community.

Eventually, Mr. Houser drilled two test wells for GMBC. Both test wells have now been completed as municipal supply

wells, and Mr. Houser is managing a project to construct a pipeline and pump house to convey water from these new wells into the community water supply system.

County of San Diego: Road Improvement Groundwater Data Analysis

To support San Diego County road improvement projects, Mr. Houser has collected and analyzed soil and groundwater data to evaluate aquifer characteristics for estimation of potential discharge during dewatering operations; determined groundwater quality and compliance with the San Diego Regional Water Quality Control Board order for discharge to inland surface waters; and prepared a groundwater treatment plan to mitigate any groundwater impacts. A treatment system was designed based on the estimated discharge during dewatering to treat constituents exceeding the levels in the order.

Confidential Client: Northern San Diego County Diesel Fuel Spill

A public utility company caused a diesel spill that threatened a fresh water spring used as a drinking water source. The site is underlain by weathered and fractured granitic rock. In addition to reviewing data collected by the utility's consultant during assessment and cleanup of the diesel spill, Mr. Houser conducted an assessment of the nature and orientation of the fractures and potential fracture connectivity between the diesel release area and the spring. This assessment included review of available documents addressing geologic and groundwater conditions in the region of the site, field mapping of the locations and orientations of fractures in available exposures in the immediate proximity of the site, and development of a 3-dimensional model of the fracture system between the release site and the spring. The result of the assessment was to conclude that potential connectivity did exist between the diesel release and the spring.

Confidential Client: Assessment of Sedimentation Rates after the Rice Fire in Northern San Diego County.

Following the 2007 Rice Fire in the Fallbrook/Rainbow area of northern San Diego County, several man-made ponds of an agricultural ranch filled with sediment and could no longer be maintained as ponds. The sediment that filled the ponds contained detectable concentrations of pesticides, limiting options for removal of the sediments and increasing substantially the cost of disposal of these sediments. Mr. Houser conducted an assessment designed to evaluate the quantity of sediment deposited after the Rice Fire. Analysis of soil core samples collected from a pond that experienced significant sedimentation after the fire revealed features in the soil consistent with rapid deposition above approximately 8 foot depth. At and below approximately 8 feet, features consistent with slow, normal deposition in a healthy pond environment were observed. These observations allowed the plaintiff to demonstrate that the fire did cause erosion leading to rapid sedimentation of the ponds and damage to the property.



Anthony “Tony” Maggio, PG, CHG, REA Data Collection - SCS Engineers

Years of Experience: 31

Education:

BS, Geology, California State University, Long Beach

MS, Geology, California State University, Long Beach

Professional Registrations:

California Professional Geologist (No. 4377)

California Certified Hydrogeologist (No. 453)

What Tony brings to the project...

- Experience completing groundwater studies in the Pauma and Pala Valleys for the county and local tribes—help the address issues during GSP development and streamline data collection
- Experience working with and for tribal governments throughout California—help account for tribal needs and reserved water rights

Anthony Maggio is a California Certified Geologist and Hydrogeologist with expertise in water resources and groundwater and soil contamination assessment and remediation. Mr. Maggio performs groundwater basin studies, assessments and remediation of contaminated properties, and environmental audits in the United States and Latin America. As a water resource specialist, Mr. Maggio performs basin studies, water resource use assessments, wellhead protection studies, well performance evaluations and aquifer testing, new well design and installation oversight and water distribution system evaluations including compliance with monitoring and sampling programs. Applying his knowledge of geological sciences and groundwater aquifer systems, Mr. Maggio helps clients develop and implement plans for both groundwater and soil contaminant investigations and water resource investigations.

Selected Project Experience

Confidential Client: Indian Reservation Water Resources Study

Chuck was the principal investigator for a water resource study within an Indian reservation in northern San Diego County. The study evaluated existing water resources and

identified new resources. To complete the study, Chuck reviewed data, completed field mapping, and performed geophysical surveys of the area. The project area had several challenging geological structures including a major Southern California fault zone. However, despite the challenges, Chuck was able to identify several favorable locations to drill exploratory test wells.

County of San Diego: Pala Landfill Facility Assessments

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City of San Marcos: San Marcos Creek Water Quality Study

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County of San Diego Landfill Site Feasibility Studies

To plan for proposed landfill sites, Mr. Houser conducted research and field work for feasibility studies at six proposed sites. Fieldwork included excavation of exploratory trenches for the purpose of assessing soil and rock conditions, and installation and sampling of shallow (up to 30 feet deep) and deep (up to 500 feet deep) groundwater monitoring wells for the purpose of assessing baseline groundwater conditions.

Big Pine Indian Reservation: Various Water Resources Studies

Mr. Maggio completed various water resources related assignments for the Big Pine Indian Reservation. Services included environmental assessment and management planning under the grant assistance program, completing a well head protection delineation assessment and a unified watershed assessment, and developing a monitoring program, and 305 (b) reporting plan.

Owens Valley Water Commission: Water Resources Studies and Support

On Indian reservations throughout the Owens Valley, Mr. Maggio has provided water resource services. These services included water resource management planning, irrigation system analysis, water supply well design and construction oversight, creation of base maps using GIS, and groundwater basin analysis for various watersheds in Inyo and Mono County.



Christine Shand Grant Administration Support - SCS Engineers

Years of Experience: 20

Education:

BA, English and American Literature, University of California, San Diego

What Christine brings to the project...

- Grant reimbursement experience—help our team format invoices and submittals to reduce District staff effort and help prevent delays in reimbursement processing
- More than 20 years of grant administration and compliance—help provide deliverables and invoices that comply with grant requirements to protect grant funding

Anthony Maggio is a California Certified Geologist and Christine has prepared applications and reimbursement requests for grants and government funding programs for more than 20 years. She has been with SCS for 12 years, preparing grant applications and proposals for environmental funding, and has 10 years of experience as a legal assistant for environmental issues. Christine develops strong working relationships with clients and state and local agency funding staff. She has worked on complex environmental sites, coordinated submittals for grant funding applications, and organized detailed budgets for clients, attorneys, and funding agencies. She has assisted several public-sector entities in Southern California with application submittals for various funding programs, as well as water agencies, Indian Tribes, Brownfields sites, and contaminated sites.

Christine can help our team maintain detailed spreadsheets to track costs and help ensure compliance with grant requirements. She has experience working directly with clients to submit third-party claims for reimbursement and will help our team verify that invoices and records are properly formatted to reduce District staff time and effort and help reduce delays in reimbursement.

Selected Project Experience

West Sacramento Area Flood Control Agency, Grant Administration

Ms. Shand assisted WSAFCA with the successful submittal of a SCAP grant to provide remediation funding.

Breitbard Properties, LLC, Grant Administration

Ms. Shand assists Breitbard Properties, LLC, with an ongoing remediation grant from the Orphan Site Cleanup Fund (OSCF).

R. D. Brown Company, Inc., Grant Administration

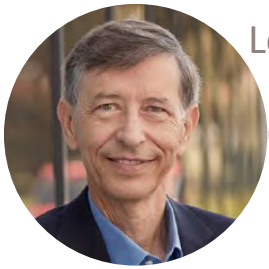
Ms. Shand worked with the client and Project Manager to successfully receive OSCF assessment and remediation grants for the Site, which will ultimately be developed as a senior facility in Imperial County.

Former Bianchi International Facility, Grant Administration

Ms. Shand tracked and submitted all USTCF reimbursement request documentation through project completion. Former Orange Glen Market Remediation. Ms. Shand continues to submit USTCF documentation for the client, the City of Escondido, for reimbursement of corrective action work.



We understand that Yuima Municipal Water District will take a lead role in grant administration, however we have added internal grant compliance support to our team to help expedite reimbursement processing and reduce District staff time and effort



Lewis Michaelson Stakeholder Engagement Lead - Participation by Design

Years of Experience: 30

Education:

BA, Sociology, University of California, San Diego

MS, Conflict Management, George Mason University

What Lewis brings to the project...

- Recognized leader in facilitation and mediation for challenging and potentially contentious technical and stakeholder deliberations—help avoid and mitigate conflict to reduce project risk
- Experience facilitating public outreach meetings for water projects in San Diego County—effectively engage basin stakeholders, obtain feedback, and reduce potential opposition

Lewis Michaelson is a facilitator, mediator and trainer with over 30 years of experience. He has performed virtually every task common to stakeholder involvement programs, including organizing and moderating public meetings, facilitating community and technical advisory groups, developing group charters, preparing agendas and training stakeholders in collaborative problem solving techniques. He has also trained over a thousand project managers, public participation practitioners and technical staff in public involvement and risk communication.

Using a collaborative problem solving approach, Lewis has facilitated stakeholder outreach and consensus for projects and issues involving a wide range of subjects, including wastewater and storm water projects, regional water supply facilities, sea level rise, hazardous waste cleanup, watershed planning, military base closures and expansions, transportation and energy infrastructure, waterfront development and land use management plans. As a facilitator, Lewis has also worked extensively on intra- and inter-organizational conflict management issues. This work has involved helping individual agencies develop strategic plans and multiple agencies develop inter-agency agreements.

Lewis has designed and conducted public participation programs in controversial situations that have built trust and credibility for the project proponents through the use of innovative workshops, citizen advisory groups, risk communication and other conflict management techniques. Among the clients he has served in this capacity are the U.S. Navy, San Francisco Public Utilities Commission, Southern Nevada Water Authority, San Diego County Water Authority, San Diego and Santa Ana Regional Water Boards, South Coast Water District and California Department of Water Resources.

Lewis has in-depth experience working with disadvantaged and environmental justice communities. He is also knowledgeable and experienced with indigenous cultural issues and concerns, having worked throughout the U.S. with Native American, Native Alaskan and Native Hawaiian stakeholders.

Lewis is the past president of the International Association for Public Participation (IAP2). As a board member of IAP2, he spearheaded developing the IAP2 Code of Ethics and Core Values for the Practice of Public Participation. He was also one of the three original developers of the IAP2 Foundations of Public Participation training.



Marissa Twite
Stakeholder Engagement Assistant - Katz & Associates

Years of Experience: 5

Education:
BA, Sustainability, San Diego State University

What Marissa brings to the project...

- Outreach material development—provide materials that effectively inform the public and build community support
- Track outreach and stakeholder contact—help ensure that appropriate stakeholder groups are contacted and reduce potential project opposition
- Social media and web content development—provide multiple methods to contact and track engagement with stakeholders to help obtain feedback and identify potential issues early

Marissa Twite is an Account Executive at Katz & Associates with experience in environmental sustainability and public outreach. She works with clients to implement communication and outreach strategies with various stakeholders.

Marissa currently provides on-going support to the Mid-Coast Trolley Project, the Trolley Renewal Project Orange Line Trolley Catenary Improvements and the Caltrain Peninsula Corridor Electrification Program. Marissa assists with stakeholder engagement by coordinating the development and distribution of outreach materials, maintaining and updating public outreach tracking databases, developing social media and website content, monitoring project information phone lines and emails and providing general support to project managers. In addition, Marissa provided project support as part of the City of San Diego’s Pure Water Program. She assisted with the development and posting of Pure Water social media content, supported tours of the Pure Water Facility, conducted post tour/event tasks such as updating tracking databases, and assisted with preparing materials for events and presentations.

Selected Project Experience

San Diego Association of Governments: Mid-Coast Trolley Project

The Mid-Coast Trolley Project will extend Trolley service from the Old Town Transit Center to the University City Community, serving major activity centers such as Mission Bay Park, the VA Medical Center, UC San Diego, and Westfield UTC. Marissa provides project support by coordinating the distribution of construction notices, monitoring stakeholder inquiries from the project information phone line and email, developing content for social media and project website and providing support to project managers

City of San Diego: Pure Water San Diego Program

Pure Water San Diego is the City’s phased, multi-year program that uses water purification technology to clean recycled water to produce safe, high-quality drinking water. The Pure Water Day Open House was free public event in which community members participated in guided tours of the demonstration Pure Water Facility, tastings of the purified water, guided tours of the facility’s Waterwise Garden, and educational youth activities. Marissa assisted with the promotion and preparation for the event by developing event social media posts, preparing giveaway materials, assisting with the development of youth activities, and assisting with the distribution of promotional fliers.



Larry Sward Biological Review - HELIX Environmental Planning

Years of Experience: 30

Education:

BS, Biology with emphasis in Ecology, San Diego State University

MS, Biology with emphasis in Botany, San Diego State University

Professional Registrations:

US Fish & Wildlife Service Endangered and Threatened Species Permit

County of San Diego Approved Biological Consultant

County of San Diego Approved Revegetation Planner

What Larry brings to the project...

- 30+ years of experience assessing impacts to water-dependent ecosystems
- Experience completing studies in the San Luis Rey River watershed—knowledge of issues and sensitive receptors
- Approved environmental consultant with the County of San Diego—knows county guidelines and requirements

Larry specializes in vegetation mapping, rare plant surveys, wetland delineations, and restoration projects. His work has been conducted according to the requirements of the National Environmental Policy Act (NEPA), Endangered Species Act (ESA) (Sections 7 and 10a), Clean Water Act (Section 404), California Environmental Quality Act (CEQA), California Endangered Species Act (CESA), and California Fish and Game Code (Sections 1600 and 2081). As a botanist and biologist in Southern California for more than 30 years, Larry has conducted many, and often extensive, surveys and biological analyses for local sensitive communities and habitats. As part of his vegetation mapping experience, he has conducted large field mapping efforts of over 10,000 acres for several sites and has conducted desktop analysis of vegetation mapping for sites using his knowledge and experience in various southern California ecosystems.

Selected Project Experience

City of San Diego: Biological Constraints Report for the San Diego Pure Water Program

Larry was the Principal Biologist for efforts to support a 20-year, phased program that involves planning, design, and construction of new advanced water purification facilities, wastewater facilities, pump stations, and pipelines for the City of San Diego Public Utilities Department's Pure Water Program. Provided direction to biologists conducting desktop analysis to support Biological Constraints Report. Work on this project was performed for the City of San Diego.

Heilos Property Solutions: Ocean Breeze Ranch

Larry was the Principal Biologist for proposed 400-lot residential subdivision and privately-owned equestrian facility on 1,400 acres in unincorporated San Diego County. Designed and implemented rare plant surveys for a 400-lot residential subdivision and privately-owned equestrian facility on 1,400 acres in unincorporated San Diego County. Work on this project was performed for Ocean Breeze Ranch, LLC. with County of San Diego as the lead agency.

Wetlands Training Institute: Instructor

Larry developed specialty curriculum associated with three courses: plant identification, riparian habitat restoration, habitat restoration, and vernal pool plant identification. Courses are regularly two-to-three days long and include classroom- and field-based learning. Previous course offerings under Mr. Sward included: Basic Wetland Delineation, Wetland Soils, Vernal Pool Flora and Restoration, and a five-day Wetland Delineation course.

City of San Juan Capistrano: San Juan Creek Groundwater Monitoring Wells

Larry was the Principal Biologist for project to evaluate the effects of groundwater pumping on riparian forest vegetation in San Juan Creek. The City was allowed to use this groundwater for municipal use provided they did not adversely affect the well-developed riparian vegetation of San Juan Creek. Data collection and analysis included vegetation line transects and the California Rapid Assessment Method. Conducted the initial site evaluation and oversaw the preparation of the reports. Work performed for Stetson Engineers, Inc. with the City of San Juan Capistrano as the lead agency.

Palmdale Water District: Littlerock Creek Groundwater Recharge & Recovery Feasibility Study

Larry was the Principal Biologist conducting a biological resources investigation of eight potential recharge sites totaling 3,250 acres in Los Angeles County for Palmdale Water District. Work performed for an engineering prime.



John Robinson

Ordinance Review and Funding Assessment - John Robinson Cons.

Years of Experience: 30

Education:

BS, Civil Engineering, California State University, Long Beach

What John brings to the project...

- Expertise in funding sources and ordinances for water infrastructure and resources projects—identify potential funding mechanisms and ordinances to implement GSP projects and management actions

John Robinson has over 20 years of experience in engineering consulting, construction management, project leadership/project management, operational/fiscal management and market sector strategy development focused most recently on obtaining local, State and Federal grants and/or loans for public agencies and special districts.

Mr. Robinson assisted in obtaining and managing the U.S. Bureau of Reclamation Title XVI funding, FEMA, State Revolving Fund (SFR) Proposition 50, State Water Resources Control Board (SWRCB) Proposition 13, Department of Water Resources Proposition 84 Rounds 1, 2 and 3 and Metropolitan Water District of Southern California Local Resources Program and Recycled Water Retrofit Pilot Program monies in order to complete the approximately \$182M of recycled water projects for clients in southern California. Mr. Robinson assisted in completing the coordination with the funding agency on the behalf of clients including monthly reports, progress deliverables, proposed financial breakdowns and coordinating field meetings.

Selected Project Experience

La Puente Valley Water District and San Gabriel Valley Water Company: Water Resources Funding

Mr. Robinson assisted in obtaining Department of Water Resources Proposition 84, Round 3 Part A funding at \$0.8M. Mr. Robinson coordinated with the application consultant, Upper District, LPCVMWD staff and SGVWC staff to develop all sections of the application and complete the review of the application before submittal to the DWR. Mr. Robinson made all the presentation to the Greater Los Angeles Steering Committee for the application. Mr. Robinson was response for the expansion of the Upper San Gabriel Valley Municipal Water District’s recycled water system to both LPCVWD and SGVWC. The facilities for these two projects include 15,000 linear feet of pipeline and the recycled water conversion of approximately 130 acre-feet per year to utilize recycled water for irrigation purposes.

Crescenta Valley Water District: Nitrate Removal Treatment Facility

Technical advisor for the funding application to CVWD. Mr. Robinson assisted in obtaining Department of Water Resources Proposition 84, Round 2 funding at approximately \$0.5M. Mr. Robinson provided technical advise to CVWD staff who developed all sections of the application and complete the review of the application before submittal to the DWR. Mr. Robinson assisted CVWD with the presentation to the Greater Los Angeles Steering Committee for the application. The project was an innovative plan to provided nitrate removal technology in order to treat and reuse more groundwater supplies versus utilizing imported water. The Project is funding 50-percent from DWR Proposition 84 Round 2 funding.

Inland Empire Utilities Agency: LRP, Proposition 50, Title XVI and Water SMART

Mr. Robinson assisted in obtaining and managing the U.S. Bureau of Reclamation (USBOR) Title XVI funding, State Water Resources Control Board (SWRCB) State Revolving Fund (SFR) linked to Proposition 50, SWRCB Proposition 13 and Metropolitan Water District of Southern California (MWD) Local Resources Program (LRP) monies in order to complete selected projects. Mr. Robinson assisted in completing the coordination ~\$85 million with USBOR, SWRCB, and MWD on the behalf of Inland Empire Utilities Agency including monthly reports, progress deliverables, proposed financial breakdowns, and coordinating field meetings.

West Basin Municipal Water District: LRP, Proposition 50, Title XVI, and Water SMART

Mr. Robinson assisted in obtaining and managing the USBOR Title XVI funding, USBOR Water SMART funding, SWRCB SRF linked to Proposition 50, SWRCB Proposition 13, and MWD LRP monies. Mr. Robinson assisted in completing the coordination with USBOR, SWRCB, and MWD on the behalf of West Basin Municipal Water District including monthly reports, progress deliverables, proposed financial breakdowns, and coordinating field meetings. In March 2012, obtained ~\$1,200,000 from CDWR Proposition 50 monies for West Basin’s Desalination Demonstration Project. Provided grant writing assistance to West Basin from 2012-2014, with over \$1.4 million in funding applied for. Applications were submitted to USBR and CDWR. In August 2014, \$150,000 was awarded by the USBR for West Basin’s Screen Study Project.



Sanjay Gaur Funding Plan - Raftelis

Years of Experience: 20

Education:

Master of Public Administration, Kennedy School of Government, Harvard University

Master of Science, Applied Economics, University of California, Santa Cruz

Bachelor of Arts, Economics and Environmental Studies, University of California, Santa Cruz

What Sanjay brings to the project...

- Expertise in developing rates that comply with Proposition 218 requirements—help develop rate structures and funding strategies that are defensible and enable GSP implementation
- Experience with GSP projects and support for GSAs—understand GSP funding requirements and the unique funding needs of GSPs

Sanjay has more than 20 years of public-sector consulting experience, primarily focusing on providing financial and rate consulting services to water and wastewater utilities. His experience includes providing rate structure design, cost of service studies, financial analysis, cost benefit analysis, capacity fee studies, conservation studies, and demand forecasting for utilities spanning the west coast. He has provided consulting service to over 100 different agencies. Sanjay is considered one of the leading experts in developing rates that meet Proposition 218 requirements and is often sought out to provide assistance on rate studies that are complex and controversial. He has experience providing rate studies and support for GSPs across the state including in San Diego County.

Selected Project Experience

Rancho California Water District: Rate Structure

Sanjay has provided consulting services to Rancho California Water District since 2007. During this time, he has helped the District develop a water budget rate structure. The project required the consultant to develop a flexible water budget model that could determine multiple blocks widths and allocations. The team was successfully able to accomplish this task and assisted the District in implementing the new water budget rate structure. The rates were successfully adopted in November 2009.

