ATTACHMENT 2

Geo-Logic ASSOCIATES

PROPOSAL FOR

Development of the Well Rehabilitation and Maintenance Program

Due Date: March 13, 2026

PREPARED FOR
Sweetwater Authority

Geo-Logic ASSOCIATES

March 11, 2026

Sweetwater Authority
Kyehee (Kay) Kim
505 Garrett Avenue
Chula Vista, CA 91910

RE: Proposal for Development of a Well Rehabilitation and Maintenance Program

Geologic Associates, Inc. (GLA) is pleased to submit this proposal to Sweetwater Authority (Authority) for preparation of a Well Rehabilitation and Maintenance Program for the Authority's groundwater production wells. We understand that the Authority seeks to evaluate the condition and operational performance of its wells and develop a structured program to guide rehabilitation planning, preventive maintenance, and long-term asset management. With several wells operating for decades, a structured maintenance program is critical to maintaining reliable production, extending equipment life, forecasting system costs, and minimizing emergency repairs.

GLA has more than 20 years of experience evaluating, designing, rehabilitating, and managing groundwater production wells for municipal and private water agencies throughout California and the western United States. We have successfully supported similar projects involving well condition assessment, downhole investigations, rehabilitation design, and development of preventive maintenance frameworks tailored to municipal groundwater systems.

For this project, Luis Busso, PG, will serve as Project Manager. He brings more than 18 years of experience in hydrogeology and groundwater resource development, including well rehabilitation, aquifer testing, production well design, and performance optimization of municipal well fields. He will be supported by Principal Hydrogeologist, Marvin Glotfelty, PG, a nationally-recognized expert in water supply wells with more than 35 years of experience and involvement in the design, installation, and rehabilitation of approximately 1,000 wells nationwide. Together with our multidisciplinary team and specialty subconsultant Weber Water Resources, GLA brings the technical expertise and field experience necessary to develop a practical, data-driven Well Rehabilitation and Maintenance Program tailored to the Authority's operational needs.

We look forward to the opportunity to partner with the Authority on this project.

Geologic Associates, Inc.

John M. Hower, PG, CEG
Senior Vice President

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Identification of Responder

Legal Name: Geologic Associates, Inc. (GLA)

Address: 11415 West Bernardo Court, Suite 200, San Diego CA 92127

Legal Form of Company: California C Corporation

Parent Company: GLA is an employee-owned firm and does not have a parent company.

Addresses of Offices and Number of Employees: GLA has 29 offices in the United States and one office in Peru. We have 6 offices in Southern California with more than 70 employees.

- San Diego Office: 11415 West Bernardo Court, Suite 200, San Diego CA 92127 (5 employees)
- Anaheim Office: 3924 – A East La Palma Avenue Anaheim, CA 92807 (1 employees)
- Costa Mesa Office: 3150 Bristol Street, Suite 210 Costa Mesa, CA 92626 (10 employees)
- Ontario Office: 2777 East Guasti Road, Suite 1 Ontario, CA 91761 (37 employees)
- Riverside Office: 21760 Van Buren Boulevard, Suite 104 Riverside, CA 92508 (15 employees)
- Solvang Office: 1607 Mission Drive, Suite 200 Solvang, CA 93463 (5 employees)

Proposal Contact
Luis Busso, PG
Project Manager
Address: 11415 West Bernardo Court, Suite 200, San Diego, CA 92127
Phone: (818) 419 - 7350
Email: lbusso@geo-logic.com

Authorized Signatory
John M Hower, PG, CEG
Phone: (858) 864 - 2584
Email: jmhower@geo-logic.com

Financial Relationships Disclosure

GLA and our subcconsultant Weber Water Resources (Weber) have no existing or past financial relationships with any current members of the Sweetwater Authority's (Authority) Governing Board or staff, nor with any entities for which such members are employed or have an interest.

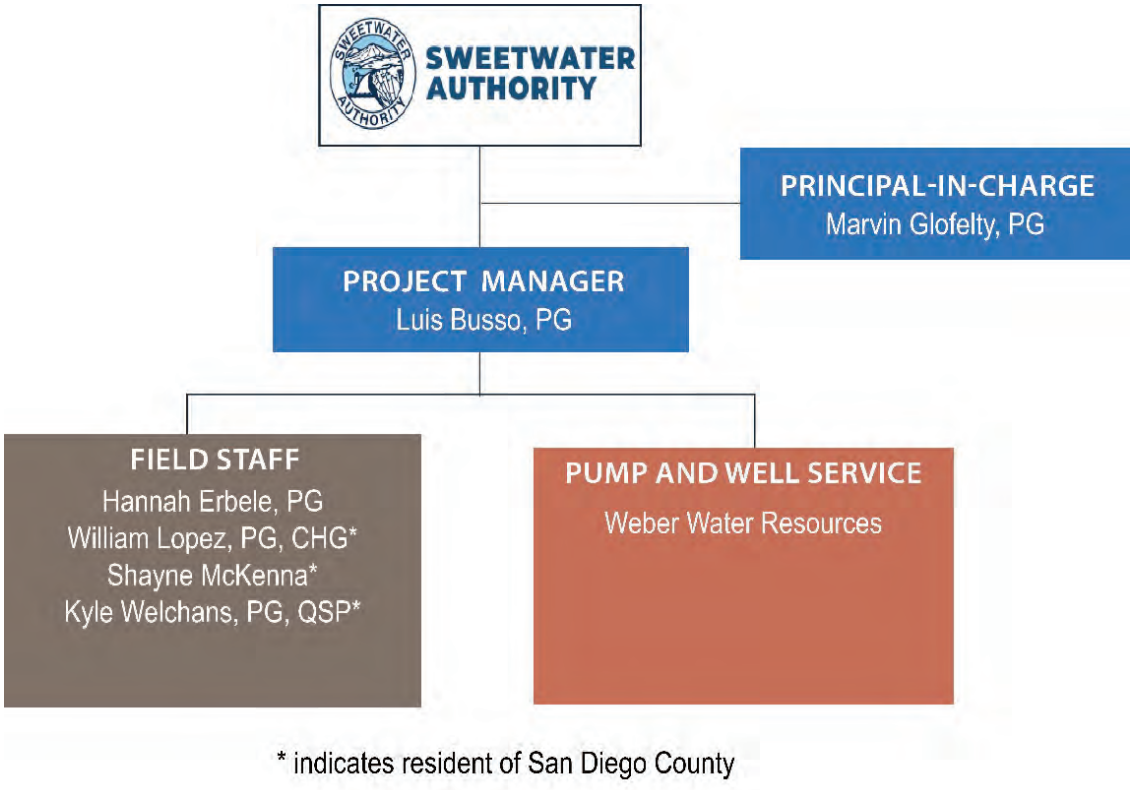
Consultant Organization and Key Personnel

Proposed Team

GLA brings together specialized expertise in groundwater supply development, well rehabilitation, and long-term wellfield asset management. Our team provides a cohesive, technically focused team dedicated to evaluating, restoring, and optimizing municipal production wells. Our collective capabilities comprise hydrogeology, well design and construction oversight, pump and equipment evaluation, aquifer testing, rehabilitation planning, and development of preventive maintenance programs tailored to aging groundwater infrastructure.

For this project, we have assembled a team with extensive experience in well rehabilitation and development programs similar in scope and complexity. Luis Busso, PG will serve as Project Manager and will be supported by Marvin Glotfelty, PG, who will serve as Principal in Charge. Mr. Busso will oversee all technical and administrative aspects of the work, ensuring that rehabilitation evaluations, field investigations, and program development tasks are executed efficiently and to the highest professional standards. Mr. Glotfelty, PG will make sure that appropriate technical resources are allocated to successfully complete each phase of the project.

Figure 1. Organizational Chart



Project Team Qualifications

GLA has the staff to provide the professional services requested by the Authority. Table 1 shows a summary of our key staff's education, office location, licensing, and experience working on similar projects. Complete individual key staff experience is highlighted on their resumes in Appendix A.

Table 1. Team Qualifications

Key Professional/ Title / Office / Years of Experience	Education/ Registrations	Similar Project Experience
Luis Busso, PG Project Manager San Diego, CA 18	BS, Geological Studies PG (CA 9146)	▪ Well Rehabilitation Design and Oversight for Irvine Ranch Water District. This project demonstrates hands-on rehabilitation program execution for a multi-well municipal system. ▪ Maintenance Program Development for Agricultural and Municipal Clients, provided technical oversight of an inspection and structured ongoing maintenance program.
Marvin Glofelty, PG Principal-in-Charge Phoenix, AZ 40+	MS, Geology BS, Geology PG (CA 4988) RG (AZ 22744)	▪ City of Phoenix – Aquifer Storage & Recovery (ASR) Wells (30+ Wells). Evaluated complex municipal well systems and provide high-level technical leadership. ▪ Municipal Public Supply Well Design & Construction (Multiple Cities – 60+ Wells). Senior-level authority on municipal well performance, design, and lifecycle management.
Hannah Erbele, PG Field Support Ontario, CA 15	BS, Earth and Environmental Science PG (CA 9961)	▪ Asset Management Plan for Water Supply Wells - California Water Service Company (Cal Water). Provided an assessment of condition, criticality, and long-term reliability
William (Bill) Lopez, PE, CEG, CHG Field Support San Diego, CA 34	BS, Geology PG (CA 6857) CEG (CA 2143) CHG (CA 706)	▪ City of San Diego - West, North and South Miramar Landfill Hydrogeologic Investigation & M&RP. Provided long-term monitoring program management and technical oversight.
Shayne McKenna Field Support San Diego, CA 3	MS, Remote Sensing and Geospatial Sciences BA, Geosciences	▪ Ramona Landfill – Leachate Operations and Maintenance. Direct field operations and system monitoring experience.
Kyle Welchans, PG, QISP Field Support San Diego, CA 20	BS, Geology PG (CA 9255) QISP	▪ City of San Diego – Groundwater Monitoring program. This project demonstrates management of a multi-site, multi-well groundwater monitoring program within the San Diego region.

Subconsultants

GLA has added Weber as an experienced specialty subconsultants with whom we have established strong working relationship.

Weber Water Resources

Weber will support GLA as the team's well rehabilitation and pump system specialist. With more than 100 years of experience in the water resources industry, Weber provides a full range of services related to groundwater production wells, including well rehabilitation, pump repair and installation, aquifer testing, well video surveys, and preventative maintenance programs for municipal, industrial, and agricultural clients. Their team combines technical expertise with extensive field capabilities, allowing them to self-perform a substantial portion of work and deliver efficient, cost-effective solutions for water system infrastructure challenges.

Weber maintains significant in-house resources, including drilling rigs, pump rigs, cranes, service trucks, video inspection equipment, and specialized well rehabilitation tooling, enabling them to respond quickly to operational issues and perform complex well repair and rehabilitation work. Their personnel have extensive experience diagnosing well performance issues, conducting rehabilitation procedures, and implementing targeted repairs that restore well efficiency and extend service life. This practical field expertise will support the project team by providing implementation-focused insight into well rehabilitation strategies, maintenance procedures, and operational improvements for the Authority's groundwater production wells.

Required Qualifications and Experience

GLA's Direct Experience

GLA has more than 20 years of experience in the development, evaluation, rehabilitation, and long-term management of groundwater production wells for municipal and private water agencies throughout California and the western United States. Our team specializes in hydrogeologic characterization, production well design, well field optimization, and the development of structured well rehabilitation and maintenance programs to ensure reliable, cost-effective water supply operations.

GLA technical services include aquifer testing and analysis, evaluation of well performance trends (specific capacity, drawdown, and efficiency), groundwater flow and water quality assessments, and identification of operational deficiencies affecting well productivity and longevity. We assist clients in diagnosing fouling, corrosion, encrustation, structural deterioration, and pump-related inefficiencies, and we develop targeted rehabilitation strategies to restore capacity and extend asset life.

With regard to groundwater supply development, GLA has experience in siting and designing new production wells; providing full-time technical oversight of drilling, construction, and development; performing step-drawdown and constant-rate pumping tests; and establishing sustainable pumping rates and pump settings. Equally important, we have overseen well rehabilitation efforts that include video surveys, mechanical and chemical redevelopment, liner installation, pump system evaluation, and performance re-testing to verify improvement. Our experience spans both new well development and the systematic evaluation and restoration of aging well infrastructure.

In addition, GLA has supported water agencies in the development of proactive well maintenance frameworks, including inspection protocols, standardized documentation tools, performance tracking databases, and short- and long-term capital improvement planning. We work collaboratively with operations staff to translate technical findings into practical preventive maintenance schedules and budget planning tools that enhance reliability, reduce emergency repairs, and support regulatory compliance.

GLA's Project Manager

Luis Busso, PG, will serve as the Project Manager and single point of contact for the Authority. He has more than 18 years of professional experience in hydrogeology and groundwater resource development, with specialized expertise in municipal production well siting, design, construction oversight, aquifer testing, well rehabilitation, pump system evaluation, and maintenance program development.

Mr. Busso has managed and supported numerous municipal and private water supply projects throughout California, including well feasibility studies, basin-scale hydrogeologic evaluations, interference analyses, and performance optimization of existing well fields. He has provided technical oversight for drilling and construction of new production wells; performed and interpreted step-drawdown and constant-rate pumping tests; evaluated specific capacity and drawdown trends; and prepared technical specifications and memoranda for well development and rehabilitation.

His rehabilitation experience includes oversight of pump removal and inspection, video surveys, mechanical and chemical redevelopment, well liner installation, packer testing, flowmeter surveys, and post-rehabilitation performance verification. Mr. Busso has also supported structured inspection and maintenance programs for municipal clients, diagnosing well and vertical turbine pump issues and developing recommendations to improve production efficiency, extend asset life, and reduce long-term operational costs.

As Project Manager, Mr. Busso will provide hands-on technical leadership, coordinate field and analytical tasks, ensure quality control, and maintain consistent communication with Authority staff to deliver a practical, data-driven Well Rehabilitation and Maintenance Program tailored to the Authority's operational needs.

Mr. Busso will be supported by Principal Hydrogeologist, Marvin Glotfelty, PG, who will serve as Principal-in-Charge for this project. Mr. Glotfelty is a nationally-recognized expert in water supply wells with more than 35 years of experience in well siting, design, construction management, aquifer testing, and rehabilitation. Over his career, he has been involved in the design, installation, rehabilitation, or abandonment of approximately 1,000 wells nationwide. He is the author of *The Art of Water Wells* and has delivered more than 100 professional presentations on hydrogeologic and well-related topics. This expertise ensures that Mr. Glotfelty can provide the highest level of senior technical oversight and strategic guidance to support Mr. Busso and ensure delivery of a technically sound and defensible Well Rehabilitation and Maintenance Program.

Project Experience

GLAs' experience in the development, evaluation, rehabilitation, and performance optimization of groundwater production wells is extensive and well established. For more than two decades, our team has supported municipal and private water agencies with well siting, design, construction oversight, aquifer testing, operational performance analysis, and structured maintenance program development. Our depth of hydrogeologic expertise, combined with practical field experience and data-driven evaluation methods, enables us to deliver technically sound and implementable solutions that extend well life and improve reliability.

Below you will find brief project descriptions that highlight our experience supporting water agencies in maintaining and optimizing groundwater production systems.

Well Rehabilitation Services, Morgan Hill, California

Contracting Agency
City of Morgan Hill
Clint Byrum
(408) 776 - 7333 | clint.byrum@morganhill.ca.gov

Initiation Date | Completion Date
Jan 2018 – Dec 2021

GLA has served as the City of Morgan Hill's Geologic and Geotechnical Consultant since 1988, providing ongoing hydrogeologic support for the City's groundwater supply system. As part of this work, GLA has evaluated the performance and condition of municipal production wells and assisted the City in developing and implementing well rehabilitation strategies to maintain reliable groundwater production.

GLA staff conducted detailed analyses of historical well performance data, including specific capacity trends, pumping rates, drawdown characteristics, and energy consumption. These evaluations were supplemented by reviews of downhole video inspections and assessments of pumping equipment condition to diagnose operational issues affecting well performance. Based on these findings, GLA recommended targeted mechanical and chemical rehabilitation methods designed to restore well efficiency and improve production capacity.

In addition, GLA developed structured well rehabilitation programs to support the City's long-term groundwater supply management. These programs incorporated evaluation of well condition, prioritization of rehabilitation needs, and recommendations for preventative maintenance measures to extend the service life of the City's production wells and optimize operational performance.

Desert Oasis Well #2 Evaluation and Modification Project, Surprise, Arizona

Contracting Agency
Wilson Engineers
Mike Johnson
(480) 893-8860

Initiation Date | Completion Date
January 2017 - May 2017

GLA performed the evaluation, modification, and testing of the City of Surprise's Desert Oasis Water Production Well No. 2. During the initial assessment, GLA gathered historical information indicating that damage to the well screen had reportedly occurred during installation and removal of a test pump shortly after the well was constructed.

GLA completed a comprehensive rehabilitation evaluation that included a downhole video survey under pumping conditions, static and dynamic spinner logging, and depth-specific water quality sampling. Based on the results of the evaluation, GLA developed and oversaw implementation of a corrective modification plan that included installation of a well liner to mitigate sand production. The annular space between the original casing and the liner was filled with glass bead filter media (SiLi Beads) to provide effective sand control while maintaining hydraulic performance.

A post-modification pumping test confirmed that the rehabilitation was successful in significantly reducing sand production with only a minimal reduction in specific capacity and overall well efficiency. This project demonstrates GLA's experience in diagnosing production well deficiencies and designing and implementing targeted structural modifications to restore performance and extend well service life.

Extraction Well Permitting for Snow Valley Mountain Resort, Running Springs, California

Client
Big Bear Mountain Resort
Jake Huxman
(909) 939-4083 | jhux@bbmr.com

Initiation Date | Completion Date
2024 - present

Snow Summit, LLC, contracted GLA to assist with permitting a groundwater production well used for snowmaking operations at Snow Valley Mountain Resort. The facility was purchased in 2023 and operates under a special use permit (SUP), as it is located on U.S. Forest Service (USFS) lands. Transfer of the SUP required an inventory of resort infrastructure by the new owner, when it was discovered, the previous owner had not received authorization from the USFS to extract groundwater for snowmaking purposes, but had been doing so for approximately 20 years. The well is the only water source for snowmaking operations at the resort and is therefore critical for operations.

GLA conducted tests to evaluate if pumping from the production well may adversely impact an ephemeral stream located at the base of the resort. Streamflow depletion from pumping is the primary concern, as reaches of the creek several miles from the resort are designated as both a Wild and Scenic River and Heritage and Wild Trout Waters. GLA is also designing and installing a telemetered monitoring network for groundwater, runoff, and meteorological observations that will be used to provide annual reports of resort operations to the USFS. Based on the data collected, a redevelopment and rehabilitation schedule is being prepared to prolong the longevity of the well asset.

New Municipal Supply Well for Redwood Valley County Water District, Redwood Valley, California

Client
Redwood Valley County Water District
Jared Walker, General Manager
(707)462-2666 | Jwalker@willowcwd.org

Initiation Date | Completion Date
April 2024 – October 2025

GLA was contracted to site, design, oversee drilling and construction, test, and sample a new municipal supply well with a desired production rate of 300 gallons per minute (gpm) for the Redwood Valley County Water District (RVCWD). Several wells with low production rates (i.e., 80 gpm or less) had previously been drilled on the property. We determined that a seismoelectric geophysical survey should be performed to inform selection of primary and alternative well sites. GLA prepared and distributed to drillers an Invitation to Bid package containing technical specifications and a bid template to facilitate contractor selection. After reviewing the bids received, GLA provided a selection recommendation to RVCWD.

An initial test well was drilled at the primary well site to collect cuttings and a suite of borehole geophysics, including nuclear magnetic resonance. Isolated aquifer zone testing was performed for three intervals selected based on cuttings and geophysical data collected. Results from this testing indicated a high probability the final well could achieve the desired production rate. Based on the results, RVCWD approved proceeding with completion of the well. GLA performed step drawdown and constant rate pumping tests and collected water quality samples for Title 22 analysis. Maximum production rate from the well was 600 gpm, or twice what was desired by RVCWD. GLA provided a final well completion report that documented all drilling, construction, development, and testing activities.

Crestview Mutual Water Well No. 7 Site Comparison Study, Camarillo, California

Client
Crestview Mutual Water Well Company
Ann DeMartini
(805) 482 - 2001|
ademartini@crestviewwater.org

Initiation Date | Completion Date
Dec 2024 – July 2025

For the Crestview Mutual Water Company, GLA prepared a comprehensive evaluation of three alternative sites for proposed new Well No. 7. We identified relevant evaluation criteria, developed an evaluation matrix, and performed a detailed investigation of each site. Criteria evaluated included expected hydrogeologic conditions, well capacity, expected water quality, ease of land acquisition, environmental constraints, permitting, site access, grading and drainage, pump-to-waste disposal, electrical service, sewer system separation, wireless communications, site security, and feasibility of constructing a future replacement well on the site. In addition, GLA evaluated constructability, construction risk, and construction cost to identify the most favorable site. We prepared a summary report including conclusions and recommendations with tables and figures and presented these findings to their board.

Subconsultant Weber's Project Experience

California American Water Garza #3

Contracting Agency
California American Water
Scott Ottmar
(831) 737 - 5505 |Scott.Ottmar@amwater.com

Initiation Date | Completion Date
June 2025 – November 2025

Weber performed an evaluation of both pumping systems and the well. The pumping system was found to be performing below its design capacity and efficiency. Equipment removal and inspection revealed aggressive water, biofouling, and high mineral content was deteriorating pumping equipment and bringing it out of tolerance.

A Well rehabilitation scope was prepared by Weber to restore the wells pumping capacity. Following the rehabilitation, step-drawdown and constant rate tests were performed to confirm post-rehab pumping capacity. Based on the rehabilitation results, an optimal efficient pump design was selected and due to the aggressive water, the pumping equipment material was upgraded to stainless steel. While the rehab was in progress the discharge piping and well pedestals were modified to allow for a circulatory preventative maintenance program that would allow for well treatments to be performed without the removal of the equipment.

Approach to Complete Tasks Identified in the Scope of Services

Our team will use a suite of techniques and knowledge to evaluate the current condition of the 3 National City Wells and 10 Reynolds Desal Wells (13 total) that make up the Sweetwater Authority Water System. The historical and current condition, performances, rehabilitation and equipment needs will be summarized and uniquely detailed for each well in a comprehensive report with a goal to recommend upgrades, maintenance, and rehabilitation at each well to prolong its operational lifespan for the Authority.

Approach to Work

The Authority is advancing a strategic effort to enhance the reliability of its water system through the development of a new Well Rehabilitation and Maintenance Program. This initiative supports objectives outlined in the Authority's Water Resources Master Plan, including replacing and improving aging infrastructure, reducing reliance on imported San Diego County Water Authority (SDCWA) and Metropolitan Water District (MWD) water, and improving supply flexibility during periods when existing wells are offline. The purpose of this Well Rehabilitation and Maintenance Program is to assess the vital well assets and develop short term and long-term maintenance schedules based on a ranking process that incorporates engineering and hydrogeological factors such as location, scope, cost, efficiency, electrical upgrades, well pumping capacity, regional water level data, and probable water quality among other metrics. This assessment will evaluate well sites and rank targeted rehabilitation and maintenance priorities based on available funding while considering the Authority personnel insights, goals, and scheduling priorities.

Following the results and schedule of this program, it is anticipated that a well-by-well bid document and technical specifications will be developed under a separate contract.

Well Site Screening Approach

Our process for evaluating and prioritizing well sites is envisioned as a tiered approach. In a tiered approach, the goal is to initially identify well sites with only minor equipment upgrades or preventative maintenance needs. The remaining sites move into a second-tier screening that includes wells that have potential critical flaws or wells that can require significant improvements to in order to restore their design functionality. Wells that require significant improvements would then be ranked for their suitability for priority scheduling. The screening criteria for Tiers 1 and 2 will be finalized with the Authority input and comment. Wells that qualify for Tier 1 will be those that require superficial improvements that can be easily serviced (e.g., VFD, motor, discharge pipe accessory upgrades, valves, is the property size sufficient for pump rig and associated equipment), in addition to hydrogeological considerations (e.g., well capacity, poor specific capacity and other aquifer properties, known water quality issues, and the presence of local sites with known groundwater). Tier 2 expands the suite of considerations to include downwell needs (e.g., pump performance and wear, corrosion, critical failure, biogrowth fouling, bacteria, well casing, hard scale, etc.) related to engineering or downwell rehabilitation logistics.

Site Ranking Approach

The ranking scheme proposed for this project will use a scalar scheme to assign a value of 1-5 (1-lowest / 5-highest) to each candidate well site for each criterion evaluated by GLA. A 2X multiplier will be given to criterion considered more critical to the project's success and goals. The sum of the scores for each candidate well site will be used to rank the sites. The resulting report will present a projected timeline with well rehabilitation and maintenance recommendations to prolong the life expectancy of each of the well sites based on our findings.

Scope of Work

GLA proposes to develop the Well Rehabilitation and Maintenance Program using a phased approach. The initial phase will include a review of the Authority provided data and readily available online data on the well performances. The second phase will include onsite inspection, testing, and analyses of the physical condition of the well components (e.g., casing, flow dynamics, pump condition).

Phase 1 –Data Collection, Review, and Project Coordination

GLA will coordinate, research, and compile readily available operations and hydrogeologic information provided by the Authority from their files. These readily available historical and current data are expected to include, but not necessarily be limited to, the following:

- Well completion report with as-built diagram;
- Water levels (i.e., static and pumping levels);
- Water quality reports;
- Groundwater extraction quantities and rates;
- Well operational hours/year or month;
- Electrical/mechanical information
- Lithologic and geophysical logs
- Driller's log
- Records of sand production;
- Well efficiency reports;
- Electrical power consumption;
- SCADA reports;
- Past well rehabilitation records;
- Well video records in digital format;
- Pump profile diagram; and
- Pump refurbishment records; and
- Maintenance records

Our team will consult with the Authority staff and management on the preferred performance metrics for their water system infrastructure. The GLA team will review time series data for multiple parameters, such as, Overall Plant Efficiency (OPE), specific capacity, sand production, aeration, static and pumping water levels, power consumption and costs/acre-foot of pumped groundwater to identify conditions indicating a degradation in well performance and, if possible, the underlying root cause of the poor performance (e.g., declining static water levels).

Phase 2 - Field Assessments and Condition Evaluation

Phase 2 includes the onsite active assessment and physical examination of the well sites. GLA will coordinate a short-term pumping test (1-3 hours maximum), during regular operational use if possible, to assess the current hydraulic conditions and performance of each well site during field assessments. These short-term pumping tests will become temporary baselines for relative comparison until future longer-term aquifer pumping tests can be conducted.

The field assessment, observations, and data collection are expected to include, but not necessarily be limited to, the following:

- Pump Performance (Pump curve plot);
- Sand Testing;
- Water levels (i.e., static and pumping levels);
- Drawdown;
- Motor oil visual inspection;
- Packing box assessment;
- Shut off pressure & valve inspection;
- Electrical/mechanical information
- Noise observations;
- Theoretical well efficiency;
- Location;
- Overall Plant Efficiency (OPE);
- Discharge pressure;
- Specific capacity;
- Flowmeter Visual Inspection;
- Motor amps/voltage;
- Oil pot & pre-lube line inspection;
- Vibration Inspection;
- Discharge gauges inspection;
- Electrical wiring review;
- Well casing and/or sounding tube access;
- Air-Vac and Discharge Pipe Coupling Leak Inspection
- Water aeration and odor observation;
- Electrical Panel or VFD Inspection;
- Airline inspection;
- Discharge line support;
- Ingress/Egress of site;
- Video Survey (if access available)
- Maintenance record

With close coordination with the Authority, these events can be coordinated over the course of two to six weeks following the notice to proceed.

Phase 3 - Well Rehabilitation Planning, Maintenance Strategy, and Program Management

This phase of work will be used to develop and process the information compiled in Phase 1 and Phase 2, as well as develop recommendations, maintenance schedules, and equipment upgrades for each well. The well site rankings developed previously will be prioritized to provide well-by-well rehabilitation recommendations.

This planning and development portion of work will additionally include, but not necessarily be limited to:

- Graphics detailing the historical (both pumping and static);
- Graphics of pump curve plots and operational details taken during short-term pumping tests;
- Review of the physical access and logistics at each well site for future rehabilitation mobilization;
- Initial well-by-well rehabilitation summary plans;
- Inspection Checklists;
- An understanding of the standard operating procedures (SOPs) to be prepared.
- Understandings and development of short-term and long-term budgets;
- Likelihood of near failure and estimated well life based on our preliminary findings;

These preliminary findings will be presented in a draft review meeting to receive feedback from Sweetwater Authority staff. Several other down well surveys may be presented at this point in the project such as casing thickness inspections, video surveys, depth-specific groundwater sampling, spinner (flowmeter), biological/scale sampling, deviation survey, and cement bond long are not included in the field assessments but can be conducted during field assessments (and contracted separately or through GLA) at the request of the Authority. These surveys may require down well access or the vertical turbine pump to be removed prior to be conducted, but can provide a wide array of additional information that the Authority may find invaluable during this evaluation. Yet, it is understood that these additional surveys may be a part of future rehabilitation scope of work.

Phase 4 - Well Rehabilitation & Maintenance Program Report

The report will summarize the information compiled in previous phases, and include the findings from our analyses of the information, as well as provide recommendations, maintenance schedule, and budget planning tools for improving well performance and/or extending the life expectancy for each well.

The report will additionally include, but not necessarily be limited to:

- Graphics detailing the historical and current water levels (both pumping and static);
- Graphics of short-term pumping tests;
- Assessments of the water quality in comparison to Sweetwater Authority wells and local data;
- Review of existing hydrogeologic data for each well site;
- Evaluations of estimated groundwater levels, specific capacity, and production rates;

- Short-Term and Long-Term budget projections and schedule;
- Preparation of engineer's opinion of probable costs (EOPC) for the recommended upgrades, construction, development, any pump equipment, electrical service, well controls, site improvements, and testing of each well;
- Well-by-Well rehabilitation plans;
- Identify maintenance needs;
- Any observed operational deficiencies;
- Recommendations to extend the lifespan of the well; and
- Standard Operating Procedures for future maintenance oversight.

The comprehensive report will present a summary of findings and recommendations deduced by the data acquisition, field data collection, data analyses, observations, and hydrogeological conditions for each well in the basin.

Exceptions to the RFP

GLA has reviewed the Request for Proposals for the Development of the Well Rehabilitation and Maintenance Program and hereby confirms that it takes no exceptions to the requirements of the RFP, including the Authority's Professional Services Agreement. GLA agrees to comply fully with the terms, conditions, and scope of services as presented.

Amendments to the RFP

GLA acknowledges receipt of all questions and answers issued for this Request for Proposals prior to the submittal deadline. GLA has reviewed and incorporated the information contained in these amendments into our proposal.

Proposal Authorization

The proposal is signed by John Hower, PG, CEG who is authorized to bind GLA to the terms and conditions of this proposal and the associated Professional Services Agreement. This proposal shall remain valid and binding for a period of ninety (90) days from the date of submittal.

RESUMES

Attachment 1

Geo-Logic ASSOCIATES

Luis A. Busso, PG

Senior Hydrogeologist

EDUCATION

BS, Geological Studies, University of California – Santa Barbara, 2006

PROFESSIONAL REGISTRATIONS

Professional Geologist, California, No. 9146

PROFESSIONAL AFFILIATIONS

American Water Resources Association

National Ground Water Association

Coast Geological Society

PROFESSIONAL TRAINING

OSHA Hazardous Waste Operations and Emergency Response Training (40-Hour), Safety Management Systems, 2018 to Present

Vertical Turbine and Submersible Pump Training Course, Goulds/Xylem Solutions Inc., 2019

Mr. Busso has 18 years of professional geological and groundwater experience. His areas of expertise include project management, pump engineering, field monitoring, and technical report writing for well siting, exploration, basin analysis, design, construction, testing, and rehabilitation of municipal-supply and irrigation-supply water wells. He applies his geological, engineering, and industry knowledge to complex water well projects for water districts, cities, farms, vineyards, and other water purveyors.

Public Supply Well Siting and Well Feasibility, Camarillo, California
Crestview Mutual Water Company required three potential well sites to be evaluated for a new public supply well to supplement their current supply based on their growing demand. This particular project required the proposed well site and preliminary design to target saturated aquifer units that would not require significant treatment and avoid seismic hazards. GLA was subconsultant for Cannon Engineering for the hydrogeological investigation, well feasibility, fault hazard investigation, and preliminary well design approach of the work.

Redwood Valley County Water District New Well Siting, Design, and Construction, Ukiah, California
GLA and a teaming partner were contracted to provide technical assistance for siting, design, and construction of a new municipal supply well. Mr. Busso provided field oversight during the initial test hole, collection of borehole geophysics, including NMR, and performance of isolated aquifer zone testing. Along with the final well design and well development technical specifications based on much of the field observations and data collected. GLA subcontracted a seismoelectric geophysical survey which was used in conjunction with a hydrogeologic investigation and other site characteristics (existing production well location, logistics, topography, etc.) to provide Redwood Valley County Water District (RVCWD) a water-supply well which exceeded their production estimates by 150%.

Frink Hydrogeology Study, Break Water Ponds, Los Olivos, California
Lead the hydrogeological investigation to identify the potential groundwater impacts of an onsite pond operation and domestic well to be constructed in the Los Olivos Area as tasked by the County of Santa Barbara Planning and Development office. An estimate of the water resources needed to support the initial pond filling, and ongoing operations based on the rate of evaporation were outlined. The project goals were to investigate if the groundwater extraction excessively impacts existing neighboring wells, alters the direction or rate of flow of groundwater, potential of basin overdraft, and possibility to degrade groundwater quality.

Mariana Ranchos County Water District New Well Evaluation
Conducted an hydrogeological evaluation of a new well construction with respect to its impact on nearby wells to determine the likelihood of interference with the production and functioning of existing nearby wells, and subsidence that would adversely impact or damage nearby infrastructure with the extraction of groundwater at the proposed well location by the water district.

Water Well Feasibility and Preliminary Design Report, South Gate, Los Angeles County, California
This City of South Gate project involved developing a hydrogeologic evaluation of local groundwater conditions along with determining the feasibility of constructing a new municipal-supply water well at a city chosen site. Provided a preliminary well design for the proposed well site which included a background review of available information, both historically and recent, in addition to water level, water quality, and production data.

Stormwater Infiltration Site Assessments, Upper Los Angeles River Area Watermaster, San Fernando Valley, California
Assisted Watermaster in assessing stormwater infiltration plans for new construction developments and redevelopments. This included reviewing geotechnical reports and state regional water quality control board-maintained databases to evaluate the concept of infiltration and recharge at each site in regard to its impact on local groundwater quality.

Well Design/Siting and Permitting, Various Vineyards Clients, Napa and Sonoma Counties, California
Evaluated the hydrogeologic conditions of alluvial, volcanic, landslide deposits, and Franciscan Formation dominant regions to site and design numerous irrigation and domestic wells. Tasks included documenting drilling-related activities; field sampling and logging of cuttings; well design, construction oversight, and development; aquifer testing; and water quality sampling.

Theoretical Water Level Interference Study, Three Valleys Municipal Water District, Claremont, California
Performed theoretical water level drawdown models for the area near the water district's treatment facility for a new well siting plan that limited interference with their existing well field and other local water district wells. Estimated transmissivity, storage, and potential water quality by conducting in-field aquifer testing, sampling, and monitoring of the existing well field in concert with historical data. The project was completed within budget and a new well was successfully designed, drilled, constructed, and put into service shortly thereafter.

Well Rehabilitation Design and Oversight, Irvine Ranch Water District, Irvine, California
Project Hydrogeologist responsible for technical specification preparation, well design reports, aquifer testing memoranda, and oversight of rehabilitation activities of approximately 10 wells with total depths up to 1,700 feet below ground surface. Activities consisted of pump removal, video surveys, wire/nylon brushing, mechanical development, chemical development, well lining or patching when applicable, packer testing, pumping development, aquifer testing, depth-specific sampling, flowmeter surveying, and water quality sampling.

Sand Production Mitigation Project, Connelly Ranch, Oxnard, California
As Project Manager, coordinated and executed a well rehabilitation plan to reduce the production of sand (as high as 160 parts per million (ppm) within 15 minutes) from a 16-inch diameter and 1,150-feet deep stainless-steel well that had been poorly developed during initial construction. Upon redevelopment completion and water system improvements, the specific capacity had increased to 1,850 gallons per minute, or by 46% when

compared to similar post-construction aquifer testing, and sand production was reduced to <2 ppm within 15 minutes. The plan saved the client significant future costs in pump and equipment replacements and provided greater water production.

Well Destruction Planning and Permitting, Golden State Water Company, Santa Monica, California
Project Manager for well destruction plans of a 500-foot deep, 18-inch diameter well lined with a 12-inch stainless-steel casing. Well destruction was compliant with state regulations and coordinated with City of Los Angeles inspectors. Destruction plans consisted of native fill and debris removal, video surveys, shaped charge perforations, and two cement seals to ensure gravel annulus seal penetration and no groundwater aquifer cross contamination within the Charnock wellfield.

Well Field Drilling Oversight, West Kern Water District, Kern County, California
Provided oversight for drilling of five water wells ranging in depths from approximately 600 to 650 feet deep using the reverse mud rotary method in the Central Valley. Wells were completed in shallow alluvial sediments and the Tulare Formation, and terminated within the Corcoran Clay. Responsibilities included overseeing drilling, geophysical logging, isolated aquifer zone testing, pumping test activities, geologic logging, well construction, well development, aquifer testing, water sampling, monitoring equipment installation, data and pumping test analysis, and reporting.

Hydrogeologic Evaluation and Water Well Feasibility, City of Laguna Beach, Laguna Beach, California
Performed field reconnaissance of City-owned land parcels to ascertain if drilling of a new water well and associated equipment would be accommodable. Reviewed available historic water quality data, hydrogeologic data, and regional well log information to rank potential properties owned by the City that could support shallow alluvial water well infrastructure of sufficient production. Wells drilled into consolidated and fractured sedimentary bedrock using the direct air rotary method were also explored as part of the project's scope. The potential benefit to the City was to reduce the impact and costs of importing water to customers.

Well Liner Installation/Rehabilitation and Pump System Design, Crescenta Valley Water District, La Crescenta, California
Assessed and evaluated pump and well systems on a yearly basis to determine potential pump/booster upgrades and rehabilitation needs based on a predetermined City board budget. At least two well/booster sites were rehabilitated each year with activities including pump removal, well inspection, rehabilitation design, chemical treatment, pumping development, well liner installation, chemical development, and aquifer testing.

Maintenance Program Development for Agricultural and Municipal Client Base, Central Coast, California
Performed technical oversight of an inspection and maintenance program for Central Coast clients consisting of diagnosing well and vertical turbine pump issues. Maintenance consisted of routine pump maintenance procedures as well as short-term pumping tests to recommend well rehabilitation and/or pump system upgrades to improve production and energy efficiency. Some of the beneficiaries of these programs were Goleta Water District, Marz Farms, City of Camarillo, City of Ventura Water, City of Fillmore, Santa Clarita Valley Water Agency, Western Berries, Golden State Water Company, Camrosa Water District, Reiter Brothers, Glasshouse Camarillo Cultivation, and Los Angeles County Public Works.

Publications and Presentations

Morgan, T., D. Tolley, L. Busso, 2025. Tried and True v. New and Innovative – A Comparison of Aquifer Hydrologic Characterization Techniques, Annual Western Groundwater Congress, Groundwater Resource Association of California, October 2025 (abstract submitted).w

Kinnaman, Franklin S., J. Kimball, L. Busso, D. Birgel, H. Ding, D.L. Valentine. 2009. Gas Flux and Carbonate Occurrence at a Shallow Seep of Thermogenic Natural Gas, Manuscript submitted to Geo-Marine Letters, special issue for Bremen Seep Conference, 2009.

L. Busso. April 2019. Know Your Aquifer. Presentation at the American Water Association Operators Technology Workshop, Ventura, California, April 18, 2019.

M. Bodart and L. Busso. April 2023. You Can't Handle the Truth ... About Well Redevelopment. Presentation at the Southern California Gas Company Well and Pump Engineering Seminar, April 2023.

Marvin Glotfelty, RG

Principal Hydrogeologist

EDUCATION

MS, Geology, 1985
Northern Arizona University

BS, Geology, 1979
Northern Arizona University

PROFESSIONAL REGISTRATIONS

Registered Geologist
Arizona, No. 22744

Registered Geologist
California, No. 4988

CERTIFICATIONS

Licensed Well Driller
Arizona, Nos. 160 and 672

PROFESSIONAL AFFILIATIONS

Arizona Hydrological Society (AHS Foundation Board of Directors, 2009-20014; AHS Phoenix Chapter Board of Directors 1989-93 & Vice President, 1990-91).

Arizona Water Well Association (Technical Director, 1990-present; Legislative Committee, 1993-present; Education Committee, 2000-present).

National GroundWater Association (NGWA), 1984-present.

Mr. Glotfelty's areas of specialization include groundwater resources investigations, well siting studies, well design and construction management, evaluation and rehabilitation of water wells, and water supply studies. During his career spanning over 35 years, Mr. Glotfelty has been involved with almost every aspect of hydrogeology, water supply studies, aquifer testing, well design, well rehabilitation, water rights issues, and water quality assessment. He has been involved with the design, installation, rehabilitation, and abandonment of about 1,000 water wells in the United States. Mr. Glotfelty has given over 100 presentations on hydrogeologic and water well topics and he has authored over 20 publications, including *The Art of Water Wells* (NGWA Press, 2019), *Glossary of Driller's Terms* (NGWA Press, 2004), and editorial review of the 3rd edition, *Groundwater & Wells* (Johnson Screens Co., 2007). In 1995, he received the ***City of Phoenix Mayor's Environmental Award*** for his work with rehabilitation of municipal wells to improve their water quality, and he was selected as the National Ground Water Association's ***Distinguished McEllhiney Lecturer*** for 2012.

WELL SITING STUDIES

Mr. Glotfelty has been involved with multiple well siting studies and recharge siting studies covering approximately 2,000 square miles in Arizona, including projects for private water purveyors such as EPCOR; Foothills Golf Club; Forest Highlands Golf Club; Global Water Company; Kachina Village Utilities; and Tonto Hills Water Company. He has also conducted well siting studies for municipalities in Arizona such as the Cities of Avondale, Casa Grande, Chandler, Flagstaff, Mesa, Peoria, Phoenix, Scottsdale, Show Low, Surprise, and Tempe.

PRODUCTION WELL DESIGN AND INSTALLATION

Mr. Glotfelty has been involved with hundreds of projects involving the design and construction management of water supply well installations for municipalities, private water companies, mining facilities, power plants, or other industrial facilities.

Public Supply Wells for Municipalities

Examples of ***municipal water supply well installations*** include: *2 wells* in Avondale, AZ; *1 well* in Benson, AZ; *11 wells* in Buckeye, AZ; *6 wells* in Chandler, AZ; *1 well* in El Mirage, AZ; *4 wells* in Goodyear, AZ; *3 wells* in Kingman, AZ; *11 wells* in Mesa, AZ; *3 wells* in Nogales, AZ; *3 wells* in Peoria, AZ; *10 wells* in Phoenix, AZ (of which four are Aquifer Storage & Recovery wells); *2 wells* in Prescott, AZ; *7 wells* in Scottsdale, AZ (of which two are Aquifer Storage & Recovery wells); *1 well* in Show Low, AZ; *13 wells* in Surprise, AZ; *2 wells* in Tempe, AZ; *2 wells* in Tolleson, AZ; and 2 *wells* in Yuma, AZ.

Non-Municipal Water Well Installations
Examples of ***water supply well installations for private water companies or other private entities*** include: California Baptist University at Riverside, CA - *one well*; Litchfield Park Service Co. - *one well*; Metro Water Company in Tucson, AZ - *three wells*; Global Water Resources in Buckeye, AZ - *six wells*; and Kachina Village Utilities near Flagstaff, AZ - *two wells*. ***Industrial or irrigation well design/installation projects*** include: Kinder Morgan near Springerville, AZ - *two wells;* Arizona Public Service - *eight wells*; First Solar Alpine Power Plant near Lancaster, CA - *one well*; Nevada Energy Co. Chuck Lenzie Generating Station, North Las Vegas, NV – *one well*; Foothills Golf Club in Phoenix, AZ - *two wells*; Harquahala Generating Power Plant in western AZ - *five wells*; and Forest Highlands Golf Association near Flagstaff, Arizona - o*ne well*. Mr. Glotfelty has also overseen the installation of ***water supply wells on Native American lands***, such as: Window Rock High School at Fort Defiance, AZ; Second Mesa Day School at Second Mesa, AZ; and the Salt River Pima-Maricopa Indian Community near Scottsdale, AZ - *four wells*.

Aquifer Storage & Recovery (ASR) Wells
Examples of ***aquifer storage & recovery (ASR) well design/installations*** Include over thirty ASR wells in the Phoenix municipal area. Three ASR wells for the City of Phoenix (ASR Well No. 299, No. 9A-300, and the Cave Creek ASR Well) involved pioneering technologies such as the *reverse-syphon injection method* and use of *manufactured glass beads* for the well's filter pack. These ASR wells were the first to incorporate these leading-edge technologies in the United States. During each ASR well installation, Clear Creek Associates coordinated the activities of the drilling contractor and sub-consultants. On the basis of the site-specific and depth-specific data from each pilot borehole, Clear Creek Associates developed a site-specific ASR well design and provided construction management on a 24-hour per day basis during each well installation, as well as oversight and monitoring during the development and testing of each ASR well. The innovative attributes and pioneering technologies of these ASR well projects resulted in the City of Phoenix being awarded the **2013 National Ground Water Association's Outstanding Groundwater Project Award** as the ***top groundwater project in the nation*** (Groundwater Supply category).

Mr. Glotfelty served as Project Manager and/or Principal Hydrogeologist for the above-listed well installation projects, and he was responsible for the design, installation, and testing of the associated water supply wells. He coordinated contractor activities, and supervised preparation of lithologic logs, analyzed geophysical logs and sieve analyses of pilot hole cuttings, coordinated the collection and analysis of depth-specific groundwater samples, and supervised the collection and analysis of hydrologic data (falling-head tests). Based on that data, he supervised or prepared the site-specific well design for each water supply or ASR well. He also analyzed aquifer test data, and provided a recommendation of the permanent pump setting and discharge rate for each new well.

PUBLICATIONS AND PRESENTATIONS
Mr. Glotfelty has given over 100 presentations on hydrogeologic and water well topics, including lectures or webinars in 17 U.S. states as well as in five other international countries (Australia, Canada, Mexico, Bolivia, and Columbia). He has authored over 20 publications, including *The Art of Water Wells* (NGWA Press, 2019) and *Glossary of Driller's Terms* (NGWA Press, 2004). Mr. Glotfelty also authors a quarterly column for the NGWA monthly publication, *Water Well Journal*.

A listing of Mr. Glotfelty's publications and presentations is available upon request.

Hannah Erbele, PG

Project Geologist

EDUCATION

BS, Earth and Environmental Science (minor in Education), University of California, Irvine, 2010

PROFESSIONAL REGISTRATIONS

Professional Geologist, California, No. 9961

PROFESSIONAL TRAINING

OSHA 40-Hour HAZWOPER Training

Ms. Erbele is an experienced Professional Geologist with 15 years of experience that encompasses regional studies, hydrogeologic investigations, environmental projects, litigation support, and carbon capture and storage (CCS) planning and permitting. She was an integral team member for the development and submittal for 7 of the 12 Underground Injection Control (UIC) Class VI permit applications submitted to the U.S. Environmental Protection Agency (EPA) Region 9 (four described below). Ms. Erbele also helped to prepare a Class VI permit application for the State of Wyoming, which is one of four states that has Primary Enforcement Responsibility (primacy). She assisted with prescreening of several depleted oil/gas reservoirs and saline aquifers to determine the suitability for injecting carbon dioxide (CO_2) into the subsurface. Ms. Erbele prepared documents related to California Air Resources Board (CARB) surface air monitoring, soil gas monitoring, and ecosystem stress monitoring for applicable CCS projects.

Asset Management Plan for Water Supply Wells, California Water Service Company, California

Provided an assessment of the condition, criticality, and long-term reliability of wells within the California Water Service Company (Cal Water) Districts consistent with American Water Works Association standards. Cal Water operates over 800 water supply wells throughout California. Identified and characterized aging infrastructure in Cal Water's districts, such that deteriorating wells can be identified and prioritized for replacement or rehabilitation.

Eastern Wyoming Sequestration Hub Class VI Permit Application, High Plains Carbon Storage, LLC, Wyoming

The Eastern Wyoming Sequestration (EWS) Hub is an innovative, multi-state decarbonization effort focused on permanently sequestering CO_2 from multiple emitters located in Wyoming and several surrounding states. The initial EWS Hub CO_2 sequestration test well, Juniper I-1, is located in Laramie County. Ms. Erbele helped to prepare edit, format, and compile the revised UIC Class VI permit application to address to comments from Wyoming Department of Environmental Quality. Ms. Erbele helped to prepare a separate Class VI permit application for five additional injection wells. In total, the EWS Hub will be used to inject of an average of 5.1 million metric tonnes (MMt) per year of CO_2 into the Sundance and Lyons formations. Ms. Erbele also helped to prepare the associated CARB permit application.

Carbon Terra Vault Underground Injection Control IV Class VI Permit Application, California Resources Corporation, California

Carbon Terra Vault (CTV) is planning to construct a carbon capture and sequestration "hub" project that collects CO_2 from multiple sources over time and injects the CO_2 stream(s) via Class VI UIC permitted injection

well(s). Ms. Erbele managed the preparation and development UIC Class VI permit application for CTV IV. This Class VI permit application proposes to inject and store CO_2 in the Mokelumne River Formation (Upper Injection Zone) and in the Starkey Formation (Lower Injection Zone) using eight injections wells. For both injection zones, the expected total storage for the site is up to 33.52 MMT at an average injection rate of up to 1.38 MMt. Ms. Erbele worked collaboratively with the California Resources Corporation (CRC) team and was involved with the preparation of most of the required Class VI permit application documents, including the project Narratives, Area of Review (AoR) and Corrective Action, Testing and Monitoring Plans and associated Quality Assurance Surveillance Plans (QASP), Pre-operational Testing Plan, Post-Injection Site Care and Site Closure Plans (PISC), and the Emergency and Remedial Response Plans (ERR). Ms. Erbele also worked with the CRC team to respond to the comments from EPA's Administrative and technical reviews.

Carbon Terra Vault V Underground Injection Control Class VI Permit Application, California Resources Corporation, California
CTV is planning to construct a carbon capture and sequestration "hub" project that collects CO_2 from multiple sources over time and injects the CO_2 stream(s) via Class VI UIC permitted injection well(s). Ms. Erbele managed the preparation and development UIC Class VI permit application for CTV. This Class VI permit application proposes to inject and store CO_2 in the Mokelumne River Formation (Upper Injection Zone) and in the Starkey Formation (Lower Injection Zone) using six injection wells. For both injection zones, the expected total storage for the site is up to 16.7 MMt at an average injection rate of up to 0.67 MMT per year. Ms. Erbele worked collaboratively with CRC team member and was involved with the preparation of most of the required Class VI permit application documents, including the project Narratives, AoR and Corrective Action, Testing and Monitoring Plans and associated QASP, Pre-operational Testing Plan, PISC, and the ERR. Ms. Erbele worked with the CRC team to respond to the comments from EPA's Administrative and technical reviews.

Carbon Terra Vault VI UIC Class VI Permit Application, California Resources Corporation, California
CTV is planning to construct a CCS project that collects CO_2 from multiple sources over time and injects the CO_2 streams via Class VI UIC-permitted injection well. Potential sources include capture from existing steam generators at Kern Front oil field and DAC. Ms. Erbele managed the preparation and development UIC Class VI permit application for CTV IV. This Class VI permit application proposes to inject and store CO_2 in the Vedder Formation (Injection Zone) at 0.213 MMt per year for a total of 2.55 MMT using one (1) injection well. Ms. Erbele worked collaboratively with CRC team and was involved with the preparation of most of required Class VI permit application documents, including the project Narratives, AoR and Corrective Action, Testing and Monitoring Plans and associated QASP, Pre-operational Testing Plan, PISC, and the ERR. Ms. Erbele worked with the CRC team to respond to the comments from EPA's Administrative and technical reviews.

Underground Injection Control Class VI Permit Applications, Pelican Renewables, California
The Pelican Carbon Sequestration Project consists of a corn-based ethanol production plant, a carbon dioxide capture and processing facility, transportation infrastructure, and two Class VI carbon dioxide deep injection wells. Ms. Erbele provided technical support for the narrative and Emergency and Remedial Response Plan. In particular, Ms. Erbele reviewed geologic cross-sections and shale gouge ratio.

Carbon Management and Energy Innovation Symposium and Subsurface Technical Issues Impacting Carbon Sequestration Workshop, Bakersfield, California
Ms. Erbele participated in a Subsurface Technical Issues Impacting Carbon Sequestration Workshop to discuss the issues and strategies associated with subsurface carbon sequestration. Key topics were presented to in the

2nd annual Carbon Management and Energy Innovation Symposium which included: seismicity, faults and fractures, storage volume, injectivity, reservoir properties, integrity of new and existing wellbores, gas phase changes, geomechanical issues, CO_2 containment and trapping, seal capacity, integrity, and continuity, CO_2 plume migration, ability to monitor to CO_2 plume, sufficient containment area, and drinking water proximity.