Sanjay also helped the District develop a New Water Demand Offset Fee. The New Water Demand Offset Program is a form of funding for conservation measures

that will help to create sustainable, zero water footprint development. New developments will pay fees called New Water Demand Offset Fees to create potable water savings in the existing system to support water demand generated by new developments.

Western Municipal Water District: Rate Studies and Financial Model Development

Since 2009, Sanjay has provided consulting services to Western Municipal Water District. He successfully implemented water budget rates, including facilitating and leading a discussion on the policy options associated with water budget rate development.

Sanjay also led efforts to develop a financial model that is capable of examining the District's 14 different fund centers, develop and save different Capital Improvement Plan scenarios, examine the financial consequences of each scenario, and compare the results.

Lastly, Sanjay completed a Capacity Fee study for the District, which included water, wastewater, and recycled water. The prior Capacity Fee was outdated and significant changes were required. This study included public outreach to the Business Industry Association. Since then, Sanjay has provided assistance to the District in updating its water rates and developing the administrative record required.

Fallbrook Public Utility District: Rate Structure Studies

Fallbrook Public Utility District provides water, recycled water, and wastewater services. The District has a complex rate structure due to the fact that it provides both domestic service, special agricultural rates from the San Diego County Water Authority, normal agricultural service, and a combination of these services to the same meter. Given the recent lawsuit associated with San Juan Capistrano, the District was interested in developing a comprehensive rate study that can fund a new source of water supply and cost of service rate study that can justify the different types of rates. In 2016, Sanjay served as the Project Manager on this study and was successful in developing a 180-page administrative record that clearly explains the nexus requirement associated with Proposition 218 and the adoption of the five years of rates.

Borrego Valley Groundwater Sustainability Agency: GSP Financial Planning Model

Sanjay oversaw efforts to develop a financial planning model and fee options for the GSA as mandated by the Sustainable Groundwater Management Act. Tasks included working with the core Project Team to develop policy options for fee structuring and various fee recovery mechanisms. Project deliverables included a financing plan memorandum, an Excel-based financial plan Model, operating and administrative budget creation, and a user manual for the Excel Model.



Kevin Dostiuk Funding Plan Support - Raftelis

Years of Experience: 12

Education:

Master of Environmental Management, Duke University

BA, Business, Economics, and History, University of California Santa Barbara

What Kevin brings to the project...

- Water infrastructure finance expertise—identify effective funding strategies to implement GSP projects and management actions
- Experience with GSP projects and support for GSAs—understand GSP funding requirements and the unique funding needs of GSPs

Kevin has a background in economics and accounting and possesses extensive analytical skills. His expertise lies in financial accounting, analysis of water supply reservoir operations and management, environmental policy, and water quality trading programs; as well as United States Army Corps of Engineers (USACE) water supply and flood control policy. Kevin is an active member of the American Water Works Association (AWWA) Young Professionals and the Young Professionals Summit Committees in conjunction with the AWWA Utility Management Conference (UMC). He authored an article on potable reuse in Journal AWWA discussing the treatment, financing structures, and pricing of treated water at advanced purification treatment plants. Most recently Kevin coauthored an article on proactive financial planning in times of drought for California Society of Municipal Finance Officers (CSMFO) Magazine.

Selected Project Experience

Borrego Valley Groundwater Sustainability Agency: Financial Planning Model

Raftelis was contracted by the Agency to develop a financial planning model and fee options for the new entity as mandated by the Sustainable Groundwater Management Act (SGMA). Tasks included working with the core Project Team to develop policy options for fee structuring and various fee recovery mechanisms. Project deliverables included a financing plan memorandum, an Excel-based financial plan Model, operating and administrative budget creation, and a user manual for the Excel Model.

Borrego Water District: SGMA Support

Raftelis contracted with the District to evaluate the impact of county growth projections as well as the Sustainable Groundwater Management Act (SGMA) of 2014. Kevin utilized the existing financial plan model, water supply analyses provided by other District consultants, and assumptions on land acquisitions to determine the effect of SGMA on long term water rates. The Borrego Groundwater Basin is critically over drafted and users will need to decrease water production significantly to achieve sustainable yield by 2040. This will require the District to reduce per capita water use and acquire production credits within the basin by fallowing agricultural land. Kevin estimated water rates in each year through 2040 incorporating assumptions on groundwater production, market values of land in the basin, debt financing, and water source alternatives. In 2017 Kevin examined the affordability of water rates charged to the District's customers. The assessment analyzed both existing and future rates and affordability under the SGMA scenario identified in 2016. The affordability assessment relied upon the SGMA Impact Assessment and corresponding demand projections, basin yield assumptions, financing assumptions, and projected rates to the year 2040. The project allowed the District to understand affordability of existing rates and water allocation and to estimate the affordability impacts of SGMA compliance in the Borrego Groundwater Basin over the long term. Kevin is currently engaged with the District and the County of San Diego to assess the costs of implementing the Groundwater Sustainability Plan (GSP) as part of SGMA. Kevin is leading the project for Raftelis which includes developing the appropriate approach and methodology for developing GSA charges, evaluating the options for funding mechanisms, advising on other charges and penalties, and assisting in designing a water market for the groundwater basin users. The District has just awarded Raftelis a contract for a new five-year rate study for water and wastewater services with work performed through 2019.

City of Riverside: Funding Study

Kevin completed a study for the City of Riverside (City) to determine the value of an elevation fee credit for present and future customers in a special district. The project required calculation of asset replacement values for infrastructure serving the special district, specific to booster capacity, and within the context of a historical assessment. The findings from the study were used to defend the City's move to assess its elevation fee schedule.

City of Corona: Financial Plan Update

Kevin helped the City in updating its financial plans for the water and reclaimed water enterprises. The study included performing cost of service analyses for both utilities and updating the water budget rate structure. In addition, Kevin developed a framework and corresponding rates for contract reclaimed water customers.



Project Experience

City of Oceanside, Mission Basin Water Supply, IPR, And Pathogen Removal (PR) Study
Oceanside, CA

Our team completed an innovative study to evaluate indirect potable reuse (IPR) feasibility combined with a technical study to evaluate pathogen removal through a water reclamation facility. Once completed, the study will help the City enhance water supply reliability for its customers. The project was conducted during a time of significant regulatory uncertainty, with the CDPH’s recently-released groundwater recharge draft regulations subject to interpretation and conversations on direct potable reuse were increasing state-wide.

As a result of our efforts, the City will soon be able to improve groundwater conditions, increase local supply reliability, optimize water recycling at the San Luis Rey Water Treatment Facility with IPR supplementing conventional Non-Potable Reuse (NPR) opportunities, and maximize opportunities for outside funding to limit potential impacts to ratepayers. When completed, the project will use between 2,000 and 5,000 acre feet of purified recycled water per year to recharge the Mission Sub-basin.

Project Data

Client: City of Oceanside
Client Contact: Cari Dale
Address: 300 North Coast Highway, Oceanside, CA92054
Phone: (760) 435-5812
Email: cdale@ci.oceanside.ca.us
Project Date: Ongoing

Scope of Work Items from RFQ:

- Basin Scale Groundwater Studies
- Data Gap Assessment and Monitoring Well Network
- Assess Groundwater Use on Streamflow/Ecosystems
- Downstream User

Geoscience Experience by the Numbers

25+

Groundwater Management Plans and Plan Components—our familiarity makes us an ideal partner to help you meet SGMA guidelines and sustainably manage groundwater resources

2,000+

Groundwater Basin Studies Completed by our Team—help you identify detailed and comprehensive solutions to groundwater issues

300+

Groundwater Flow Projects including Groundwater Budgets and Sustainable Yield—provide accurate data helping you to plan for the future and improve water supply reliability

39+

MODFLOW Models Developed and/or Modified—efficiently complete and update groundwater models to provide certainty in planning efforts while reducing costs and improving reliability

20

Groundwater Monitoring Networks Developed and Gap Analyses Completed in the past five years—partner with you to identify and acquire needed information to manage your groundwater basin

120+

The Number of Stakeholders on a Single Project—help you obtain sound and defensible data to receive regulatory agency approval and community acceptance



Western Municipal Water District, Riverside-Arlington Basin Groundwater Sustainability Plan

Riverside, CA

Western Municipal Water District was formed in 1954 to bring supplemental water (Colorado River and State Water Project) to western Riverside County and serves more than 23,000 retail water customers and 130 irrigation customers. To meet demand, the District also uses supplemental groundwater from the Arlington Subbasin.

Building upon previous work in the basin completed by Geoscience and others, we are leading efforts to develop a Groundwater Sustainability Plan. Our team is working in conjunction with the district to complete all studies and investigations necessary to complete a compliant GSP. Specific activities include supporting grant administration and stakeholder engagement, assessing and developing a data management system, reviewing monitoring networks and providing recommendations, and defining the plan area.

Prior to this project, Geoscience began developing the Santa Ana River Integrated model that will combine nine ground and surface water models into one integrated model for the upper watershed. Because the integrated model will cover the Riverside-Arlington Basin, we are using the model to either complete, or provide guidance for several studies required to complete the GSP. Specifically we will use the model to assess the basin's current and historical conditions, provide a detailed basin characterization, develop the water budget, assess sustainable management criteria, and determine the effectiveness of proposed projects and management actions.

As each GSP component and study are completed, we are developing Technical Memoranda for the District to review and comment upon. Each approved and finalized Technical Memoranda will become a section of the final GSP. Our

Project Data

Client: Western Municipal Water District
Client Contact: Karly Gaynor
Address: 14205 Meridian Pkwy, Riverside, CA 92518
Phone: (951) 571-7212
Email: kgaynor@wmwd.com
Project Date: Ongoing

Scope of Work Items from RFQ:

- Grant Administration and Support
- GSP Components
- Plan Area and Basin Setting
- Hydrogeologic Conceptual Model, Groundwater Flow Modeling, and Water Budget
- Management Goals and Objectives
- Monitoring Network
- Environmental Compliance and Permitting
- Cost of Schedule and Implementation
- Stakeholder Outreach
- Monitoring Well Planning, Evaluation, Design and Construction, and Monitoring Plan



team will compile the final GSP document for public review and comment prior to final District and State Approval.

The project is currently in progress and expected to be completed by 2022.



We are using groundwater models to provide more detailed hydrogeological information and help better determine the effectiveness of selected projects and management actions



Olivenhain Municipal Water District, Groundwater Supply and Brine Management Program

San Diego County, CA

Olivenhain Municipal Water District (OMWD) serves approximately 84,000 customers in the communities of Encinitas, Carlsbad, portions of San Diego, San Marcos, and Solana Beach. Because OMWD relies almost entirely on imported water from the California and Colorado aqueducts, the district is investigating ways to develop local water supplies. Our team is working with OMWD staff to determine the safe yield increment of water available in the San Dieguito basin without impacting other users, and determine locations for well fields, treatment facilities, pipelines, and brine discharge facilities to produce 1,600 acre-feet (AF) per year.

Currently, OMWD is not pumping from the San Dieguito basin because it contains mostly brackish water caused by sea water intrusion and recharge with marine sediments—degrading the water quality. Our team is assessing the current basin conditions and helping to plan for water treatment facilities to provide the district with an additional source of water.

Our team is collecting data, completing a hydrological investigation, updating the current groundwater model, and calculating sustainable yield. **This will support a future GSP.** We are also developing preliminary well designs, recommending brine management activities,

Project Data

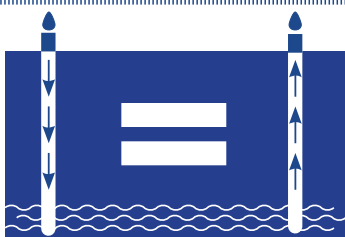
Client: Olivenhain Municipal Water District
Client Contact: Joseph Randall
Address: 1966 Olivenhain Road, Encinitas, CA 92024
Phone: (858) 522-6743
Email: jrandall@olivenhain.com
Project Date: Ongoing

Scope of Work Items from RFQ:

- Groundwater Management Plan Components
- Basin Scale Groundwater Studies
- Develop, Apply, and Review Groundwater Flow Models
- MODFLOW Based Groundwater Modeling
- Data Gap Assessment and Monitoring Well Network
- Assess Groundwater Use on Streamflow/Ecosystems
- Collaborate with Stakeholders
- Hydrogeologic Characterization Studies
- Prepare Technical Reports

supporting community outreach, and completing desk-top environmental reviews.

The basin was mapped by the state Department of Water Resources in 2016 as part of the Sustainable Groundwater Management Act, however it did not consider the relationship between the mapped geology and the extent of water bearing materials within the basin. To develop a more accurate model, we modified the basin boundaries based on the local lithology and bedrock geology. The refined boundary allowed OMWD to get a clearer picture of the basin's sustainable yield and more accurate data to plan for the future.



Sustainable Groundwater Use

Much like with a GSP, we are helping Olivenhain Municipal Water District determine how to sustainably use their groundwater resources. In fact, some of the studies that we are completing for the district (water budget, hydrogeologic model, etc.) are the same that would be required to complete a GSP.



San Bernardino Valley Municipal Water District, Upper Santa Ana River Integrated Model

San Bernardino and Riverside Counties, CA

The Santa Ana River (SAR) watershed is the largest in Southern California and home to some of the fastest population growth in the country. The communities in the upper watershed from the Seven Oaks Dam upstream to the Prado Dam downstream rely on groundwater for much of their water supply. Currently the SAR passes over four groundwater basins in the area, multiple water districts, and nine separate groundwater and watershed models—making it difficult to identify current conditions and potential impacts that planned projects could have on groundwater and the watershed as a whole. Complicating matters is that the basins are hydrologically connected to several other basins in the area.

San Bernardino Valley Municipal Water District formed a joint effort with Riverside Public Utilities, Western Municipal Water District, Inland Empire Utilities Agency, Orange County Water District, the U.S. Geological Survey, the California Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service. This joint effort will develop a combined model for the Santa Ana River that will help determine baseline hydrological conditions and the potential effects of proposed projects on the Santa Ana River and groundwater levels for the entire upper watershed.

The goals of the project are:

- Develop a tool to help riparian habitat and endangered species protection efforts
- Identify any perennial rising or shallow groundwater locations and how these areas might be affected by current and proposed projects
- Enhance the Habitat Conservation Plan (HCP) baseline condition to include both streamflow and groundwater levels

Project Data

Client: San Bernardino Valley Municipal Water District
Client Contact: Bob Tincher, Engineering and Planning Mgr.
Address: 380 East Vanderbuild Way, San Bernardino, CA 92408
Phone: (909) 387-9215
Email: bobt@sbvmwd.com
Project Date: Ongoing

Scope of Work Items from RFQ:

- Groundwater Management Plan Components
- Basin Scale Groundwater Studies
- Develop, Apply, and Review Groundwater Flow Models
- MODFLOW Based Groundwater Modeling
- Data Gap Assessment and Monitoring Well Network
- Assess Groundwater Use on Streamflow/Ecosystems
- Collaborate with Stakeholders
- Hydrogeologic Characterization Studies/Recharge
- Prepare Technical Reports

- Develop a better understanding of how current projects (i.e. groundwater operations in the various basins, etc.) impact flow in the Santa Ana River and groundwater levels
- Predict how proposed projects and mitigation measures addressed in the HCP will impact flow in the Santa Ana River and groundwater levels in the area

Currently, our team is using the existing groundwater and surface water models to develop an integrated watershed model. The resulting Upper SAR Integrated Model (or Integrated SAR Model), will be used to determine what factors may contribute to declines SAR flows, and assess cumulative effects on SAR surface flows and groundwater levels from approved, outstanding, and proposed projects, including Upper SAR Habitat Conservation Plan Covered Activities.



Rancho California Water District, Integrated Murrieta-Temecula Groundwater Basin and Streamflow Model

Temecula, CA

The Rancho California Water District (RCWD) overlies a groundwater basin encompassing approximately 90 square miles in southern Riverside County. Approximately half of the annual water needed by the District is produced from saturated alluvial deposits through a system of 100 deep wells. Between 1995 and 2002 Geoscience developed an integrated groundwater and streamflow model for the Murrieta-Temecula Groundwater Basin located at the upper part of the Santa Margarita River Watershed.

The primary purpose of the model is to help resolve water-right controversies between the RCWD, located in the upper part of the watershed, and the Camp Pendleton Marine Corps Base, located in the lower part of the watershed. Much of the legal controversy in the past focused on the quantity, timing, and quality of flow in the Santa Margarita River at the “Gorge,” a gap in the coastal mountains that separates the upper part of the watershed from the lower part. The model helped the parties arrive at a consensus, and is used as one of the District’s groundwater management tools to evaluate proposed groundwater management schemes on a basin-wide level. The scope of this investigation included:

- Compile and analyze geohydrologic data
- Assess local geography including faults within the basin
- Develop and calibrate an integrated groundwater and streamflow model



Consensus Based Dispute Resolution

Our study helped resolve a long-standing dispute between RCWD and Camp Pendleton Marine Corps Base. By coming to a consensus on the model, both parties avoided costly litigation.



Federally Reserved Water Rights

The Winters Doctrine applies to all lands reserved by the Federal Government. For this project, we worked with all stakeholders including a military installation that had reserved water rights.

Project Data

Client: Rancho California Water District
Client Contact: Rich Ottolini, Water Operations Manager
Address: 42135 Winchester Road, Temecula, CA 92590
Phone: (951) 296-6900
Email: otolinir@ranchowater.com
Project Date: 2015

Scope of Work Items from RFQ:

- Groundwater Management Plan Components
- Basin Scale Groundwater Studies
- Develop, Apply, and Review Groundwater Flow Models
- MODFLOW Based Groundwater Modeling
- Data Gap Assessment and Monitoring Well Network
- Assess Groundwater Use on Streamflow/Ecosystems
- Collaborate with Stakeholders
- Hydrogeologic Characterization Studies/Recharge
- Prepare Technical Reports

- Develop and run model scenarios
- Provide overall coordination with Technical Advisory Committee (TAC) members including the U.S. Geological Survey, RCWD, Camp Pendleton, Stetson Engineers, Inc., and the Santa Margarita River Watershed Watermaster. During the model development, 30 model workshops were conducted to present and discuss ongoing modeling results and to address reviews and comments from TAC members
- Prepare a report documenting the integrated groundwater and streamflow model
- Provide regular updates and model recalibration



Project Approach and Scope of Work

Executive Summary

Members of the Upper San Luis Rey Valley GSA have already spent a significant amount of time and effort to form a Groundwater Sustainability Agency (GSA) and begin preparing a Groundwater Sustainability Plan (GSP). In developing our approach to completing this project, we were mindful of the substantial effort already expended by the USLR GSA member agencies. Our approach will be to build upon previous work and information whenever possible, and maximize State grant funds to help reduce out-of-pocket costs incurred by GSA members.

We have assembled our project team based on careful consideration of your strategic objectives. We feel that our project team is uniquely qualified to partner with you on this effort. We have worked in your basin and understand your issues and concerns with this GSP effort. Over the past four decades, we have focused solely on sustainable groundwater management and have successfully completed numerous safe yield studies and basin management plans prior to the recent SGMA efforts. Working on several other GSPs as well as working with DWR for SGMA model review, we understand SGMA and what is needed to develop a successful GSP for your basin.

Detailed Work Task Description

To develop the detailed scope of work contained in the following section, we carefully reviewed all aspects of this project and available supporting information. We also leveraged our team’s experience in the basin, our more than four decades of groundwater management experience, and knowledge of GSA members and stakeholders to better identify key issues and how to address them. While we have provided a detailed scope of work, we also provide an overview of the tasks by required GSP chapters to give a clear picture of the steps and timing to complete this project.

Project Deliverables

The project tasks were organized to logically follow the progression of studies needed to complete the GSP. The table to the right lists each task and GSP deliverable produced during each task.

Task	Description	Deliverable
1.0	Existing Data Compilation	TM: Data Compilation
2.0	Existing Data Assessment	TM: Data Gap Assessment
3.0	Develop Monitoring Program	TM: Monitoring Program
4.0	Quarterly Water Level Monitoring and Reporting	Quarterly Groundwater Monitoring Reports
5.0	Water Quality Data Sampling and Analysis	Semi Annual Water Quality Reports
6.0	GSP Document Development	GSP Documents
7.0	Groundwater Dependent Ecosystem Assessment	TM; Groundwater Dependent Ecosystems
8.0	Communication and Outreach	GSP Public Involvement Plan, Message Plan, Collateral Materials, and Meeting Materials
9.0	Funding Plan	Input to Quarterly Grant Reports
10.0	Ordinance and Permitting	TM: Planning, Permitting, and Zoning Ordinance
11.0	Project Management	

Detailed Task Description

Task 1.0: Existing Data Compilation

Task 1.1: Charter Meeting (Kick-Off Meeting)

The primary objective of the Charter, or project kick-off, meeting will be to meet with key project individuals from the Groundwater Sustainability Agency (GSA) to review project goals and timelines. The meeting will also include a discussion of data needs. Geoscience will initiate a data request and will submit it to the District.

Task 1.2: Data Compilation

We know by experience and completing numerous groundwater sustainable yield and water budget studies the importance of efficient data collection and the use of software that helps ensure accurate, thorough, and efficient data collection and manipulation.