Waves LA Warehouse Environmental Services, Los Angeles, California
Assistant Project Manager for the site field investigations which included the installation of eight groundwater monitoring wells and numerous soil vapor probes at a former fabric processing warehouse site with elevated concentrations of chlorinated solvents in soil, soil vapor, and groundwater. Samples were collected, analyzed, and presented to the Los Angeles Regional Water Quality Control Board, including a site characterization report, a conceptual site model report, a soil vapor extraction system evaluation report, and routine monitoring reports. Ms. Erbele managed field activities for the removal of two underground storage tanks under the direction of the Los Angeles County Fire Department. Ms. Erbele managed the sampling and monitoring program for groundwater sampling, soil vapor sampling, and soil vapor extraction system sampling.

Chino Basin Project, Aquifer Replenishment, Rancho Cucamonga, California
Provided technical support for borehole investigation and monitoring well installation in preparation for a regional aquifer replenishment project which plans to directly inject advanced treated water into the local aquifers. Developed a static subsurface geologic model using Leapfrog Works. Interpreted and correlated geologic units from newly installed monitoring wells using Petra geophysical correlation software.

Ventura River Watershed Modeling, Ventura, California
Provided technical support for the Ventura River Watershed Model, which covers Ojai Valley Groundwater Basin, Upper Ojai Valley Groundwater Basin, Upper Ventura River Groundwater Basin, and Lower Ventura Groundwater Basin. Prepared cross-sections and groundwater contours. Helped maintain well database containing nearly 1,500 wells. Developed cross-sections from historical data and modeling data.

Groundwater and Reclaimed Water Study, City of Thousand Oaks, California
Performed a groundwater assessment of the Conejo Valley Groundwater Basin, which included an operational yield analysis, analysis of groundwater elevations and storage changes, as well as water quality issues and concerns. The purpose of this study was to evaluate the role that development of local supplies, including groundwater, surface water, and reclaimed water, can play in improving the City's water supply reliability.

Watershed Management and Hydrologic Monitoring Program, Pepperdine University, Malibu, California
Managed the HMP at a private university to confirm that irrigation from reclaimed water is not adversely affecting slope stability. Prepared semiannual and annual reports for the hydrologic monitoring program, which included data from groundwater monitoring, surface water monitoring, storm drain and sub drain discharge calculations, irrigation flow volumes, and evapotranspiration and precipitation. Performed as needed hydrogeological consulting services such as a hydrogeologic investigation to identify a source of groundwater accumulating at base of slope including a general chemistry and stable isotopes analysis of groundwater and other water sources (delO/delD and nitrogen). Procured and implemented a flow monitoring telemetry system for real-time monitoring.

Critical Infrastructure Problems and Restoration Solutions, Portuguese Bend Area, City of Rancho Palos Verdes, California
Developed a geographic information system (GIS) database for the feasibility study, examined sensitive habitats within the Portuguese Bend Landslide, and provided technical support as directed by the City for an engineering feasibility study. The feasibility study was developed to systematically select a remedy to stabilize the Portuguese Bend Landslide Complex and restore community infrastructure in the City of Rancho Palos Verdes, California. Collected storm water flow data to study the runoff on infiltration from precipitation.

Water Quality Investigation and Impacts Analysis for Cottonwood Sand Mine, San Diego County, California
Assisted with impacts analysis and water balance calculations in support of an Environmental Impact Report in accordance with guidelines established by the County of San Diego Department of Planning and Development Services.

Hydrogeologic Investigation, Private Residence, Newport Beach, California
Performed a hydrogeologic investigation for a private property with steep down-sloping hillsides that exhibited abnormally high groundwater elevations which included a review of historical site documentation, drilling and installing monitoring wells, and groundwater sampling and analysis for general minerals, delO/delD isotopes, and pharmaceutical and personal care products (PPCPs).

Central Valley-Salinity Alternatives for Long-Term Sustainability, Nitrate Surveillance and Monitoring Program, Central Valley, California
Participated in a program under the guidance of Central Valley-Salinity Alternatives for Long-Term Sustainability (CV-SALTS), Central Valley Regional Water Quality Control Board, the State Water Resources Control Board, the Central Valley Salinity Coalition, and other stakeholders, to develop a comprehensive regulatory and programmatic approach to the management of salt and nitrate in the Central Valley. Assisted in the development of a cost-effective monitoring program that will allow for statistically-defensible ambient water quality determinations and trend analyses for management zone in the Central Valley. Calculated the volume weighted average nitrate and TDS for each groundwater basin. The project team used a Monte Carlo approach to determine a subset of wells that could represent a monitoring network that when calculated was within 15 percent of the determined basin volume weighted average.

Yorba Linda Water District, Yorba Linda, California
Onsite Geologist who oversaw the drilling, aquifer testing, installation, pumping test, and water quality sampling of a production well which was installed to a depth of 570 feet in an alluvial aquifer.

Leavens Ranches, Ventura, California
Onsite Geologist who oversaw the drilling and construction for an agricultural irrigation replacement well in Santa Paula Basin. The well was installed to a depth of 835 feet in an alluvial aquifer.

Puente Valley Operable Unit Superfund Site, San Gabriel Valley, California
Field Geologist who provided drilling, sampling, and well construction oversight for this U.S. EPA cleanup project. This project included the use of simulprobe technology while drilling to collect immediate samples of 1,4-Diox and VOCs to delineate plume boundaries. Puente Valley Operable Unit is one of four Superfund sites located in the 170-square-mile San Gabriel Valley. The project goal was to delineate the vertical and lateral extent of the groundwater contamination.

J. Kyle Welchans, PG, QISP

Senior Geologist

EDUCATION

Bachelor of Science, Geology, 2007
San Diego State University

PROFESSIONAL REGISTRATIONS

Professional Geologist, California, No. 9255

Qualified Industrial Stormwater Practitioner

PROFESSIONAL TRAINING

OSHA 40-Hour HAZWOPER Training

Nuclear Gauge Safety Training Course

Mr. Welchans is a Professional Geologist registered in the State of California and is a Senior Geologist at Geo-Logic Associates (GLA). He is responsible for managing and preparing quarterly and semi-annual water quality monitoring reports and National Pollutant Discharge Elimination System (NPDES) annual reports for landfills and composting facilities throughout the state of California. His responsibilities have included project management of data analyses and report preparation for soil, groundwater and surface water monitoring programs; logging of exploratory borings and well drilling; and geologic log preparation. Mr. Welchans is certified as a California Qualified Industrial Stormwater Practitioner (QISP) and prepares Level 1 and Level 2 Compliance reports for several California landfills. He is also experienced in grading and foundation construction quality assurance testing.

Replacement Water Supply Well Drilling and Install for Border Patrol Facility-Tecate Boarder Crossing, KCorp Support Services, San Diego County, California
Geologist responsible for drilling and installation of one groundwater supply well.

Mid-Valley Sanitary Landfill Well Construction, San Bernardino County SWMD, San Bernardino County, California
Staff Geologist responsible for logging and drilling operations for three dual nested monitoring wells using mud rotary drilling methods.

City of San Diego M&RPs for Seven Landfills, City of San Diego Environmental Services, San Diego, California
Project Manager for routine annual and semi-annual reporting at these closed (6) and active (1) landfills. Project work includes evaluations of groundwater geochemical trends, statistical analysis of water quality data and preparation of semi-annual and annual groundwater quality reporting for the City's seven landfills. Previous work has included site sampling via low-flow purging methods in compliance with San Diego standard operating procedures. Non-routine work includes drilling and logging of Title 27 perimeter landfill gas monitoring probes and an air injection well at the West Miramar Landfill; repairs to damaged wells, abandonment and construction of two replacement monitoring wells, and drilling and construction of three landfill gas extraction wells at the South Miramar Landfill; and minor repairs to groundwater monitoring wells at other closed City of San Diego landfills.

Stormwater Industrial General Permit Compliance Support at Several California Landfills, Transfer Stations and Trucking Sites, Republic Services, Inc., Northern California
Stormwater compliance support services have included one or more of the following tasks: preparation of Level 1 and 2 Exceedance Response Action Reports, Stormwater Pollution Prevention Plans (SWPPPSs), annual reports

and ad hoc reports; annual comprehensive site compliance evaluations; and third-party legal support for several facilities located in northern California, including: Acme Landfill, Martinez; and the following Republic Services, Inc. facilities: Newby Island Landfill, Milpitas; Ox Mountain Landfill, Half Moon Bay; Keller Canyon Landfill, Pittsburg; Vasco Road Landfill, Livermore; Forward Landfill, Manteca; Solano Garbage Company, Fairfield; Contra Costa Transfer/Recycling Station, Martinez; Allied Waste Services of Alameda County, Fremont, Allied Waste Services of Daly City, Daly City; Allied Waste Services of Rancho Cordova, Rancho Cordova; Allied Waste Services – Pleasant Hill/Bayshore, Pacheco; and Elder Creek Transfer and Recovery Station, Sacramento.

Rialto Groundwater Treatment System Perchlorate and Volatile Organic Compound (VOC) Removal Well Construction, San Bernardino County SWMD, San Bernardino County, California
Staff Geologist responsible for logging and drilling operations for three triple nested and two seven-port West Bay monitoring wells using mud rotary drilling methods, and two extraction wells using reverse circulation drilling methods.

Salton City Solid Waste Site M&RP and Geological Services, Burrtec Waste Industries, Salton City, California
Project Manager for routine semiannual groundwater monitoring and reporting and quarterly landfill gas and off-site spring monitoring and reporting for this landfill located within the Colorado River RWQCB jurisdiction. Previously as a Staff Geologist responsible for logging and constructing five groundwater monitoring wells and 16 multi-depth soil-pore gas probes and groundwater sampling using standard purging and sampling methods and perimeter landfill gas probe monitoring. Work at the site has also included drawdown and slug tests and repairs to damaged wells.

American Organics Composting Facility M&RP and Geological Services, Athens Services, Inc., San Bernardino County, California
Project Manager for routine quarterly water quality monitoring and reporting at American Organics Composting Facility located within Lahontan RWQCB jurisdiction. Duties have included non-routine work such as developing a monitoring and reporting plan, a sampling and analysis plan, drilling and installation of four groundwater monitoring wells and oversight of five monitoring well abandonments. Routine tasks have included coordination with field staff and subcontracted laboratories to provide sampling and analysis of groundwater and impoundment pond samples and preparation of reports using the collected data.

Allied Imperial Landfill M&RP and Geological Services, Republic Services, Inc., Imperial County, California
Project Manager for routine semiannual groundwater monitoring and reporting at Allied Imperial Landfill, located within the Colorado River RWQCB jurisdiction. Project duties include coordination of field staff and client-contracted laboratory to collect and analyze samples from groundwater wells and leachate, and analyses and report preparation of this data. Reporting also includes analyses and compilation of client-supplied data related to soil-pore gas chemistry, waste intake, and standard observations. Previously, as a staff Geologist, was responsible for logging and construction of seven groundwater monitoring wells and seven soil-pore gas probes, as well as groundwater sampling.

Sunshine Canyon Landfill M&RP, Republic Services, Inc., Los Angeles County, California
Project Manager for routine semiannual groundwater monitoring and reporting at Sunshine Canyon Landfill, located within the Los Angeles RWQCB jurisdiction. Project duties include coordination of field staff and client-contracted laboratory to collect and analyze samples from groundwater wells, underdrains, lysimeters, and leachate, and analyses and report preparation of this data. Reporting includes analyses and compilation of

client-supplied data related to soil-pore gas chemistry, waste intake, liquid generation and management, and waste acceptance. Project has also included re-development of lysimeters and raising of monitoring wells.

Borrego, Otay, Ramona, and Sycamore Landfill M&RPs, San Diego Landfill Systems, San Diego County, California
Project Manager for routine semiannual groundwater monitoring and reporting at these closed (1) and active (3) landfills located within the San Diego RWQCB and Colorado River RWQCB jurisdictions. Also responsible for maintaining corrective action pump and treat systems at three of the four landfills and maintaining the leachate pumping system at one of the landfills. Project has included well abandonment and replacement at Borrego Landfill and piezometer abandonments at Sycamore and Otay Landfills. Previously, as a staff Geologist, duties included groundwater sampling, including both standard and low-flow purging and sampling methods.

Newby Island Sanitary Landfill M&RP and Geological Services, Republic Services, Inc., Milpitas, California
Geologist responsible for data review, statistical analyses and preparation of semi-annual water quality monitoring reports for this active landfill located in the San Francisco Bay RWQCB. Project has included drilling and installation of 17 leachate extraction wells.

Hydrogeologic Investigations for East Otay Mesa Landfill Siting Study, East Otay Mesa Recycling and Landfill, LLC., San Diego County, California
Geologist responsible for drilling of borings and construction of groundwater monitoring wells.

Waste Water Treatment Facilities M&RP, Placer County Department of Public Works, Placer County, California
Geologist responsible for data review, statistical analyses and preparation of quarterly and semi-annual water quality monitoring reports for current (2) and former (1) waste water treatment facilities located within the Central Valley-RWQCB. Project also included training of field staff in groundwater sampling techniques and preparation of a Request to Cease Monitoring Report for the former waste water treatment facility.

Azusa Land Reclamation Groundwater Sampling, Waste Management, Inc., Azusa, California
Staff geologist responsible for groundwater sampling and treatment using a three-phase generator and water truck. Experience also includes logging and construction of a replacement well and directing subcontractors for construction of a well discharge extension line.

Temecula Valley Gun Club Site Investigation, Murrieta KLC Holdings, Riverside County, California
Lead Field Geologist responsible for implementing a sampling and analysis plan to characterize lead impacts from a historical shooting range. Established the sampling grid and collected more than 100 soil characterization samples. After results were received, researched viable site remediation alternatives including clean closure, asphalt encapsulation, chemical stabilization, and liner encapsulation.

Tule Wind Groundwater Investigation, Tule Wind, LLC, East San Diego County, California
Field Geologist responsible for piezometer construction and well abandonment, groundwater pumping tests and collection of groundwater elevation data to support evaluation of groundwater resources for construction and operation of a wind farm near Boulevard, California. Work included long term (72-hour) aquifer pumping tests.

William B. Lopez, PG, CEG, CHG

Senior Geologist

EDUCATION

Bachelor of Science, Geology, 1992
California State University, Fullerton

PROFESSIONAL REGISTRATIONS

Professional Geologist, California, No. 6857

Certified Engineering Geologist, California, No. 2143

Certified Hydrogeologist, California, No. 706

PROFESSIONAL TRAINING

OSHA Hazardous Waste Operations and Emergency Response Training (40-Hour)

Nuclear Gauge Safety Training

Desert Tortoise Awareness Training

Mr. Lopez has participated in a wide range of geotechnical and hydrogeologic projects with an emphasis on solid waste sites. He is well-versed in a wide array of geological field methods. In the last few years, he has logged more than 100 boreholes drilled using air-rotary coring, mud-rotary coring, dual-wall reverse air rotary, air-rotary casing hammer, sonic, hollow-stem auger, and bucket auger methods. Over the past 31 years, Mr. Lopez has participated in the preparation of quarterly and semi-annual water quality and landfill gas (LFG) monitoring reports in accordance with state CCR Title 27 and site-specific waste discharge requirements (WDRs). In addition, he is experienced in aquifer test data analysis, geophysical data analysis, groundwater flow modeling (Visual MODFLOW), unsaturated fluid flow modeling, and statistical analyses of groundwater chemistry data using a wide variety of software packages (Sanitas®, ChemStat®).

Newby Island Landfill M&RP, Republic Services, Inc., Milpitas, California
Project Manager and Lead Hydrogeologist for groundwater and surface water M&RP programs for this landfill on San Francisco Bay. Work includes oversight and coordination of water quality sampling, data evaluation, and reporting. Also, responsible for the design and construction of 5 vibrating-wire piezometers in the interior of the landfill to monitor leachate elevations. Worked with client and RWQCB to evaluate the status of existing leachate extraction wells and to support design and construction of 15 additional leachate extraction wells in the unlined area of the landfill to reduce interior leachate levels at the site.

San Diego Landfill Systems, Borrego, Ramona, Sycamore and Otay Landfills M&RP, Republic Services, Inc., San Diego County, California
Lead Hydrogeologist for groundwater quality monitoring and reporting programs for four landfills within the San Diego and Colorado River Basin Region RWQCBs. Work includes groundwater sampling, statistical analyses using the statistical program Sanitas, and preparing semi-annual reports. Provided stormwater sampling services during the rainy season, annual leachate sampling and reporting, and as needed regulatory liaison services for Republic Services on landfill issues. Also, responsible for sampling-crew training for this site.

Chestnut Avenue and Chateau Fresno Landfill M&RPs/O&M, Republic Services, Inc., Fresno County, California
Project Manager and Lead Hydrogeologist for groundwater M&RP programs for these landfills. Work includes oversight of water quality sampling and CAP O&M services. Responsible for data evaluation, preparation of monthly CAP reports, and production of semiannual monitoring reports for submittal to the Central Valley RWQCB in Fresno. Also, coordinated repairs to the landfill geosynthetic cover at the Chateau Fresno Landfill following a brush fire that damaged portions of the cover system. More recently, assisted the client with

RWQCB liaison assistance to reduce the number of groundwater monitoring wells for the Chestnut Avenue M&RP and acted as the Lead geologist for the design and installation oversight of two replacement wells as a result of groundwater overdrafting.

South Hilo Sanitary Landfill Monitoring Well and Soil-Pore Gas Probe Construction, County of Hawaii, Hilo, Hawaii
Lead Field Geologist responsible for coordinating and supervising drilling of six groundwater monitoring wells and four soil-pore gas probes in support of the site monitoring programs.

Soil-Pore Gas Probe Construction, West Miramar Landfill, City of San Diego, San Diego County, California
Lead Field Geologist responsible for coordinating and supervising drilling of 11 multi-depth soil-pore gas probes in support of the site monitoring program at this active landfill.

Geotechnical Investigations, Habitat for Humanity Housing, San Diego County, California
Project Manager and Lead Geologist for numerous multi-unit residential homes throughout San Diego County. Work includes drilling, mapping, percolation testing, and test pit investigations along with construction management and problem-solving for Habitat for Humanity.

Gregory Canyon Landfill Siting Project, Gregory Canyon Landfill, LLC, San Diego County, California
Lead Geologist and Hydrogeologist for geologic/hydrogeologic characterization of both alluvial and fractured crystalline bedrock aquifers in support of an Environmental Impact Report (EIR) to site a new landfill in San Diego County. Work included a thorough literature review; extensive field mapping, including fracture orientations in outcrop; a very low-frequency (VLF) geophysical survey to identify preferentially fractured bedrock likely to provide more productive groundwater wells; oversight and coordination during construction of 26 groundwater monitoring wells and geophysical testing of 18 bedrock wells to assess productive zones within the fractured bedrock beneath the site. Also conducted both step-drawdown and long term (24- to 72-hour) aquifer pumping tests to characterize the bedrock aquifer and demonstrate interconnection between wells along the point of compliance. Results of the field investigations were used to develop a two-dimensional groundwater contaminant transport model and three-dimensional groundwater flow model in support of the monitoring and reporting program for the proposed Gregory Canyon Landfill.

Paradise Hills Park Landfill Solid Waste Assessment Test (SWAT), City of San Diego, San Diego, California
Lead Geologist/Hydrogeologist for a geologic and hydrogeologic investigation at this former Class III landfill. Work included soil sampling, well construction and development followed by quarterly soil-pore gas and water quality sampling. Based on evaluation of the data, conclusions were developed for the likelihood of impacts from this landfill to the underlying soil and groundwater. Based on the lack of measured impacts, the report recommended to the San Diego RWQCB monitoring, including soil pore gas sampling and groundwater well abandonment.

Sycamore Landfill Expansion Environmental Support Services, Republic Services, Inc., San Diego, California
Lead Hydrogeologist responsible for oversight of drilling and well construction activities at the Sycamore Landfill in anticipation of landfill expansion. Work included oversight of drilling of a new background monitoring well, and abandonment of several existing wells and piezometers that were located within the proposed landfill footprint. Also provided site-specific geologic and hydrogeologic knowledge in reviewing the geology and hydrogeology sections of the Sycamore Landfill Expansion Environmental Impact Report and performed detailed geologic mapping of the expansion area.

West, North and South Miramar Landfill Hydrogeologic Investigation and M&RPs, City of San Diego, San Diego, California
Staff Geologist for an initial hydrogeologic characterization including geophysical surveys, groundwater monitoring well and lysimeter construction and preparation of a revised M&RP. Lead Hydrogeologist responsible for water quality monitoring, data evaluation, and reporting for the active West Miramar Landfill and inactive South and North Miramar Landfills. Assisted the City with RWQCB liaison assistance for the design and installation of replacement 3 groundwater monitoring wells at the South Miramar Landfill.

Arizona Street and South Chollas Landfill Investigations and M&RPs, City of San Diego, San Diego, California
Lead Hydrogeologist responsible for review of water quality data, preparation of non-statistical (trend) analyses, and semiannual reporting for these two inactive landfills. Providing input to the City regarding appropriate responses to the local RWQCB on these sites, which are experiencing apparent LFG impacts. Also developed EMPs, including the removal of lysimeters, well design, construction of a downgradient well, contaminant fate and transport modeling, and preparation of an EMP report with recommendations for additional source control measures at each site.

Geotechnical Investigation for Expansion of the Frank R. Bowerman Landfill, Orange County Waste & Recycling, Orange County, California
Field Geologist responsible for logging exploratory boreholes, analysis of site geologic conditions for stability of refuse and native cut slopes, rippability of on-site borrow materials, laboratory analysis of select borrow materials, and bentonite admixtures for use as low-permeability liner material.

Alternative Final Cover Borrow Source Investigations – Mead Valley and Highgrove Landfills, Riverside County Waste Management Department Riverside County, California
Field Geologist responsible for conducting the field investigations to evaluate final cover borrow sources at these two landfills. The Mead Valley site required blending of on-site soils with off-site soils, and the field work included sampling of multiple borrow areas to determine the sites and quantities of potential borrow sources. Work included test pit excavation, logging, soil sampling, and coordinating laboratory testing for these two metropolitan landfills.

Alternative Final Cover Borrow Source Investigations – 12 Landfills, San Bernardino County SWMD, San Bernardino County, California
Field geologist responsible for conducting the field investigations to evaluate final cover borrow sources at the Apple Valley, Baker, Hesperia, Newberry, Phelan, Trona-Argus, Victorville, and Yermo Landfills in the Lahontan Region of the County; at the Milliken and Mid-Valley Landfills in the Santa Ana region of the County; and at the Lucerne Valley and Morongo Valley landfills in the Colorado River Basin region of the landfills. Supervised, logged, and sampled test pit excavations and coordinated laboratory testing of representative soils.

Publications and Presentations

Lopez, W.B., 1991. "Depositional Environments and Provenance of the Saugus and San Pedro Formations, Las Posas-Camarillo Hills Area, Ventura County, California;" AEG Annual Field Trip Guidebook; Engineering Geology Along the Simi-Santa Rosa Fault System, Simi Valley to Ventura County, California. pp 76-80.

Shayne McKenna

Staff Geologist

EDUCATION

MS, Remote Sensing and Geospatial Sciences, 2025
Boston University

BA, Geosciences, 2018
Princeton University

CERTIFICATIONS

OSHA Hazardous Waste Operations and Emergency Response Training (40-Hour), 2025

Mr. McKenna is a recent graduate of Boston University with relevant coursework in database design and implementation, advanced spatial analysis, and geographic information system (GIS) programming, solid earth science, minerology, and environmental geochemistry. He is skilled in remote sensing techniques, field investigation activities, geologic mapping, groundwater monitoring, global positional systems (GPS) field data collection, database management, and data quality assurance/quality control (QA/QC). He is proficient in Python Scripting, R, structured query language (SQL), ArcGIS Pro, AutoCAD, cartographic design, and data visualization.

Automated Forest Change Detection with Machine Learning, Boston University, Boston, Massachusetts
Extracted and organized a 35-year Landsat dataset, performing data cleaning, conversion, and correction of anomalies to prepare it for analysis in Google Earth Engine using JavaScript. Designed and implemented a machine-learning classification model to detect spatial patterns of deforestation and reforestation in Mexico's Monarch Butterfly Biosphere Reserve with 86.6% accuracy. Created detailed maps and custom satellite imagery to deliver data-driven insights assessing effectiveness of conservation efforts and compliance.

LiDAR-Based Solar Radiation and Flood Risk/Inundation Analysis, Boston University, Boston, Massachusetts
Executed a full georeferencing and digitizing workflow, creating vector boundary layers from non-spatial imagery using control points to delineate a project area of interest. Processed raw LiDAR point cloud data to create high-resolution Digital Elevation Models (DEM) and Digital Surface Models (DSM) in ArcGIS Pro. Performed advanced 3D spatial analysis, using the DSM to simulate solar radiation on building rooftops and using the DEM to model a 3-meter storm surge flood inundation scenario for emergency management planning.

Ramona Landfill Leachate Operations and Maintenance, Republic Services, Inc., San Diego County, California
Staff geologist responsible for weekly collection of transducer data and inspection/maintenance of leachate pumping system. Routine inspection includes control panel functionality, equipment, piping, valves, etc. at the leachate treatment area, the leachate pump, and the irrigation transfer pump; inspecting groundwater storage tanks and irrigation tank for leaks; collecting data and logging totalizer, flow meter, pressure readings, and tank water levels.

Senior Thesis: Analysis SiO_2 Under Shock Compression, Princeton University, Princeton, New Jersey
Analyzed raw experimental data from *in situ* X-ray diffraction (XRD) experiments conducted at the Linac Coherent Light Source (LCLS) national

laboratory. Processed complex diffraction patterns using a suite of software (Python, CrystalDiffract, Dioptas) to identify mineral phase transitions and calculate physical properties, such as density. Authored a comprehensive, publication-style senior thesis detailing the methodology, data analysis, and results, demonstrating strong technical writing and data organization skills.