The first step in collecting data will be to provide a written Data Request Package to stakeholders at the project kick-off meeting (**Task 1.1**). The data request will provide an overview of the GSP process as a whole and summarize data that will be needed for the GSP effort. Concurrent with the data request, we will begin preparing confidentiality agreements with each pertinent stakeholder, as discussed in **Task 1.4 below**. We have found that first having the full scope of the data request in hand will better inform stakeholders for preparing confidentiality agreements.

We will use a rigorous set of Quality Assurance and Quality Control (QA/QC) standards that we have developed in similar projects, to collect and ensure the accuracy and quality of data we collect (**see Task 1.5**). We will establish a timeline specific to the data collection effort which will allow our team to efficiently request, obtain, and review data for accuracy and completeness to keep the project on schedule. After the initial data request, which will clearly identify the required data, our team will use an internal Data Collection Log to track data we already have, data received, sources of data, and any changes to the data (manually entered, unit conversions, etc.). We understand data may be received in various formats.

In addition to data collected from stakeholders, we will collect all other available data relating to conditions in the groundwater basin. Our team has experience completing geologic and hydrogeologic investigations within the entire San Luis Rey River Valley. As such, we currently have a database of geological and hydrogeological reference material for your basin. Data that we currently have in our library includes local lithology, water quality, groundwater levels, and pumping test data from our previous studies and reports. Our pre-existing data will help our team efficiently compile data and identify data gaps.

Additional information and data collected will include, but not be limited to:

- Groundwater elevation data
- Surface water and groundwater quality data
- Geologic and hydrogeologic reports and studies
- Well log reports and other well information
- Pumping and water demand records
- Available water budgets prepared for relevant portions of the basin
- Additional known and reported cases of groundwater contamination, such as leaking underground tanks or impacts from nitrates

We have already obtained stream gauge data from several public sources and will request additional data from other sources, including local water agencies and tribes. Similarly, precipitation data are available from public sources such as the National Oceanic and Atmospheric Administration (NOAA), Weather Underground, and will be included in the data collection. If land subsidence has occurred and records are available, those data will also be included in the data collection. As part of this effort, we will collect and review available information related to existing and contested water rights and recent tribal water rights agreements and settlements to develop water demand estimates and water budgets for the basin.

We will catalogue the data and include a reference summary and table of contents. Data will be entered into a comprehensive, searchable database with an optional graphic web-interface for stakeholders (discussed in **Task 1.6 below**). We will provide the data to a GSA-approved Secured File Exchange site to share information and maintain confidentiality. Data provided by the tribes will be managed in accordance with a confidentiality protocol developed in consultation with the tribal representative/consultant and approved by the tribes (**see Task 1.4 below**).

Task 1.3: Locate Existing Wells

For purposes of streamlining this work, we concur that locating and assessing the condition of existing wells as a parallel effort to collecting existing data from stakeholders is valuable. As part of preparing our recommended scope for your GSP, our team has conducted an initial reconnaissance survey of the wells located in your Basin. We will use GPS mapping to document the location of these and other available wells. However, we can expand the initial well canvassing efforts more efficiently by partnering with GSA members. We will meet respondents onsite to map their wells and discuss pumping history and access for monitoring and sampling. After locating and cataloging existing wells, the existing monitoring network will be initially assessed. The SGMA groundwater monitoring system must be specific to the basin hydrogeologic

conditions and designed to track measurable objectives and interim milestones set by the GSA for current and future project conditions.

We will first summarize known monitoring programs and activities within the groundwater basin that can be used to meet SGMA requirements. Identifying existing monitoring points will help the project team determine the scale of the monitoring plan needed to consistently collect data and evaluate progress in meeting all sustainability goals. The inset below shows the locations of wells within the Upper San Luis Rey Groundwater Basin which have 1.5 years of water level and/or water quality data. **Our initial review suggests there may be sufficient monitoring points to develop a groundwater monitoring network for the basin, without needing to construct additional monitoring wells.**

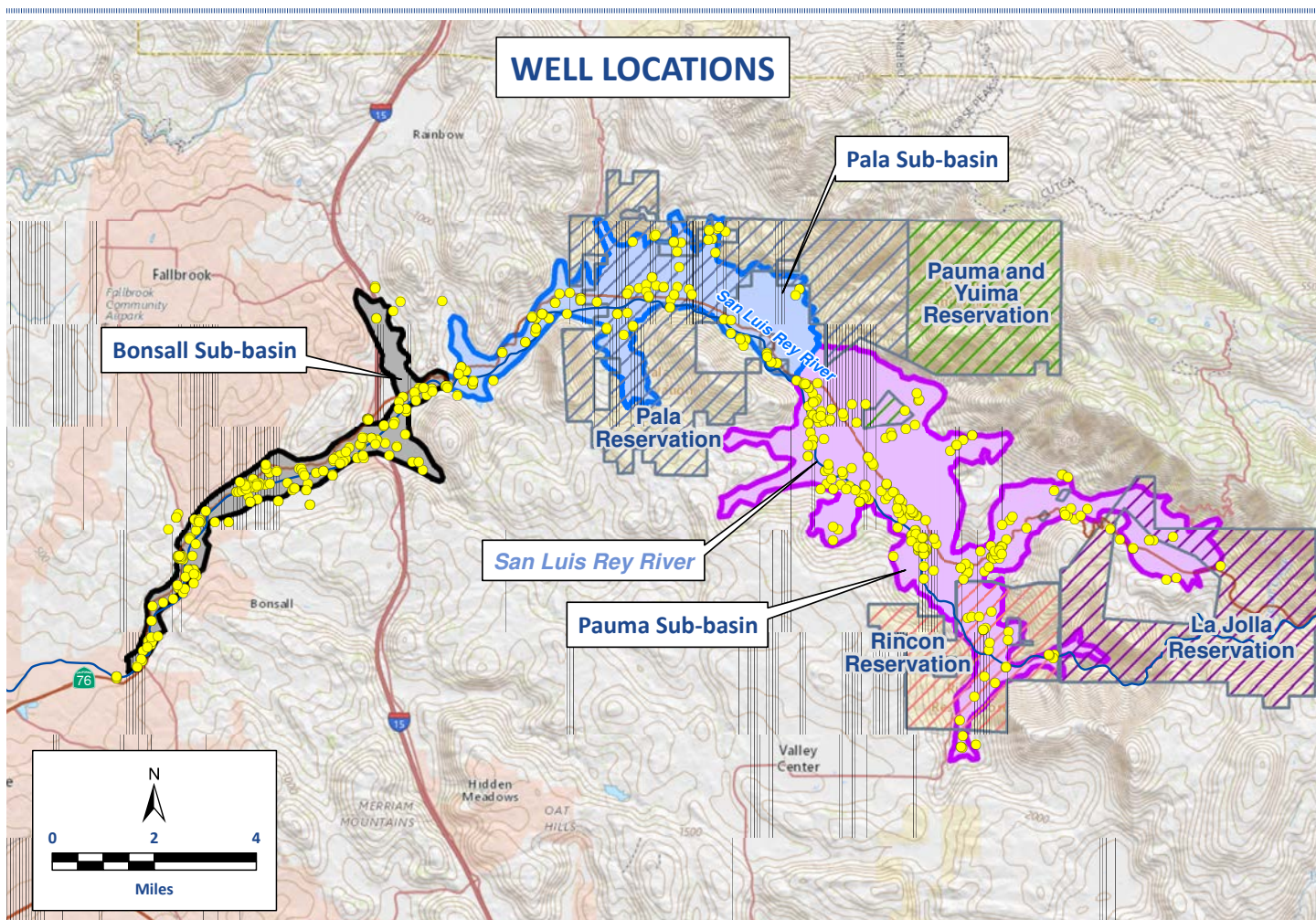
We will review available aerial photos to confirm locations of known wells and unknown well sites. For known wells without available pumping records, we will review publicly available electrical usage data to estimate well usage.

Task 1.4: Prepare Confidentiality Protocol

Although confidentiality agreements are very effective among private parties, they are less effective when one of the parties is a public agency due to the California Public Records Act. While the Act exempts utility customer information from public disclosure, the exemption likely does not cover groundwater information provided to develop a GSP. Recently, some GSAs have developed a new strategy that we feel may be a good fit with your GSP effort. We recommend the following approach to legally ensure data confidentiality in this effort:

- Current and past pumping data are sent only to the consultant developing the GSP, and not the GSA.
- Furthermore, the consultant and the GSA agree in writing that the consultant will hold data in complete confidence, will not share data with any party, and that the GSA does not have the right to get data from the consultant.

This strategy will help ensure that confidential data stays confidential and is not disclosed through legal leverage.



Existing Well Locations:

The map above illustrates current well locations. Because the large number and distribution of wells, the GSA may be able to establish a monitoring network with existing wells—**reducing implementation costs.**

We assume that District council will review the draft protocol to verify that the document:

- Adequately defines “confidential information” without being over inclusive
- Describes the procedure for identifying protected information
- Clearly sets forth the level of care that the receiving party must take in keeping the information confidential
- Identifies permitted disclosures—by court order or when the law otherwise provides
- Defines the law governing the agreement—California or Federal



The California Public Records Act may present challenges in keeping groundwater information confidential. One option would be to have GSA partner agencies send data only to the consultant developing the GSP.

Task 1.5: Data Collection QA/QC

We will develop a rigorous Quality Assurance and Quality Control (QA/QC) plan to verify the thoroughness and completeness of data collected for your GSP. Before beginning data collection in Task 1.0, a plan detailing proposed data quality procedures will be submitted for approval.

Task 1.6: Develop Digital Data Library

Based on our previous experience with similar data collection projects, we have found that capturing all pertinent well information at this stage is key and streamlines later efforts. We will map and enter well information data that includes all pertinent well operation, water quality, and construction data (e.g., well depth, screen intervals, equipping, elevation, and water level measurement reference points) into a comprehensive and customized database.

There are several options for database management software. However, as a first step to expediently gather and enter data, we recommend using Microsoft Access (relational database software) in conjunction with ESRI ArcMap GIS for data visualization. From experience, we have found these tools to be the most effective for data collection tasks as they are simple, effective, and efficient. They allow us to manipulate and analyze large amounts of data in a short amount of time—increasing the project’s overall efficiency and reducing the chance of incorrect data affecting the final study results. In addition, these tools can provide visual aids to display spatial and temporal changes of data and results.

Optional: Developing a Long-Term Database Solution for Managing and Reporting Your Data

We understand that establishing the best tools for long-term data management and SGMA reporting is not a one-size-fits-all approach. We will work with you to identify the best solution for your long-term data management and reporting needs, and recommend a solution that best fits

Data	Have	Need	Source/Notes
Local and Regional Reports	✓	✓	Geoscience and SCS work products, Need additional
Plans, Studies, Models	✓	✓	Geoscience and SCS work products, Need additional
Existing Well Information	✓		CASGEM Data, Will review and verify data
Basin Condition		✓	Limited historic data available
Water Quality Data	✓		CASGEM Data, Need additional and verify with water providers
Pumping Records		✓	
Water Demand		✓	
Water Rights	✓		Review current court case, review additional rights
Prior Water Budgets		✓	
Subsidence Reports		✓	
Precipitation Data	✓		
Streamflow	✓	✓	Data acquired from public sources, will seek additional data
Water Levels	✓		
Fault maps	✓		USGS Map and previous projects in the valley

Acquired Data vs. Needed Data:

We have collected a substantial amount of data needed to complete the GSP. The table above lists the data that our team has acquired versus the data still needed.

your strategic goals and budget. Some GSAs have adopted an approach of hosting data on web-accessible platforms to streamline communication. Data confidentiality, your existing GIS tools, long-term costs, staff responsible for data reporting, and other concerns associated with access of your basin’s data must be considered when developing a long-term strategy for data management.

Solutions that we have recommended for other clients include Earthsoft EQuIS software in conjunction with ArcMap GIS. This is one of the industry standards for geospatial water quality and water level electronic data. It may be run locally or web-hosted and has a library of standard Electronic Data Delivery (EDD) formats used to directly upload electronic water quality and level data without the need to reformat, which saves time, reduces cost, and reduces the chance for errors.

Thoroughness and Completeness of Data Collection

Establishing a timeline specific to the data collection effort allows our team to efficiently request, obtain, and review data for accuracy and completeness—keeping the project on schedule. Our team will use an internal Data Collection Log to track data we already have, data received, sources of data, and any changes to the data (manually entered, unit conversions, etc.). We understand that data may be received in various formats. All data will be maintained electronically. Therefore, any data received in hard-copy format will be entered manually. We will retain all raw data as a reference should any data issues arise. Using the Data Collection Log, the team will track missing data and follow up with respective stakeholders according to the data collection timeline. Checking data for accuracy and completeness as it is received and maintaining open communication with stakeholders will help ensure the integrity and efficiency of the data collection effort.

QA/QC Procedures for Existing Data

Our team will use a set of rigorous QA/QC procedures to verify that the existing data we collect is thorough and accurate. In-house QA/QC will be implemented throughout the data handling and entry process. Specifically, the initial QA/QC process for collection of existing data will include:

- Check for consistency in water production units (e.g., gallons vs. acre-ft)
- Document well operational status (e.g., continually operating or intermittently operated)
- Check for consistent water quality constituents (e.g., Nitrate or Nitrate-Nitrogen)
- Check for and ensure consistent concentration units (e.g., ug/L or mg/L)
- Check for and ensure unique well identification (Well No. and Owner)
- Remove duplicate records
- Screen water quality results for sampling error (e.g., iron and manganese concentrations that exceed soluble limits)
- Check for accuracy of water quality analyses using statistical methods of cation/anion balance
- Apply statistical test to determine normality and identify outliers in well datasets
- Verify water level data are consistent with reference points (i.e., depth to water vs. drawdown)
- Validate data entry through creation of graphical plots of data

Once our in-house QA/QC process is complete, we will plot well-specific TDS concentrations, nitrate concentrations, water levels, and well location maps to submit for visual review and final validation.

Task 1.7: Data Compilation Draft Technical Memorandum

A Draft Data Compilation Technical Memorandum (TM) will be prepared that provides all of the data collected and QA/QC procedures conducted during **Task 1.0**. The draft TM will be submitted to the GSA technical advisory committee (TAC) for review and comment.

Task 1.8: Data Compilation Technical Memorandum Meeting

A meeting will be scheduled after the GSA and TAC has had sufficient time to review and comment on the Draft Data Compilation TM. This meeting will be used as a forum to discuss any comments on the Draft TM. All comments will be addressed in the Final TM (**Task 1.9**).

Task 1.9: Data Compilation Final Technical Memorandum

A Final Data Compilation TM will be prepared, which will incorporate all comments discussed in Task 1.8. The Final Data Compilation TM will be submitted to the GSA and TAC.

Task 2.0: Existing Data Assessment

Task 2.1: Data Gap Assessment

Following the compilation and quality control checks on existing data, as discussed in Task 1.0, our team will prepare a Data Quality Objective (DQO) narrative that will be used as a basis for assessing both the existing dataset and as a guideline for monitoring network recommendations discussed in Task 3.0. The DQO will include:

- Goals of data collection for each sustainability indicator
- Acceptance criteria for different types of data
- Boundaries of data acquisition for different sustainability parameters
- Acceptable analytical methods for groundwater flow and level
- Detection limits and acceptable accuracies for selected water quality indicators

Our team will review the collected data and compare the acquired data to data requirements in the California Water Code (CWC) §10727 through §10728.6 and SGMA Emergency Regulations.

The DQO will be used for a data gap assessment, which will identify any data gaps and needs for each of the sustainability indicators for your basin. The data gap assessment will also consider gaps in both the conceptual model and water balance. It is therefore important to be concurrently looking at the previous tasks while collecting data. Data quality and temporal and spatial distribution will be evaluated based on the DQO, as discussed below. The groundwater model (**Task 6.0**) will also be used to assess data gaps.

Assessment of data gaps will be based on:

- Insufficient spatial frequency
- Insufficient temporal frequency
- Quality of data due to access, funding, and resources
- Gaps in the data based on sustainability indicators
- Gaps in data based on the hydrogeologic conceptual model

Recommendations will be made regarding increasing the density, frequency, and/or quality of data collection to better understand the conceptual model, refine the water balance, and evaluate sustainability goals.

Task 2.2: Develop Technical Memorandum: Existing Data Assessment

A TM detailing the existing data, data gaps, and recommendations will be provided to the GSA. The TM will provide a graphical-based representation of the completeness of existing data and an identification of critical data gaps for each type of data and sustainability indicator.

Task 3.0: Develop Monitoring Program

Task 3.1: Recommend Additional Monitoring Sites

We will review well data collected during **Tasks 1.2 and 1.3** in detail to determine the suitability of available and selected wells to make up the monitoring well network. The County currently reports data from four wells in the Pauma/Pala subbasins to the CASGEM program. The configuration of the subbasins and water quality conditions (which were briefly assessed for this proposal) suggest that three to four additional monitoring points each in the Pala and Pauma valleys should be included in the monitoring network, and may be available from existing wells. Therefore, we will review data from existing wells to determine whether any of the existing wells are appropriately located and constructed to allow adequate spatial and temporal collection of multiple groundwater level and water quality datasets. The monitoring network must also include points monitoring changes in land surface elevation and water discharge conditions to demonstrate compliance with GSP regulations. Ideally, enough data from existing wells will be available to calculate baseline (ambient) groundwater conditions and assess current conditions for all sustainability indicators.

Task 3.2: Develop Monitoring Protocols

The scale and frequency of monitoring outlined in the Monitoring Program will be constructed to provide a cost-effective means to evaluate if on-going water quality conditions are consistent with water quality objectives defined in the Basin Plan and by California's Division of Drinking Water (DDW), and to track progress towards achieving sustainability goals for the basin. The monitoring protocols will be developed to ensure efficient, accurate and consistent data collection through the course of the Monitoring Program. As appropriate, the monitoring protocols may recommend installing pressure transducers in several key wells to collect data between quarterly monitoring events—allowing for an evaluation of seasonal fluctuations in the interaction between surface water and groundwater. The extent of monitoring will depend on site-specific conditions investigated as a part of this work. We will use the basin conditions that our team identifies to prepare rationale for the scale, location, and frequency of monitoring proposed in the Sampling and Analysis Plan.

Task 3.3: Develop Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) will include supporting data to develop monitoring objectives and interim milestones, monitoring protocols (considering Data Quality Objectives and the QA/QC plan), and reporting requirements to meet SGMA guidelines. The recommended monitoring network will help evaluate short-term, seasonal, and long-term trends in groundwater level and water quality and surface water flow in sufficient frequency to demonstrate progress towards meeting measurable objectives. The SAP will contain maps and construction details for proposed monitoring wells (if needed), initial baseline water level, water quality data, surface water flow, historical groundwater in storage estimates, potential subsidence areas, and proposed subsidence monitoring methodology. Proposed sampling frequency and analytical suites will be included in tabular form. The SAP will be submitted for review and approval prior to commencing water level and water quality sampling efforts. The SAP prepared as a part of this work will be included as an Appendix in the GSP.

Water Level Data Quality Control

We will establish procedures and methods used for groundwater level monitoring as part of the SAP that will be developed for your GSP. QA/QC procedures for water level measurements will be important to verify that measured water level data is accurate and representative of actual basin conditions. Components of the plan for water level monitoring will include:

- Procedures to ensure accuracy of water level instrumentation used in measurement
- Establishing the ground surface elevation and reference measurement point
- Recording measurement method
- Documenting activity of well during measurement (e.g., static or pumping)
- Establishing procedures for converting depth to water into groundwater elevation

Water quality sampling will follow a set of rigorous QA/QC procedures, which will be detailed in the SAP. We will tailor the QA/QC standards for this project to ensure that water quality data collected in this sampling effort is accurate and representative of your basin conditions without imposing unnecessary costs that may accompany overly-rigorous QA/QC sampling or analytical requirements. The components of the QA/QC plan for water quality samples will include:

- Table of analytes and approved methods
- Procedures for collecting samples from pumping wells, and purging procedures for collecting samples from static wells
- Procedures for sample container and preservation
- Procedures for collection of water quality samples
- Procedures for sample handling, documentation, and chain of custody
- Procedures for duplicates and blanks

Task 3.4: Draft Technical Memorandum: Monitoring Program

The Draft Monitoring Program TM will include data collected for the recommended additional monitoring sites, sampling protocols, and information on the SAP.

Task 3.5: Monitoring Program Meeting

After the Draft Monitoring Program TM is submitted and reviewed by the GSA and TAC, a meeting or workshop will be held with the GSA and TAC to review existing data, key areas of the basin, and comments on the draft TM. This will allow an opportunity for stakeholders to share knowledge and input.

Task 3.6: Final Technical Memorandum: Monitoring Program

After the Monitoring Program meeting, a Final Monitoring Program TM will be issued which will incorporate all comments received from the GSA and TAC.

Task 4.0: Quarterly Water Level Monitoring and Reporting

Task 4.1: Quarterly Groundwater Level Monitoring

Groundwater monitoring data is key to SGMA compliance as it provides the basis to evaluate water level trends and chronic lowering of the water table in the basin; it also demonstrates measured progress toward achieving sustainability goals by implementing the GSP. Once the groundwater monitoring program has been established (i.e., network of available wells), the monitoring network is used to collect representative groundwater level and groundwater quality data for the basin.