Geo-Logic
ASSOCIATES

COST PROPOSAL FOR

Development of the Well Rehabilitation and Maintenance Program

Due Date: March 13, 2026

PREPARED FOR
Sweetwater Authority

Geo-Logic ASSOCIATES

Sweetwater Authority Well Rehab and Maintenance Program: Terms and Approvals

Client Name:	Sweetwater Authority
Project Name:	Well Rehab and Main Prog
Project Number:	DB26.1041.PR
Terms:	

Date:	3/11/2025
Estimator:	LB
Project Manager:	LB
Reviewed by:	JMH
Approved by:	JMH

Sweetwater Authority Well Rehab and Maintenance Program: Cost Summary

Task Description	Task Hours	Labor Costs	Other Direct Costs	Total
Phase 1 - Data Collection, Review and Proj Coordination	74	$17,914	$300	$18,214
Phase 2 - Field Assessments and Condition Evaluation	167	$44,492	$4,850	$49,342
Phase 3 - Rehab Planning, Maint Strategy, and Program Mngt	62	$14,304	$0	$14,304
Phase 4 - Final Program Prep and Deliverables	168	37,952	0	37,952
GRAND TOTAL	471	$114,662	$5,150	$119,812

GRAND TOTAL:	$119,812

Sweetwater Authority Well Rehab and Maintenance Program

Description	Duration (Days)	Start Date	Principal Professional II Gelforty, Marvin *$321.00*	Senior Professional I Busso, Luis Welchans, Kyle *$249.00*	Staff Professional I McKenna, Shayne <Notes> *$154.00*	Weber Resources Personnel <Notes> *$350.00*	Task Hours	Labor Costs	ODCs	Markup on ODCs	Total
Phase 1 - Data Collection, Review and Proj Coordination											
Kickoff Meeting and Data Compliation			4	16			20	$5,268			$5,268
Data Processing and Screening			2	16	16		34	$7,090			$7,090
Project Management			8	12			20	$5,556	$300		$5,856
Total			14	44	16	0	74	$17,914	$300	$0	$18,214
Phase 2 - Field Assessments and Condition Evaluation											
Field Well Site Visits	7			28	36	65	129	$35,266	$4,550		$39,816
Data Review and Recommendations			2	16	4		22	$5,242	$300		$5,542
Meetings/Presentations				16			16	$3,984			$3,984
Total			2	60	40	65	167	$44,492	$4,850	$0	$49,342
Phase 3 - Rehab Planning, Maint Strategy, and Program Mngt											
Rehab Recommendations and Projections			4	20	10		34	$7,804			$7,804
Standard Operating Procedures Prep			4	16	8		28	$6,500			$6,500
Total			8	36	18	0	62	$14,304	$0	$0	$14,304
Phase 4 - Final Program Prep and Deliverables											
Prepare Draft Report and Deliverables			12	60	40		112	$24,952			$24,952
Prepare Final Report and Deliverables			8	32	16		56	$13,000			$13,000
Total			20	92	56	0	168	$37,952	$0	$0	$37,952
GRAND TOTAL			44	232	130	65	471	$114,662	$5,150	$0	$119,812
								GRAND TOTAL INCLUDING TAXES:			$119,812

GEOSCIENCE

PROPOSAL / MARCH 13, 2026

DEVELOPMENT OF THE WELL REHABILITATION & MAINTENANCE PROGRAM

SUBMITTED TO:

SWEETWATER AUTHORITY

160 Via Verde, Suite 150, San Dimas, CA 91773 | **main office**
909.451.6650 | **phone**
gssiwater.com

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GEOSCIENCE

The First Name in Groundwater

March 13, 2026

Ms. Xochitl Aranda, PE
Director of Engineering & Operations
Sweetwater Authority
505 Garrett Ave.
Chula Vista, CA 91910

RE: Proposal for the Development of a Well Rehabilitation & Maintenance Program for Sweetwater Authority

Dear Ms. Aranda,

Geoscience Support Services, Inc. (Geoscience) is pleased to submit this proposal to Sweetwater Authority for professional hydrogeologic services related to the development of a Well Rehabilitation and Maintenance Program. We understand that the Authority seeks a practical, data-driven program for thirteen groundwater wells, including ten brackish wells that supply the Richard A. Reynolds Desalination Facility and three fresh groundwater wells in National City that pump directly to the distribution system. Our team recognizes that these wells are critical assets within a system that must remain reliable, efficient, and compliant as facilities age and operational demands evolve.

Our approach builds on the same disciplined methodology that Geoscience recently applied for the City of Santa Monica's Well Rehabilitation and Replacement Priority Ranking, where we compiled construction, operational, groundwater level, water quality, aquifer test, rehabilitation, and downhole video data for fourteen (14) municipal wells and translated those data into a prioritized program, recommended operational protocol, and knowledge-transfer workshop. For Sweetwater Authority, we will adapt that proven framework to a maintenance-focused program for thirteen (13) wells - 10 brackish wells supporting the Reynolds Desalination Facility and three (3) fresh wells serving the distribution system - so the final deliverable is both technically defensible and directly usable by operations staff.

The proposed scope is intentionally aligned to the Authority's four-task framework and goes beyond a generic condition assessment. We will create a well-by-well data inventory and gap register; review historical performance trends such as production, drawdown, water levels, water quality, and specific capacity; conduct field assessments of wells and supporting equipment; and apply an Authority-specific prioritization matrix that considers condition, system criticality, rehabilitation feasibility, remaining useful life, and cost. The output will be a clear action tier for each well together with preventive maintenance schedules, inspection procedures, SOPs, trigger criteria for additional diagnostics, and short- and long-term budget guidance.

Our experience includes the City of Santa Monica well priority ranking effort, the City of Pomona Groundwater Well Evaluation and Rehabilitation Program, and the City of Riverside well rehabilitation and groundwater monitoring program. Collectively, these assignments demonstrate our ability to move from data compilation through condition evaluation and prioritization to SOPs, knowledge transfer, and implementation support.

We have provided our firm details and contact information for Geoscience Support Services, Inc. in the table located on the following page. In addition, Geoscience takes no exceptions to the Authority's contract under the terms and conditions prescribed by this RFP and in the Sample Agreement. This proposal, and the Billing Rates and Cost proposal, are both valid for ninety (90) days from the date of submission.

GEOSCIENCE

The First Name in Groundwater

Geoscience Support Services, Inc.
Main Address: 160 Via Verde, Ste. 150, San Dimas, CA 91773
Mailing Address: P.O. Box 220, Claremont, CA 91711

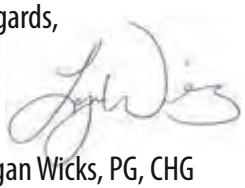
Authorized Contact: Logan Wicks, PG, CHG

Phone: (909) 286-2214 ***Fax:*** (909) 451-6638

Email: loganwicks@geoscience-water.com ***Website:*** www.gssiwater.com

We are committed to maintaining our partnership with Sweetwater Authority. The experience acquired during our history of working with you and other California water districts and agencies allows us to provide the technical capabilities that the Authority requires to develop a comprehensive rehabilitation and maintenance program for your well facilities. If you have any questions regarding our qualifications or need any additional information, please contact me at (909) 286-2214 or via email at loganwicks@geoscience-water.com.

Regards,



Logan Wicks, PG, CHG
Sr. Geohydrologist and Project Manager

WELL REHABILITATION & MAINTENANCE PROGRAM DEVELOPMENT
SWEETWATER AUTHORITY

IDENTIFICATION OF RESPONDER
ABOUT GEOSCIENCE

Founded in 1978 by Dr. Dennis Williams, Geoscience Support Services, Inc. (Geoscience) was one of the first hydrogeology firms in California established to provide consulting services to the groundwater industry. We are a leading groundwater consulting firm, working with water utilities, government agencies, and private industry to overcome the most complex challenges in developing, managing, and preserving groundwater resources. Our firm is a trusted advisor to industry professionals and stakeholders—delivering solutions to groundwater supply, development, management, and protection challenges that meet the changing needs of our clients.

For more than four decades, Geoscience has been serving the water districts and municipalities of Southern California, performing work in nearly every basin, and completing more than 3,000 groundwater projects. Geoscience is one of the first, and today is one of the largest, groundwater-focused consultancies in the state. We are world renowned for well expertise, having helped to develop the national standards for well design and completed work on more than 1,050 wells in Southern California and worldwide.

GEOSCIENCE *by the Numbers*

Legal Name: Geoscience Support Services, Inc.

Company Headquarters:
160 Via Verde, Suite 150 , San Dimas, CA 91773
P: 909.451.6650 E: email@geoscience-water.com

Mailing Address:
PO Box 220, Claremont, CA 91711

Contact:
Logan Wicks, PG, CHG
P: 909.286.2214
E: loganwicks@geoscience-water.com

Type of Business Organization: Corporation (CA)
Number of years in business: 48
Number of staff: 25

Practice Disciplines:
- Hydrogeological/Basin Studies
- Groundwater/Surface Water Modeling
- Well Siting & Design
- Well Construction Management & Inspection
- Hydrogeological Litigation Support

Well rehabilitation, design, development, and supervision of construction are part of our day-to-day business at Geoscience. Our expertise comes from practical, hands-on experience designing and rehabbing hundreds of municipal, high capacity water wells. We also design and supervise well construction for municipal and private clients and are often called upon to help increase water production efficiency, and troubleshoot and test existing wells for water quality and other issues. In addition, we assist agencies in assessing and managing well infrastructure to prolong well life, minimize long term expenses, and improve water supply reliability. Geoscience handles all phases of well projects—from evaluating geohydrologic data and developing and calibrating groundwater flow models for well siting, to borehole drilling and design and construction supervision of new wells. Our well design and rehabilitation methods, quality of construction supervision, and experience have led to our wells being known for their high efficiency, low sand production, and long lifetime with minimal maintenance—helping clients meet their goals of installing wells that produce the most water with the lowest lifecycle costs.

FINANCIAL RELATIONSHIPS DISCLOSURE

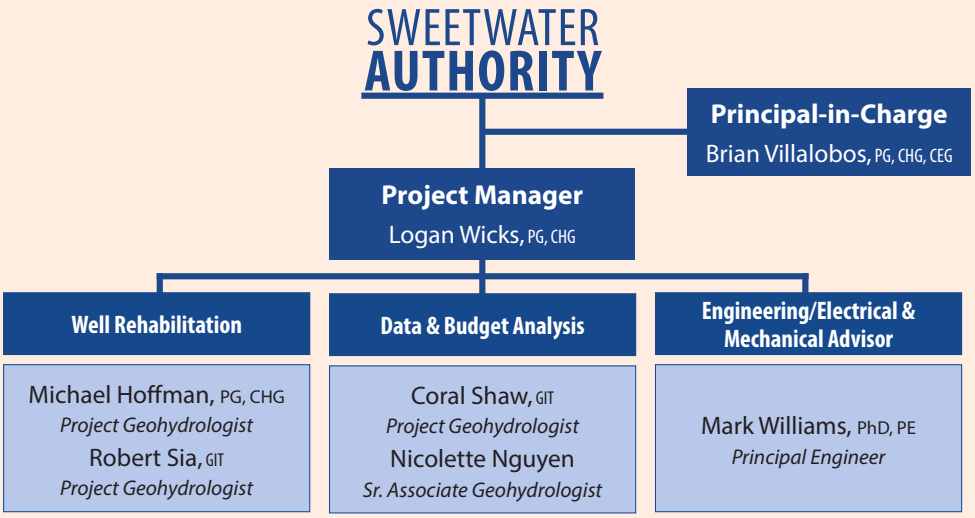
Geoscience has no current, existing, or any past financial relationships, nor personal relationships with any current members of Sweetwater Authority's Governing Board, staff, and entities for which said members are employed or have an interest, both past and present. However, Geoscience has performed well siting services for the Authority in the past five years and is currently .

CONSULTANT'S ORGANIZATION & KEY PERSONNEL

Since the late 1970s, Geoscience has focused solely on groundwater wells and consulting, resulting in a team with extensive experience in well development and inspection. Geoscience proposes a compact, senior-led team built around hydrogeology, well rehabilitation, data analysis, and practical utility implementation. Our Project Manager will serve as the Authority's single

point of contact and will lead the scope of work, schedule, quality oversight, technical review, and coordination with Authority staff. Supporting personnel will provide field assessment, performance trend analysis, development of maintenance tools, and preparation of the final program documents. Our assigned team has more than 125 years of combined experience in well rehabilitation and condition assessments, engineering and water quality, as well as well siting, design, development, and construction.

Figure 1: Proposed Team Organization Chart



PROJECT MANAGER & ASSIGNED STAFF

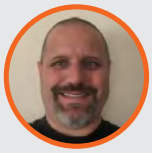
Logan Wicks, PG, CHG will serve as our assigned project manager. He has assisted in or completed more than 200 well projects and has recently managed several well rehabilitation and replacement projects, including the development of a well rehabilitation and replacement priority ranking program for the City of Santa Monica. Logan will be supported by a technical advisor, Brian Villalobos, PG, CHG, who has extensive hydrogeological and geological engineering experience. Brian is available to provide backup support to Logan if needed, QA/QC review, and can be available to address any soil stability or development issues if they occur. The organization chart in Figure 1 above, lists our assigned staff and their role on this contract, as well as the lines of communication. We have also included short biographies below and focused resumes for our team members in an appendix to this proposal. In addition, personnel assigned to this project will not be changed for the duration of the project without the advance written approval of Sweetwater Authority. All of our team members for this project are located in our main office in San Dimas, CA.

Team Member Biographies

	Team Member & Role	Specific Expertise
	Logan Wicks, PG, CHG Sr. Geohydrologist / Project Manager Main Point of Contact for the Authority	• More than 18 years of experience on more than 30 municipal direct/alternative supply wells and 30 well rehabilitations and condition assessments • Completed more than 75 well field assessments and groundwater studies • Experience includes geohydrologic investigations, groundwater quality studies, artificial recharge, water well test drilling programs, and the management and supervision of water well projects including: siting, design, aquifer pumping test analyses, and well construction

WELL REHABILITATION & MAINTENANCE PROGRAM DEVELOPMENT

SWEETWATER AUTHORITY

	Team Member & Role	Specific Expertise
	Brian Villalobos, PG, CHG, CEG Principal Geohydrologist / Technical Advisor and QA/QC Review	• More than 35 years of groundwater resource studies and reports • Specific expertise in hydrogeologic investigations to support groundwater basin characterization, indirect potable reuse, and groundwater recharge • Has led efforts to develop studies and reports including monitoring well networks, sustainable yield, and water budgets
	Mark Williams, PhD, PE Principal Engineer/ Engineering / Electrical & Mechanical Advisor	• More than 30 years of engineering and groundwater experience, focused on municipal water quality • Oversees the QA/QC procedures and practices for Geoscience projects • Has participated in numerous studies focusing on water quality investigations and worked on a range of water quality projects including studies on nitrates, NDMA, perchlorate, and bromate in municipal water supplies.
	**Michael Hoffman, PG, CHG** Project Geohydrologist / Well Rehabilitation Lead	• More than 27 years of experience in well rehabilitation, production and monitoring well design, installation and testing • Experienced with cost benefit analysis of rehabilitation methods and fluid disposal options, well condition assessments and well performance, and implementation of well rehabilitation procedures and activities • Involved in the drilling of more than 65 production, injection, and extraction wells
	Robert Sia, GIT Project Geohydrologist, Well Rehabilitation and Data & Budget Analysis	• 14 years of experience focused on groundwater recharge and banking, construction management, environmental site investigations and characterization, and regulatory compliance. • Has been responsible for the completion of technical plans, specifications, and cost estimation of the rehabilitation of multiple wells, as well as mechanical and chemical rehabilitation, redevelopment, and aquifer testing • Experienced with managing from the field all aspects of well rehabilitation including mechanical and chemical rehabilitation, as well as exploratory drilling and well construction including development, pump testing, disinfection, water quality sampling
	Coral Shaw, GIT Project Geohydrologist / Data & Budget Analysis	• More than a decade of experience performing well construction inspection for tasks such as pilot borehole drilling and reaming, casing inspection and installation, air lifting and swabbing, development by pumping, and down-hole video logging • Has also performed various pumping test analyses, including large scale pumping tests and water quality sample collection, as well as final well designs based on data collected during the drilling process • Performed well condition assessments and evaluations for well rehabilitation
	Nicolette Nguyen Associate Geohydrologist / Data & Budget Analysis	• Performs well siting studies and has contributed to the development of Geoscience's proprietary Site Suitability Analysis Tool • Provides permitting assistance, collecting and analyzing data, developing technical reports and maps, and providing field services for well condition assessments • Has experience with field supervision during well design and construction, water quality sampling and analyses, and completion of DWSAP assessments

REQUIRED QUALIFICATIONS & EXPERIENCE

For more than 47 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 groundwater production wells. During this time, we have completed more than **2,000** groundwater studies and more than **1,050** well design projects.

Geoscience's expertise comes from daily, real-world experience designing, constructing, and rehabilitating numerous municipal water supply wells. Our quality methods of well design, detailed construction supervision, and experience in the development of hundreds of supply wells have led to Geoscience being known for highly efficient, long-lasting wells with minimal maintenance—meeting our clients' goals of installing wells that produce the most water with the lowest lifecycle costs.

Our team members are also often called upon to troubleshoot and test existing wells for pump and water quality issues, as well as look into increasing efficiencies in water production. We work closely with the professionals at our public and private clients to make sure their objectives are met, and our staff are well-versed in project management and stakeholder communications.

Our team helps agencies assess and manage well infrastructure to prolong well life, minimize long term expenses, and improve water supply reliability. Geoscience offers several services for water supply wells including well siting and specification, well operation modeling and scenario development, well design (monitoring, injection, extraction, production, etc.), well rehabilitation, construction observation, well development, inland and ocean desalination subsurface intakes, and slant wells.

Throughout our firm's existence, our dedicated focus on groundwater wells and consulting has resulted in an expert team with a vast knowledge and experience in well design, development and inspection. We also specialize in groundwater modeling and studies, well and wellfield condition assessments, and well rehabilitation. On the following pages, we have provided a list of past and ongoing projects where Geoscience has provided services similar to those requested in the Authority's RFP. In addition, for each of these projects we have listed the beginning and end dates, our client references, and brief descriptions.

OUR EXPERIENCE *by the Numbers*

MORE THAN **3,000**

Hydrogeology projects completed

proven consulting expertise in well design and rehabilitation, groundwater modeling, and hydrogeologic studies

5

Rehabilitation and/or priority evaluations

provided for specific well systems within the last 10 years

MORE THAN **500**

Well developed and/or rehabilitated

by Geoscience, providing detailed knowledge and new perspectives to meet the challenges your well system faces

55

Wells assessed & rehabilitation recommendations developed

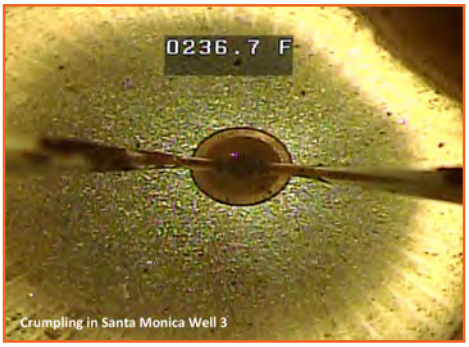
for on a single project, demonstrating a proven ability to complete large, multi-well rehabilitation projects while minimizing project delays and cost overruns

SIMILAR QUALIFYING EXPERIENCE

Well Rehabilitation and Replacement Priority Evaluation

Santa Monica, California

In the interest of maintaining groundwater as a reliable source for potable use, the City of Santa Monica (City) wanted to evaluate the condition of its current wells and develop a plan to maintain or increase groundwater supply through a program of regular well maintenance and replacement. As part of the development of this program and to optimize the sequence of work performed, Geoscience evaluated the current condition of the wells and provided recommendations for their systematic rehabilitation or replacement. The evaluation assessed 14 groundwater extraction wells using a fifteenth (15th) destroyed well to test and calibrate the scoring and ranking matrix, which incorporated a number of different factors. This matrix is designed to identify wells that are most in need of immediate attention, while also providing a framework for future well maintenance and replacement planning. Geoscience developed well-specific recommendations for rehabilitation for five (5) wells based on the available data, the results of the scoring and ranking matrix, and City plans.



Crumpling in SM Well No. 3

Bacterial Growth in SM Well No. 1

Project Relevance:	Project Dates:	Client Reference:
• Well condition assessment • Well rehabilitation priority evaluation • Well rehabilitation plan • Well operations and maintenance plan	*Start: July 2024* *Complete:* Dec. 2024	City of Santa Monica, Chris Aguillon, PE, CIP Project Manager P: (310) 458-8235; E: chris.aguillon@santamonica.gov

Four Well Condition Assessment & Rehabilitation Plan

Anaheim, California

Anaheim Public Utilities selected PACE to evaluate four existing water wells and identify rehabilitation options as part of the City's plans to improve their groundwater treatment program in response to the discovery of per- and polyfluoroalkyl substances (PFAS) in local groundwater. The four wells evaluated were between 20 and 45 years old, and it was suspected that the casings may have begun to deteriorate. As a subconsultant to PACE, Geoscience conducted a well condition assessment for APUC Well Nos. 39, 47, 48, and 53 to evaluate their current operational status and recommend necessary rehabilitation measures. The assessment revealed significant declines in well efficiency, with all wells experiencing at least a 50% reduction in specific capacity due to screen plugging, mineral deposits, and biofouling. Well No. 47 showed the most severe efficiency loss at 70%, suggesting advanced well plugging. Preliminary downhole video surveys identified moderate bacteriological activity and scale deposits on the well screens and casing, though no major structural failures were observed. However, Well No. 39 could not be fully inspected due to access tube obstructions. Additionally, PFAS contamination was confirmed in all wells, necessitating future treatment

Anaheim Well No. 48

considerations. Water level data suggested stable static levels, but pumping levels have shown increasing drawdown, further indicating declining well performance.

Based on these findings, PACE and Geoscience recommended a comprehensive rehabilitation program for all wells, including mechanical brushing, chemical treatment, and redevelopment to restore hydraulic efficiency, as well as phased approach with multiple video inspections throughout the rehabilitation process to ensure the effectiveness of the treatments. Post-rehabilitation aquifer testing was also advised to assess recovery efficiency, and a long-term maintenance and monitoring program was recommended to be implemented to track well conditions and optimize future rehabilitation schedules. Geoscience prepared bid documents and technical specifications for rehabilitation efforts for the four wells and will oversee rehabilitation and redevelopment efforts in the field.

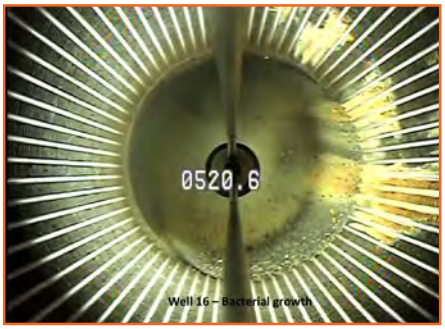
Project Relevance:	Project Dates:	Client Reference:
• Well condition assessment • Well rehabilitation priority evaluation • Well rehabilitation plan • Technical Specifications/Bid Documents	*Start:* Jan. 2025 *Complete:* Ongoing	Anaheim Public Utilities Divya Agrawalla, Project Manager P: (714) 765-4964, E: dagrawalla@anaheim.net

City of Pomona, Groundwater Well Evaluation & Rehabilitation Program

Pomona, California

Bacterial Growth in Well No. 26

Geoscience assisted the City of Pomona in maximizing groundwater supply reliability by preparing a Groundwater Well Evaluation and Rehabilitation Program. Geoscience provided services that included evaluating the City's wells, identifying those needing attention, providing recommendations to improve capacity and/or return wells to service, preparing standard specifications and detailed protocols for well diagnostic, cleaning, rehabilitation, redevelopment, and testing methodologies, developing a priority list for well rehabilitation, providing long-term well replacement strategy recommendations to support fiscal planning, overseeing rehabilitation efforts, and evaluating post-rehabilitation data with follow-up recommendations. Using the evaluation and priority list, Geoscience also prepared rehabilitation plans for three (3) of the City's wells.



Bacterial Growth in Well No. 16

Project Relevance:	Project Dates:	Client Reference:
• Well condition assessment • Well rehabilitation priority evaluation • Well rehabilitation plan • Technical Specifications/Bid Documents	*Start:* 2015 *Complete:* 2017	City of Pomona Chris Diggs, Water Resources Director P: (909) 802-7412; E: chris.diggs@pomonaca.gov

City of Riverside, Public Utilities Division, Well Rehabilitation & Groundwater Monitoring Program

Riverside, California

Geoscience evaluated and ranked an aging system of 55 active production wells according to their need for rehabilitation or replacement. The work included recommendations for rehabilitation steps to improve capacity and/or return wells to

WELL REHABILITATION & MAINTENANCE PROGRAM DEVELOPMENT

SWEETWATER AUTHORITY

Encrustation in a Riverside Well

service, development of standard specifications for recommended diagnostic, cleaning, rehabilitation, redevelopment, and testing methodologies, review of historical well data and the City's draft Energy Management Plan, development of a well rehabilitation and replacement priority list, conduct of knowledge transfer workshops, and preparation of draft and final technical memorandums. Following completion of the rankings and specifications, Geoscience supported rehabilitation of four wells and provided field inspection and training to City personnel. On one well, the team diagnosed a collapsed casing in a 1927 cable tool well, developed ranked repair options, and supported repair, redevelopment, and testing.

Bacterial Growth in Gage Well 92-1

Project Relevance:	Project Dates:	Client Reference:
• Well condition assessment • Well rehabilitation priority evaluation • Well rehabilitation plan • Technical Specifications/Bid Documents • Knowledge transfer workshops	*Start:* 2013 *Complete:* 2015	City of Riverside, Public Utilities Division David Garcia, Utilities General Manager P: (951) 782-0330; E: dagarcia@riversideca.gov

UNIVERSITY WELL CONDITION ASSESSMENT & REHABILITATION

Camarillo, California

Due to a continuing decline in pumping water level, Camrosa Water District (District) contracted Geoscience to assess the condition of University Well, develop a rehabilitation work plan, and provide field services during the testing and rehabilitation of the well. Geoscience reviewed original completion reports for the well, previous studies of the well and aquifer, water quality data from state databases and operational data, as well as conducted a step drawdown pumping test to determine the current efficiency of the well. In early 2023, the well pump failed, and the pump was removed for inspection and a video survey was performed. The initial inspection found the well shaft separated below the first pump impeller. Geoscience reviewed the pump removal photos and video survey, and developed a rehabilitation program. A vigorous mechanical brushing procedure was implemented (brushing and bailing) and after, a chemical cleaning procedure was performed. Following these procedures, initial development by swabbing and airlifting was performed, and final development consisted of pumping the well at gradually increasing discharge rates until the sand concentration reached a minimum threshold. The well was then "surged" repeatedly until turbidity and sand concentration measurements approached a minimum and remained stable.