We will develop a well inventory database as an Excel spreadsheet file for the monitoring network. Before conducting water level monitoring, we will determine and add well elevations to the database to normalize groundwater levels (see [Task 4.2](#)). As part of this work, our team will perform four (4) quarterly water level monitoring events on up to 40 wells.

Task 4.2: Quarterly Data Reporting

We will record existing survey data for well elevation (above mean sea level [msl]) in the database. Wells that do not have existing elevation data will be surveyed and added to the database. Water level data will be collected using an electric wireline sounder capable of measuring depth to water with an accuracy of 1/100th of a foot. Our team will set up the database to allow the team to generate hydrographs to track temporal changes in groundwater levels. Data entered will be compatible with GIS to generate groundwater elevation maps for the basin. Groundwater elevation monitoring will be performed quarterly (four times per year), with cumulative water level data provided 15 days after each monitoring event (four per year). A total of six events (four quarterly and two semi-annual events)

will be conducted prior to submittal of the Draft GSP. The report will consist of a summary of groundwater conditions using maps, figures, and tables.

Task 5.0: Water Quality Data Sampling and Analysis

Task 5.1: Semi-Annual Well Sampling

Our team will perform two (2) sampling events on 20 wells (per sampling event) in the monitoring network. During each sampling event, groundwater monitoring wells and inactive supply wells will be purged to remove “stale” water within the well, allowing us to sample water that represents aquifer conditions. Active pumping wells will be allowed to discharge for several minutes to allow a suitable exchange of water within the well boring. Field parameters including dissolved oxygen, specific conductance, pH, and temperature will be measured during purging to confirm stabilization of water field parameters and adequate purging.

After an appropriate volume of groundwater has been purged and field parameters have stabilized, groundwater samples from monitoring and inactive supply wells will be collected with single-use disposable samplers, such as bailers, or directly from an appropriate sample port or stream if the well has a functional pump. Active pumping wells will be sampled through a dedicated sample port or sample stream. Groundwater samples will be collected into laboratory-supplied containers and placed in an ice-filled cooler pending delivery to the laboratory for analysis. Chain of custody procedures will be implemented for sample tracking.

Task 5.2: Semi-Annual Water Quality Laboratory Analysis/Reporting

The groundwater samples will be analyzed for general mineral and physical constituents along with selected organic and inorganic parameters, based on the recommendations of the SAP ([Task 3.3](#)). As with the monitoring data, groundwater analytical data will be included in the database to create chemographs comparing groundwater quality data to groundwater elevation data over time, and to generate maps depicting distribution and trends in groundwater quality parameters in the basin. Groundwater quality data will be submitted to the GSA and TAC approximately 30 days after each sampling event, or at the earliest possible date, depending on normal sample turn-around times and laboratory reporting. Because of their past experience in the basin, we propose contracting with Babcock Laboratories to complete analytical testing.

Task 6.0: Groundwater Sustainability Plan

The GSP will be developed to address the seven main components of a groundwater sustainability plan, as recommended in DWR’s GSP annotated outline guidance document:

- Executive Summary
- Chapter 1 – Introductory Information
- Chapter 2 – Plan Area
- Chapter 3 – Basin Setting (Water Budgets)
- Chapter 4 – Sustainable Management Criteria
- Chapter 5 – Projects and Management Actions
- Chapter 6 – Plan Implementation
- Chapter 7 – GSP Monitoring Network

The tasks described below are planned to progressively develop each GSP chapter and section efficiently by data collection and analysis, technical advisory meetings for input, review and approval, and creating GSP technical memorandums representing parts of or complete chapters. Reports and deliverables will be formatted so that as each is completed, reviewed, and approved, they can be efficiently compiled to form the draft GSP. The executive summary will be prepared last and included in the administrative draft of the GSP.

Task 6.1: Introductory Chapter

This chapter mainly covers background information for the basin and stakeholders and GSA. Required information will be assembled and submitted as a draft technical memorandum for review.

Task 6.2: Plan Area Chapter

We will develop a description of the plan area by assimilating appropriate information already prepared in previous documents. The description will include all relevant information from previous studies to take advantage of information already generated in the basin. The plan area description will include information outlined in the DWR provided GSP checklist and GSP Emergency Regulations.

Plan Contents, Subarticle 1 “Administrative Information” of DWR’s “Preparation Checklist for GSP Submittal” (“Checklist”)

Most of the information for this chapter will be derived from existing documents previously prepared for the GSA and new information generated during GSP development. The Plan Area chapter of the GSP will be provided as a technical memorandum for review. The portion of the Plan Area section to include “Notice and Communication” will be prepared and added to the section during the preparation of the Draft GSP to include all communications and notices.

We will develop one (1) Draft and Final Technical Memorandum of the Plan Area chapter, including draft and final maps.

Task 6.3: Basin Setting Chapter

Article 5. Plan Contents, Subarticle 2. Basin Setting of the “Checklist” describes the content needed to fully characterize current and historical groundwater conditions. Items that will be discussed in the Basin Setting Chapter include:

- Groundwater elevation
- Estimate of groundwater storage
- Groundwater quality issues
- Land subsidence conditions

- Identification of interconnected surface water systems
- Identification of groundwater-dependent ecosystems

With the requested groundwater elevation data and our team’s in-house data, we can efficiently prepare maps to illustrate both current and historical conditions. In addition, we will develop a hydrological conceptual model which will be used to create a calibrated groundwater model (see **Task 6.4**). The model will be able to estimate groundwater storage, evaluate land subsidence issues, and identify interconnected surface water systems quickly and efficiently.

Task 6.4: Water Budgets

Data collection and evaluation of the Pauma and Pala Subbasins indicates that both basins are interconnected and were essentially formed from the same geologic processes. Therefore, as requested, we will address the Upper San Luis Rey Groundwater Basin as a whole and will prepare all information, including water budgets, for both sub-basins and estimate subsurface inflows and outflows to/from Pauma and Pala Subbasins and to Bonsall Subbasin using the calibrated groundwater model.

Modeling Tools

We concur that a modeling tool will provide significant efficiency and time savings to the development of GSP. While a groundwater model is not mandatory under SGMA, it is highly recommended by DWR and by our team since a groundwater model would be calibrated to real water levels and seasonal water level responses over an appropriate hydrologic base period in the basin(s). The modeling tool we propose to create for the Upper San Luis Rey Groundwater Basin would consist of an integrated surface water and groundwater model. The Geoscience team has extensive experience in constructing and calibrating surface water and groundwater models. Locally, we have constructed a groundwater model for the Mission Basin and Oceanside Harbor, the Santa Margarita River area at Camp Pendleton, Rancho California Water District area, and a surface water model for the Warm Springs Subbasin. We can efficiently construct a surface water model and groundwater model well within the timeframe of the GSP (**see project schedule**). Using an integrated surface/groundwater model will make addressing all evaluation criteria required for the GSP chapters (such as water budgets, sustainability goals, and especially for assessing the spatial distribution of groundwater storage and water quality changes from current and future projects, etc.) efficient and defensible, and will address potential impacts from climate change. In addition, model construction will provide a valuable tool that can be used to evaluate proposed basin projects and management actions. The following sections provide our approach to construct and calibrate modeling tools for the GSP. A discussion of the pros and cons of developing a calibrated groundwater model are provided on the following page.

Develop Watershed Model (Surface Water Model)

Based on available precipitation, land use, and soil data, the development of a watershed model represents an effective tool to help determine inflow components for a groundwater budget. Geoscience has developed and

applied watershed models in developing water budgets and evaluating safe yield for many groundwater basins in Southern California. By applying a modern numerical modeling tool, we can better quantify water budget terms within the Upper San Luis Rey Groundwater Basin, both spatially and temporally. We propose to use the Hydrologic Simulation Program – Fortran (HSPF) watershed model for this study. HSPF is a widely used, accepted, and proven watershed model code. The computer software resulted in publicly-available codes developed for, and with support of the United States Environmental Protection Agency (EPA) and United States Geological Survey (USGS). The most recent release is HSPF version 12.

HSPF is a comprehensive and physically-based watershed model that can simulate the hydrology and water quality with a time step of less than one day. This approach is a physical-based and distributed parameter method. In other words—the areal distribution of watershed parameters such as precipitation, vegetation density, slope, pervious/impervious areas, and soil parameters will be taken into account. By completing model simulations, we can quantify recharge to the groundwater system, including recharge due to potential changes in land use within the basin. Also, potential stormwater capture can be quantified, which can potentially be used to increase the basin’s local groundwater supply and sustainable yield. Once the watershed parameters have been estimated, the model is calibrated to observed streamflow at streamflow gages within the basin.

The watershed model for the basin will be developed for a selected hydrogeologic period based upon the long-term rainfall record. Also, a 50-year base period is required by the SGMA Modeling best management practice (BMP). The time period selected should meet the following criteria:

- Be representative of long-term hydrologic conditions
- Include wet, dry, and average precipitation years
- Span at least a 50-year period
- Have its start and end years preceded by comparatively similar rainfall quantities
- Preferably start and end in a dry period. This will minimize any water draining (in transit) through the vadose zone
- Include recent cultural conditions

The hydrologic water balance for a basin considers inflow and outflow from the groundwater system. Inflow terms include:

- Deep infiltration of precipitation (areal recharge)
- Streambed percolation
- Mountain front recharge
- Subsurface inflow
- Return flow from applied water
- Outflow terms include:
- Groundwater extraction (pumping)
- Evapotranspiration
- Subsurface outflow

Benefits of Using a Model to Develop the GSP

More Reliable Conceptual Model: Calibrating a model will compare model-predicted water levels to measured water levels in wells. This will help you better understand where the model is having difficulty reproducing observed water levels and therefore where the assumed basin geometry and/or previous conceptual models need to be refined

More Defendable Water Budgets: The modeling tool will provide a quick and efficient way of calculating historical, current, and future water budgets under wet, dry, and average hydrologic conditions. The model will reliably establish seasonal changes to inflow and outflow between the Pauma and Pala Valleys, and more accurately determine changes in storage based on observed water levels. In addition, the model allows for water budget terms to be applied spatially (as opposed to a lumped-parameter model that considers the basin as a whole) so that basin sustainability can be managed more effectively. The model can also easily incorporate DWR climate change datasets, as required for the GSP.

Better Assess Data Gaps and Establish a Monitoring Network: Using a model, you can see data needs that may not be apparent by just looking at available data in an area. The modeling tool will provide a quick and efficient way of reviewing data and siting potential new locations of monitoring wells for both water level and water quality tracking. It will also allow final siting of the monitoring network based on the final selection of projects and management actions.

Better Evaluate Projects and Management Actions: Evaluation of proposed basin projects and management actions will be iterative. Empirical methods are doable but cumbersome and only provide an average basin-wide impact. The modeling tool will allow project scenarios to be conducted quickly and efficiently while providing estimates of site-specific impacts. This will facilitate the evaluation of a project or combinations of projects and aid final selection.

On-Going Data Evaluation and GSP Modifications: The GSP will be evaluated on a regular basis as new datasets are added to the database. The modeling tool can be refined periodically and used to efficiently evaluate sustainability indicators and potential refinements needed in the monitoring network

Benefits of Not Using A model to Develop the GSP

Save on Additional Time and Costs to Construct and Calibrate the Models: Constructing and calibrating the surface water/ groundwater model will add some additional time and costs to the project (although it can still be completed within the project schedule). The additional costs are provided in our cost estimate. However, the time spent will be saved during the assessment of the future impacts of selected projects as well as in making future management decisions.

None

None

None

None

Benefits of Developing a Groundwater Model During GSP Development:

The table above reviews the pros and cons of developing a calibrated groundwater model during GSP development.

In essence, the HSPF watershed model quantifies and tracks the volume of rainfall over a specific area (model cell) at a selected time (day/month/year). The model then subtracts the amount of that volume that is lost to evapotranspiration, streamflow, or infiltrates downward to the groundwater body. The amount that infiltrates downward is calculated based on the land use coverage, soil type, and its corresponding infiltration rate. The quantity is then calculated for each cell and totaled for all cells in the entire area of concern (watershed/subwatershed/ subarea/ subbasin/ basin). The watershed model provides estimates of natural recharge from precipitation and streamflow runoff. These fluxes will then be used as input for the groundwater model. The complete water balance is determined from the groundwater model, as discussed below.

Develop Groundwater Model

Because Geoscience has constructed groundwater models for the Mission Basin and the Oceanside Harbor area, which is in the Lower San Luis Rey Groundwater Basin, we understand that accurately representing the Upper San Luis Rey Groundwater Basin hydrogeologic conceptual model will be essential to the construction of a defensible groundwater model. To that effect, we will develop a calibrated groundwater model of the basin using the MODFLOW. Construction of the Pauma-Pala Groundwater Model (PPGWM) will require the following tasks.

Model Domain and Grid Design

We anticipate that the PPGWM will be a 4-layer model with a uniform cell size equal to or less than 50 ft x 50 ft and use monthly stress periods. Geoscience will make test runs with different cell sizes to verify that the model's execution run time is manageable. The model domain, number of model layers, and cell size will be discussed with the GSA and TAC prior to model construction.

Delineate Model Layers

We will delineate model layer elevations and model layer boundaries based on lithologic and hydrogeologic data. The model boundaries will coincide with the subbasin boundaries.

Estimate Aquifer Properties

To estimate initial hydraulic conductivity values, we will first calculate a weighted average lithologic value of the model cell for each model layer, based on reviewing well log data, summing thicknesses of each lithologic category, and determining a weighted average based on classification type and thickness for each flow model cell in each model layer, respectively. We will then calculate a hydraulic conductivity multiplier based on a relationship between the weighted average of lithologic values and estimates of hydraulic conductivity. The estimated hydraulic conductivity values will be derived based on aquifer pumping tests and data (if available), available specific capacity data from production wells, or from estimates based on log descriptions. Finally, we will calculate hydraulic conductivity values for each model cell of each layer as the product of the weighted lithologic value and a hydraulic conductivity multiplier. Vertical hydraulic conductivity values will be assumed to be a ratio of horizontal hydraulic conductivity values.

Specific yield values will be derived from available pumping test data or assigned representative values based on material type and aquifer distribution. Initial values assigned to the model will be within the typical ranges of reported values and adjusted during model calibration.

Prepare Recharge and Discharge Packages

Our team will use a recharge package to simulate regionally distributed recharge to the groundwater system as a result of precipitation or artificial recharge. The rate of deep percolation from precipitation will be estimated using the watershed model developed for this study. A general head boundary (GHB) package will be assigned to portions of the groundwater model where the aquifers extend beyond the bounds of the Pauma/Pala Subbasins to simulate flows across the model boundaries, such as inflow from the Warner Subbasin. Estimated pumping data will be loaded into a well package and applied to the groundwater model.

Data from the integrated surface water and groundwater model will be used to prepare a historical water budgets for the basin. The inset below provides an example graphical representation of a basin water balance showing inflows and outflows. In addition to the historical (base period) water balance, we will prepare a maximum perennial yield calculation under both dry, average, and wet hydrologic conditions. The maximum perennial yield determinations will be based on maintaining sustainability thresholds.

Streamflow Routing Package

The streamflow routing package (SFR) will be used to address the surface water/ groundwater interaction from streamflow in San Luis Rey River and the underlying groundwater basin under baseline and potential future pumping and climactic conditions. Using the SFR, baseline conditions will be determined under historical conditions and be used for comparison with potential future conditions such as increased pumping, groundwater recharge, and climate change. The interaction of surface water and groundwater as a sustainability goal will also be assessed and determined using the groundwater model.

Subsidence Package

Lithologic data will be reviewed and analyzed to evaluate potential historical land subsidence and to determine whether there is a potential for future land subsidence. Lithologic logs will be analyzed for percent clay content and to assess potential locations, both spatially and vertically, where soil conditions would indicate potential susceptibility to land subsidence due to groundwater pumping. The lithologic data, as well as any available surveyed benchmark data, will be incorporated into the groundwater model using the subsidence package.

Development of Predictive Simulations

The watershed model and groundwater model will be used together to run predictive simulations. The initial scenario run will consist of baseline historical conditions to determine the water budgets for the selected hydrologic base period. The calibrated groundwater model will become a tool for evaluating the impact of various scenarios of proposed projects and management actions. The model will be used to assess "minimum thresholds", which would essentially be considered "failure points", and

measurable objectives which will be treated as points of sustainability.

NOTE: The final model will be provided to the client and to DWR in formats available to staff with modeling expertise (MODFLOW, Excel, plain text, general GIS files, etc.).

Model Calibration and Sensitivity Analysis

Groundwater flow model calibration will be performed using the “history matching” technique. In this method, the historical groundwater level data will be compared with model-generated groundwater levels. Results of the model calibration will be explained in terms of calibration statistics, plots of observed versus model-generated water levels, and transient hydrographs of observed versus model-generated heads for specific wells. The calibration statistics will be used to determine the accuracy of the model and uncertainty of predictive results. The flow model calibration will be conducted based on the guidelines documented in “Standard Guide for Comparing Ground-Water Flow Model Simulations to Site-Specific Information (ASTM, 1993), “Standard Guide for Calibrating a Ground-Water Flow Model Application” (ASTM, 1996) and “Guidelines for Evaluating Ground-Water Flow Models” (USGS, 2004). We will recommend that the model be updated and recalibrated with data collected during the on-going monitoring program.

As part of the model calibration procedure, we will perform a sensitivity analysis of the groundwater model which will identify key model parameters that cause the most changes in model results. During the sensitivity analysis, selected parameters or flux terms will be iteratively altered by a given factor to determine its effect on model output.

Model parameters that cause significant changes in model results will be investigated thoroughly to identify model uncertainty.

Develop Model Documentation Report

We will prepare a draft surface water and groundwater model documentation report for GSA review and comment on, followed by a final report which will be included as an appendix to the GSP.

Developing Water Budgets

The historical, current, and future groundwater budgets will be derived from the calibrated modeling tools. The basin’s historical water budgets will be developed through the creation and calibration of the groundwater model. Inflow terms for the model area include recharge from precipitation, mountain front recharge, streambed percolation, return flows from agricultural and municipal water use, and subsurface inflows. Outflow terms include groundwater pumping, evapotranspiration, and subsurface outflow. These inflow and outflow terms will be quantified for the transient calibration period. Changes in groundwater storage will be calculated based on the Equation of Hydrologic Equilibrium (**i.e., Inflow = Outflow +/- Change in Groundwater Storage**) for the same period of time.

Groundwater production from municipal and private wells will be collected, compiled, and documented based on

available data. Where pumping data is not available, we will use traditional methods to assess pumpage by land use and parcel size. We will also develop estimates of private and agricultural groundwater use on a time interval that matches previously-completed irrigation requirement analyses.

Changes in groundwater storage will independently be calculated based on the observed changes of water levels, assumed effective porosity, and area to validate the water budget analysis. Changes in water balance under future changes in land use or from future subbasin operational changes as a result of implementation of proposed projects or management actions will be calculated using the calibrated groundwater model.

A draft “Basin Setting” chapter (**Tasks 6.3 and 6.4**) will be prepared and provided to the GSA and TAC for review and comment. Comments will be addressed and included in the draft GSP.

Task 6.5: Sustainable Management Criteria Chapter

Objectives, Minimum Thresholds, and Undesirable Results

Work from the previous tasks will provide historical baseline conditions for the basin outlined in Article 5. Plan Contents, Subarticle 3 Sustainable Management Criteria. Baseline conditions will be used to assess and describe the current status of all six sustainability indicators and whether current or historical operation of the groundwater subbasins has resulted in “undesirable” results. Undesirable results for the basin will be defined by the TAC and GSA. If the subbasins have no undesirable results from historical and current operations, then assessment of proposed changes in basin management from selected projects will be conducted to determine whether proposed changes will result in undesirable results based on the sustainability indicators. If baseline conditions indicate current undesirable results in any of the sustainability indicators, then management actions will be required to mitigate current conditions. Based on the assessment, measurable objectives, including interim milestones and minimum thresholds to reach or maintain sustainability and mitigate or avoid undesirable results set by the GSA, will be recommended, as appropriate, for TAC review, workshop discussion, and final approval.

As an example, historical groundwater levels in the 1970s and 1980s, and over the last four years suggest that the central and western portions of the Pauma Subbasin are fairly stable, with lowering of groundwater levels from annual pumping offset by seasonal rainfall and surface water recharge. However, the western portion of the Pala Subbasin appears to be trending slightly downward over last decade. Basin-wide groundwater use will be evaluated to assess the appropriate measurable objective(s) to be adopted to ensure that groundwater users and the basin in general are not harmed by current or future projected pumping.

One option provided by DWR is to consider adoption of management areas within the basin. Adopting management areas would allow the flexibility of assigning specific measurable objectives to one area over another based on the specific needs and conditions of the basin and users. The inset **figure below** shows jurisdictional areas of water districts and tribes overlying the Pauma and Pala Groundwater Subbasins. The map suggests that management areas could be assigned according to these jurisdictional areas, since each jurisdiction occupies a distinct area overlying the groundwater basins. However, this consideration would be subject to GSA discussion and evaluation based on management considerations and potential benefits to the basin.