Brushing & Bailing Procedure

Project Similarities:	Project Dates:	Client Reference:
• Well condition assessment • Well rehabilitation work plan • Well rehabilitation and testing observation/ inspection	*Start:* Nov. 2022 *Complete:* Aug. 2023	Camrosa Water District Terry Curson, PE, District Engineer P: (805) 482-8063; E: terryc@camrosa.com

APPROACH TO COMPLETE TASKS IDENTIFIED IN THE SCOPE OF SERVICES

PROJECT UNDERSTANDING

Sweetwater Authority (Authority) produces groundwater from the Coastal Plain of the San Diego Groundwater Basin, including brackish water treated at the Richard A. Reynolds Desalination Facility and fresh water from the National City Wells, using thirteen (13) wells supported by the required treatment systems and conveyance infrastructure. The Authority is seeking professional engineering and consulting firms with specialized expertise in hydrogeology and well rehabilitation, particularly in well condition assessment, operational performance evaluation, rehabilitation methods, and maintenance planning, to develop a Well Rehabilitation and Maintenance Program for the Authority's groundwater production wells. The primary objective of this Well Rehabilitation and Maintenance Program is to develop preventive well maintenance procedures, inspection schedules, and standardized documentation tools that will enhance long-term reliability. With some of these wells operating for more than 70 years, a structured rehabilitation and maintenance program is essential to maintain reliable production, extend equipment life, minimize emergency repairs, and ensure continued compliance with regulatory water quality standards.

SWEETWATER AUTHORITY'S

KEY PROJECT OBJECTIVES

1. Evaluate the current condition and operational performance of the Authority's wells.
2. Identify maintenance needs, rehabilitation priorities and operational deficiencies that could affect long-term reliability.
3. Develop preventative maintenance procedures, inspection schedules, and standardized documentation tools.
4. Provide clear recommendations and cost-planning guidance tailored to the Authority's operational needs.

PROJECT APPROACH

Geoscience will apply a maintenance-focused wellfield asset-management approach tailored to the Authority's operating context. Because the Authority's system includes both brackish wells that feed treatment and fresh wells that pump directly to distribution, our evaluation will consider not only physical condition and performance trends but also each well's operational role, outage consequence, rehabilitation potential, remaining useful life, and budget timing. The objective is to provide the Authority a repeatable decision framework - not merely a one-time report - that supports maintenance prioritization, rehabilitation planning, and capital budgeting.

Program Development Framework

The program framework (Figure 2 on the following page) adapts the logic of our recent municipal well ranking work into a Authority-specific program tool. Each well will be evaluated using available design/construction data, field condition indicators, operating trends, system criticality, and rehabilitation feasibility. The resulting matrix will assign an action category (routine maintenance, targeted rehabilitation, equipment upgrade, additional diagnostics, or replacement planning) and will include straightforward instructions for refreshing the ranking as new data become available.

Figure 2: Authority Well Rehabilitation & Maintenance Decision Framework

Step 1: Build the working dataset	Step 2: Evaluate each well through five lenses	Step 3: Convert findings into a usable program
• Well construction, equipping, and repair history • Historical pumping, water levels, drawdown, and specific capacity • Water quality, maintenance, rehabilitation, and video records • Operations staff interviews and known issues • Sweetwater context: 10 brackish wells, 3 fresh water wells	• Construction and remaining-life indicators • Physical condition: fouling, corrosion, debris/fill, casing/ screen concerns • Operating trends: production, water levels, divergence, sand, efficiency • System criticality: desalination plant support, distribution impacts, redundancy • Rehab feasibility: likely	• Assign a clear action tier for each well • Develop preventive maintenance schedules and inspection procedures • Prepare SOP topics, checklists, logs, and well summary sheets • Define triggers for optional diagnostics or follow-on rehabilitation • Prepare 1-3 year and 5-10 year budget guidance

Illustrative action categories reflected in the final Sweetwater program

Routine maintenance | **Targeted rehabilitation** | **Equipment upgrade** | **Additional diagnostics** | **Replacement planning**

Matrix logic will be calibrated to Sweetwater operations and refreshed as new data becomes available.

Table 1: Well Rehabilitation Framework Decision Matrix

Category	Representative Factors	How Information is Used
Well construction and baseline risk	Age, casing and screen material, slot size, design depth, repair history, remaining service life	Identifies inherent vulnerabilities, likely failure modes, and realistic rehabilitation intervals or remaining-life expectations
Physical condition and site observations	Wellhead/appurtenances, fouling or biofilm indicators, corrosion, debris/fill, casing or screen concerns, access and safety, pump/motor/electrical condition	Supports well-by-well condition narratives, immediate maintenance flags, safety issues, and site-specific operational considerations
Operational monitoring and performance trends	Production, drawdown, static and pumping levels, divergence trends, specific capacity, sand production, water quality, duty cycle, efficiency indicators	Distinguishes decline caused by clogging, structural issues, equipment condition, aquifer limitations, or operating practices
System criticality	Role in desal plant support or direct distribution supply, redundancy, outage consequences, seasonal demand needs, treatment implications	Prioritizes rehabilitation timing and contingency planning based on operational impact to the Authority
Rehabilitation feasibility, cost, and action	Probability of favorable rehabilitation, likely method intensity, equipment upgrades, replacement horizon, planning-level cost	Drives action tiers, trigger criteria for additional diagnostics, and 1-3 year / 5-10 year budget planning

SCOPE OF WORK

Task 1: Data Collection, Review, & Project Coordination

At project initiation, Geoscience will conduct a kickoff meeting with Authority staff to confirm objectives, communication protocols, schedule expectations, available records, preferred data and deliverable formats, and decision milestones. Consistent with our work on similar well rehabilitation programs, kickoff objectives will include clarifying key issues for the project, confirming the structure of existing electronic data, refining assumptions as needed, and establishing how technical memorandums, templates, and editable deliverables should be organized for Authority staff use.

Following kickoff, Geoscience will issue a focused data request and compile available well construction logs, drilling and completion records, development and testing records, pump design and performance information, historical pumping data, groundwater level records, specific capacity and drawdown trends, water quality results, maintenance and rehabilitation history, repair history, downhole video or borehole logs where available, and electrical/mechanical information. We will also meet with staff familiar with day-to-day well operations to capture institutional knowledge, known problem wells, past maintenance practices, operational constraints, and observations that may not be evident from the written record alone.

The collected information will be organized into a working well database, a data inventory/gap register, and individual well summary sheets for each Authority well. As part of the historical review, Geoscience will prepare the trend plots and screening analyses needed to support defensible well-by-well evaluation, including hydrographs, production histories, and specific-capacity or drawdown plots where data allow. Early in the review, Geoscience will identify data discrepancies, gaps, and assumptions that materially affect the program and will distinguish between information needed for the base maintenance program and information that may justify optional follow-up testing. Throughout Task 1, the Project Manager will maintain day-to-day coordination with the Authority, track schedule and budget status, implement internal QA/QC, and coordinate progress meetings at key milestones. Concise meeting notes and action items will be prepared after kickoff and milestone review meetings.

Task 2: Field Assessments & Condition Evaluation

Task 2 will combine field assessments with review of each well's historical design and operating record so current conditions can be interpreted in context. Geoscience will review available video surveys, drilling and completion logs, geophysical or borehole log information where available, well design details, development and testing records, pump design and efficiency information, past modifications or repairs, rehabilitation history, water level data, water quality trends, and any available pump or aquifer test results. Field visits to each Authority well site will then be conducted with Authority staff, to the extent feasible, to document existing conditions and understand the operating context of each well.

Condition evaluation will consider, as applicable based on available records, well age and construction materials, remaining service life, fouling or bacteriological growth indicators, debris or fill, casing or screen condition, site access and safety, pump/motor/electrical condition, water levels relative to screen or pump setting, divergence between static and pumping water level trends, specific capacity decline, sand production, operational duty, and other signs of deterioration or inefficiency. Field observations will include review of wellheads, pumps, motors, electrical equipment, appurtenances, site access, safety considerations, and surrounding infrastructure, together with available operational indicators and historical performance data. For each well, Geoscience will prepare a concise condition narrative and scorecard summarizing observed conditions, likely issues, performance history, and preliminary maintenance or rehabilitation needs.

Task 3: Rehabilitation Planning, Maintenance Strategy, & Program Development

Using the results of the data review and field assessments, Geoscience will develop well-by-well rehabilitation recommendations and a prioritized action framework. The prioritization will consider condition, system criticality, anticipated benefit, probability of favorable rehabilitation, likely rehabilitation approach, estimated remaining useful life, relative cost, and whether rehabilitation, major equipment replacement, or eventual well replacement appears most cost-effective over the planning horizon. In addition to ranking rehabilitation needs, we will identify maintenance actions that should occur on a preventive basis so the Authority can shift from reactive response toward a more structured program.

The maintenance program will include preventive maintenance schedules, inspection procedures, and standardized tools that support consistent implementation across the well system. These tools will include inspection checklists, maintenance logs, template well summary sheets, and draft standard operating procedures for recurring activities such as groundwater level monitoring, production and specific-capacity tracking, water quality review, maintenance documentation, rehabilitation trigger evaluation, pre- and post-rehabilitation documentation, and periodic pump/motor or wire-to-water efficiency review as appropriate.

Where warranted, the program will also identify operational recommendations such as cyclic pumping, minimizing extended idle periods, refinement of inspection or monitoring triggers, recommended intervals for video inspection when pumps are pulled, periodic step-drawdown or performance testing, sand monitoring where applicable, or targeted equipment adjustments that may help preserve production and reliability. When beneficial, we will recommend additional investigation such as updated downhole video under pumping or static conditions, spinner or flow-meter surveys, casing thickness evaluation, step-drawdown or constant-rate testing, focused water quality sampling, or sidewall scale evaluation; however, those items would be treated as follow-up recommendations or optional services unless specifically authorized by the Authority. Planning-level cost estimates will be developed for rehabilitation tasks together with short-term (1-3 year) and long-term (5-10 year) budget projections so the final program functions as both a maintenance manual and a capital planning tool.

A draft review meeting will be held with Authority staff to present preliminary findings, confirm priorities, and refine the program structure before finalization. This workshop-style review is intended to support knowledge transfer, obtain operational feedback, and ensure that the final program is grounded in how Authority actually operates and maintains its wells.

Figure 3: Rehabilitation Priority Ranking Example

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
	Condition Ranking Score															Rehabilitation Assessment Score					Other Rehabilitation Factors			Final Scores & Ranks			
	Construction Details						Physical Inspection			Operational Monitoring																	
Detailed Well Information Table Column / Scoring Criteria	Age	Steel Type	Screen Type	Screen Slot Size	Remaining Well Life	Potential for Underdevelopment	Bacteriological Growth	Casing Condition	Debris and Fill	Water Levels Below Well Screen	Divergence of Static and Pumping Water Level Trends	Specific Capacity Trend	Sand Production	Current Operational Status and Duty Factor	Preliminary Condition Score	Production Volume (1986-2023) (Higher = More Production)	Treatment Level (Higher = Less Expensive)	Rehabilitation Cost (Higher = Less Expensive)	Significance of Groundwater Remediation	Rehabilitation Assessment Score	Probability of Favorable Rehab (Higher = More Successful)	Preliminary Ranking Score	Preliminary Relevance to System (1 - 3, 1 least relevant, 3 most)	Comprehensive Ranking Score	Comprehensive Ranking	Final Ranking Without Destroyed Wells and Wells Less Than 3 Years Old	Final Ranking Excluding Wells to be Rehabed or Replaced
Importance (Weighting Factor)	3	3	2	2	3	1	1	3	1	2	3	1	3	2		3	1	3	3		3						
[1] Arcadia Well 4	3	1	3	3	3	1	3	3	3	2	0	3	3	3	71	1	2	1	1	11	2	4,686	1	4,686	8		
[2] Arcadia Well 5	2	3	3	3	3	3	3	3	2	3	0	3	3	2	75	1	2	1	1	11	2	4,950	1	4,950	6		
[3] Santa Monica Well 1	3	1	1	0	3	1	1	1	3	3	1	3	3	1	54	1	3	1	1	12	1	1,944	2	3,888	12		
[4] Charnock Well 13	2	3	1	3	3	3	2	3	3	3	1	3	3	2	74	3	1	0	3	19	1	4,218	1	4,218	9		
[5] Charnock Well 16	2	0	0	0	0	2	3	3	3	3	2	3	1	1	43	3	2	2	3	26	2	6,708	1	6,708	3		
[6] Charnock Well 18	2	3	1	2	3	2	3	3	3	2	3	3	3	1	74	3	2	2	3	26	2	11,544	1	11,544	1		
[7] Charnock Well 19	2	0	0	0	0	2	1	0	2	3	2	3	3	1	37	2	1	1	3	19	2	4,218	1	4,218	9		
[8] Charnock Well 20	1	0	0	1	0	2	0	0	0	3	3	3	0	1	27	2	1	1	3	19	2	3,078	3	9,234	2		
[9] Charnock Well 21	0	0	0	1	0	2	1	0	0	0	1	1	0	1	11	3	1	3	3	28	2	1,848	3	5,544	5		
[10] Charnock Well 22	0	0	0	1	0	2	1	0	0	0	1	1	0	1	11	3	2	3	3	29	2	1,914	3	5,742	4		
[11] Santa Monica Well 3 - DESTROYED	3	3	1	3	3	2	3	3	3	3	3	3	3	2	83	2	1	0	3	16	1	3,984	0	0	15		
[12] Santa Monica Well 4	2	3	0	0	3	2	2	3	3	3	3	3	3	2	71	2	1	0	3	16	1	3,408	1	3,408	13		
[13] Santa Monica Well 8*	0	0	0	1	0	3	1	0	0	0	1	1	3	1	21	3	1	1	3	22	1	1,386	3	4,158	11		
[14] Santa Monica Well 9*	0	0	1	2	0	3	1	0	0	0	1	1	3	1	25	3	1	1	3	22	1	1,650	3	4,950	6		
[15] Airport Well	0	0	1	2	0	2	1	0	0	2	1	1	0	1	19	3	3	3	1	24	2	2,736	1	2,736	14		

Task 4: Final Program Preparation & Deliverables

Geoscience will compile the completed analyses, prioritization, maintenance strategy, and supporting tools into a draft Well Rehabilitation and Maintenance Program for Authority review. After receiving consolidated comments, we will revise the document and conduct a final presentation / knowledge transfer workshop summarizing basin-wide findings, recommended priorities, operational recommendations, budget implications, and next-step considerations.

The final package will be delivered in PDF and editable electronic formats and will include, at a minimum, an executive summary, basin-wide findings and evaluations, well-by-well rehabilitation plans, maintenance schedules and standard operating procedures, budget planning tools, and supporting data tables, figures, and templates. Where appropriate, editable components such as inspection forms, maintenance logs, prioritization tables, and budget tools will be provided in Word, Excel, and GIS-compatible formats consistent with the RFP.

If the Authority elects to carry the program into implementation, Geoscience can also support optional follow-on work to translate recommended methods into contractor-facing rehabilitation scopes or technical specifications. That follow-on support can address pre-rehabilitation diagnostics, selected mechanical and chemical cleaning methods, redevelopment and testing, post-rehabilitation documentation, bid support, and post-rehabilitation performance review; however, that level of implementation support is identified here as optional because the Authority RFP is focused on development of the rehabilitation and maintenance program itself.

Task 5: Digital Project Delivery (Optional)

Geoscience has developed the WellSmart platform — an AI-native groundwater intelligence system purpose-built for municipal well operations. WellSmart continuously monitors well and pump performance, compares current conditions against baseline, quantifies efficiency degradation, and identifies maintenance needs before they become emergencies. The platform operates independently — it collects the data it needs through its own field instrumentation and does not require integration with the Authority's existing SCADA or control systems.

At the core of WellSmart is a physics-based digital twin that models each well and pump as an integrated system. When production declines, the digital twin can distinguish the cause — whether a pump has worn and needs replacement, the well screen has fouled and rehabilitation will restore capacity, or aquifer water levels have dropped and no amount of capital investment in the well itself will meaningfully increase yield. This diagnostic capability directly informs how the Authority allocates capital improvement dollars, ensuring rehabilitation and equipment budgets are directed where they will produce measurable returns and not spent on wells where the underlying conditions have changed (see Figure 4 on the following page).

For the Sweetwater program, Geoscience will use WellSight — the project delivery interface within WellSmart — to compile the Authority's well records, performance analyses, and program deliverables in a digital format that remains updatable after the engagement is complete. This is how Geoscience will deliver new well construction projects and rehabilitation of existing wells. The Authority benefits directly through more defensible prioritization and deliverables designed to stay current. IF the Authority later elects to pursue ongoing instrumented monitoring , the platform provides a seamless path from program delivery into continuous performance tracking and capital planning.

By incorporating WellSmart™ into your wellfield operations, the Authority can benefit from enhanced system intelligence, reduced maintenance costs, and improved water resource sustainability. This SCADA-enhanced platform offers a future-proof solution for maximizing the performance, reliability, and efficiency of groundwater infrastructure.

Figure 4: Representative Digital Platform Output - fleet-wide well performance comparison showing condition relative to baseline, with automated severity classification and current well pump performance vs. the pump's proven potential

SCOPE COVERAGE & KEY DELIVERABLES

Deliverable	Purpose / Content
Kickoff meeting, data request, and communication plan	Confirms communication protocol, requested records, preferred deliverable formats, milestone dates, and coordination structure
Project controls, progress meetings, and meeting notes	Provides schedule and quality oversight, milestone coordination, and concise action-oriented meeting documentation
Data inventory, gap register, and historical review	Compiles and quality-checks construction, operations, maintenance, water quality, repair, and equipment information for each well and documents assumptions
Well summary sheets and trend analyses	Presents hydrographs, production histories, specific-capacity or drawdown trends, and key observations needed for defensible well-by-well evaluation
Field assessments, safety/access review, and condition narratives	Summarizes site observations, operational context, current issues, and preliminary needs for each well
Prioritization matrix, action categories, and rehabilitation recommendations	Ranks wells and recommended actions based on condition, system criticality, rehabilitation feasibility, benefit, and cost
Maintenance program tools and SOPs	Inspection checklists, maintenance logs, SOP outlines, well summary sheets, monitoring triggers, and pre/post-rehabilitation documentation tools
Budget planning and capital phasing	Planning-level rehabilitation cost estimates and short-term / long-term budget guidance by well or well group
Draft program, review workshop, and final presentation	Provides an integrated document plus knowledge-transfer workshop and final presentation for Authority staff

PROPOSED SCHEDULE

The table below provides a proposed schedule that can be revised and refined once the notice to proceed, record availability, and Authority review durations are confirmed. The final schedule will be calibrated to support delivery of the final program by the end of August 2026, as stated in the RFP.

Task / Milestone	Duration	Draft timing
Kickoff meeting, data request, communication plan, and project controls	2 weeks	Weeks 1-2
Historical review, staff interviews, and well data sheets	3-4 weeks	Weeks 2-6
Field assessments, well narratives, and operational observations	3-4 weeks	Weeks 5-8
Performance analysis, prioritization, maintenance tools, and budget framework	4-5 weeks	Weeks 8-13
Draft program and review workshop	2 weeks + review	Weeks 14-16
Final revisions, presentation / knowledge transfer	2-3 weeks	Weeks 17-19
Final submittal	-	No later than end of August 2026

PROJECT ASSUMPTIONS

The following assumptions are consistent with the Authority's RFP and with the level of effort reflected in similar program-development proposals.

- Authority staff will provide available well construction records, pumping and performance history, water quality data, maintenance and rehabilitation records, and available electrical/mechanical information in reasonably accessible electronic form where available.
- The base scope assumes one coordinated round of Authority comments on the draft program and associated revisions.
- The base scope is for program development, field assessment, planning-level analysis, progress meetings, knowledge-transfer review/presentation, and preparation of editable program tools. It does not include intrusive field testing, advanced borehole logging, design drawings/specifications for construction, permitting, bidding support, or construction observation unless specifically authorized.
- Recommendations for additional testing will be provided where beneficial, but such work would be treated as optional or contingency services unless otherwise directed by the Authority. Potential optional diagnostics may include downhole video (static or pumping), spinner/flow-meter or noise logging, casing thickness evaluation, step-drawdown or constant-rate pumping tests, focused water quality or sidewall sampling, and post-rehabilitation verification.
- If requested as follow-on work, Geoscience can also develop implementation-level rehabilitation scopes/specifications, assist with bidding, and provide field support during rehabilitation, repair, redevelopment, and post-rehabilitation testing.
- Schedule assumes timely data transfer, site access coordination, and consolidated review comments from the Authority.
- Geoscience's Schedule and Consultants Fee included with this bid are valid for a period of 12 months assuming the starting date shown in the baseline schedule.
- Geoscience will manage work hours between employee classifications or utilize other employee classifications provided that the total project fee is not exceeded without prior approval of the Owner. Geoscience will first request approval from the Owner before work hours are managed between Tasks as listed in the Consultants Fee Schedule.
- Reimbursable expenses for sub-consultants, sub-contractors, equipment and instrumentation purchase or rental, supplies, travel, and other reimbursable project expenses—excluding field staff per-diem costs--will be billed to client at cost + 10%.
- Services not Specifically Identified in the Scope of Work are not included in this Agreement for Professional Services.
- This proposal is valid for 90 days from submission. For projects extending into subsequent calendar years, the proposed budget assumes 2026 billing rates, based on Geoscience Support Services, Inc.'s standard annual rate escalations. All work will be invoiced per Geoscience's current billing rate tables for the year performed. For change orders or projects extending significantly past the original completion date, billing rates will reflect Geoscience's current rates for that year.
- All owner/stakeholder furnished data required for a given Task will be provided to Consultant within a timeframe agreed upon between Consultant and Client, or as shown in the project schedule. Owner-furnished data that is received after the agreed-upon Collection Time Frame, and that necessitates a revision of analyses, calculations, design, or written deliverable, may necessitate a contract amendment.
- Consultant assumes that data assembled and provided by the Client and/or Project Stakeholders is accurate, complete and can be used as it is. Verification of Owner furnished-data accuracy from primary source(s) is outside the scope of work.

EXCEPTIONS TO THE RFP

As stated in our introductory letter, Geoscience certifies that we take no exceptions to the Authority's Request for Proposal (RFP) for Development of the Well Rehabilitation and Maintenance Program including the Authority's Professional Services Agreement.

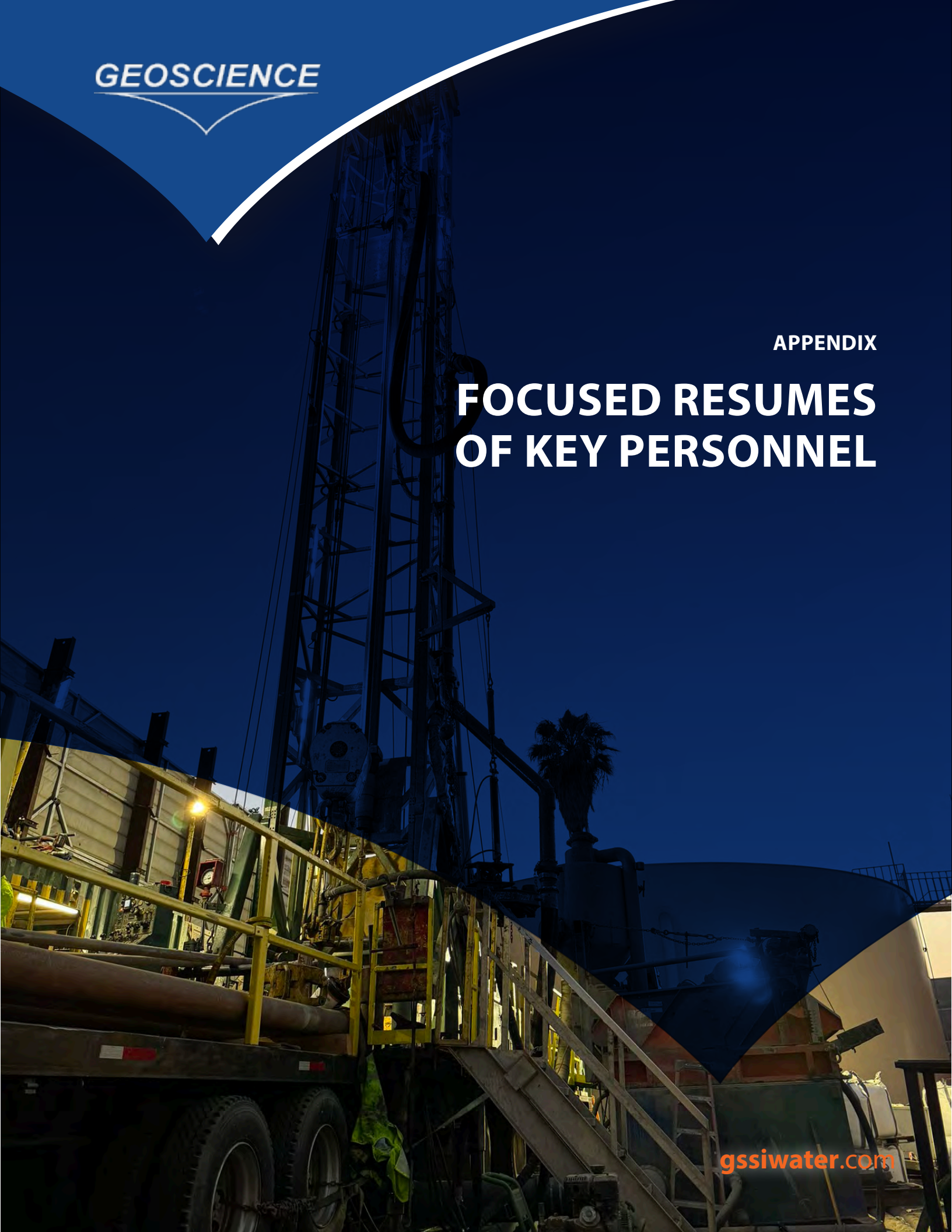
AMENDMENTS TO THE RFP

Geoscience has received no amendments for this RFP.

GEOSCIENCE

APPENDIX

FOCUSED RESUMES OF KEY PERSONNEL



gssiwater.com

Logan Wicks, PG, CHG

Senior Geohydrologist

Years of Experience: 18
Years with Geoscience: 10

Education and Professional Registrations/Certifications:

- BS, Geology, Cal Poly Pomona
- BS, Biology, Cal Poly Pomona
- MS Geology, Cal Poly Pomona
- California Professional Geologist (No. 9580)
- California Certified Hydrogeologist (No. 1131)

Logan has more than 18 years of professional experience on more than 30 municipal direct or alternative supply wells and has completed more than 75 well field assessments and groundwater studies. His experience includes many different types of projects, such as geohydrologic investigations, groundwater quality studies, artificial recharge projects, water well test drilling programs, sea water desalination programs, and the management and supervision of water well projects including: siting, design, aquifer pumping test analyses and well construction. He has managed numerous well projects including water supply wells, injection wells, and monitoring wells. He has performed various aquifer pump tests analyses and help developed water quality sampling protocols including specialized depth specific sampling and analysis. He is also part of a team developing new methodologies for collecting real time flow and water quality data for better and more accurate well design and quality control.

KEY QUALIFICATIONS...