Measurable objectives, interim milestones, and minimum thresholds will be evaluated based on the data collected from the monitoring network. Data from the monitoring network will form the basis to consistently update basin conditions and the groundwater model, which will be necessary to assess management action effectiveness to reach proposed sustainability goals. Therefore, an ongoing assessment of the monitoring network and any potential data gaps is essential to verify data accuracy and predictive simulation reliability. Assessment will determine whether the existing network provides data that adequately characterizes groundwater flow, storage change, and potential variations or changes in water quality. Results from this assessment will inform recommendations for monitoring network improvement, contained within a technical report.

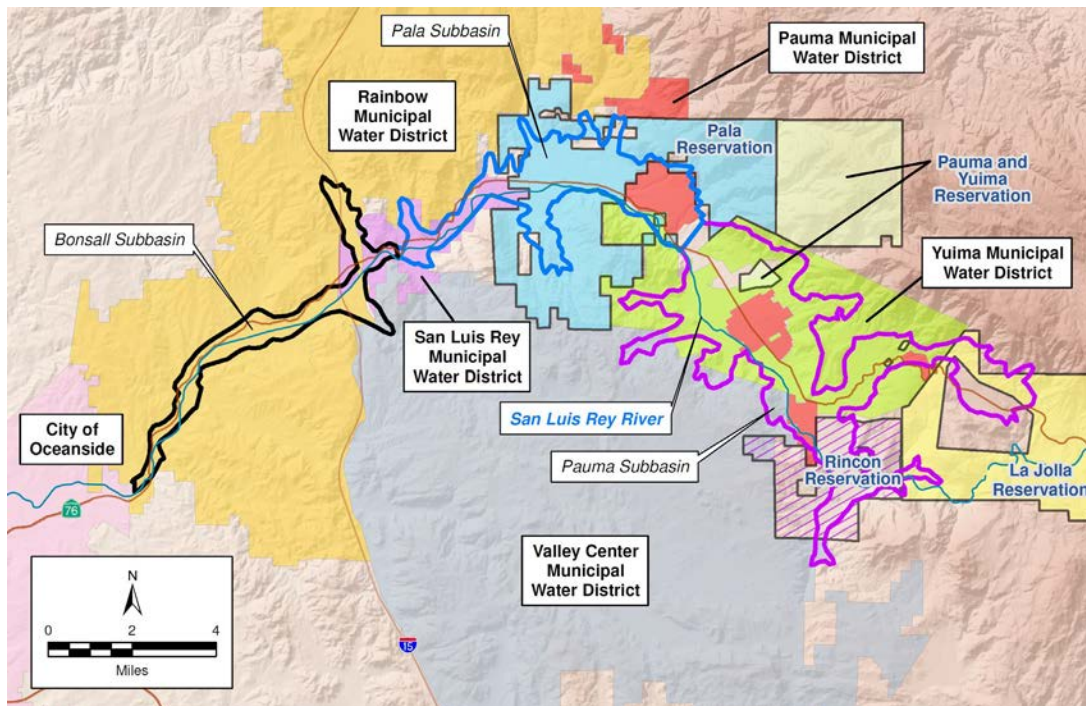
Task 6.6: Projects and Management Actions Chapter

We will assess information required by SGMA guidance (Article 5. Plan Contents, Subarticle 5 Projects and

Management Actions) to develop projects and management actions. The projects and management actions to achieve groundwater sustainability are the heart of the GSP and require the input of the GSA, TAC, and the public to identify, develop, screen, and prioritize projects. In collaboration with the GSA and the TAC, the project team will develop a list of up to ten (10) projects and management actions. Each project will include a description of expected benefits to achieve groundwater sustainability goals, how the benefits will be evaluated through the monitoring program, and measurable objective(s) that the project/management action will apply to. A scoring matrix will be developed for the projects and management actions and scoring criteria will be prioritized in collaboration with the GSA. The matrix will be used to prioritize the projects/management actions for their benefit to groundwater sustainability.

As the GSP preparation progresses and the sustainability goals are developed, projects and management actions will likely evolve through the discussions that occur during meetings and workshops. A log will be maintained during these discussions to capture the range of ideas and locations where projects/management actions could be implemented, as different concepts may be relevant in different portions of the GSP area. Examples of potential projects/management actions include:

- Installation of additional groundwater monitoring wells
- Installation of metering facilities for water production wells that do not currently have them
- Enhanced stormwater capture and recharge/reuse in partnership with the appropriate agencies
- Development of a conjunctive management and groundwater recharge program to maximize benefit of local and imported water
- Implementation of a variety of watershed protection



Management Area Selection:

One way to establish management areas would be to use existing jurisdictional boundaries (pictured left).

activities, such as pollution prevention programs, recharge area protection, sediment management in waterways, and salt and nutrient monitoring programs

In addition to the matrix, a fact sheet will be developed for each of the ten projects/management actions which will include a description, range of potential benefits, location map, measurable objectives the project/management action will achieve, existing/new infrastructure that may be required to implement the project/management action, and other information necessary to understand and prioritize the project/management action within the goals of the GSP. A narrative to document the selected GSP projects and management actions will also be prepared for the GSP.

Selected Projects and Management Actions

The surface water/groundwater tool will be used to efficiently support the GSA and TAC during their selection of projects and to evaluate project impacts to basin sustainability. For budgeting purposes, we assume the ten (10) proposed projects selected by the GSA will be evaluated to assess impacts of projects and management actions relative to basin sustainability goals.

Environmental Permitting Constraints for Proposed Projects and Management Actions

HELIX will conduct a desktop analysis for potential environmental (including biological and archaeological) permitting constraints for up to ten (10) projects proposed for development under the GSP (see Task 7.1). Results from HELIX's analysis will be summarized in the Project and Management Actions Chapter.

Ordinance and Permitting Review

While SGMA leaves great latitude for local decision making (primary responsibility for groundwater governance lies with the GSA), SGMA does not specify how GSAs are to be structured, or what specific governance actions and ordinances must be implemented to achieve sustainable groundwater management. Options will be reviewed as part of Task 10.1. Results of Planning, Permitting, and Ordinance Technical Memorandum (see **Task 10.1**) will be summarized in the Project and Management Actions Chapter.

Technical Memorandum: Projects and Management Actions
A summary TM, representing the Projects and Management Actions chapter of the GSP, will be prepared to provide rationale and supporting information for project and management action selection, and to document all model simulations for the proposed projects, management actions, and proposed BMPs. The TM will include a summary of scenario input and output along with appropriate figures (maps) to illustrate results of the simulations. A draft TM will be provided to the GSA and TAC for review. Comments received on the draft Projects and Management Actions TM will be incorporated in the corresponding chapter of the draft GSP.

Task 6.7: Plan Implementation Chapter

The work completed during the previous tasks will assist the GSA in selecting sustainability goals, minimum thresholds, and interim milestones to achieve or maintain sustainable operation of the groundwater basin. The GSA will collaboratively select, evaluate, and approve projects

and management actions that will ensure sustainable long-term operation of the basin, and will have developed a monitoring plan to track groundwater levels, surface water flows, and water quality to validate that the basin is operating according to plan. If revisions are necessary, then they will occur as data are collected and evaluated.

The Plan Implementation chapter of the GSP will spell-out:

- An estimate of costs for projects and management actions
- Schedule for implementation of the projects and management actions
- How annual reporting will be conducted
- How the plan will be periodically evaluated to ensure it meets GSP goals

Therefore, as part of the development of the GSP, an implementation plan will be prepared which will include a cost estimate and schedule for implementing the GSP's projects and management actions. Our team will prepare a cost and cost benefit analysis for each proposed project/management action to determine its impact on the community. This task will include preparation of a cost estimate (in Excel format) for each proposed project, management action, and BMP identified to achieve the relevant sustainability goal for the subbasins. The implementation plan will also outline reporting and compliance activities required by GSP regulations.

A standard template for required annual reporting to DWR will also be prepared. This cost of implementation template will be prepared in Microsoft Excel and will also be developed to track overall program costs for implementation. The Plan Implementation section will also include an overview of potential available funding resources to implement the projects and management actions. We will prepare a Plan Implementation TM which will become a chapter of the GSP. The TM will include costs and schedule for implementation of the selected projects and management actions, as well as proposed form of the annual reports and proposed process for periodic evaluation of the effectiveness of the GSP.

Task 6.8: GSP Monitoring Network Chapter

Most of the work to understand the available information and sites for the GSP monitoring network will be completed in earlier tasks. However, the monitoring network will be revisited – first, to provide monitoring to track sustainability indicators that will be developed in this task, and once again when projects and management actions are selected and evaluated by the GSA (**Task 6.6**).

The finalized monitoring network and program will be used to track the selected measurable objectives, interim milestones, and potential undesirable results based on current and anticipated future basin conditions. The monitoring network may require periodic refinements as data are collected. The basis for revising the monitoring program will be outlined in **Task 6.7** – Plan Implementation. The Monitoring Network will be provided as Chapter 7 of the GSP.

Task 6.9: Administrative Draft of GSP

An administrative draft GSP will be provided in electronic format for initial review and comment by the TAC, followed by review and comment by the GSA. Once comments are received, we will develop a draft GSP for public comment and review. We anticipate an additional stakeholder meeting will be needed to present the draft GSP and provide opportunity for additional public comment.

Task 6.10: Final Draft of GSP

To prepare the final GSP, our team will collect, evaluate, and respond to comments, and incorporate revisions into the Final GSP, as necessary and approved by the GSA. The Geoscience team will tabulate all comments and prepare a response sheet indicating how each response will be addressed in the final GSP. The comments and responses to comments will be incorporated as part of the GSP in an appendix. The final GSP will be submitted in both electronic form as well as hard copy. For purposes of budgeting, we assume that seven hard copies will be provided to the GSA.

Task 7.0: Groundwater Dependent Eco-System Assessment

Task 7.1: Groundwater Dependent Eco-System Assessment

HELIX will conduct a desktop analysis for potential environmental permitting constraints for up to ten (10) projects proposed for development under the GSP. A HELIX biologist will review the following information to help inform potential biological constraints: recent aerial photographs, topographic maps, soils maps, California Natural Diversity Database (CNDDDB), California Native Plant Society (CNPS) Rare Plant Inventory, US Fish and Wildlife Service critical habitat and species occurrence databases, SanBIOS database, and the National Wetland Inventory database. A HELIX archaeologist will conduct a focused records search for each project at the South Coastal Information Center (SCIC); contact the Native American Heritage Commission (NAHC) for a Sacred Lands File search; review existing archaeological information, historic maps, and aerial photographs of the project area; and conduct a desktop analysis to assess the potential for cultural resources or buried cultural material/deposits to be present within the project area. Following each desktop analysis, HELIX will provide a brief constraints letter to summarize the methods, potential biological constraints and permitting requirements, potential archaeological constraints, and recommendations for additional studies that may be needed. This scope of services does not include a field survey, focused surveys, Tribal outreach, meetings, technical analysis, or development of mitigation measures. This scope also assumes that each of the ten projects will be reviewed independently of each other.

Task 8.0: Communication and Outreach

The Pala and Pauma Valleys, in the eastern portion of the San Luis Rey Valley Groundwater Basin, consist of

multiple jurisdictions and land ownership. Reservation land from several tribes including Pala, Pauma, Rincon, and La Jolla are inter-mixed with private property and agricultural land. Because of the small area, consistent pumping, multiple stakeholders with overlapping interests, and past water rights lawsuits, the importance of public outreach and communication cannot be stressed enough. Our team believes that successful implementation of the GSP relies on addressing five central considerations in the communications and outreach process:

- Evaluate past outreach efforts for planning processes and incorporate “lessons learned”
- Align public/stakeholder outreach programs and activities with planning tasks and milestones to help ensure meaningful responses to public/stakeholder input during each phase of plan development
- Balance more vocal, single-issue interests with broader perspectives by engaging a full range of stakeholder interests
- Invest in capacity building opportunities to educate stakeholders on SGMA efforts and allow for greater, more sustained engagement and relationship building
- Utilize facilitation, public participation and conflict management experts to formulate and guide the outreach process for a greater level of success

All outreach performed will be documented and compiled for submittal with the GSP as required by regulation, including the following outreach efforts that will need to be conducted as part of the development of the GSP.

Task 8.1: Develop Public Involvement Plan

We will develop a Public Involvement Plan in consultation with the project team. The plan serves to explore community values, forecast potential stakeholder and community concerns, and determine the best ways to engage them with suitable outreach techniques, including accommodations for special needs such as language and accessibility. The plan will outline all public outreach activities to be conducted as part of the master planning process. This will include purpose, timeline, and targeted participants for each activity.

The plan will also address strategies for publicizing involvement opportunities. Three client reviews are assumed (draft, draft final, and final).

Task 8.2: Message Plan Development

A well-crafted message plan can help the GSA, its partner agencies, and the project team communicate effectively and consistently about the GSP to their various audiences. We will develop key messages to cover the goals and objectives of the GSP, development process, data collection and authentication, and any related areas of opportunity or concern. Key messages will be used to inform a wide variety of communication materials including presentations, fact sheets, media advisories, and email notices. Considering the various areas of interest across the GSA, key messages will be customized to specific groups, as needed.

Three client reviews are assumed (draft, draft final, and final).

Task 8.3: Develop Collateral Materials

Providing early, comprehensible, and accessible project information to the public greatly assists in establishing GSA as the direct source of project information and managing misinformation. Working in collaboration with the project team, we will create a two-page, double-sided, 8.5 x 11 fact sheet brochure and responses to up to 20 anticipated stakeholder questions (“FAQs”) that build awareness for SGMA efforts and the plan development process and facilitate informed engagement. Includes up to three updates to the fact sheet brochure in advance of each of three selected milestones/ public meetings. Assumes three client reviews (draft, draft final, and final).

Task 8.4: Meetings, Meeting Design and Facilitation

Katz and Associates and Participation by Design are expert facilitators can help guide discussions and decision-making between the partner agencies and their various audiences throughout the GSP process. Professional input for public meeting materials and other related outreach engagements by a neutral third-party can be instrumental to effectively manage public dialogue and confirming that all voices are heard, and meaningful input is gathered to arrive at widely supported decisions. Our partners will provide services in preparation for meetings and to help develop project messaging.

While cooperation and consensus are the preferred modes of interaction for development of a GSP, there are naturally competing interests and potential conflicts which inevitably arise. We believe that having an experienced, professional neutral involved to administrate and manage any emerging conflicts can be an essential element of success. Consequently, our team includes Lewis Michaelson of Participation by Design, a recognized leader in facilitation and mediation for input that might arise from challenging and potentially contentious technical and stakeholder deliberations.

Convening a Technical Advisory Committee has proven successful for collecting and authenticating data. The intent of the advisory committee is to provide input and guidance to the project team regarding the data gathered and used in the development of the GSP. We will provide guidance to help ensure the successful convening and clear definition of roles and responsibilities of the advisory committee in addition to expert facilitation to facilitate a productive meeting process.

Meetings for GSP preparation fall into three major categories: those of the Technical Advisory Committee where more detailed discussions of GSP content will occur, executive level meetings where higher-level policy discussion will occur, and the Stakeholder Outreach meetings where the content will be directed to obtain input from the general public.

General Meeting Assumptions

We assume the meetings will generally be no more than two (2) hours in length. Meeting tasks assume that meeting administration, notices on the GSA website, scheduling, and logistical responsibilities will be fulfilled for up to 14 meetings. All meetings will be recorded, notes taken, and a meeting summary prepared (not a transcript). Assumes that during the life of the project, meetings will be online. In this case, a staff person will manage the online platform during the meetings. A strategic advisor/facilitator will assist with meeting design, format, and review of content. **Facilitation services will be available as needed but are not included in this cost estimate.** Our budget does not include costs for venue rentals or related equipment.

Public Meetings

For budgeting purposes, we assume five (5) meetings, depending on the level of participation from the public and stakeholders.

- Chapter 3 Basin Setting and Water Budgets
- Chapter 4 Sustainable Management Criteria Input
- Chapter 5 Projects and Management Actions Input
- Review Public Draft GSP
- GSP Adoption Public Hearing

Includes five (5), 2-hour public meetings. The meetings are assumed to use an open house format. Meeting format may change depending on the public outreach objectives defined for the meetings. Develop logistics planning document for each workshop. Arrange for meeting locations and logistics associated with holding the meetings. Our budget does not include costs for venue rentals or related equipment. Provide one support staff and facilitator to support the workshops. Hold up to two team planning meetings in preparation for each workshop and one debrief meeting for each workshop. Hold one dry run for each workshop to last no more than 3 hours.

Our team will provide:

- Public Meeting Agendas (5)
- Public Meeting Summaries (5)

Presentation Material

Meeting preparation will include development of meeting-specific Q&A documents (up to 20 questions), review of presentations, and other meeting materials developed by the technical consultant, as needed, to support the meetings. Our budget does not include production costs. Assumes draft, draft final, and final review by the client.

Our Team will provide:

- Public Meeting-Specific Q&A (5)

Stakeholder Database

We assume that the GSA will prepare a Stakeholder Database will be assembled and maintained as a project-specific master distribution and contact database, and will be updated as outreach activities and efforts result in the collection of information from new contacts.

Record of Public Outreach

The Record of Public Outreach will document the outreach, education, and communication performed during GSP development. Documentation will include identification of participants, the nature of consultation with parties affected by the GSP, a list of public meetings held where the GSP was discussed or considered by the GSA, and a collection and posting of comments received regarding the GSP. Meeting summaries and/or presentations will be compiled and included in an appendix of the GSP.

In addition, documentation of the Communication and Outreach Plan implementation activities for each quarter will be summarized and included in the Grant Administration Quarterly Progress Reporting. We assume that the GSA will prepare a record of public outreach for the GSP.

Major Milestones for Public Outreach

- The GSP 60-day public review and comment period prior to final GSP submittal to the SLR Working Group.
- The final GSP submittal to the Technical Advisory Committee and SLR Working Group
- The final GSP approval by Technical Advisory Committee and SLR Working Group

Task 9.0: Funding Plan

Task 9.1: Funding Plan

Kick-Off Meeting and Data Collection

Team members from Raftelis will participate in the kick-off meeting so that they can complete their due diligence to verify that project participants agree to the project's goals, approach, work plan, schedule, and priorities for the funding plan. At the meeting, they will discuss objectives, policy considerations, methodologies, and data needs as well as finalize the project schedule. Prior to the kick-off meeting, Raftelis will work with our team to prepare a detailed data request so that the appropriate data can be assembled in the required format. Raftelis will thoroughly review any data provided in advance of the kick-off meeting. They will also discuss key financial policies such as an appropriate reserve target or contingencies to be considered in the study. Following the kick-off meeting, Raftelis will prepare detailed meeting minutes pertaining to the funding strategy and plan to be provided the project team. This task assumes one in-person kick-off meeting with GSA staff, stakeholder agencies, and Geoscience. A data request list in Microsoft Word, kick-off meeting presentation in Microsoft PowerPoint, and kick-off meeting minutes in Microsoft Word will be provided.

Budget Development

With input from the project team and stakeholders, Raftelis will develop an operational budget for the joint operation of the GSA. The GSA will incur staff costs in implementing and executing the GSP, collecting fees within the basin, providing customer service to basin users and stakeholders, and enforcing the GSP. Additional costs may be incurred in supplemental water purchases to achieve annual or interim basin targets and costs incurred in brokering transactions between basin users. Raftelis will work with the project

team to gather all information necessary to estimate total expenses in developing, implementing, and executing the GSP, estimate required revenues, and develop the financial plan model. This task assumes three webinars with GSA staff, stakeholder agencies, and Geoscience. A Webinar Presentation in Microsoft PowerPoint format will be provided.

Financial Plan Model

Raftelis will design a financial plan model for the GSA that provides a 10-year cash flow analysis (or longer if desired). The model will have the flexibility to evaluate different scenarios, in real time, to achieve different objectives and/or different financial outcomes. Raftelis' models feature a dashboard, which displays key variables and results on-screen, will show the results of each scenario and facilitate discussion for quick consensus building. This has proven to be particularly useful when making presentations, allowing attendees to fully appreciate the impacts of changes instantly. This task assumes three webinars with the project team, stakeholder agencies, and others as necessary to review the proposed financial plan. A financial plan model in Microsoft Excel will be submitted to the client.

Draft and Final Memorandum

Raftelis will develop a draft and final TM for the GSP financing plan and proposed fees and penalties. The draft TM will detail the operating expenses and financial plan. It will also discuss issues and decisions reached during fee development. The main body of the report will discuss the financial plan, fee structure selection, study assumptions, and methodologies used to develop the fees. The SLR working group will provide comments for incorporation into the Final TM.

This task assumes one webinar to discuss comments and edits to the Draft TM. Draft & Final TMs in Microsoft Word will be provided.

Task 10.0: Ordinance and Permitting

Task 10.1: Ordinance and Permitting

While SGMA leaves great latitude for local decision making (primary responsibility for groundwater governance lies with the GSA), SGMA does not specify how GSAs are to be structured, or what specific governance actions and ordinances must be implemented to achieve sustainable groundwater management. Instead, the legislation provides a variety of regulatory and non-regulatory tools—mostly optional—for GSAs to choose from. These tools, as well as those already available to local agencies, provide the basis for groundwater governance in each basin. The relatively short timeline for GSA formation and GSP development requires local governments and stakeholders to assess available options and quickly decide how to form novel agencies that are armed with the tools needed to implement strategies to meet current and future groundwater challenges.

After review, we will develop and submit a Planning, Permitting, and Ordinance Technical Memorandum detailing the recommended modifications to the County's

General Plan, zoning ordinance, Pala-Pauma Community Plan, landscape and groundwater ordinances, well permitting, and code enforcement guidelines.

Task 11.0: Project Management

Task 11.1: Ongoing Project Management Activities

Our project management for this process will be methodical and well documented. In order to establish this process, our team will coordinate, convene, and facilitate a formal kick-off meeting to outline the project goals, timelines, and deliverables and to receive feedback from the Upper San Luis Rey GSA regarding the materials and approach presented. Throughout the project we will attend virtual meetings with the GSA and TAC. In addition, or in concert with the multiple TAC meetings and workshops, we recommend holding project status meetings at least quarterly to coincide with the Quarterly Progress Reports. The Quarterly Progress Reports will, at a minimum, detail the following:

- Current project status
- Percent of budget expended
- A narrative of work accomplished and anticipated work in the next quarter
- Revised project schedules in MS Project format

We will manage project time and expense using our Deltek project management system, which will include all time and expense from subcontractors – ensuring strict adherence to project budgets.

Tracking and Reporting

At the beginning of the project we will identify and track critical path items (i.e., items that are required for other parts of the project to proceed) and develop a log to track quality issues, comments, and resolution. Additionally, our project manager will review progress and time spent on the project weekly.

Problem Identification and Correction

We will begin the project by identifying critical project elements, data sets, and potential quality issues that may require additional attention. Subsequent quality review meetings will identify and resolve issues as they occur. Additionally, potential errors and issues will be brought to the QA/QC Lead and Project Manager's attention as they are identified and logged.

Project Schedule

A proposed project schedule is provided on the following pages:

Project Schedule for Yuima Groundwater Sustainability Plan (GSP)

DRAFT

ID	WBS	Task Name	Duration	Start	Finish	2020					Half 1, 2021					Half 2, 2021					Half 1, 2022			
						A	S	O	N	D	J	F	M	A	M	J	J	A	S	O		N	D	
1	0	Phase 1: Data Collection	324 days	Mon 8/17/20	Thu 11/11/21	[Gantt bar from 8/17/20 to 11/11/21]																		
2	1.0	Existing Data Compilation	50 days	Mon 8/17/20	Fri 10/23/20	[Gantt bar from 8/17/20 to 10/23/20]																		
3	1.1	Charter Meeting (Kick-Off Meeting)	1 day	Mon 8/17/20	Mon 8/17/20	● 8/17																		
4	1.2	Data Compilation	15 days	Mon 8/17/20	Fri 9/4/20	[Orange bar from 8/17/20 to 9/4/20]																		
5	1.3	Locate Existing Wells (Task 6 of MOU)	10 days	Wed 8/19/20	Tue 9/1/20	[Orange bar from 8/19/20 to 9/1/20]																		
6	1.4	Prepare Confidentiality Protocol	15 days	Wed 8/19/20	Tue 9/8/20	[Orange bar from 8/19/20 to 9/8/20]																		
7	1.5	Data Collection QA/QC	20 days	Wed 9/2/20	Tue 9/29/20	[Orange bar from 9/2/20 to 9/29/20]																		
8	1.6	Develop Digital Data Library	21 days	Wed 8/19/20	Wed 9/16/20	[Orange bar from 8/19/20 to 9/16/20]																		
9	1.7	Draft Technical Memorandum: Existing Data Compilation	10 days	Thu 9/24/20	Wed 10/7/20	■ 10/7																		
10	1.8	Meeting	1 day	Fri 10/16/20	Fri 10/16/20	● 10/16																		
11	1.9	Final Technical Memorandum: Existing Data Compilation	5 days	Mon 10/19/20	Fri 10/23/20	■ 10/23																		
12	2.0	Existing Data Assessment	11 days	Fri 10/16/20	Fri 10/30/20	[Gantt bar from 10/16/20 to 10/30/20]																		
13	2.1	Data Gap Assessment	5 days	Fri 10/16/20	Thu 10/22/20	[Orange bar from 10/16/20 to 10/22/20]																		
14	2.2	Draft and Final Data Gap Assessment Technical Memorandum	10 days	Mon 10/19/20	Fri 10/30/20	[Orange bar from 10/19/20 to 10/30/20]																		
15	3.0	Develop Monitoring Program	38 days	Mon 10/19/20	Wed 12/9/20	[Gantt bar from 10/19/20 to 12/9/20]																		
16	3.1	Recommend Additional Monitoring Sites	5 days	Mon 10/19/20	Fri 10/23/20	[Orange bar from 10/19/20 to 10/23/20]																		
17	3.2	Develop Monitoring Protocols	10 days	Mon 10/19/20	Fri 10/30/20	[Orange bar from 10/19/20 to 10/30/20]																		
18	3.3	Develop Sampling and Analysis Plan (SAP)	5 days	Fri 10/30/20	Thu 11/5/20	[Orange bar from 10/30/20 to 11/5/20]																		
19	3.4	Draft Technical Memorandum: Monitoring Program	15 days	Thu 11/5/20	Wed 11/25/20	■ 11/25																		
20	3.5	Meeting Date	1 day	Wed 12/2/20	Wed 12/2/20	● 12/2																		
21	3.6	Final Technical Memorandum: Monitoring Program	5 days	Thu 12/3/20	Wed 12/9/20	■ 12/9																		
22	4.0	Quarterly Groundwater Level Monitoring and Reporting (assumes 4-monitoring events)	220 days	Mon 1/4/21	Fri 11/5/21	[Gantt bar from 1/4/21 to 11/5/21]																		
23	4.1	Quarterly Groundwater Level Monitoring	198 days	Mon 1/4/21	Wed 10/6/21	[Orange bar from 1/4/21 to 10/6/21]																		
24	4.1.1	1st Quarter	3 days	Mon 1/4/21	Wed 1/6/21	● 1/6																		
25	4.1.2	2nd Quarter	3 days	Mon 4/5/21	Wed 4/7/21	● 4/7																		
26	4.1.3	3rd Quarter	3 days	Mon 7/12/21	Wed 7/14/21	● 7/14																		
27	4.1.4	4th Quarter	3 days	Mon 10/4/21	Wed 10/6/21	● 10/6																		
28	4.2	Quarterly Data Reporting	215 days	Mon 1/11/21	Fri 11/5/21	[Blue bar from 1/11/21 to 11/5/21]																		
29	4.2.1	1st Quarter Reporting	20 days	Mon 1/11/21	Fri 2/5/21	■ 2/5																		
30	4.2.2	2nd Quarter Reporting	20 days	Mon 4/12/21	Fri 5/7/21	■ 5/7																		
31	4.2.3	3rd Quarter Reporting	20 days	Mon 7/19/21	Fri 8/13/21	■ 8/13																		
32	4.2.4	4th Quarter Reporting	20 days	Mon 10/11/21	Fri 11/5/21	■ 11/5																		
33	5.0	Water Quality Data Sampling and Analysis	154 days	Mon 4/12/21	Thu 11/11/21	[Gantt bar from 4/12/21 to 11/11/21]																		
34	5.1	Semi-Annual (assumes 2 sampling events) Well Sampling (20 wells/sampling event)	134 days	Mon 4/12/21	Thu 10/14/21	[Yellow bar from 4/12/21 to 10/14/21]																		
35	5.1.1	1st Semi-Annual	4 days	Mon 4/12/21	Thu 4/15/21	■ 4/15																		
36	5.1.2	2nd Semi-Annual	4 days	Mon 10/11/21	Thu 10/14/21	■ 10/14																		
37	5.2	Semi-Annual Water Quality Laboratory Analysis/Reporting	150 days	Fri 4/16/21	Thu 11/11/21	[Blue bar from 4/16/21 to 11/11/21]																		

Project: Yuima GSP
Date: Mon 7/13/20



Summary
Task



Meetings



Semi-Annual Sampling

Quarterly Monitoring



Deliverables Duration



References

The following pages contain references for Geoscience and selected references for some members of our subconsultant team. Full descriptions for Geoscience projects is also provided in the **Project Experience** section of this proposal.

Geoscience Support Services, Inc.

Project: Arlington Basin Groundwater Sustainability Plan
Client: Western Municipal Water District
Client Contact: Karly Gaynor
Address: 14205 Meridian Pkwy, Riverside, CA 92518
Phone: (951) 571-7212
Email: kgaynor@wmwd.com
Contract Amount: \$183,062
Project Date: 2019- Ongoing until 2022
Project Description: Building upon previous work in the basin completed by Geoscience and others, we are leading efforts to develop a Groundwater Sustainability Plan. Our team is working in conjunction with the district to complete all studies and investigations necessary to complete a compliant GSP.

Project: Mission Basin Water Supply, IPR, And Pathogen Removal (PR) Study
Client: City of Oceanside
Client Contact: Cari Dale
Address: 300 North Coast Highway, Oceanside, CA92054
Phone: (760) 435-5812
Email: cdale@ci.oceanside.ca.us
Contract Amount: \$930,402 (All Phases)
Project Date: 2016-Ongoing
Project Description: We completed an innovative study to evaluate indirect potable reuse (IPR) feasibility combined with a technical study to evaluate pathogen removal through a water reclamation facility. The City will soon be able to improve groundwater conditions, increase local supply reliability, and optimize water recycling. Currently, we are completing exploratory borings and designing and managing well construction.

Project: Groundwater Supply and Brine Management Program
Client: Olivenhain Municipal Water District
Client Contact: Joseph Randall
Address: 1966 Olivenhain Road, Encinitas, CA 92024
Phone: (858) 522-6743
Email: jrandall@olivenhain.com
Contract Amount: \$1,699,660
Project Date: Ongoing
Project Description: Our team is collecting data, completing a hydrological investigation, updating the current groundwater model, and calculating sustainable yield. This will support a future GSP. We are also developing preliminary well designs, recommending brine management activities, supporting community outreach, and completing desk-top environmental reviews. Currently, our team is designing and overseeing well construction for a desalter pilot plant.

Project: Integrated Murrieta-Temecula Groundwater Basin and Streamflow Model
Client: Rancho California Water District
Client Contact: Rich Ottolini, Water Operations Manager
Address: 42135 Winchester Road, Temecula, CA 92590
Phone: (951) 296-6900
Email: otolinir@ranchowater.com
Contract Amount: \$250,000
Project Date: 1995-2002, and 2015
Project Description: Geoscience developed an integrated groundwater and streamflow model for the Murrieta-Temecula Groundwater Basin located at the upper part of the Santa Margarita River Watershed to help resolve water-right controversies between the District and Camp Pendleton Marine Corps Base. The model helped the parties arrive at a consensus, helping to avoid costly litigation.

SCS Engineers

Project: Water Resources Study

Client: Jacumba Community Services District

Client Contact: Debby Trout

Address: 1266 N. Railroad St., Jacumba Hot Springs, CA 91934

Phone: (619) 766-4359

Project Date: Ongoing

Project Description: Jacumba Hot Springs is known for its thermal springs and unlike regular groundwater, water from thermal springs needs to be cooled and treated to remove a sulphur odor that is prevalent in portions of the town. SCS helped the Jacumba Community Services District complete a hydrogeologic assessment of the Jacumba Valley groundwater basin to help identify new and sustainable sources of water for the community.

Project: Water Well Siting and Development

Client: Guatay Mutual Benefits Corporation

Client Contact: Andy Papp

Address: PO Box 310043, Guatay, CA 91930

Phone: (619) 300-2043

Project Date: Ongoing

Project Description: Guatay Mutual Benefits Corporation (GMBC) operates a small system of production wells that have issues with water quantity and quality. To increase their water supply, SCS worked with GMBC to identify potential water well sites and select two properties that had potential to produce adequate supply. SCS drilled and developed test wells on both properties, and is helping GMBC to complete the test wells as municipal supply wells.

Katz & Associates

Project: San Pasqual Groundwater Management Plan

Client: City of San Diego c/o Trussel Technologies, Inc.

Client Contact: Celine Trussel

Address: 380 Stevens Ave # 308, Solana Beach, CA 92075

Phone: (858) 314-4129

Email: celinet@trusseltech.com

Project Date: 2017

Project Description: The City of San Diego adopted a Long-Range Water Resources Plan to evaluate different water supply alternatives to meet the city's current and future water needs, including the San Pasqual Basin as a potential source of groundwater. K&A provided opportunities to inform the public, basin stakeholders and land lessees about the plan and facilitated an advisory committee.

HELIX Environmental Planning

Project: Ocean Breeze Ranch

Client: Ocean Breeze Ranch LLC

Client Contact: Pete Fagrell

Address: 5820 West Lilac Road, Bonsall, CA 92003

Phone: (760) 553-7261

Email: pfragrell@sbcglobal.net

Project Date: 2017

Project Description: HELIX conducted biological studies and permitting for a proposed residential subdivision and equestrian facility in Northern San Diego County, west of

Interstate 15 and south of the San Luis Rey River. HELIX completed general biological surveys, vegetation mapping, a jurisdictional wetland delineation, rare plant surveys, and habitat assessments for sensitive species, including arroyo toad.

Project: Pure Water San Diego Program

Client: City of San Diego, Public Utilities Department

Client Contact: Keli Balo

Address: 5820 West Lilac Road, Bonsall, CA 92003

Phone: (858) 292-6423

Email: kbalo@sandiego.gov

Project Date: Ongoing

Project Description: HELIX conducted a desktop analysis to identify biological resources within the project study area using a combination of data sources, including sensitive species databases, Geographic Information Systems (GIS) data on regional vegetation mapping, wetland habitat mapping, and designated critical habitat, and various aerial photographs. HELIX is currently providing the environmental compliance oversight during construction of Phase 1 of the Pure Water project.

Raftelis

Project: Petaluma Valley, Sonoma Valley, and Santa Rosa Plain GSP

Client: County of Sonoma c/o West Yost Associates

Client Contact: Andy Rodgers

Address: 2235 Mercury Way, #2015, Santa Rosa, CA 95407

Phone: (707) 543-8506

Email: arodgers@westyost.com

Project Date: Ongoing

Project Description: Raftelis is working with Petaluma Valley GSA, Sonoma Valley GSA, and Santa Rosa Plain GSA to develop appropriate and politically feasible funding for Phase I funding, or funding leading up to and including administrative costs and preparation costs for the required Groundwater Sustainability Plans. Phase II will include funding for specific improvements identified by the completed GSP.

“[Geoscience is] always outstanding and highly qualified staff. [Their] work products are of the highest quality and their accuracy is excellent”

**- Richard Bell, Principal Engineer (Retired)
Municipal Water District of Orange County**



Conflict of Interest

To our knowledge, our team does not have any potential conflicts in performing this work. However, members of our team have recently completed, or are currently completing the following projects for basin stakeholders:

Geoscience Support Services, Inc.

- Yuima Municipal Water District, Hydrogeological Study for a Portion of Pauma Valley, 2013

SCS Engineering

- Rincon Band of Luiseño Indians, Phase I Environmental Site Assessments, 2015 and 2019
- Rincon Band of Luiseño Indians, Phase I Environmental Site Assessments, 2016 and 2019
- Rincon Band of Luiseño Indians, Phase I Environmental Site Assessment, 2016
- Rincon Band of Luiseño Indians, Phase I/Phase II Environmental Site Assessments, 2015 and 2016
- Rincon Band of Luiseño Indians, Asbestos/Lead Paint Survey, 2017
- Rincon Band of Luiseño Indians, Phase I Environmental Site Assessments, 2016
- Rincon Band of Luiseño Indians, Phase I Environmental Site Assessments, 2017
- La Jolla Band of Luiseño Indians, Hydrogeological Evaluation, 2012

Raftelis

- Yuima Municipal Water District, Rate Study, 2017



Fee Schedule

The following pages contain fee schedules for each team member.

Cost Proposal for Professional Services
Upper San Luis Rey Valley Basin Groundwater Sustainability Plan

Task Description	GEOSCIENCE SUPPORT SERVICES, INC.									SCS Engineers					Katz	PBD	Helix	John Robinson Cons.	Raffellis	Totals		
	Principal Geohydrologist	Principal Modeler	Senior Modeler/Engineer	Senior Geohydrologist	Project Geohydrologist	Staff Modeler	Staff Geohydrologist	GSI/CAD Specialist	Geoscience	Principal	Project Manager	Staff Professional	Designer/ Drafter	Admin. Assistant	All Staff	All Staff	All Staff	All Staff	Labor	Reimbursable Expenses ¹	Total Cost	
	Hourly Rate:	\$263	\$278	\$253	\$226	\$201	\$179	\$153	\$146	Labor Cost	\$225	\$185	\$175	\$115	\$75			\$150	\$200			
1.0 Existing Data Compilation																						
1.1	Charter Meeting (Kick-Off Meeting)	4				4		8		\$ 3,080										\$ 3,080	\$ 3,080	
1.2	Data Compilation	12				40		80		\$ 23,436										\$ 23,436	\$ 23,436	
1.3	Locate Existing Wells (Task 6 of MOU)	12				24		24	16	\$ 13,988										\$ 13,988	\$ 13,988	
1.4	Prepare Confidentiality Protocol	8		16		6				\$ 7,358										\$ 7,358	\$ 7,358	
1.5	Data Collection QA/QC	2			8	16		24	8	\$ 10,390										\$ 10,390	\$ 10,390	
1.6	Develop Digital Data Library	4				8		16	4	\$ 5,692										\$ 5,692	\$ 386.00 \$ 6,078	
1.7	Data Compilation Draft Technical Memorandum	4				16		40	8	\$ 11,556										\$ 11,556	\$ 11,556	
1.8	Data Compilation Technical Memorandum Meeting	4				4			8	\$ 3,024										\$ 3,024	\$ 3,024	
1.9	Data Compilation Final Technical Memorandum	2				8		16	8	\$ 5,750										\$ 5,750	\$ 5,750	
	Subtotal:	52	0	16	8	126	0	208	52	\$84,274	0	0	0	0	0	0	0	0	0	\$ 84,274	\$ 386	\$ 84,660
2.0 Existing Data Assessment																						
2.1	Data Gap Assessment	4				8		24	8	\$ 7,500										\$ 7,500	\$ 7,500	
2.2	Draft and Final Data Gap Assessment Technical Memorandum	2				12		20	4	\$ 6,582										\$ 6,582	\$ 6,582	
	Subtotal:	6	0	0	0	20	0	44	12	\$14,082	0	0	0	0	0	0	0	0	0	\$ 14,082	\$ -	\$ 14,082
3.0 Develop Monitoring Program																						
3.1	Recommend Additional Monitoring Sites	2				8		16	8	\$ 5,750										\$ 5,750	\$ 5,750	
3.2	Develop Monitoring Protocols	2				8		16		\$ 4,582										\$ 4,582	\$ 386 \$ 4,968	
3.3	Develop Sampling and Analysis Plan (SAP)	2				8		16	8	\$ 5,750										\$ 5,750	\$ 5,750	
3.4	Draft Technical Memorandum: Monitoring Program	8				24		32	16	\$ 14,160										\$ 14,160	\$ 14,160	
3.5	Monitoring Program Meeting	4				4		8		\$ 3,080										\$ 3,080	\$ 3,080	
3.6	Final Technical Memorandum: Monitoring Program	2				8		16	8	\$ 5,750										\$ 5,750	\$ 5,750	
	Subtotal:	20	0	0	0	60	0	104	40	\$39,072	0	0	0	0	0	0	0	0	0	\$ 39,072	\$ 386	\$ 39,458
4.0 Quarterly Water Level Monitoring and Reporting (Assumes 4 Monitoring Events)																						
4.1	Quarterly Groundwater Level Monitoring (up to 40 wells per event)	3				16		80		\$ 16,245			40							\$ 23,245	\$ 2,700 \$ 25,945	
4.2	Quarterly Data Reporting	4				32		72	8	\$ 19,668										\$ 19,668	\$ 19,668	
	Subtotal:	7	0	0	0	48	0	152	8	\$35,913	0	0	40	0	0	0	0	0	0	\$ 42,913	\$ 2,700	\$ 45,613
5.0 Water Quality Data Sampling and Analysis (Assumes 2 Sampling Events)																						
5.1	Semi-Annual Well Sampling (up to 20 wells per event)	0				4				\$ 804			40	140						\$ 23,904	\$19,700 \$ 43,604	
5.2	Semi-Annual Water Quality Laboratory Analysis/Reporting	4				4				\$ 1,856	4		12	20						\$ 7,156	\$ 7,156	
	Subtotal:	4	0	0	0	8	0	0	0	\$2,660	4	0	52	160	0	0	0	0	0	\$ 31,060	\$19,700	\$ 50,760
Total Phase 1 Data Collection																						
		89	0	16	8	262	0	508	112	\$176,001	4	0	92	160	0	0	0	0	0	\$211,401	\$23,172	\$234,573
6.0 Groundwater Sustainability Plan																						
6.1	Introductory Chapter	8				20		40		\$ 12,244										\$ 12,244	\$ 12,244	
6.2	Plan Area Chapter	16				24		32	50	\$ 21,228										\$ 21,228	\$ 21,228	
6.3	Basin Setting Chapter (Includes Historical Water Budgets)	40				32		40	60	\$ 31,832										\$ 31,832	\$ 31,832	
6.4	Water Budgets (includes construction of groundwater and surface water model and estimation of safe yield. Will be included in "Basin Setting" Chapter and Appendix: Development of Upper San Luis Rey Groundwater and Surface Water Model)	48	32	120		120	300	40	80	\$ 147,500										\$ 147,500	\$ 147,500	
6.5	Sustainable Management Criteria Chapter, Sustainability Indicators and Measurable Objectives, and Minimum Thresholds	32		24		40	60	24	40	\$ 42,780										\$ 42,780	\$ 42,780	
6.6	Projects and Management Actions Chapter	32		24		40	40	24	24	\$ 36,864										\$ 36,864	\$ 36,864	
6.7	Plan Implementation Chapter (Includes estimate of cost and schedule)	32		16		48		32	16	\$ 29,344								132		\$ 49,144	\$ 49,144	
6.8	GSP Monitoring Network Chapter	18			4	24		24	8	\$ 15,302										\$ 15,302	\$ 15,302	
6.9	Administrative Draft of GSP	24				60		32	16	\$ 25,604										\$ 25,604	\$ 25,604	
6.10	Final Draft of GSP	24				40		24	16	\$ 20,360										\$ 20,360	\$ 20,360	
	Subtotal:	274	32	184	4	448	400	312	310	\$ 383,058	0	0	0	0	0	0	0	132	0	\$ 402,858	\$ -	\$ 402,858