- Nearly two decades of experience designing and constructing of all types of wells — high-capacity, monitoring, injection, recovery wells, etc.
- Experience and familiarity with groundwater production and monitoring well installation— helping to maximize well production and efficiency
- Proficient in interpreting well pump tests and well productions analyses, and troubleshooting drilling issues

Summary of Experience:

City of Santa Monica: Well Rehabilitation and Replacement Priority Evaluation

Logan led a team to evaluate the current condition of wells and provide recommendations for their systematic rehabilitation or replacement for the City of Santa Monica. The evaluation assessed 14 groundwater extraction wells using a fifteenth destroyed well to test and calibrate the scoring and ranking matrix designed to identify wells that are most in need of immediate attention, while also providing a framework for future well maintenance and replacement planning. Logan's team developed well-specific recommendations for rehabilitation for five wells based on the available data, the results of the scoring and ranking matrix, and City plans.

City of Anaheim Public Utilities: Four Well Condition Assessment & Rehabilitation

Logan is supervising a team responsible for conducting a well condition assessment for APUC Well Nos. 39, 47, 48, and 53 to evaluate their current operational status and recommend necessary rehabilitation measures. Based on the findings, a comprehensive rehabilitation program was recommended for all wells, with multiple video inspections and post-rehabilitation aquifer testing, and a long-term maintenance and monitoring program. The team is currently preparing bid documents and technical specifications for rehabilitation and redevelopment efforts for the four wells.

Camrosa Water District: University Well Rehabilitation

Logan managed a team to assess the condition of University Well, develop a rehabilitation work plan, and provide field services during the testing and rehabilitation of the well. The team provided

datat review, conducted a step drawdown pumping test, and performed a video survey after a pump failure and developed a rehabilitation program, which consisted of both a mechanical and chemical component.

City of Whittier: Well No 8 Rehabilitation and Relining

Logan is managing a team that provided hydrogeologic services, performed/supervised well rehabilitation efforts, and is currently supervising the installation of a casing liner and the equipping of the submersible pump. Logan and his team provided updates and revisions to the technical specifications, field supervision of the contractor's activities, and permitting support that included preparation of updated final DWSAP documents.

Sweetwater Authority: Well Siting Study

Logan was the Sr. Geohydrologist for a comprehensive well siting study for Sweetwater Authority, located in National City, CA. During the project, the team developed Geoscience's proprietary Site Suitability Analysis Tool, which created a custom suitability model for the project based on various criteria (i.e., geohydrologic, environmental, engineering, logistical).

Rancho California Water District: Well No. 232 and Well No. 139 Rehabilitation

Logan was the project manager for the rehabilitation of Well Nos. 232 and 139 for Rancho California Water District. The team prepared rehabilitation plans and specifications to rehabilitate both wells. Since the cost of rehabilitation was high, District staff is performing the rehabilitation of both wells.

City of South Pasadena: Rehabilitation of Wilson Well #2

Logan reviewed and evaluated video survey, production and pumping performance, hydrographs, water quality data, and side wall scraping results for Wilson Well #2. He helped prepare technical specifications for well rehabilitation, which included: cleaning of well casing and screen by brushing, applying dispersing agents, airlifting and swabbing, pumping and surging, aquifer pump tests, flowmeter survey, post-development video survey, and final well disinfection.

Elsinore Valley Municipal Water District: Multiple Projects

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.

Rancho California Water District: Replacement of Nine Municipal Wells

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.

Elsinore Valley Municipal Water District: Terracotta Well Rehabilitation, Flagler Wells 2A & 3A Rehabilitation, and Palomar Well Rehabilitation

Logan is the project manager responsible for rehabilitation plans, and technical plans and specifications the rehabilitation of four (4) existing wells including mechanical and chemical rehabilitation, redevelopment, and aquifer testing.

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.

Brian Villalobos, PG, CHG, CEG

Principal Geohydrologist / Principal-in-Charge

Years of Experience: 35
Years with GEOSCIENCE: 17

Education and Professional Registrations/ Certifications:

- BS, Geology, California State University, Los Angeles
- California Professional Geologist (No. 4153)
- Certified California Hydrogeologist (No. 794)
- Certified California Engineering Geologist (No. 1298)

Brian has more than 35 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 indirect potable reuse, groundwater recharge, and groundwater basin characterization projects. He has studied and modeled groundwater basins across the State and has led efforts to develop studies and reports including, monitoring well networks, groundwater recharge projects, sustainable yield, water budgets, and more. He currently serves several cities and water districts to develop and assess groundwater recharge projects, including the City of Oceanside, Elsinore Valley Municipal Water District, San Bernardino Valley Municipal Water District, Yucaipa Valley Water District, and others. Brian has also supported 20 groundwater related litigation cases serving as either the lead technical advisor or in a support role.

KEY QUALIFICATIONS...

- More than 35 years of groundwater resource studies and reports
- Specializes in the application of geologic and hydrogeologic principles to groundwater recharge and water reuse
- Certified Hydrogeologist and Engineering Geologist
- Experience supporting more than 20 groundwater-related litigation cases.

Summary of Experience:

Yucaipa Valley Water District: Aquifer Storage & Recovery Wells (Injection/Recovery Wells)

Brian is providing technical and quality reviews for the design and development of three new injection wells and two new recovery wells for the Oak Valley Town Center Recharge Project.

South Coast Water District: Exploratory Drilling for Full-Scale Doheny Desalination Project

Brian is the technical advisor for the exploratory drilling for the siting and design of the full-scale subsurface slant wells to obtain desalination feed water for the planned Doheny Desalination Project.

City of Oceanside: Groundwater Well Site Evaluation

Brian provided technical and quality reviews for a geohydrologic assessment evaluating the local aquifer systems, groundwater production potential, and water quality. Using a weighted ranking matrix based on 13 criteria, locations that maximized production potential while mitigating risks related to environmental hazards and land use constraints were identified and prioritized. Refined from an initial preliminary site selection process to seven locations, each were assessed against multiple criteria including groundwater availability, potential interference with existing wells, and environmental considerations.

Mojave Water District: West Victorville Groundwater Banking Pilot Test Project

Brian is leading a team that is providing characterization of the existing groundwater conditions regarding water quality and the extents of the native aquifer system within the West Victorville area for Mojave Water Agency. Early results are favorable; therefore the work has moved onto a complete geotechnical field investigation and design of surface recharge facilities on a 40-acre parcel. Project team members have updated environmental documents to move the project ahead. Geoscience's

team is currently evaluating geophysical data to complete an update of the local groundwater model which will be used to select locations for new production wells and monitoring wells.

Yucaipa Valley Water District: Oak Valley Town Center Recharge Project

Brian was the project manager leading the efforts to complete a feasibility study for a recycled water recharge project. To complete the study, our team developed a focused groundwater model, a 3-D lithologic model, and developed a test infiltration basin.

City of Oceanside: Pure Water Oceanside

Brian was the project manager of a team that conducted a phased evaluation to characterize the Mission Basin and study the feasibility of Groundwater Storage and Recovery projects in the Lower San Luis Rey River Valley in northern San Diego County, California. With the findings suggesting the potential for a conjunctive-use storage project in the Mission Basin (MGB), a geohydrological groundwater model (Mission Basin Ground Water Model) was redeveloped and updated using these results. Geoscience was also tasked with investigating groundwater replenishment reuse projects (GRRP) using treated wastewater from the City's SLRWRF that would otherwise be discharged to the ocean. A series of groundwater analyses were conducted, technical and regulatory issues were analyzed, advanced wastewater treatment methods were identified, and groundwater recharge project options were developed. Based on the findings, the City and our team moved forward with the development of an indirect potable reuse (IPR) groundwater augmentation project known as Pure Water Oceanside and expanding the City's existing Title 22 tertiary recycled water distribution system.

Olivenhain Municipal Water District: Groundwater Supply and Brine Management Program

Olivenhain Municipal Water District relies almost entirely on imported water from the California and Colorado Aqueducts. To reduce independence on imported water, Brian is leading our team's efforts to determine the safe yield 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.

California American Water Company: Monterey Peninsula Water Supply Project

Brian is the project manager overseeing day to day project activities. The Monterey Peninsula Water Supply Project (MPWSP) will provide up to 6 million gallons per day (24,227 m3) of desalinated water to relieve pressure on the local groundwater aquifer. Brian worked with our team to complete hydrogeologic studies of the area and design and install 24 monitoring wells to collect data. Brian oversaw our team's efforts to design and construct a 724-ft (221 m) test slant well for a two-year pump test. The slant well consistently produced 2,100 gallons per minute (7.9 m3 per minute).

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: Riverside Aquifer Storage and Recovery Project Hydrogeologic Evaluation

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.

Mark Williams, PhD, PE

Principal Engineer

Years of Experience: 29
Years with GEOSCIENCE: 11

Education and Professional Registrations/ Certifications:

- BS, Geology, University of Colorado, Boulder
- MS, Civil Engineering, University of Southern California
- PhD, Civil Engineering, University of California
- California Professional Civil Engineer (No. 68138)

KEY QUALIFICATIONS...

- Nearly three decades of experience, specializing in municipal water quality
- Experienced investigator for water quality contamination, focusing on nitrates, NDMA, perchlorate, and bromate in municipal water supplies
- Oversees all Quality Assurance procedures and practices for staff on water quality investigation projects

For nearly 30 years, Dr. Mark Williams has focused on municipal water quality. Dr. Williams 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 water quality investigations. Dr. Williams 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.

Water Quality Investigations:

Dr. Williams has served in various capacities in numerous studies focusing on water quality investigations. He has served as a project engineer in a study on perchlorate removal study; the study focused on measuring the efficacy of commercially-available ion exchange resins for removing perchlorate. In another study, Dr. Williams served as the principal investigator on a study testing perchlorate removal in biological reactors.

He has served as the project engineer for a study to evaluate parameters controlling bromate formation during ozonation. The study determined the effects of seasonal water quality changes, particularly changes in organic carbon, on bromate formation. The study involved design and construction of a small pilot ozone reactor to model the hydrodynamics of a full-scale ozone contactor.

In another study, he served as project engineer to evaluate operating strategies for lowering bromate formation. The study involved demonstration-scale evaluations of bromate control strategies, which included pH control, adding ammonia, and staging ozone dose across the contactor. Outcomes of this study were used as basis for design and operation of Metropolitan's full-scale ozone facilities. The study demonstrated that ammonia was an effective Works Association Research Foundation (AWWARF).

Summary of Experience:

California American Water Company: Monterey Peninsula Water Supply Project

The Monterey Peninsula Water Supply Project (MPWSP) will provide up to 6 million gallons per day (24,227 m3) of desalinated water to relieve pressure on the local groundwater aquifer. Mark oversees the Geoscience project team, who have completed hydrogeologic studies, designed and installed 24 monitoring wells to collect data, and designed and constructed a 724-ft (221 m) test slant well. Our team is currently using data collected from the test well to further characterize the basin and assist the team in designing a full-scale system.

City of Oceanside: Pure Water Oceanside

Mark oversaw the team that performed a phased evaluation to characterize the Mission Basin and study the feasibility of Groundwater Storage and Recovery projects in the Lower San Luis Rey River Valley in northern San Diego County, California. A series of groundwater analyses were conducted, technical and regulatory issues were analyzed, advanced wastewater treatment methods were identified, and groundwater recharge project options were developed. Based on the findings, the City and our team moved forward with the development of an indirect potable reuse (IPR) groundwater augmentation project known as Pure Water Oceanside and expanding the City's existing Title 22 tertiary recycled water distribution system.

Municipal Water District of Orange County/South Coast Water District: South Orange Coast Ocean Desalination Plant

Mark oversaw the team that developed technical data for an environmental impact report to use subsurface slant wells to obtain desalination feed water for the planned South Orange Coastal Ocean Desalination Project, which is currently in design for a full-scale project.

Rancho California Water District: VDC Recharge Basin Pilot Testing

As the Project Manager, Dr. Williams was responsible for pilot testing of recharge facilities at RCWD for health department permitting compliance. Conducted tracer testing and virus removal testing to determine ground water residence times and log-removal credit for artificial recharge basins.

Shallow Ground Water Quality in the Vicinity of Mills Treatment Plant

Dr. Williams 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.

Rancho California Water District: Lower VDC Recharge Test Plan

Dr. Williams was responsible for the development of preliminary test plant for recycled water recharge in the lower VDC area, which established methods for tracer testing procedures to establish horizontal and vertical ground water travels times.

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

Dr. Williams established impacts 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

As the Project Manager, Dr. Williams was responsible for evaluating 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.

Professional Memberships / Registrations:

- American Chemical Society
- American Institute of Chemical Engineers
- Peer Reviewer – Ozone Science and Engineering
- Peer Reviewer – Journal of Environmental Engineering
- Peer Reviewer – American Water Works Association
- Peer Reviewer – National Science Foundation
- Project Advisory Committee Member – American Water Works Research Foundation: Zero Liquid Discharge
- Technical Advisory Committee Member – American Water Works Research Foundation: Desalination Product Water Recovery
- Project Advisory Committee Member – American Water Works Research Foundation: Strategies for Removing Bromide

Michael Hoffman, PG, CHG

Project Geohydrologist

Years of Experience: 27
Years with GEOSCIENCE: <1

Education and Professional Registrations/ Certifications:

- BS, Geology, Western Washington University
- MS, Geology, California State University, Fullerton
- California Professional Geologist (No. 7735
- Certified California Hydrogeologist (No. 817)
- 40-Hr. HAZWOPER (OSHA)
- 30-Hr. Construction Safety Training (OSHA)

KEY QUALIFICATIONS...

- Nearly three decades of experience, specializing in production and monitoring well design and construction
- Experienced in well rehabilitation, aquifer testing and analysis, and cost benefit analyses of rehabilitation methods and fluid disposal options

Mike Hoffman is a hydrogeologist with more than 27 years of experience in production and monitoring well design, installation and testing; well rehabilitation; groundwater monitoring and sampling; aquifer testing and analysis; soil sampling; groundwater modeling; and downhole geophysical logging including open hole (resistivity, dual induction, sonic velocity/variable density, nuclear magnetic resonance, temperature, fluid resistivity, caliper and deviation) and cased hole (gyroscopic alignment surveys, electromagnetic casing inspection, static and dynamic video surveys, static and dynamic flow meter surveys and analysis, and depth specific sampling and mass balance calculations). He is familiar with the reverse rotary, direct rotary, air rotary casing hammer and other percussion methods, sonic rotary, NQ and HQ core barrel, cone penetration test (CPT), direct push (Geoprobe) and hollow-stem auger drilling methods. He has been involved in 65 production, injection, and extraction wells via reverse circulation drilling method, and has also completed a week-long drilling fluid class at the Baroid Industrial Drilling Products facility. Mike is also proficient in the aquifer testing analysis software Aqtesolv for Windows, and Aquifer Win32; the groundwater modeling software Groundwater Vistas, Visual MODFLOW, and Groundwater Modeling System, and completed a five-day PEST training course; Geographic Interface program (gINT), Surfer, and ArcMap.

Summary of Experience:

United States Army Corp of Engineers: Rehabilitation of Wells I-2A and I-9 at Ft. Irwin

Mike was the project manager for the rehabilitation of two wells at Ft. Irwin in California. His duties included project management, permitting, assessment and implementation of well rehabilitation procedures, field supervision, staff training, well performance assessment, aquifer test analysis, and preparing well rehabilitation summary reports.

Glendale Respondent Group: Rehabilitation of Eight Extraction Wells

California. Mike was the Project Manager and Project Geologist for the rehabilitation of eight extraction wells in Glendale, CA. His duties included project management, cost benefit analyses of rehabilitation methods and fluid disposal options, permitting, assessment and implementation of well rehabilitation procedures, field supervision, staff training, extraction well performance assessment, collecting and analyzing pumping test data, maintaining a record of the field activities, and preparing well rehabilitation summary reports.

Confidential Client: Well Rehabilitation at Omega Chemical Superfund Site

Mike was the Project Manager and Project Geologist for the rehabilitation of a water well located on

the Omega Superfund site in Whittier, CA. Due to declining pumping rates at the Omega Superfund Site wells, Mike prepared the well rehabilitation scope of work, secured required permits from the City of Whittier, and oversaw well rehabilitation activities for five 80-foot deep, 6-inch diameter extraction wells. Rehabilitation activities included jetting with recirculation pumping, swabbing, bailing and pumping.

City of Garden Grove: Rehabilitation Specifications and Sampling of Wells

Mike was the Lead Hydrogeologist responsible for preparing rehabilitation specifications for City of Garden Grove, and performed initial sampling for water characterization. The City decided against well rehabilitation because the well still had a high specific capacity.

City of San Luis Obispo: PCE Proposition 1 Round 3 Implementation, Bob Jones Trail Well

Mike was the Senior Hydrogeologist for this project that supported the development of a Proposition 1 Groundwater Grant Program conceptual planning proposal to characterize the PCE plume impacting many of the City of San Luis Obispo's production wells. The project includes installation of one new production well (BJT Well), equipping of an existing well, and construction of a groundwater treatment system to remove volatile organic compounds and provide water for direct potable reuse. Tasks included preparing the preliminary design report, DWSAP development including generating a large PCA inventory, producing a bid set and technical specifications, bidding phase support services, coordination with the client and contractor, submittal review, invoice review, scheduling, budget tracking, training and supervision of field staff, well design, aquifer test design and analysis, and a well completion report.

Citrus Heights Water District: Highland Well

Mike was the Senior Hydrogeologist for this project, supporting the design of the Highland Well which will increase local supply reliability and leverage ASR capabilities. Tasks include developing technical specifications for a new production well with ASR capabilities, coordination with the client and contractor, submittal review, invoice review, scheduling, budget tracking, training and supervised field staff, well design, well development oversight, aquifer test design and analysis, and a well completion report.

East Valley Water District: Well 129 Drilling Design and Construction Management

Mike was the Senior Hydrogeologist for this project, where he provided a bid set and bidding phase support services for a new groundwater production well at the Plant No. 129 site. Developed technical specifications, performed construction oversight, trained and supervised field staff, designed isolated zones and falling head tests in pilot borehole and performed analyses, developed final well design, designed aquifer tests and performed analyses, completed well completion report, and completed a preliminary DWSAP report based on the preliminary design report, including instructing and supervision of staff hydrogeologist who created draft version.

IEUA: Chino Basin Program – Nested Monitoring Wells

Mike was the Senior Hydrogeologist for this project, supporting the design and construction of three deep (1,000 to 1,100 feet) triple completed nested monitoring wells for the Chino Basin Program exploration phase. Tasks performed included well construction oversight, training and supervision of field staff, designed isolated zones and falling head tests in pilot borehole and performed analyses, developed final well design, and supervised well development.

East Valley Water District: Drought Contingency Plan, New Production Well Siting

Mike was the Senior Hydrogeologist for this project, where he identified potential sites to construct new production wells per EVWD's Drought Contingency Plan in accordance with California Title 22 standards and regulatory setbacks. Additionally, Mike compiled and analyzed local geology, historical groundwater and well data of the site vicinity to create site plans and layouts with GIS, as well as prepared a technical memorandum discussing well siting results.

Robert Sia, GIT

Project Geohydrologist

Years of Experience: 14
Years with Geoscience: 5

Education and Professional Registrations/Certifications:

- BS, Geological Sciences, California State University, Fullerton
- Geologist-in-Training, CA

Robert has more than a decade of professional experience that was earned from working as a field geologist, project manager, and client service manager on a diverse range of challenging projects that have focused on groundwater recharge and banking, construction management, environmental site investigations and characterization, real estate redevelopment/due diligence, and regulatory compliance. Robert is experienced with managing from the field all aspects of exploratory drilling and well construction including development, pump testing, disinfection, water quality sampling, as well as well rehabilitation. He has logged, managed the construction, and participated in the design for more than 35 large diameter groundwater supply wells in Southern and Northern California using mud direct rotary and reverse circulation drilling methods.

KEY QUALIFICATIONS...

- More than a decade of experience with both well construction and groundwater studies—helping to verify data to aid in the development of groundwater models and studies that reflect basin conditions.

Summary of Experience:

Elsinore Valley Municipal Water District: Technical Plans, Specifications, and Estimate for Rehabilitation of the Terra Cotta Well, and Construction Management Inspection, and Permitting Support

Robert was responsible for completion of technical plans, specifications, and estimate of the rehabilitation of one existing well including mechanical and chemical rehabilitation, redevelopment, and aquifer testing.

Elsinore Valley Municipal Water District: Joy Street Well Rehabilitation

Robert provided field oversight during rehabilitation of one mild steel 20-inch diameter 1,680 feet deep well with 1,020 feet of screen. Robert inspected chemical treatment, mechanical development such as swabbing and airlifting and pumping development, aquifer pump testing, and spinner log survey, and collected water quality samples.

City of Whittier: Well No 8 Rehabilitation and Relining

Robert provided hydrogeologic services, performed/supervised well rehabilitation efforts, and supervised the installation of a casing liner and the equipping of the submersible pump. Robert assisted in updates and revisions to the technical specifications, field supervision of the contractor's activities, and permitting support that included preparation of updated final DWSAP documents.

Rancho California Water District: Well No. 232 and Well No. 139 Rehabilitation

Robert provided hydrogeological services for the rehabilitation of Well Nos. 232 and 139 for Rancho California Water District. The team prepared rehabilitation plans and specifications to rehabilitate both wells. Since the cost of rehabilitation was high, District staff is performing the rehabilitation of both wells.

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

Robert helped provide further insight into the geology of the subbasins. Robert reviewed existing borehole lithology data and created 3 subsurface cross-sections in the Monterey and Seaside

Subbasins, which included the Dune Sand, Aroma Sand, 400-Foot, and 180-Foot Aquifers; the Fort Ord Salinas Valley and 180/400-Foot Aquitards; and the Paso Robles, Purisma, and Santa Margarita Formations.

Rancho California Water District: Technical Plans, Specifications, and Estimate for Three New Production Wells, Construction Management Inspection, Permitting and Bidding Support
Robert was responsible for completion of technical plans, specifications and estimate of the drilling, construction, development, and testing of three new production wells in the District's UVDC recharge facility. The new wells will bolster and add flexibility to the District's water supply.

Elsinore Valley Municipal Water District: Near-Term Water Supply Program, Lee Lake Wells No. 1 and No. 2, Construction Management Inspection and Permitting Support
Robert was responsible for collecting data and inspection of the drilling, construction, development, and testing of two new ~100-foot deep production wells. This included conductor casing installation and sanitary seal, pilot hole drilling, geophysical survey, isolated aquifer zone testing, well construction, borehole reaming, swab and airlift development, pump and surge development, step test, 24-hr constant rate test and recovery, plumbness and alignment survey, video survey, water quality sampling, and final well disinfection. Robert also helped write the well summary report.

Rancho California Water District: Preliminary Design and Technical Specifications for Construction of New Well No. 172 and New Monitoring Well No. 512
Robert played a major role in drafting preliminary well designs, technical construction specifications and sheets, bid items, engineer's estimate, Drinking Water Source Assessment and Protection (DWSAP) Report, and the well construction permit application. Technical specifications covered drilling, construction, development, testing, and disinfection. The design involves Well No. 172 extracting groundwater from the Pauba Aquifer while Monitoring Well No. 512 provides a point to collect groundwater level data. Rancho California Water District plans to add Well No. 172 to their network of groundwater recovery wells operated at the Upper Valle De Los Caballos Recharge and Recovery Facility containing 100 acres of recharge ponds. The goal of the facility is to increase groundwater recharge and recovery in Pauba Valley. Monitoring Well No. 512 is situated in the middle of a recharge pond and screened across the Pauba Aquifer.

Bedford-Coldwater Groundwater Sustainability Authority: Construction Management Inspection of New Monitoring Wells No.1 and No. 2
Robert was responsible for inspection of the construction, development, and water quality sampling of two new monitoring wells (290 and 350 ft deep) located within the Bedford- Coldwater Groundwater Subbasin. Sonic and direct mud rotary drilling rigs were used. Robert also prepared ancillary equipment, bench tested, calibrated, and installed new pressure dataloggers in these two monitoring wells and in two existing production wells (City of Corona Well 20 and EVMWD Trilogy Well).

Rancho California Water District: Update and Enhancement of the Cooperative Water Resources Management Agreement (CWRMA) Model and Site Suitability Analysis Tool
Robert helped evaluate the potential suitability of sites for use as recharge basins by determining the optimal property sizes and creating a criteria-scoring matrix to input into the GIS site suitability analysis tool (ESRI ArcGIS Pro ModelBuilder). The scoring matrix evaluated land use, parcel size, soil type, flood zones, proximity to existing production wells and DWR open case sites, and distance from existing infrastructure. Robert helped write a technical memorandum to document the update of the model and site suitability analysis tool.

Yuima Municipal Water District: Groundwater Sustainability Plan for Upper San Luis Rey Valley Groundwater Basin
Robert reviewed DWR driller's logs, existing geologic data, and studies and created four (4) cross sections of subsurface geology in the Pala and Pauma Subbasins, which included young and old alluvium, Paleo Lake Pauma, and bedrock complex. Robert helped analyze water level data by creating hydrographs for key monitoring wells.

Coral Shaw, GIT

Project Geohydrologist

Years of Experience: 11
Years with Geoscience: 11

Education and Professional Registrations/Certifications:

- BS, Geology, California State University, Fullerton
- Geologist-in-Training, CA

Coral has more than a decade of experience performing well construction inspection for tasks such as pilot borehole drilling and reaming, casing inspection and installation, air lifting and swabbing, development by pumping, and down-hole video logging. She has performed various pumping test analyses, including large scale pumping tests and water quality sample collection. Coral also prepares well designs based on data collected during the drilling process, provided final pump design recommendations, and final summary reports.

KEY QUALIFICATIONS...

- Field experience supporting well construction, development, and testing projects—helping to maximize well production and efficiency
- Well versed in the inspection of pilot borehole drilling and reaming, casing inspection and installation, air lifting and swabbing, development by pumping, and down-hole video logging

Summary of Experience:

Riverside Public Utilities: Well Rehabilitation and Groundwater Monitoring Program

Coral helped compile and review historical well data for 60 potable water supply wells to develop a well ranking system prioritizing wells in need of rehabilitation and repair. She also created well summary letters detailing existing well conditions.

Sweetwater Authority: Well Siting Study

Coral performed the well siting study for Sweetwater Authority, located in National City, CA. Coral collected and processed relevant data from multiple sources, such as regulatory bodies, historical records, geohydrologic models, geophysical models, and used this information to develop a technical report and maps containing the findings of the study. She also provided field observation during exploratory drilling and permitting support for the client.

City of Huntington Beach: Well Site Evaluation (8 sites)

Coral assisted with a comprehensive geohydrological evaluation of multiple potential sites to identify the most suitable well site locations for the City of Huntington Beach. The evaluation carefully considered key factors that were weighted based on its importance, allowing the sites to be ranked systematically. Coral also helped prepare preliminary designs and recommendations for well drilling and testing.