RESOLUTION NO. _____

**RESOLUTION OF THE BOARD OF DIRECTORS
OF YUIMA MUNICIPAL WATER DISTRICT
REQUESTING THE LOCAL AGENCY FORMATION COMMISSION
TO TAKE PROCEEDINGS FOR THE
CONCURRENT ANNEXATION OF CERTAIN TERRITORY TO YUIMA MUNICIPAL
WATER DISTRICT AND TO SAN DIEGO COUNTY WATER AUTHORITY
AND TO METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
(Rancho Corrido Annexation, APN 130-040-16, Approximately 31.29 acres)**

WHEREAS, the Board of Directors of the Yuima Municipal Water District desires to initiate proceedings pursuant to the Cortese/Knox/Hertzberg Local Government Reorganization Act of 2000, Division 3, commencing with Section 56000 of the California Government Code, more specifically Government Code Section 56654, for the Rancho Corrido Annexation; and

WHEREAS, by Resolution No. 1800-18, adopted September 25, 2018, the Board of Directors of the Yuima Municipal Water District requested concurrent annexation from the San Diego County Water Authority and the Metropolitan Water District of Southern California for Rancho Corrido, APN 130-040-16; and

WHEREAS, by Resolution No. 1802-18, adopted December 20, 201, the Board of Directors of Yuima Municipal Water District adopted a CEQA determination and ordered the filing of a Notice of Exemption with the San Diego County Clerk; and

WHEREAS, by Resolution No. 1859-20, adopted May 26, 2020 the Board of Directors of the Yuima Municipal Water District accepted the formal terms and conditions of the Metropolitan Water District of Southern California; and

WHEREAS, the proposed changes of organization include the following jurisdictional change and sphere of influence action:

1. Concurrent Annexation of parcel 130-040-16-00 to Yuima Municipal Water District (District), The San Diego County Water Authority (Authority) and The Metropolitan Water District of Southern California (Met).
2. Change of District, Authority and Met boundaries, as necessary, to incorporate the annexation area.
3. Change the District's Sphere of Influence boundary (Sphere Amendment), as necessary, to include the annexation area.

WHEREAS, the reason for the proposed changes of organization is as follows:
The water supplied from groundwater wells at the Rancho Corrido site has ongoing water issues related to elevated nitrates and cannot be resolved through blending due to limited storage. Therefore, Rancho Corrido desires to secure water service for potable use of onsite facilities and its residents; and

WHEREAS, the territory subject to the proposed changes of organization is inhabited and a description of the external boundary of the territory is set forth in Exhibit “A,” attached hereto and by this reference incorporated herein; and

WHEREAS, the district requests that the proposed changes of organization be subject to the following terms and conditions:

1. Upon receipt of San Diego County LAFCO’s resolution approving Rancho Corrido concurrent annexation to Yuima Municipal Water District, San Diego County Water Authority and the Metropolitan Water District of Southern California, Rancho Corrido RV, LP, or its successors in interest as owners of the property, shall pay to Yuima Municipal Water District annexation fees in the amount of \$85,014.93 if the annexation is completed before April 1, 2021. If the annexation is completed after April 1, 2021, the annexation fee will be calculated based on the then-current adopted per acre annexation fee rate.
2. The annexation to Yuima shall not be final, and Rancho Corrido shall not receive potable water service from Yuima, until such fee is paid by Rancho Corrido RC, LP, or its successors in interest as owners of the property, to Yuima.
3. That the terms and conditions as ordered by the Board of Directors of the San Diego County Water Authority shown in Resolution No. 2020-11 (Exhibit B) are fulfilled as required.
4. That the terms and conditions as ordered by the Metropolitan Water District of Southern California shown in Resolution No. 9264 (Exhibit C) are fulfilled as required.

NOW, THEREFORE, this Resolution of Application is hereby approved and adopted by the Board of Directors of the Yuima Municipal Water District. The Local Agency Formation Commission of San Diego County is hereby requested to take proceedings pursuant to Governmental Code 56654 for the proposed changes of organization that include the territory as described in Exhibit “A,” according to the terms and conditions stated above, and in the manner provided by the Cortese/Knox/Hertzberg Local Government Reorganization Act of 2000.

PASSED AND ADOPTED at a special meeting of the Board of Directors of YUIMA MUNICIPAL WATER DISTRICT held August 4, 2020 by the following roll call vote to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

Roland Simpson, President

Don Broomell, Secretary / Treasurer

EXHIBIT "A"

ANNEXATION TO YUIMA MUNICIPAL WATER DISTRICT, THE SAN DIEGO COUNTY WATER AUTHORITY AND THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

THOSE PORTIONS OF LOTS 2 AND 3 OF SECTION 5, TOWNSHIP 10 SOUTH, RANGE 1 WEST, SAN BERNARDINO, ACCORDING TO OFFICIAL PLAT THEREOF, AND OF BLOCK 5 OF RIVER TRACT NO. 1, ACCORDING TO MAP THEREOF NO. 1451, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JUNE 10, 1912, ALL IN THE UNINCORPORATED AREA OF THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, DESCRIBED AS A WHOLE AS FOLLOWS:

COMMENCING AT STATION 1 IN THE NORTHWESTERLY BOUNDARY OF PAUMA RANCHO, PER RECORD OF SURVEY 3308 FILED MARCH 2, 1954; THENCE ALONG THE NORTHWESTERLY LINE THEREOF, SOUTH 31°30'31" WEST (RECORD SOUTH 32°00' WEST) 111.82 FEET TO THE SOUTHWESTERLY LINE OF STATE HIGHWAY XI-SD-195-C, AS DESCRIBED IN DEED TO THE STATE OF CALIFORNIA, RECORDED FEBRUARY 11, 1957 IN BOOK 1957 IN BOOK 6451. PAGE 362, OF OFFICIAL RECORDS, BEING THE TRUE POINT OF BEGINNING; THENCE ALONG SAID SOUTHWESTERLY LINE, SOUTH 69°57'11" EAST 70.05 FEET TO A POINT OF CUSP WITH A 30.00 FOOT RADIUS CURVE CONCAVE SOUTHEASTERLY; THENCE SOUTHWESTERLY ALONG SAID CURVE THROUGH AN ANGLE OF 84°04'14" A DISTANCE OF 44.02 FEET; THENCE TANGENT TO SAID CURVE, SOUTH 25°58'35" WEST 45.71 FEET; THENCE SOUTH 24°37'03" EAST 75.11 FEET; THENCE SOUTH 50°07'07" EAST 228.10 FEET; THENCE SOUTH 46°14'54" EAST 113.95 FEET; THENCE SOUTH 38°16'09" EAST 441.87 FEET; THENCE SOUTH 17°56'13" EAST 10.00 FEET TO A POINT "A" OF THIS DESCRIPTION; THENCE CONTINUING SOUTH 17°56'13" EAST 17.00 FEET; THENCE SOUTH 44°49'19" EAST 375.29 FEET TO THE SOUTHEASTERLY LINE OF SAID LAND DESCRIBED IN DEED TO JEAN K. BARTLETT AND ELIZABETH P. ADAMS, RECORDED NOVEMBER 22, 1983 AS INSTRUMENT NO. 83-425111, OF OFFICIAL RECORDS; THENCE ALONG SAID SOUTHEASTERLY LINE SOUTH 58°45'43" WEST (RECORD SOUTH 59°12' WEST) 1545.32 FEET TO THE WESTERLY LINE OF SAID BLOCK 5; THENCE ALONG SAID WESTERLY LINE, NORTH 5°47'17" WEST (RECORD NORTH 5°23'10" WEST) 892.35 FEET; AND NORTH 31°30'31" EAST (RECORD NORTH 32°00' EAST) 388.56 FEET TO THE SOUTHERLY PROLONGATION OF THE EASTERLY LINE OF LAND DESCRIBED IN DEED TO ADOLF SCHOEPE RECORDED APRIL 10, 1972 AS INSTRUMENT NO. 72-86529, OF OFFICIAL RECORDS; THENCE TO AND ALONG SAID EASTERLY LINE, NORTH 8°58'40" EAST 651.98 FEET (RECORD NORTH 8°58'40" EAST 639.07 FEET) AND NORTH 38°39'50" EAST 46.09 FEET TO THE SOUTHWESTERLY LINE OF SAID LAND DESCRIBED IN

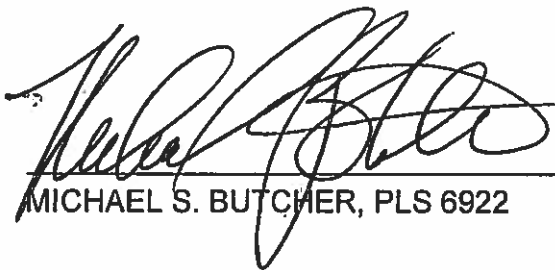
DEED TO THE STATE OF CALIFORNIA RECORDED MAY 13, 1957 AS INSTRUMENT NO. 70512, OF OFFICIAL RECORDS; THENCE SOUTH 69°57'11" EAST 249.05 FEET TO THE TRUE POINT OF BEGINNING.

THIS PROPERTY DESCRIPTION HAS BEEN PREPARED BY ME, OR UNDER MY DIRECTION, IN CONFORMANCE WITH THE PROFESSIONAL LAND SURVEYORS ACT.

SAID PROPERTY CONTAINS 31.29 ACRES, GROSS & NET, MORE OR LESS.

ALL AS SHOWN ON EXHIBIT MAP ATTACHED HERETO AND MADE A PART HEREOF.




MICHAEL S. BUTCHER, PLS 6922

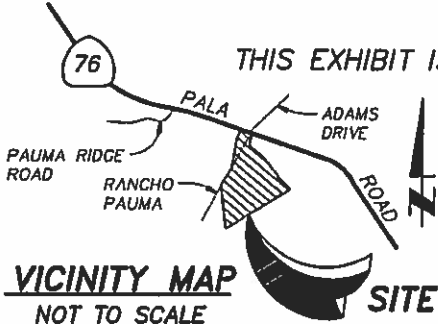
5/2/19

DATE

NOTE: For assessment purposes only. This legal description is not a legal description as defined in the Subdivision Map Act and may not be used for an offer for sale of the land described herein.

EXHIBIT "B"

THIS EXHIBIT IS TO BE ATTACHED TO THE LEGAL DESCRIPTION

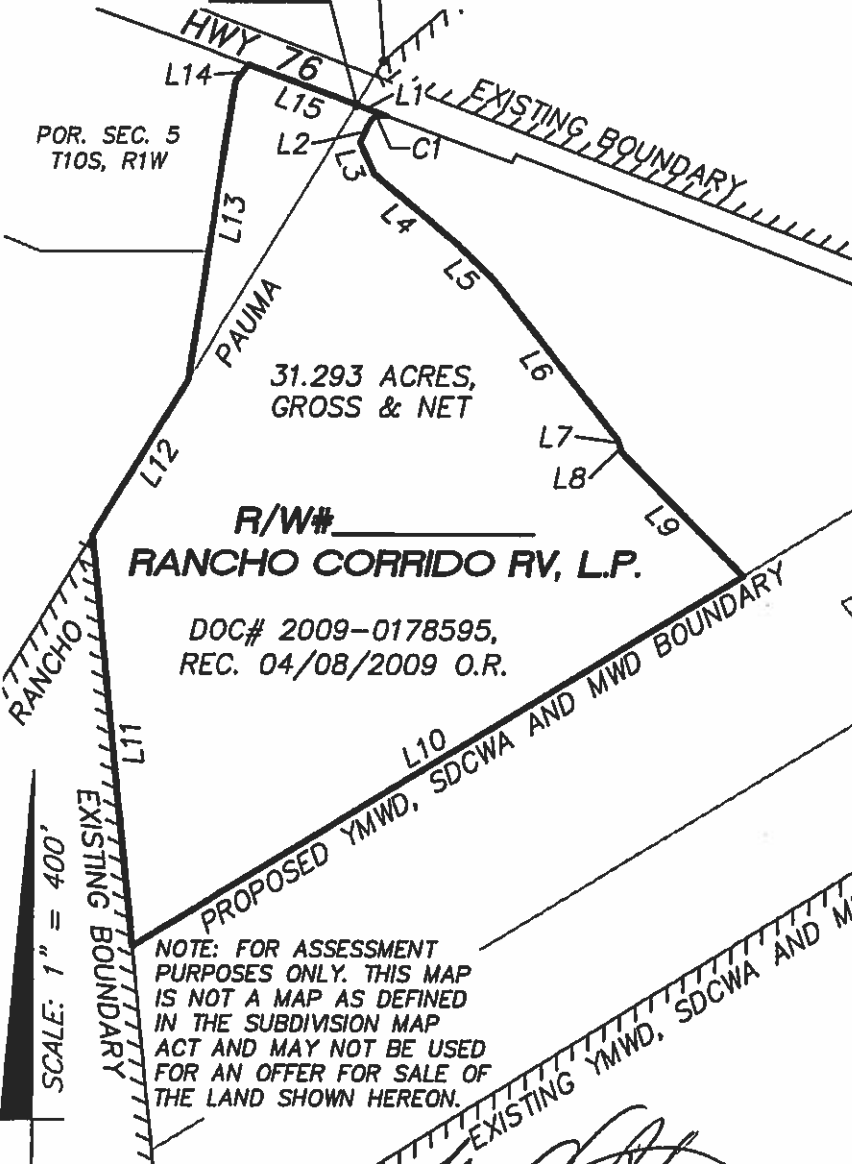


VICINITY MAP

NOT TO SCALE
THOMAS GUIDE
PG. 1030, GRID G-7
57TH EDITION

P.O.C.

P.O.B.



31.293 ACRES,
GROSS & NET

R/W# _____
RANCHO CORRIDO RV, L.P.

DOC# 2009-0178595,
REC. 04/08/2009 O.R.

NOTE: FOR ASSESSMENT
PURPOSES ONLY. THIS MAP
IS NOT A MAP AS DEFINED
IN THE SUBDIVISION MAP
ACT AND MAY NOT BE USED
FOR AN OFFER FOR SALE OF
THE LAND SHOWN HEREON.

ANNEXATION COURSES			
LINE	BEARING	RADIUS	DIST.
L1	S69°57'11"E		70.05'
C1	Δ=84°04'14"	R=30'	44.02'
L2	S25°58'35"W		45.71'
L3	S24°37'03"E		75.11'
L4	S50°07'07"E		228.10'
L5	S46°14'54"E		113.95'
L6	S38°16'09"E		441.87'
L7	S17°56'13"E		10.00'
L8	S17°56'13"E		17.00'
L9	S44°49'19"E		375.29'
L10	S58°45'43"W		1545.32'
L11	N05°47'17"W		892.35'
L12	N31°30'31"E		388.56'
L13	N08°58'40"E		651.98'
L14	N38°39'50"E		46.09'
L15	S69°57'11"E		249.05'

SCALE: 1" = 400'



400' 0 400'

Michael S. Butcher
MICHAEL S. BUTCHER, PLS 6922 DATE 5/2/19



74671.00
SB&O INC.
PLANNING ENGINEERING SURVEYING

RESOLUTION NO. 2020-11

**RESOLUTION OF THE BOARD OF DIRECTORS OF THE
SAN DIEGO COUNTY WATER AUTHORITY
APPROVING THE CONCURRENT ANNEXATION OF
TERRITORY TO SAID AGENCIES
(RANCHO CORRIDO ANNEXATION)**

WHEREAS, pursuant to Section 10(d) of the County Water Authority Act, the Board of Directors of the Yuima Municipal Water District adopted Resolution No. 1800-18, requesting formal terms and conditions from the San Diego County Water Authority and Metropolitan Water District of Southern California for the concurrent annexation of the lands described in Resolution No. 2018-18, and known as the RANCHO CORRIDO ANNEXATION; and

WHEREAS, a copy of Yuima Municipal Water District Resolution No. 1800-18, is attached (Attachment 1); and

WHEREAS, pursuant to Section 10(d) of the County Water Authority Act, the Board of Directors of the San Diego County Water Authority may grant or deny the application and, in granting the application, may fix terms and conditions upon which the territory may be annexed to the San Diego County Water Authority; and

WHEREAS, the Board of Directors of the San Diego County Water Authority adopted Annexation Policies in February 2006 that provide criteria for the evaluation of potential annexations and conditions that may be applied; and

WHEREAS, the Board of Directors of the San Diego County Water Authority approved procedures for Implementation of the San Diego County Water Authority's Annexation Policy #2: Protection of Member Agency Supply Reliability in April 2010 that provide guidance in determining if approval of a proposed annexation will have an adverse effect on member agency supply reliability, and provide direction on the potential conditions to be imposed; and

WHEREAS, the Board of Directors of the San Diego County Water Authority, in July 2016, amended Water Authority Annexation Policy #4: Annexation Fee, and amended Policy #12: Administrative Costs, to address approved revisions to the annexation fee structure; and

WHEREAS, by Resolution No. 2018-18, adopted October 25, 2019, the Board of Directors of the San Diego County Water Authority granted preliminary informal terms and conditions for the RANCHO CORRIDO ANNEXATION, and requested the Metropolitan Water District of Southern California set formal terms and conditions and grant conditional approval; and

WHEREAS, by Resolution No. 9264, adopted April 14, 2020, the Board of Directors of the Metropolitan Water District of Southern California set formal terms and conditions and granted conditional approval for the RANCHO CORRIDO ANNEXATION; and

WHEREAS, by Resolution No. 1859-20, adopted May 26, 2020, the Board of Directors of the Yuima Municipal Water District accepted the terms and conditions of the concurrent annexation for the RANCHO CORRIDO ANNEXATION; and

WHEREAS, conditions from the Annexation Policies will need to be satisfied prior to approval of the RANCHO CORRIDO ANNEXATION; and

NOW, THEREFORE, the Board of Directors of the San Diego County Water Authority RESOLVES subject to the following terms and conditions, to grant the application of the governing body of Yuima Municipal Water District for consent to annex the RANCHO CORRIDO ANNEXATION to the San Diego County Water Authority and to establish the following conditions of such annexation:

1. WHEREAS, pursuant to the provisions of the California Environmental Quality Act (CEQA), the Yuima Municipal Water District, acting as a Lead Agency, adopted a Notice of Exemption (NOE) in December 2018. The Water Authority, as a Responsible Agency under CEQA, has reviewed, reaffirms and certifies the aforementioned NOE; reviewed the proposed action and independently determines that it is categorically exempt from CEQA under Title 14 of the California Code of Regulations, section 15319 (Class 19 – annexations of existing facilities and lots for exempt facilities and 15303 (Class 3 – new construction of small facilities) and will file a NOE; and

2. Pursuant to Section 10(d) of the County Water Authority Act, the Board of Directors of the San Diego County Water Authority requires the following:

- a. That the property owner acknowledges and agrees to participate in any required Proposition 218 action and will be subject to the imposition of any taxes, fees, charges, and assessments currently applicable to the San Diego County Water Authority service area.

3. That the terms and conditions as ordered by the Board of Directors of the Metropolitan Water District of Southern California shown in Resolution No. 9264, be a condition of the concurrent annexation to said Metropolitan Water District of Southern California and the San Diego County Water Authority of the properties described in Attachment 1.

4. That the Clerk of the Board is authorized and directed to forward certified copies of this resolution to the Metropolitan Water District of Southern California and the Yuima Municipal Water District.