City of Oceanside: Groundwater Well Site Evaluation

Coral assisted with a thorough geohydrologic assessment evaluating the local aquifer systems, groundwater production potential, and water quality. Using a weighted ranking methodology based on 13 criteria, locations that maximized production potential while mitigating risks related to environmental hazards and land use constraints were identified and prioritized. Refined from an initial preliminary site selection process to seven locations, each were assessed against multiple criteria including groundwater availability, potential interference with existing wells, and environmental considerations.

Yucaipa Valley Water District: Aquifer Storage & Recovery Wells (Injection/Recovery Wells)

Coral is providing field observation and well development of three new injection wells and two new recovery wells for the Oak Valley Town Center Recharge Project.

Golden State Water Company: Willowbrook No. 4
Coral managed the field observation to construct a new well for municipal use in Los Angeles' Central Basin. He was responsible for observing aquifer zone testing, sampling, grading analysis, casing and gravel pack installation, swab and airlift development, pump development, and downhole video survey. Coral also prepared the final Summary Report for this well.

Elsinore Valley Municipal Water District: Multiple Well Projects, On-Call Hydrogeology Services Contract
As part of this on-call contract, Coral provided inspection services for several EVMWD wells, including construction management for three well rehabilitations - Diamond Well, Summerly Well, and the Mayhew Well.

Elsinore Valley Municipal Water District: Near Term Water Supply Program
Coral provided construction management services for the rehabilitation of five EVMWD wells, including Flagler Wells 2A and 3A, Cereal Wells 1 and 3, and the Terra Cotta Well. She also provided inspection and testing services during the construction of the two new Lee Lake Wells.

Three Valley Municipal Water District: Miragrand Well
Coral supported design efforts and was the lead inspector for a new potable supply well. This project provided unique challenges in that it is in an affluent residential community whose neighbors do not want construction activity to disturb them. Close coordination and additional noise mitigation procedures were required to complete this work.

Chino Basin Desalter Authority: Ph. 3 Well II-10 & II-11
Coral developed pre-bid meeting notes, reviewed technical specifications, and bid contracts. She also provided on-site observation during constant rate testing and pump development.

City of Torrance (Water Works Engineers): North Torrance Well Field
Coral provided construction observation for three new groundwater production wells. Field activities included observing and documenting well construction, pump development, and step and constant rate testing.

Orange County Water District: Alamitos Barrier Improvement Project
Coral supported design efforts and provided field observation and coordination to install 17 new injection wells, four nested monitoring wells, and two shallow piezometers. The injection wells will serve to increase the capacity and effectiveness of the existing Alamitos seawater barrier system. Coral was involved in all construction, development, and testing phases. She also oversaw final video inspection, performed final site inspections, and helped develop the final project report.

RCWD: New Well No. 176 Drilling Phase
Coral provided field observation and permitting support for a new groundwater production well. During construction, Coral observed conductor borehole and casing install, mechanical development, and final video survey. She also developed the preliminary and final Drinking Water Source Assessment and Protection documentation and helped prepare the final well construction report.

Hillwood Investment Properties: Raub Well Relocation, and Raub Wells 1, 4, and 5 Destruction
Coral provided all onsite field supervision, field work, well destruction letters, and observed well bailing, filling the casing with cement, and well head burial and cementation.

California American Water Service Company: Monterey Peninsula Water Supply Program
As part of the Monterey Peninsula Water Supply Program (MPWSP), Geoscience helped develop slant well subsurface intakes to provide ocean desalination feed water. The proposed reverse osmosis ocean desalination facility will provide a new source of water and reduce impacts to the local groundwater basins and nearby Carmel River. To support the project, Coral provided field observation during test slant well construction and development. During and after a two-year pump test, Coral performed follow up well monitoring and water quality sampling.

Nicolette Nguyen

Associate Geohydrologist

Years of Experience: 3
Years with Geoscience: 3

Education and Professional Registrations/Certifications:

- BS, Earth Sciences, University of California San Diego at Scripps Institute of Oceanography

Nicolette has recent experience in performing well siting studies and contributing to the development of Geoscience's proprietary Site Suitability Analysis Tool, as well as providing permitting assistance, collecting and analyzing data, and developing technical reports and maps. Nicolette also provides field supervision during well design and construction, water quality sampling and analyses, and assisting in the completion of DWSAP assessments.

KEY QUALIFICATIONS...

- Assisted in the development of the Site Suitability Analysis Tool (SSAT) for well siting
- Field experience and familiarity with well siting—helping to provide more accurate field data and refine siting criteria

Summary of Experience:

Sweetwater Authority: Well Siting Study

Nicolette performed the well siting study for Sweetwater Authority, located in National City, CA. During the project, she contributed to development of Geoscience's proprietary Site Suitability Analysis Tool, introducing new methods of data analysis using multivariate interpolation. Using this tool, a custom suitability model was created for the project based on various criteria (i.e., geohydrologic, environmental, engineering, logistical). Nicolette collected and processed relevant data from multiple sources, such as regulatory bodies, historical records, geohydrologic models, geophysical models, and used this information to develop a technical report and maps containing the findings of the study. She is currently providing construction and permitting support for the client.

City of Santa Monica: Well Rehabilitation and Replacement Priority Evaluation

Nicolette is part of a team to evaluate the current condition of wells and provide recommendations for their systematic rehabilitation or replacement for the City of Santa Monica. The evaluation assessed 14 groundwater extraction wells using a fifteenth destroyed well to test and calibrate the scoring and ranking matrix designed to identify wells that are most in need of immediate attention, while also providing a framework for future well maintenance and replacement planning. The team developed well-specific recommendations for rehabilitation for five wells based on the available data, the results of the scoring and ranking matrix, and City plans.

Camrosa Water District: University Well Rehabilitation

Nicolette was part of a team to assess the condition of University Well, develop a rehabilitation work plan, and provide field services during the testing and rehabilitation of the well. The team provided data review, conducted a step drawdown pumping test, and performed a video survey after a pump failure and developed a rehabilitation program, which consisted of both a mechanical and chemical component.

City of Whittier: Well No 8 Rehabilitation and Relining

Nicolette is part of a team that provided hydrogeologic services, performed/supervised well rehabilitation efforts, and is currently supervising the installation of a casing liner and the equipping of the submersible pump. Nicolette provided field supervision of the contractor's activities, and permitting support that included preparation of updated final DWSAP documents.

City of Huntington Beach: Well Site Evaluation (8 sites)

Nicolette is part of a team that conducted a comprehensive geohydrological evaluation of multiple potential sites to identify the most suitable well site locations for the City of Huntington Beach. The evaluation carefully considered key factors that were weighted based on its importance, allowing the sites to be ranked systematically. Logan also prepared preliminary designs and provided recommendations for well drilling and testing.

Olivenhain Municipal Water District: San Dieguito Groundwater Desalination Project

For this project, Nicolette calculated return flow of imported vs. native water to the watershed and groundwater basin in support of the modeling team using geospatial analysis. She also complied, georeferenced, and analyzed water meter data for four (4) different water providers over a 20 year period. Additionally, she used aerial imagery to classify crop types and groundcover to calculate the return flow for un-metered areas.

Independent Well Drilling: Subsidence Evaluations for Multiple Wells

Nicolette provided permitting support for multiple wells in Southern California to comply with Executive Order N-7-22 by evaluating the potential for each well to cause subsidence or adverse effects to existing infrastructure. For the project, she collected and analyzed historical well records and production data; generated missing production data using historical aerial imagery and crop demands; and obtained and processed InSAR data to evaluate land surface elevation change against historical seismic activity and precipitation.

Various Clients: Drinking Water Source Assessment and Protection (DWSAP) Program

Nicolette works with several client to provide hydrogeological services for DWSAP programs. She has provided DWSAP reports for multiple clients including the City of Ontario, Rancho California Water District, and Bellflower-Somerset Municipal water Company. In conjunction, Nicolette also worked with the SWRCB Department of Drinking Water to ensure compliance of current assessment procedures.

CADIZ Inc.: Three New Agricultural Wells

Nicolette provided supervision for the drilling, construction, development, and testing of three (3) new agricultural wells. She contributed to field efforts by logging lithology samples, performing mechanical grading analysis, recording field data, and collecting water quality samples, as well as assisted with the final summary report and figures.

Rancho California Water District: Monitoring Well No. 512 and Production Well No. 172

Nicolette provided supervision for the drilling, construction, development, and testing of a monitoring well and production well using air rotary casing hammer, direct mud, and reverse mud rotary methods. She contributed to field efforts by logging lithology samples, performing mechanical grading analysis, recording field data, and collecting water quality samples, as well as completing the DWSAP assessment after the completion of the wells.

GEOSCIENCE SUPPORT SERVICES, INC.
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909.451.6650 | **gssiwater.com**

GEOSCIENCE

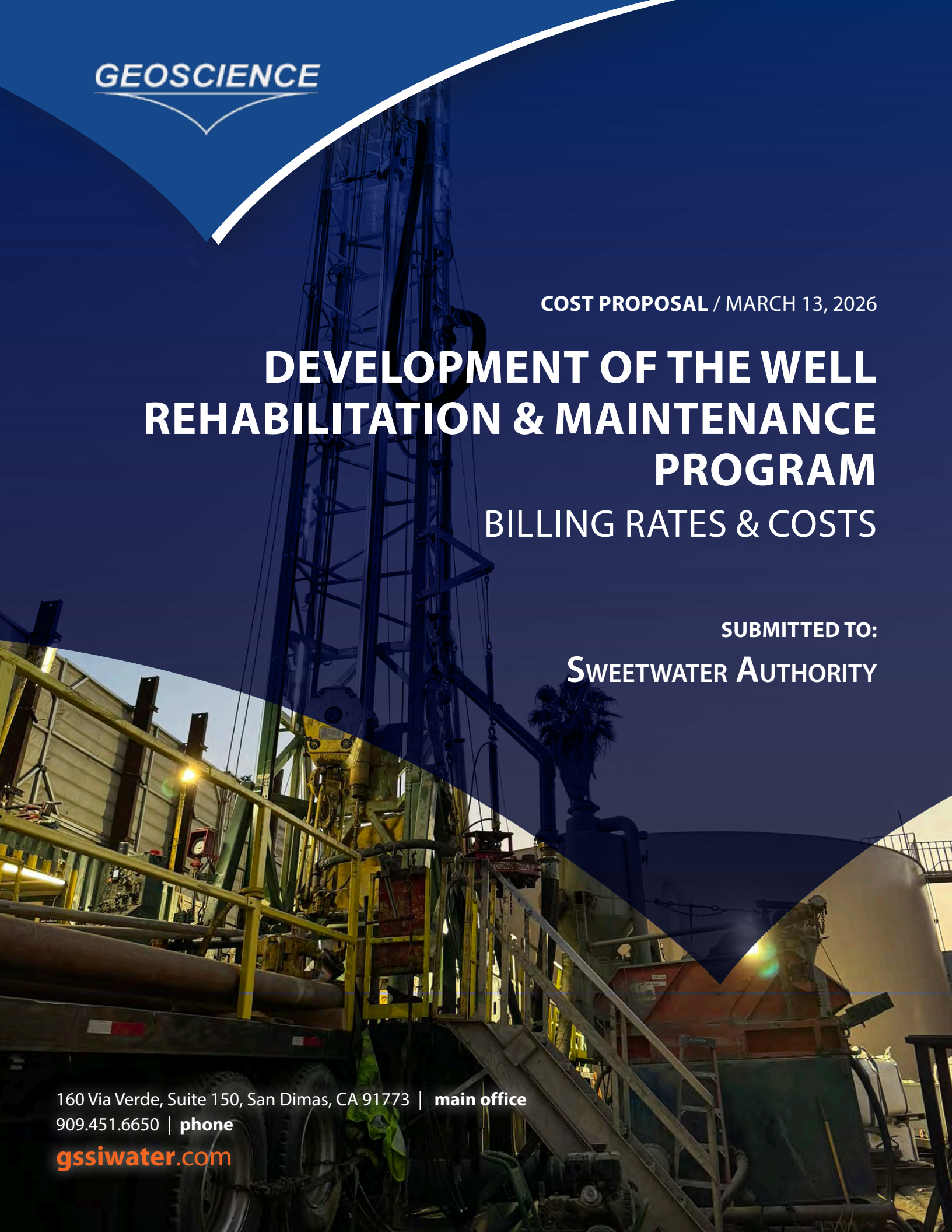
COST PROPOSAL / MARCH 13, 2026

DEVELOPMENT OF THE WELL REHABILITATION & MAINTENANCE PROGRAM

BILLING RATES & COSTS

SUBMITTED TO:

SWEETWATER AUTHORITY



160 Via Verde, Suite 150, San Dimas, CA 91773 | **main office**
909.451.6650 | **phone**
gssiwater.com

Cost Proposal for Professional Hydrogeological Services Related to the Well Rehabilitation and Maintenance Program for Sweetwater Authority

Task Description			GEOSCIENCE SUPPORT SERVICES, INC.							
			Principal Geohydrologist/ Engineer	Senior Geohydrologists	Project Geohydrologists	Associate Geohydrologist	GIS/Technical Illustrator	Labor	Reimbursable Expenses[1]	Total Cost
		Hourly Rate:	$290	$264	$240	$180	$175			
1.0	**PROJECT MANAGEMENT, PROJECT MEETINGS, AND DATA REVIEW**									
	1.1	Project Management and Administration	2	4	16	8		$ 6,916	$ -	$ 6,916
	1.2	Prepare for and attend one (1) "Kick-Off" meeting and Data Request. Three (4) Status Update meetings (assumes kick-off is on-site, remaining meetings via video calls)		8	8	8		$ 5,472	$ 435	$ 5,907
	1.3	Obtain, Compile, and Review Relevant Data Pertaining to All of the Authority's Wells		2	6	40		$ 9,168	$ -	$ 9,168
	1.4	Meet and Interview with Authority Staff		2	10	12		$ 5,088	$ 290	$ 5,378
		Subtotal	*2*	*16*	*40*	*68*	*0*	*$ 26,644*	*$ 725*	*$ 27,369*
2.0	**FIELD ASSESSMENTS AND CONDITION EVALUATION**									
	2.1	Field Visits to Each Well (13 wells in total), Site & Equipment Inspections (assumes 2 days in the field, escort with Authority staff and access, visual condition, safety, and physical infrastructure assessments)	2	6	20	20		$ 10,564	$ 290	$ 10,854
	2.2	Performance & Data Evaluation (Operational observations and historical data review). Assess the functional health of the wells by analyzing both current and past data (assumes 13 wells and editable digital data).	6	4	8	22	6	$ 9,726	$ 290	$ 10,016
		Subtotal	*8*	*10*	*28*	*42*	*6*	*$ 20,290*	*$ 580*	*$ 20,870*
3.0	**REHABILITATION PLANNING, MAINTENANCE STRATEGY, AND PROGRAM DEVELOPMENT**									
	3.1	Rehab & Maintenance Strategy Development (Well recommendations, PM schedules, upgrades, and standard tools/SOPs)	4	8	20	72	12	$ 23,132	$ -	$ 23,132
	3.2	Financial Planning & Draft Review (planning level estimates, 1-10 yr budget projections, and virtural draft review meeting)	2	4	6	14	6	$ 6,646	$ -	$ 6,646
		Subtotal	*6*	*12*	*26*	*86*	*18*	*$ 29,778*	*$ -*	*$ 29,778*
4.0	**FINAL PROGRAM PREPARATION AND DELIVERABLES**									
	4.1	Draft Revisions & Presentation (Draft submission, Assumes full set of comments for incorporation, and one Authority presentation)	4	4	8	20	8	$ 9,136	$ -	$ 9,136
	4.1	Final Program Deliverables (Submission of the comprehensive final report in PDF and editable formats)	1	6	10	18	6	$ 8,564	$ 290	$ 8,854
		Subtotal	*1*	*6*	*10*	*18*	*6*	*$ 8,564*	*$ 290*	*$ 8,854*
		TOTAL HOURS AND COST FOR TASKS 1-4:	**17**	**44**	**104**	**214**	**30**	**85,276**	**1,595**	**86,871**
5.0	**OPTIONAL**									
	5.1	WellSmart™/ WellSight™ Digital Platform for Monitoring and Assessing Well/ Pump Health	Costs are variable and customizable dependent on Sweetwater's requirements and can be negotiated during Project execution							

Notes:

[1] Reimbursable expenses include mileage, field per diem at $145/day, and report reproduction costs.

It should be noted that additional costs, which cannot be foreseen at this time, are sometimes incurred due to equipment breakdowns on the part of the drilling contractor, and/or problems in material procurement or construction. Additional inspection hours for such field-related problems are not included in the above costs.

Geoscience is aware of the requirements of California Labor Code Sections 1720 et seq. and 1770 et seq., which require the payment of prevailing wage rates and the performance of other requirements on certain “public works” and “maintenance” projects.

The work Geoscience performs does not fall under prevailing wage rate categories.

Geoscience Support Services, Inc. – 2026 SWEETWATER FEE SCHEDULE

Schedule of Hourly Rates

Professional Services	Hourly Rates ($US)
Principal Modeler	$325
Principal Geohydrologist	**$290**
Principal Engineer	$290
Senior Geohydrologist	**$264**
Senior Modeler	$297
Project Modeler	$275
Project Geohydrologist	**$240**
Senior Associate Modeler	$236
Associate Modeler	$220
Senior Associate Geohydrologist	$191
Associate Geohydrologist	**$180**
Research Analyst	$166
CAD/GIS Illustrator	$175
Clerical	$120

Reimbursable Expenses

Reimbursable Project Expenses	Cost + 5%
(Telephone, Outside Reproduction, Presentation Supplies, Postage, etc.)	
Computer Services	Project Dependent
Internal Photocopying - B&W	$0.10/page
Internal Photocopying - Color	$0.70/page
Subconsultant Services	Cost + 10%
Automobile Transportation	Current IRS Allowable Rates
Commercial Travel/Subsistence	Cost + 3%
Local Per Diem	$145/day
Non-Local Per Diem	$258/day

GEOSCIENCE is aware of the requirements of California Labor Code Sections 1720 et seq. and 1770 et seq, which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. The work GEOSCIENCE performs does not fall under prevailing wage rate categories.

Note: Fees valid from January 1, 2026. All fees are subject to change on January 1, 2027.

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The First Name in Groundwater

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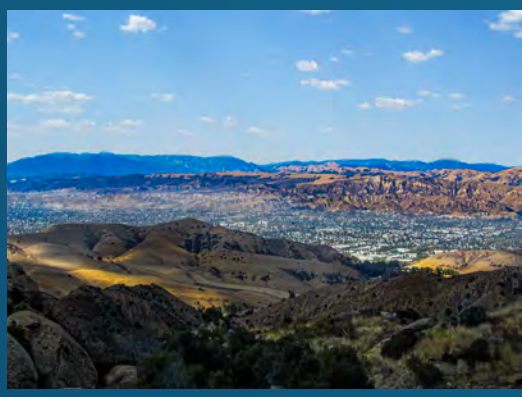
909.451.6650 | **gssiwater.com**

Sweetwater Authority

Proposal for Development of the Well Rehabilitation and Maintenance Program

March 13, 2026



HYDRO-GEOLOGIC SOLUTIONS, INC.

GROUNDWATER. WELLS. RECHARGE. SOLUTIONS.

www.hydro-geologic.com

verdantas

March 13, 2026

Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910
Attention: Kyehee Kim, Engineering Manager
kkim@sweetwater.org

RE: REQUEST FOR PROPOSALS — DEVELOPMENT OF THE WELL REHABILITATION AND MAINTENANCE PROGRAM

Dear Ms. Kim and the Sweetwater Authority Evaluation Team,

Hydro-Geologic Solutions, Inc. (HGS) is pleased to submit our proposal for the Development of the Well Rehabilitation and Maintenance Program for Sweetwater Authority's 13-well groundwater supply system. As a **small, minority and women-owned hydrogeologic consulting firm, we are especially well suited to this kind of work with senior staff in the field, principal-led technical judgment applied to every assessment**, and deliverables designed to be used by your team long after project closeout.

We understand that the Authority's National City Wells currently produce approximately 81% of rated capacity under average conditions. We also understand the SDF wellfield — the backbone of the Reynolds Desalination Facility — includes wells constructed between 1998 and 2016, each facing evolving deterioration challenges in a brackish, biofouling-prone environment. This program is more than a maintenance checklist; it is the foundation for protecting a critical local supply asset over the next decade.

Why HGS and Verdantas:

Our Project Manager and Principal Hydrogeologist, Eros Bilyeu, PG, CHG, CGWP, QSD/QSP, brings 18 years of well assessment, rehabilitation planning, and groundwater supply experience, including **direct institutional knowledge of the SDF wells based on construction support performed at his prior firm in 2016.** He understands how these wells were built, what their original performance baselines looked like, and how marine-formation, brackish-environment conditions influence long-term screen integrity, biofouling risk, and pump efficiency. That institutional knowledge cannot be replicated by reviewing records alone.

Our senior field geologist, Andrew Kieta, PG, brings 15 years of well construction, assessment, and rehabilitation experience including condition assessments for Golden State Water Company's multi-well system and Pasadena Water and Power's Monk Hill wellfield. **Eros and Andrew will personally conduct field inspections; this work will not be delegated to junior staff.**

Critically, HGS has teamed with Verdantas, Inc., and their local San Diego office, to provide licensed professional engineering coverage of the above-ground infrastructure that is inseparable from any credible well condition assessment. Verdantas brings dedicated electrical and controls engineers with direct experience in pump station power systems, variable frequency drives, MCC layout, and SCADA integration. For the SDF wells feeding the Reynolds Desalination Facility, electrical and controls condition is not a secondary concern. **It is a primary cost driver and operational risk factor that requires licensed PE review. Our team covers it.**

Our approach to this program is built on three principles:

First, we front-load the records review before any field work begins. Historical performance data, construction logs, and prior rehabilitation records are compiled into a wellfield data matrix that gives every field observation a verified baseline to measure against. This is how you identify a well that is degrading faster than its age suggests — and prioritize accordingly.

Second, our field assessments are fully integrated across disciplines. Hydrogeologic condition, pump and motor performance, electrical infrastructure, controls and instrumentation, these are **evaluated together by the HGS and Verdantas team during coordinated site visits**, not in separate standalone reviews that have to be reconciled later.

Third, **deliverables are designed for Authority independence.** The multi-year capital budget tool, inspection checklists, maintenance logs, and standard operating procedures will be structured so your engineering and operations staff can execute the program without continued consultant dependency. That is the measure of a successful program.

Addressing the Experience Criteria Directly:

We recognize that Sweetwater Authority experience carries significant weight in your evaluation criteria. While HGS has not previously contracted directly with the Authority, Eros Bilyeu's **hands-on involvement with SDF well construction in 2016 provides a level of wellfield-specific familiarity** that goes beyond general industry experience. We have also reviewed your 2023 Water Resources Master Plan in detail, and our proposed approach is built around the specific conditions, challenges, and planning assumptions you identify. We are not learning this wellfield from scratch.

We are committed to the Authority's success on this program and stand ready to execute from day one of a notice to proceed. This proposal constitutes a firm offer valid for 90 days from the date of submission. If you have any questions regarding our proposal please call us at (949) 274-4784.

Susan Kang, Esq.
President
SusanKang@hydro-geologic.com

Eros Bilyeu, PG, CHG, CGWP, QSD/QSP
Principal Hydrogeologist, Vice President
ErosBilyeu@hydro-geologic.com

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1

1. Identification of Responder

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

HYDRO-GEOLOGIC SOLUTIONS, INC. | FIRM PROFILE

FIRM SNAPSHOT

GROUNDWATER. WELLS. RECHARGE. SOLUTIONS.

TEAM

California Corporation | HQ • Newport Beach, CA
Serving California + Western US
Principal-led advantage — Senior-level execution
Est. 2025

CERTIFICATIONS & LICENSES

PG • CHG • QSD • QSP • CGWP • PE • Esq/JD • SWE CSW
Certified | SBE • WBE* • MBE (*In Progress)
40-Hour OSHA HAZWOPER • OSHA 30-Hour Construction

Team's Agency Experience | Sweetwater Authority • LADWP • EMWD • WRD • GSWC • Calleguas

CORE EXPERTISE

Groundwater Supply & Wells • Managed Aquifer Recharge (MAR) • Aquifer Storage and Recovery (ASR) • Hydrogeology • Hydrogeologic and Groundwater Modeling • SGMA Support • Public Affairs • Agency, Interested Parties & Community Engagement • Water Policy and Strategy • Water Transfers

Hydro-Geologic Solutions, Inc. provides specialized hydrogeologic, engineering, and groundwater management services throughout California. We focus on developing, managing, and protecting groundwater resources. Founded by two impassioned, hands-on principals—Eros Bilyeu, PG, CHG and Susan Kang, Esq.—to provide **collaborative, responsive, and technically driven groundwater solutions** for communities, utilities, and public agencies. Our team includes certified hydrogeologists (CHG), professional geologists (PG), and civil engineers/hydrologists (PE) who bring principal- and senior-level attention to the front line with clear, executive-level communication, strong relationships, work that earns trust. **Clients receive senior-level execution from kickoff through delivery.**

BRINGING THE BEST IDEAS & SOLUTIONS TO YOUR PROJECTS.

DELIVERING RESULTS THAT MATTER

- **25+** Agencies, Districts, and Cities Served
- **60+** Groundwater and Well Projects Delivered
- Single-Well Capacity up to **4,000 GPM**
- **20% to 40%** Capacity Restored on Well Rehabilitations
- **14,000 AFY** of Imported Surface Water Recharged/Stored
- Deep and Complex Well Designs Across Multiple Basins

HEADQUARTERS CONTACT INFORMATION:

Newport Beach | 2618 San Miguel Dr., #406 | Newport Beach, CA, 92660 | Tel: 949.274.4784

1. Company Background

Verdantas Inc. (Verdantas) is a nation-wide company specializing in engineering, planning, and science services to support their clients' sustainability, resiliency, and strategic infrastructure objectives. Verdantas has grown exponentially in the last five years through a blend of strategic acquisitions of over 35 outstanding companies across the United States and 9 within the West, including PBI, Surf 2 Snow, Civil West, CBEC, MHM, Colibri Ecological Consulting, PACE, and Leighton Consulting. With over 2,300 professionals, we work across industries to protect the environment, enhance communities, and integrate sustainable development into everyday business.

We are diversified within the water resources realm and provide planning and design services for distribution systems, drinking water treatment, water storage and pump station systems, well rehabilitation and new well development, wastewater collection systems, wastewater treatment, storm water management, integrated water resources management, water and wastewater system master planning, and flood management support.