5. That the General Manager of the San Diego County Water Authority be authorized and is directed to file a Notice of Exemption as provided in Section 15062 of the State CEQA Guidelines.


PASSED, APPROVED, AND ADOPTED on this twenty-fifth day of June 2020.

Ayes: Unless noted below all Directors voted aye.

Noes: None.

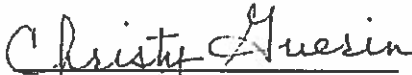
Abstain: None.

Absent: Hogan, Kennedy, Mosca and Simpson




Jim Madaffer,
Chair

ATTEST:



Christy Guerin,
Secretary

I, Melinda Nelson, Clerk of the Board of the San Diego County Water Authority, certify that the vote above is correct and this Resolution No. 2020-11 was duly adopted at the meeting of the Board of Directors on the date stated above.



Melinda Nelson
Clerk of the Board

EXHIBIT A**RANCHO CORRIDO ANNEXATION****CONCURRENT ANNEXATION TO YUIMA MUNICIPAL WATER DISTRICT, THE SAN DIEGO COUNTY WATER AUTHORITY AND THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**

All those portions or Lots 2 and 3, Section 5, Township 10 South, Range 1 West, San Bernardino Base and Meridian according to official plat thereof, and of Block 5 of River Tract No. 1, according to map thereof No. 1451, filed in the Office of the County Recorder of San Diego County, June 10, 1912, all in the unincorporated area of the County of San Diego, State of California, partially described on Record of Survey No. 22606, filed March 23, 2017 in the office of the County Recorder of said County, Being further described as follows:

Beginning at Station 1 in the northwesterly boundary of Pauma Rancho, per Record of survey 3308 filed March 2, 1954; thence along the northwesterly line thereof S31°30'31", a distance of 111.82' to a point in the southwesterly line of State Highway XI-SD-195-C as described in deed to the State of California recorded February 11, 1957 in Book 6451, Page 362 of official records, said point being the **True Point of Beginning**;

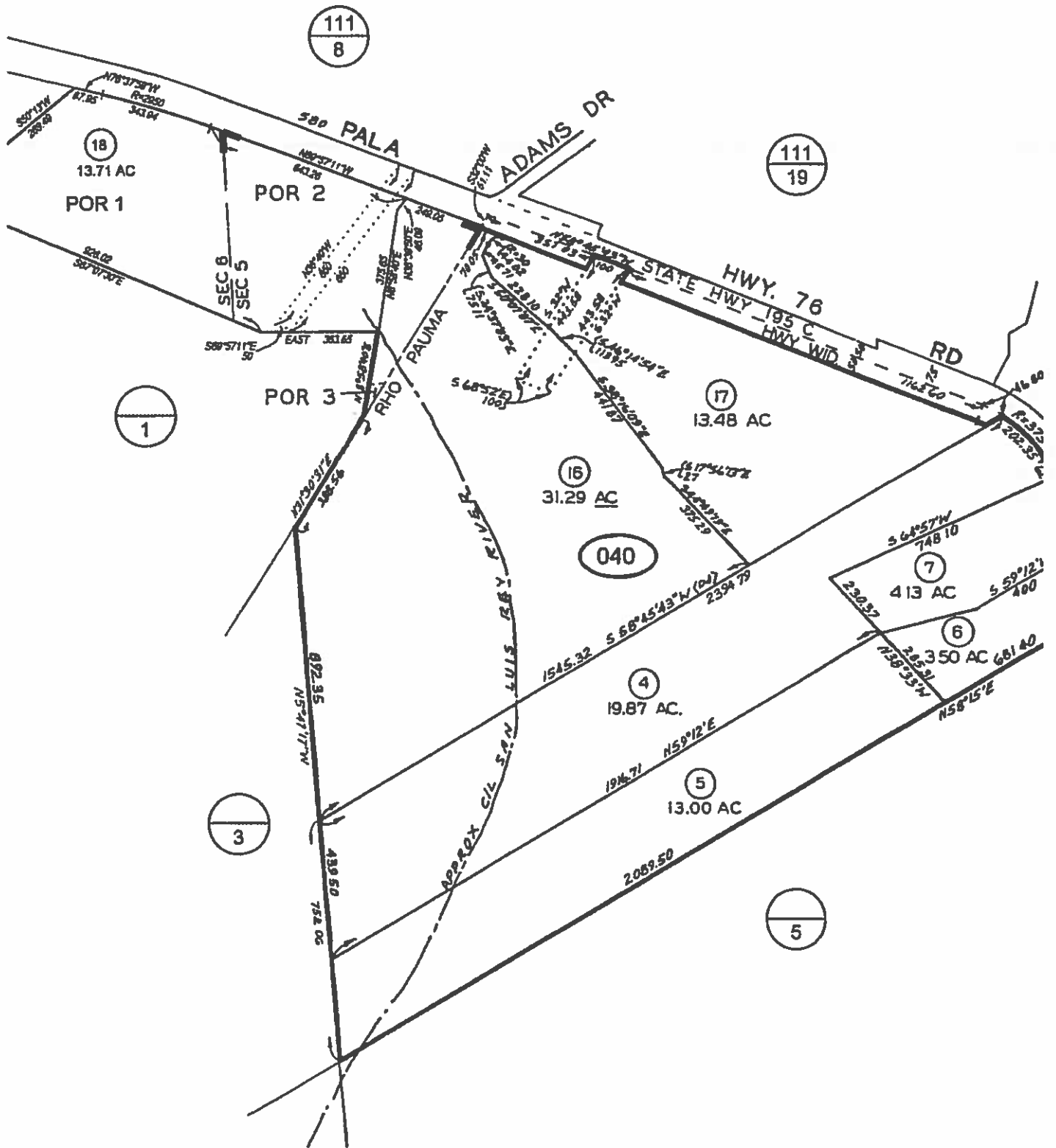
1. Thence along said southwesterly line, S69°57'11"E a distance of 70.05' to a point of cusp with 30.00' radius curve, concave southeasterly;
2. Thence southwesterly along said curve through a central angle of 84°04'14" a distance of 44.02';
3. Thence tangent to said curve S25°58' 35"W a distance of 45.71';
4. Thence S24°37'03"E a distance of 75.11';
5. Thence S50°07'07"E a distance of 228.10';
6. Thence S46°14'54"E a distance of 113.95';
7. Thence S38°16'09"E a distance of 441.87';
8. Thence S17°56'13"E a distance of 10.00' to a point to be know as "Point A" of this description;
9. Thence S17°56'13"E a distance of 17.00';
10. Thence S44°49'19"E a distance of 375.29' to the southeasterly line of that land described in deed to Jean K. Batrlett and Elizabeth P. Adams, recorded November 22, 1983 as Document No. 1983-425111 of Official Records;

11. Thence along said southeasterly line S58°45'43"W a distance of 1,545.32' to the westerly line of said Block 5;
12. Thence along said westerly line N05°47'17"W a distance of 892.35';
13. Thence N31°30'31"E a distance of 388.56' to the southerly prolongation of the easterly line of land described in deed to Adolf Schoepe recorded April 10, 1972 as Document No. 86529 of Official Records;
14. Thence along said easterly line N08°58'40"E a distance of 651.98';
15. Thence N38°39'50" a distance of 46.05' to the southwesterly line of land described in deed to the State of California recorded May 13, 1957 as Document No 70512 of Official Records;
16. Thence S69°57'11"E a distance of 249.05' to the **True Point of Beginning**.

Gross Area: 31.29 acres
Net Area: 31.29 acres

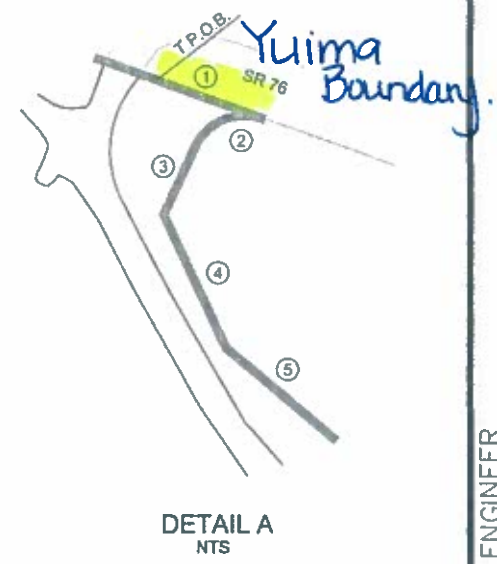
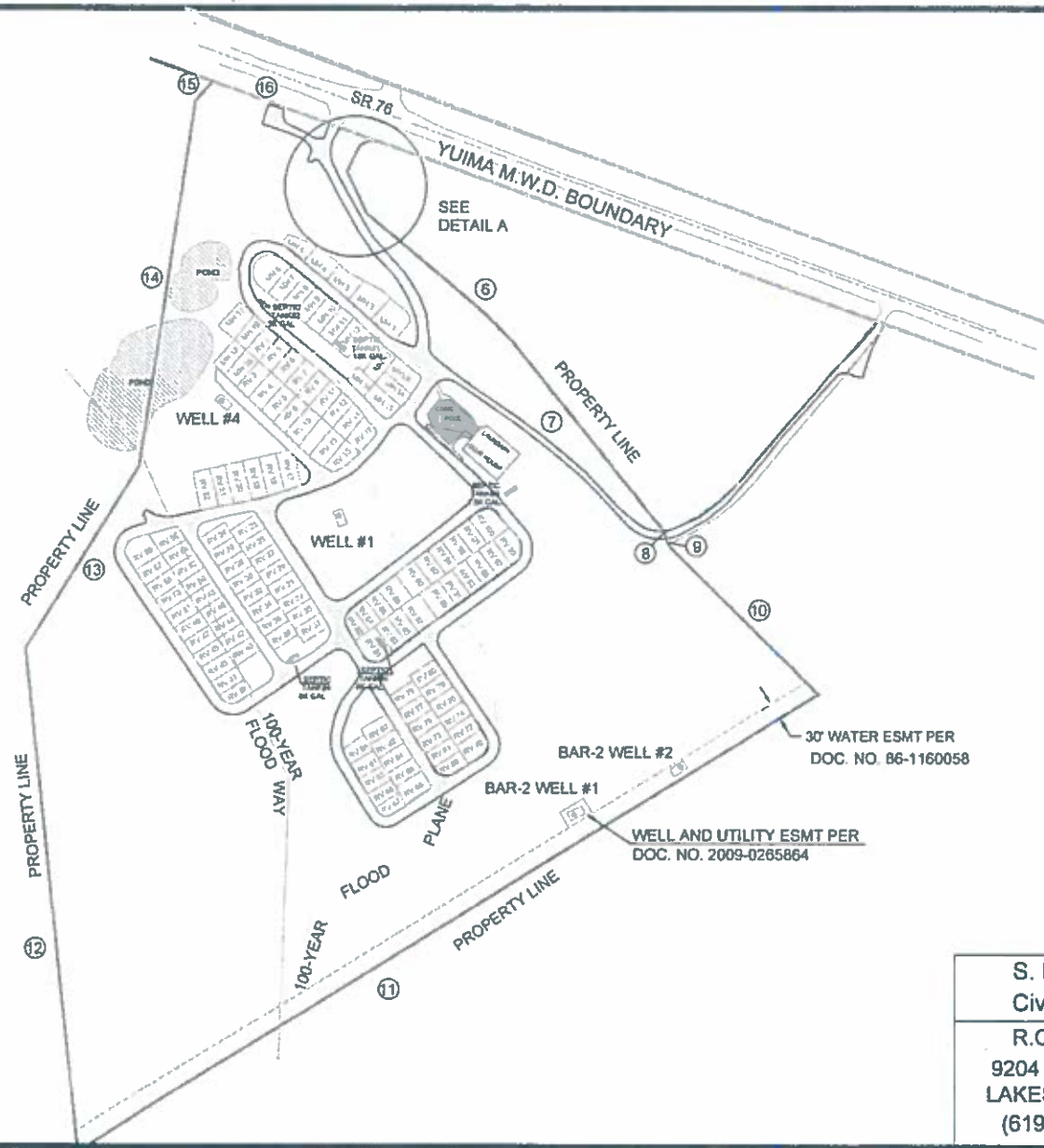
All as shown on Exhibit Map attached hereto and made part of hereof.

NOTE: For annexation purposes only. This legal description is not a legal description as defined in the Subdivision Map Act and may not be used to sale of the land described herein.



THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY. NO LIABILITY IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. ASSESSOR'S PARCELS MAY NOT COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES.


 SCALE
 1" = 200'



S. Pat Rymer
 Civil Engineer
 R.C.E. 38709
 9204 JOVIC ROAD
 LAKESIDE, CA 92040
 (619) 871-5389

RANCHO
 CORRIDO
 ANNEXATION
 SHEET OF

ENGINEER'S NAME: S. PAT RYMER, CIVIL ENGINEER
 PHONE NO. (619) 871-5389

RESOLUTION 9264

**RESOLUTION OF THE BOARD OF DIRECTORS OF
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
CONSENTING TO SAN DIEGO COUNTY WATER AUTHORITY'S
RANCHO CORRIDO ANNEXATION
AND FIXING THE TERMS AND
CONDITIONS OF THE ANNEXATION TO
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**

WHEREAS, the Board of Directors of the San Diego County Water Authority (SDCWA), a county water authority situated in the county of San Diego, state of California, pursuant to Resolution No. 2018-18, in accordance with the provisions of the Metropolitan Water District Act (MWD Act), has applied to the Board of Directors of The Metropolitan Water District of Southern California (Metropolitan) for consent to annex thereto certain uninhabited territory situated in the county of San Diego referred to as Rancho Corrido Annexation, more particularly described in an application to the San Diego County Local Agency Formation Commission (LAFCO), concurrently with Rancho Corrido Annexation thereof to SDCWA, such annexation to Metropolitan to be upon such terms and conditions as may be fixed by the Board of Directors of Metropolitan;

WHEREAS, the current owner, Rancho Corrido RV, LP (Property owner) of San Diego County Assessor Parcel Number 130-040-16 (Property) has applied for annexation of the Property into the SDCWA and Metropolitan service areas;

WHEREAS, completion of this Rancho Corrido Annexation shall be contingent upon approval by the LAFCO;

WHEREAS, Metropolitan requests that LAFCO condition its approval of the Rancho Corrido Annexation upon a requirement that Metropolitan's existing and established taxes, benefit assessments, or property-related fees or charges in place in the service area are levied or fixed and collected on the parcels being annexed to the agency; these taxes, benefit assessments, or property-related fees or charges are identified below;

WHEREAS, Metropolitan has levied and collected ad valorem taxes on parcels within the territory of SDCWA. Such charges for fiscal year 2019/20 are described in Resolution 9258, adopted by Metropolitan's Board on August 20, 2019;

WHEREAS, since fiscal year 1992-93, Metropolitan has levied and collected water standby charges pursuant to Section 134.5 of the MWD Act on parcels within the territory of SDCWA. Such charges for fiscal year 2019/20 are described in Resolution 9253, adopted by Metropolitan's Board on May 14, 2019;

WHEREAS, upon Rancho Corrido Annexation, the parcel will be within Metropolitan's service area, Metropolitan water will be available to such parcels and such parcels will receive the benefit of the projects provided in part with proceeds of Metropolitan's water standby charges;

WHEREAS, pursuant to the provisions of the California Environmental Quality Act (CEQA), Yuima Municipal Water District, acting as Lead Agency, prepared a Notice of Exemption (NOE) for the Rancho Corrido Annexation Project, filed on December 20, 2018, to annex the Rancho Corrido RV, LP, and Metropolitan, as Responsible Agency under CEQA, is required to review and consider the information contained in the NOE prior to approval of the formal terms and conditions for the Rancho Corrido Annexation; and Metropolitan, acting as Responsible Agency, independently determined that the proposed action is categorically exempt as an infill development and annexation of individual small parcels of a minimum size;

WHEREAS, it appears to this Board of Directors that such application should be granted, subject to the terms and conditions hereinafter set forth;

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of Metropolitan, acting as Responsible Agency, has reviewed and considered the information in the NOE prior to approval of the final terms and conditions for the Rancho Corrido Annexation; and subject to the following terms and conditions, does hereby grant the application of the governing body of SDCWA for consent to annex Rancho Corrido Annexation to Metropolitan and does hereby fix the terms and conditions of such annexation:

Section 1. Annexation of this area to SDCWA shall be made concurrently with annexation thereof to Metropolitan, and all necessary certificates, statements, maps, and other documents required to be filed by or on behalf of SDCWA to effectuate Rancho Corrido Annexation shall be filed on or before December 31, 2021.

Section 2. Prior to filing a request for a Certificate of Completion of Rancho Corrido Annexation proceeding with LAFCO, SDCWA shall submit a certified copy of LAFCO's resolution approving Rancho Corrido Annexation to SDCWA, and shall pay to Metropolitan \$197,464.79 for its annexation fee, if annexation is completed by December 31, 2020. If the annexation is completed during the 2021 calendar year, the annexation charge will be calculated based on the then-current rate, in accordance with Metropolitan's Administrative Code Section 3300.

Section 3. a. Metropolitan shall be under no obligation to provide, construct, operate, or maintain feeder pipelines, structures, connections, and other facilities required for the delivery of water to this area from works owned and operated by Metropolitan.

b. SDCWA shall not be entitled to demand that Metropolitan deliver water to SDCWA for use, directly or indirectly, within this area, except for domestic or municipal use therein.

c. The delivery of all water by Metropolitan, regardless of the nature and time of use of such water shall be subject to the water service regulations, including rates and charges promulgated from time to time by Metropolitan.

d. The delivery of all water by Metropolitan, regardless of the nature and time of use of such water shall be subject to the water service regulations, including rates and charges promulgated from time to time by Metropolitan.

e. Except upon the terms and conditions specifically approved by the Board of Directors of Metropolitan, water sold and delivered by Metropolitan shall not be used in any manner which intentionally or avoidably results in the direct or indirect benefit of areas outside Metropolitan, including use of such water outside Metropolitan or use thereof within Metropolitan in substitution for other water outside Metropolitan.

i. Metropolitan approves this annexation (1) acknowledging that an existing covenant is recorded on the Property to allow an adjacent landowner access to a well on the Property for temporary emergency water deliveries, and that transfer of water from the well on the Property to an adjacent parcel outside Metropolitan's service area would be a violation of Metropolitan's Administrative Code sections 3104(b) and 4509, and (2) requiring the following of the Property owner and its successors:

ii. The Property owner agrees to notify Metropolitan in advance of any future temporary emergency deliveries outside its service area and to commence and complete either (1) removal of the covenant to serve from the Property or (2) annexation of the adjacent parcel receiving water; and

iii. Upon request by Metropolitan, the Property owner agrees to report on the status of the well, including on its usage and water quality.

Section 4. LAFCO has conditioned approval of Rancho Corrido Annexation upon a requirement that Metropolitan levy or fix and collect all previously established and collected taxes, benefit assessments, or property-related fees or charges on parcels being annexed to the agency.

Section 5. Such charges, which are subject to change over time, include but are not limited to:

a. Metropolitan's ad valorem tax on properties located within the territory of SDCWA, in the amount of 0.003500 percent of the assessed value of each parcel. Metropolitan shall levy the ad valorem tax in the amount, at the same time and in the same manner as ad valorem tax on other properties located within the territory of SDCWA. Such charges for fiscal year 2019/20 are 0.0035 percent of the assessed value of each parcel, as described in Resolution 9258, adopted by Metropolitan's Board on August 20, 2019.

b. Metropolitan's water standby charge on properties located within the territory of SDCWA, in the amount of is \$11.51 per acre of land, or per parcel of land less than one acre. Metropolitan shall levy the water standby charge in the amount, at the same time and in the same manner as water standby charges on other properties located within the territory of SDCWA. Such charges for fiscal year 2019/20 are described in Resolution 9253, adopted by Metropolitan's Board on May 14, 2019.

Section 6. That the General Manager is hereby authorized and directed to take all necessary action to secure the collection of the ad valorem taxes and water standby charges by the appropriate county officials, including payment of the reasonable cost of collection.

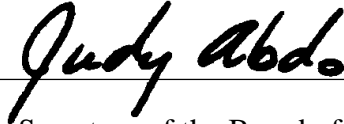
Section 7. That Metropolitan, acting as Responsible Agency under CEQA, and prior to approval of the final terms and conditions for the Rancho Corrido Annexation, has reviewed and considered the information in the NOE and independently determined that the proposed action is categorically exempt as an infill development and annexation of individual small parcels of a minimum size.

Section 8. That the General Manager and General Counsel are hereby authorized to do all things necessary and desirable to accomplish the purposes of this resolution, including, without limitation, the commencement of defense of litigation.

Section 9. That if any provision of this resolution or the application to any member agency, property or person whatsoever is held invalid, that invalidity shall not affect the other provisions or applications of this resolution which can be given effect without the invalid portion or application, and to that end the provisions of this resolution are severable.

BE IT FURTHER RESOLVED that the Board Executive Secretary is directed to transmit forthwith to the governing body of SDCWA a certified copy of this resolution.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on April 14, 2020.

A handwritten signature in black ink that reads "Judy Abdo". The signature is written in a cursive style and is positioned above a horizontal line.

Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California