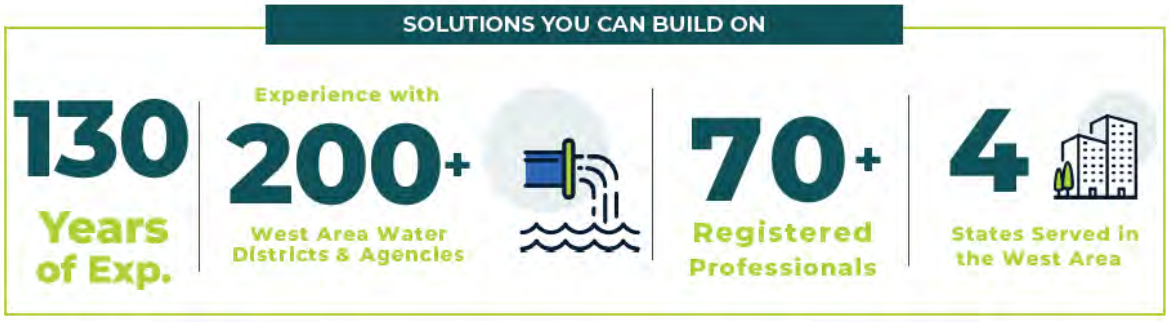
verdantas

History of Repeat Business

The true measure of a firm's quality of service comes in the form of repeat business.

More than 80% of annual services over the last ten years were from repeat business, who now receive the same level of specialized care and the additional benefits of the larger Verdantas team. In the last twenty years, our team has amassed multiple projects with many of our clients shown in the table below. These clients have come to trust us with their water infrastructure and water resource projects.

Karl Brustad, a founding principal of PBI and now an Assistant Vice President and West Area Water Market Sector Leader for Verdantas Inc., has more than 30 years of experience in the water industry, and is actively involved in project delivery. He ensures that his clients receive expert attention, high quality products, and outstanding client service. Our team has decades of experience delivering industry leading civil engineering design and consulting services that help our water clients move projects forward in support of our local communities.



WATER AGENCIES SERVED

State Agencies

- California Department of Water Resources
- California Water Service Company
- Metropolitan Water District of Southern California
- Southern California Edison
- Southern California Water Company

Inland Empire

- Alta Apple Valley Ranchos Water Company
- Basin Water Inc.
- Chino Basin Municipal Water District
- Chiriaco Summit Water District
- Coachella Valley Water District
- Corona Department of Water and Power
- Cucamonga Valley Water District
- Devore Water Company
- Eastern Municipal Water District
- Elsinore Valley Municipal Water District
- Indian Wells Valley Water District
- Joshua Basin Water District
- Mission Springs Water District
- Mojave Water Agency
- Myoma Dunes Mutual Water Company
- Rancho California Water District
- Riverside County Flood Control and Water Conservation District
- San Antonio Water Company
- San Bernardino County Department of Public Works
- San Bernardino County Special Districts
- Santa Rosa Regional Resources Authority
- Temescal Valley Water District
- Three Valleys Municipal Water District
- Valley County Water District
- Western Municipal Water District
- Western Riverside County Regional Wastewater Authority
- West Valley Water District
- Yucaipa Valley Water District

OC & LA

- Antelope Valley-East Kern Water Agency
- Calleguas Municipal Water district
- City of Corona, Department of Water and Power
- East Orange County Water District
- El Toro Water District
- Golden State Water Company
- Irvine Ranch Water District
- La Habra Heights County Water District
- Laguna Beach County Water District
- Liberty Utilities (Park Water) Corp.
- Los Angeles Department of Water and Power
- Meeks and Daley Water Company
- Moulton Niguel Water District
- Orange County Water District
- San Gabriel County Water District
- San Gabriel Valley Water Company
- San Gorgonio Pass Water Agency
- Sanitation Districts of Los Angeles County
- South Coast Water District
- South Orange County Wastewater Authority
- Trabuco Canyon Water District
- Ventura County Watershed Protection District
- Walnut Valley Water District
- Water Replenishment District of Southern California
- West Basin Municipal Water District
- Yorba Linda Water District

San Diego County

- Carlsbad Municipal Water District
- Encina Wastewater Authority
- Foothill Municipal Water District
- Helix Water District
- Leucadia Wastewater District
- Olivenhain Municipal Water District
- Otay Water District
- Padre Dam Municipal Water District
- Rainbow Municipal Water District
- Valley Center Municipal Water District

Firms Partnered with for Water Projects

- AECOM
- Albert A. Webb Associates
- Anser Advisory Management LLC
- Arcadis
- Ardurra Group Inc.
- Black & Veatch Corporation
- Cannon
- Carollo Engineers
- CASC Engineering and Consulting Inc.
- Civiltec Engineering Inc.
- Condon-Johnson & Associates Inc.
- Cora Construction
- Dewberry Engineers Inc.
- Dudek
- Hunsaker & Associates Irvine Inc.
- Hushmand Associates Inc.
- JLC Engineering and Consulting Inc.
- Kennedy/Jenks Consultants
- Kimley-Horn and Associates Inc.
- KOA Corporation
- Krieger & Stewart Inc.
- Michael Baker International
- Psomas
- R.C. Foster Corporation
- Reilly Construction Management Inc.
- Rick Engineering Company
- Southstar Engineering & Consulting Inc.
- Stantec Consulting Services Inc.
- Tetra Tech
- TRC Companies
- TKE Engineering Inc.
- Valley Construction Management
- Wallace & Associates Consulting Inc.

RESOURCE LOCATIONS

SOUTHERN CA OFFICES:
Irvine | Palm Desert | Rancho Cucamonga | San Diego | Santa Clarita | Temecula | Victorville

LABORATORIES:
San Diego | Temecula | Irvine

verdantas.com

2

2. Financial Relationships Disclosure

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

Financial Relationships Disclosure(s):

Hydro-Geologic Solutions, Inc. (HGS) and its proposed subconsultant, Verdantas, hereby state that there are no existing or past financial relationships (including, without limitation, consulting agreements, contracts, retainers, referral fees, gifts, loans, or other compensation arrangements) between HGS and/or Verdantas and any current Sweetwater Authority Governing Board member or Sweetwater Authority staff member, nor with entities for which such Board or staff members are employed or in which they have an interest, whether past or present.

If any potential conflict or reportable relationship is identified at any time prior to award or during performance, HGS and Verdantas will promptly disclose it to the Authority and take appropriate action consistent with the Authority's requirements.

3. Organization and Key Personnel

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

HYDRO-GEOLOGIC SOLUTIONS, INC. | LEADERSHIP + TEAM

SUSAN KANG, ESQ | PRESIDENT

714.299.0322 | Mobile
SusanKang@hydro-geologic.com

Susan has over 20 years of executive leadership and public service experience, including her role as Chief of Staff at the Orange County District Attorney's (OCDA) Office. Her background in legislative advocacy and public affairs includes decades of experience building consensus across political and community arenas. She has published over 8,000 press releases and has been quoted or placed stories on every major news outlets nationally. She played a pivotal leadership role in coordinating public engagement for one of California's most consequential environmental enforcement efforts, the OCDA MTBE litigation against major petroleum companies for contamination of the groundwater basin. This groundbreaking litigation, conducted in parallel with the Orange County Water District's (OCWD) case, advanced critical groundwater protections and helped shape recharge and remediation programs statewide. At Hydro-Geologic Solutions, Susan leads agency partnerships, public affairs, public and partner engagement, water policy and strategy, and grant administration support ensuring that complex groundwater programs are supported by clear communication, trusted relationships, and broad community understanding to drive successful groundwater management outcomes.

EROS BILYEU, PG, CHG, QSD, QSP, CGWP | HYDROGEOLOGIST

949.274.4784 | Direct 334.718.9789 | Mobile
ErosBilyeu@hydro-geologic.com

Eros is a California Certified Hydrogeologist with 18 years of expertise specializing in: well design and construction oversight; aquifer/high-resolution basin characterization; and 3-D conceptual/numerical groundwater-flow modeling in basin-fill, karst, and fractured-bedrock settings. He collaborates with federal, state, municipal, and defense/aerospace clients in California and nationally. He leads SGMA implementation (GSP programs) in groundwater basins, translating policy into engineered projects with measurable outcomes (e.g., recharge programs delivering 12,000+ AFY, municipal wells producing up to ~4,000 GPM, basin-wide conceptual models). He has managed/overseen 60+ well and groundwater projects in California and across the United States. His experience and projects span MAR/recharge basins, well siting/design, and construction management for all types of wells, groundwater and well assessments, groundwater management, and contaminant hydrogeology. His technical focus includes the design and installation of production, extraction, and ASR wells, multi-level/nested monitoring wells, and select horizontal wells. He integrates lithology, geophysics, aquifer testing, modeling, and water-quality datasets to evaluate groundwater resources and delineate the vertical and lateral distribution of contaminants (PFAS and other COCs).

VARINDER OBEROI, PE | ENGINEER / HYDROLOGIST

415.424.3009 | Mobile

Varinder is a civil engineer groundwater specialist with over 30 years of experience in groundwater resources management:

- analytical and numerical groundwater flow and fate-and-transport modeling; stratigraphic modeling;
- aquifer characterization, water-supply assessments, aquifer testing;
- supply and monitoring well siting and design, development of monitoring programs;
- SGMA support (water budgets, safe- and sustainable-yield determinations, sustainability indicators, minimum thresholds, and undesirable results); and
- dewatering assessments and design, and litigation support.

Varinder's work spans basins across California, including Orange County, Sylmar, San Fernando, Upper Santa Ana Valley, Santa Clara River, Owens Valley, Mid-Kaweah, Eastern San Joaquin, Livermore Valley, Downtown San Francisco, and Santa Clara Valley basins. He develops and refines local and regional groundwater models, often in GMS™, to inform decisions from project to basin scale. Recent work includes City of Lodi GSA, well-field optimization and siting for Cal Water, and quantitative analyses for LADWP (San Fernando and Sylmar Basins) and Inyo County (Owens Valley).

ANDREW KIETA, PG | GEOLOGIST

626.315.6832 | Mobile

Andrew is a Professional Geologist with 15 years of expertise in hydrogeologic, groundwater, and water-utility consulting, with expertise in well design and construction management of large-diameter municipal water-supply and monitoring wells. His responsibilities have also included well-database management, raw-water treatment, and well field management. He served four years as a hydrogeologist at Golden State Water Company. His skill set encompasses data management and analysis, well design, pump-efficiency testing, and hydrogeologic reporting. He has supported technical work for water wells and distribution systems for both municipal and private clients across California, Oregon, and Washington.

Andrew has contributed to a diverse range of well and groundwater projects and clients including: the Cities of Long Beach, Pasadena, Claremont, Pomona, Vacaville, and Elk Grove, Phillips 66, Sacramento Suburban Water District, Sacramento County Water Agency, Twentynine Palms Band of Mission Indians, Indio Water Authority, Rancho California Water District, California Water Service Company, Eastern Municipal Water District, Niagara Bottling LLC, Golden State Water Company; Olam Farms, Angus Petroleum, and Irvine Ranch Water District.

Key Personnel and Roles

HGS is a small women and minority owned business enterprise (SBE/MBE/WBE) hydrogeologic consulting firm that works best as an extension of an agency's operations team—responsive, practical, and principal-led with senior-level execution. For Sweetwater's Well Maintenance Program, the licensed professionals shown will be hands-on in the field evaluation, analysis, and reporting, supported by Verdantas for engineering/electrical inputs as needed. The chart below shows project roles, years of experience, lines of communication, and each key person's primary work location.

Hydro-Geologic Solutions, Inc.

Verdantas, Inc.

Principal-in-Charge
31 Years of Experience - Orange County, CA
Susan Kang, Esq.
President

Project Manager & Principal Hydrogeologist
18 Years of Experience - Orange County, CA
Eros Bilyeu, PG, CHG, QSD, CGWP
Vice President

Mechanical, Electrical, & Automation Engineer
27 Years of Experience - Luzerne, PA
A.J. Speicher, PE, LEED, PMP
Associate V.P. - Practice Lead
Mechanical/Electrical/Automation

Civil Engineer - QA/QC
34 Years of Experience - Santa Clara County, CA
Varinder Oberoi, PE
Principal Engineer/Hydrologist

Engineering Geologist
36 Years of Experience - San Diego County, CA
Robert Stroh, PG, CEG
Department Lead

Hydraulic Engineer
45 Years of Experience - Larimer County, CO
Robert Beccard, PE
Senior Consultant/Engineer

Geologist/Hydrogeologist
15 Years of Experience - Orange County, CA
Andrew Kieta, PG
Senior Hydrogeologist

Geologist/Engineer
Various Years of Experience - San Diego County, CA
Geologist/Engineer

Hydraulics & Modeling
30+ Years of Experience - Larimer County, CO
J.D. Leonard, CID
Senior Hydraulics and Modeling Specialist

Field Inspector
15+ Years of Experience - Orange County, CA
Principal & Senior Hydrogeologist

Electrical Engineer
28 Years of Experience - Allegheny County, PA
Troy Delzer, PE
Electrical Engineering Group Leader

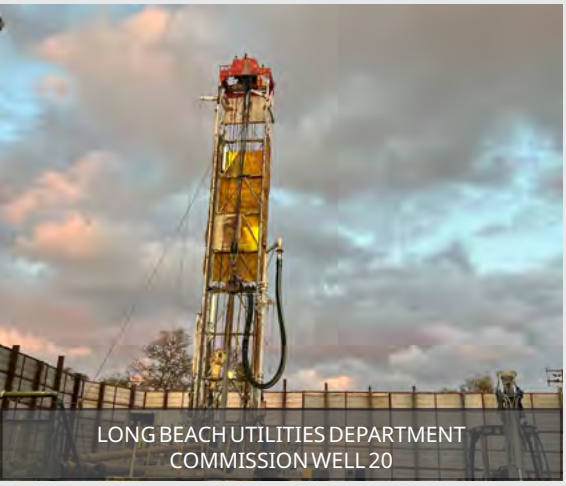
Electrical Engineer
36 Years of Experience - Allegheny County, PA
Corey Zachel, PE, LEED
Senior Electrical Engineer

Automation Specialist
27 Years of Experience - Luzerne County, PA
John Stachyra, CAP
Senior Automation Specialist

4. Qualifications and Experience

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

HYDRO-GEOLOGIC SOLUTIONS, INC. | PROFESSIONAL SERVICES


LONG BEACH UTILITIES DEPARTMENT
COMMISSION WELL 20

OUR SERVICES AND ABILITIES

- Potable Water System Planning
- Well Siting, Assessments, & Design
- **Well and Aquifer Testing**
- Plans and Specifications
- Bid Support
- Field Services & Well Construction Oversight
- Water Quality Sampling and Analysis
- Permitting and SGMA Compliance
- **Groundwater Management & Planning**
- Cost Estimating and Budgeting
- **Condition and Lifecycle Cost Analysis**
- Soil and Groundwater Assessments
- Fate and Transport
- Geophysical Data Analysis
- Dynamic Flow Profiling
- Tracer and Low Flow Profiling
- **Municipal, Agricultural & Industrial Wells**
- Monitoring Wells (Cluster & Nested)
- Aquifer Storage and Recovery Wells
- Vadose Zone and Recharge Wells
- **Injection, Desalter, and Dry Wells**
- **Well Rehabilitation and Optimization**
- Managed Aquifer Recharge
- Groundwater Banking
- Surface Water Transfers
- Water Accounting and Portfolios
- Hydrogeologic and Groundwater Modeling
- Grant Writing Assistance
- Water Rights Research
- Public Affairs and Engagement Strategy
- Interested Parties Engagement
- Water Policy Planning and Strategy
- Third-Party Technical Review
- Expert Witness Support

WHAT WE DO – HYDROGEOLOGY SERVICES

Hydro-Geologic Solutions, Inc. team's project experience and client base extend across California, the United States, and Puerto Rico, serving public agencies, utilities, private clients, and industries that rely on sound hydrogeologic analysis and engineering. Our team's clients include many of the largest municipal and regional water agencies, as well as private operators and firms, all of whom have trusted us to deliver technically rigorous and defensible results. Our past experience with innovative yet practical approaches has consistently produced success on technically challenging and time-sensitive projects.

Founded by two hands-on principals with decades of combined field and management experience, we are built on a simple premise: **flexibility, adaptability, collaboration, and delivering solutions that integrate strong technical, regulatory understanding, and real-world constructibility**. Our team of Certified Hydrogeologists (CHG), Professional Geologists (PG), and Civil Engineers (PE) partners with software experts and developers, and we leverage in-house analytical and AI-assisted tools to stay ahead of industry trends. By integrating AutoCAD Civil 3D, ESRI ArcGIS Pro, and advanced modeling software, our workflows streamline design and ensure the consistency and clarity that our clients depend on.

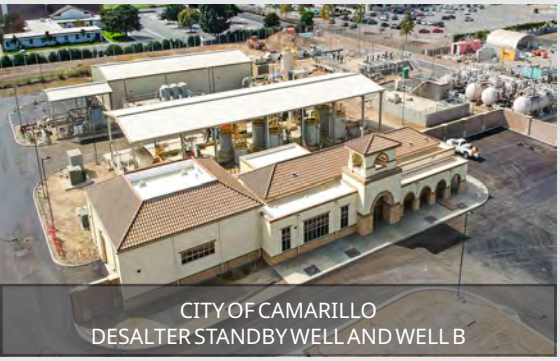
Fieldwork is a key component of our successful project delivery. Our professionals do more than oversee contractor operations—they actively participate, document , and optimize every stage of drilling, construction, and testing. **Our field geologists, hydrogeologists, and engineers possess a comprehensive knowledge of drilling methods, geophysical interpretation, and well design principles**, allowing us to make real-time adjustments that save budget and schedule. Our protocols emphasize drilling-fluid design, quality of materials, polymer and clay chemistry, and hydraulic performance, ensuring each well or borehole achieves its intended performance standards.

At Hydro-Geologic Solutions, we understand that technical success is only part of the equation. **We prioritize communication, responsiveness, and reliability**. Our deliverables are built for clarity, from intuitive figures and cross sections, to well-organized design and data packages. The result is a consulting team that brings technical excellence and integrity to every project.

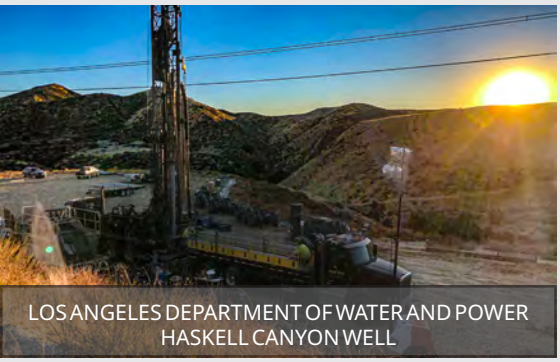
OUR PROJECT EXPERIENCE

Principal-led advantage - Senior-level execution

HYDRO-GEOLOGIC SOLUTIONS, INC. | GROUNDWATER SUPPLY & WELLS

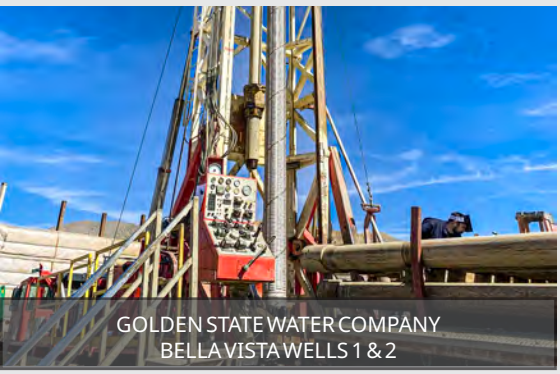


CITY OF CAMARILLO
DESALTER STANDBY WELL AND WELL B



LOS ANGELES DEPARTMENT OF WATER AND POWER
HASKELL CANYON WELL

EASTERN MUNICIPAL WATER DISTRICT
WELL 37



GOLDEN STATE WATER COMPANY
BELLA VISTA WELLS 1 & 2

WELL SITING, DESIGN, CONSTRUCTION MANAGEMENT, INSPECTION & TESTING

Hydro-Geologic Solutions, Inc. helps public agencies, utilities, communities, and engineering partners **plan and deliver groundwater supply and monitoring infrastructure projects**. **We combine impassioned, principal-led execution with program level discipline, delivering groundwater supply management and planning projects that perform in the field and earn regulatory confidence and public trust.**

We manage siting and exploratory drilling (including geophysics and pilot holes), develop complete well designs, drilling mud and development programs, produce specifications and bid packages, and provide submittal review, full-time inspection, and field observation/inspection. Our aim is sustainable yield, protecting water quality, and cost-efficient operation. **We integrate hydrogeologic data, field testing, and performance modeling to guide each phase**—from exploration through final design and commissioning.

WELL PERFORMANCE TESTING

We apply **practical, cost-effective well and aquifer performance testing, supported by analytical and numerical tools**, to **quantify aquifer parameters,** well capacity, and efficiency and to optimize wellfield operations. **We specialize in designing and interpreting step-drawdown and constant-rate pumping tests, including recovery and interference analyses,** as well as ambient/dynamic flow logging, tracer testing, low-flow profiling, and isolated zone testing. We use these results to diagnose well and water-quality limitations, inform pump sizing and well spacing, and establish data-driven operating limits and sustainable performance thresholds. The result is higher efficiency, specific capacity, optimized pumping rates, and wellfield programs that deliver long-term reliability at lower lifecycle cost.

WELL REHABILITATION & OPTIMIZATION

When production drops, we triage, treat, and tune. Our **hydrogeologists bring principal and senior level diagnostics to the front line** to restore capacity—camera surveys, spinner/flow meter profiling, pumping tests analysis, water quality, and mineral scaling and bacteriological review—isolate the drivers of specific capacity decline (biofouling, encrustation, sand production, seal failure, screen/casing damage). Our findings translate into a targeted rehabilitation plan rather than a boilerplate.

Treatment is tailored to the cause: mechanical redevelopment (brushing, swabbing, airlift/surge) paired with calibrated chemistry (disinfectants, acids/chelants, dispersants), plus repairs to screens, seals, or column where needed. We verify results with post-rehab testing to set an updated performance baseline and refine maintenance plans.

At the system scale, we refine pump sizing and controls, coordinate run-times to limit interference, and adjust drawdowns to curb energy use and wear on the pumps. The outcome is measurable capacity recovery, steadier drawdown, and a documented path to longer service life—grounded in data that agencies and their operators can trust.

WELL TYPES WE DELIVER

Hydro-Geologic Solutions sites, designs, and provides construction management and testing for municipal and industrial production wells · desalter, extraction · injection · standby wells · aquifer storage and recovery (ASR) wells · remedial wells · monitoring wells in single-casing, nested, and clustered configurations · horizontal wells · geothermal and hot springs wells · high-resolution scientific wells and systems including FLUTe™ liners and multilevel wells, Westbay™ multilevel wells, and Solinst Waterloo™ multilevel wells. **We have expertise in alluvial & sedimentary, fractured bedrock, and karst hydrogeological settings.**

HYDRO-GEOLOGIC SOLUTIONS | RELEVANT PROJECT EXPERIENCE

Hydro-Geologic Solutions, Inc. is dedicated to the assessment, protection, and sustainable development of groundwater resources in California. Our services include **groundwater management and planning**, municipal well design and construction support, **hydrogeologic studies**, conjunctive use programs, **monitoring programs**, and regulatory support.

Our production wells incorporate the design components and methods that we have implemented on many highly successful and efficient production wells. We are also **well forensic experts**, allowing us to design cost effective and successful well rehabilitation programs that restore yield, improve water quality, and reduce sand production.

Our team has provided hydrogeologic services to more than 25 communities, cities, counties, water districts and agencies in California. Our hydrogeologists and geologists are California groundwater resources and municipal and groundwater well experts. We have been delivering successful projects to our clients in California since the 1990s.

GOLDEN STATE WATER COMPANY – BELLA VISTA WELLS NO. 1 AND 2

Morongo Valley, CA - (2022 through 2025) (See GSWC Below for Contact)

From 2022 through 2025 Eros Bilyeu and Andrew Kieta, then at another firm, performed hydrogeologic evaluations to support the well siting, design, permitting, and construction of new replacement potable supply well—Bella Vista No. 2— and the destruction of Bella Vista No. 1 using shot perforation method. The work included review of existing subsurface and well-performance data, preliminary and final design of the well, and development of the plans and specification for the drilling and testing program, which included characterizing site-specific aquifer conditions, evaluating downhole geophysical data, isolated aquifer zone testing, water quality, and mass balance calculation. The team successfully designed the well to optimize production efficiency and minimize poor groundwater quality. The final design matched the preliminary design assumptions. Data collected during drilling were integrated with geophysical logs, and step-drawdown and constant rate aquifer testing to maximize the yield and performance capabilities of the well. The resulting production well demonstrated a performance three times greater than the design capacity and expected water quality, confirming the effectiveness of the design approach and construction oversight.

WELL ASSESSMENT & PERFORMANCE ANALYSIS + WELL SITING + PLANNING AND DESIGN

LONG BEACH UTILITIES DEPARTMENT – WELL COMMISSION 20 REHABILITATION

Long Beach, California

From 2023 to 2025, Eros Bilyeu, then at another firm, provided hydrogeologic consulting services that directly align with Sweetwater Authority's Well Maintenance Program needs, including: rehabilitation assessment; development of bid-package requirements and test plans for step-drawdown and constant-rate pumping (with extended drawdown and recovery monitoring); discharge conveyance/containment concepts to support disposal requirements; and aquifer testing using nearby production/monitoring wells as observation wells to refine aquifer parameters.

We supported the field effort with mechanical and operational recommendations and pump design review, then used drawdown/recovery data from multiple observation wells to estimate aquifer transmissivity and storativity—key parameters used to calibrate planning-level evaluations and optimize wellfield operations. Deliverables translated test results into operating guidance (target flow rates, allowable drawdown, startup practices, and performance benchmarks) and document measurable rehabilitation outcomes, including specific-capacity improvement on the order of 200% at approximately 1,250 gpm—providing quantitative aquifer performance data to inform ongoing water-supply planning and preventive maintenance.

2023 through 2025

Leela Stevens, Civil Engineer - (leela.stevens@lbwater.org)

Long Beach Utilities Department

WELL REHABILITATION + WELL PERFORMANCE ANALYSIS + AQUIFER TESTING

GOLDEN STATE WATER COMPANY – CAPITAL IMPROVEMENT PROGRAM SUPPLY WELL ASSESSMENTS

Northern and Southern, California

In 2023, Golden State Water Company (GSWC) worked with Eros Bilyeu and Andrew Kieta, then with another firm, to perform condition assessments for 12 and 16 municipal supply wells, respectively, spanning 18 water systems across Regions I, II, and III. GSWC's objective was to better understand well and basin conditions and to receive practical recommendations to maintain a high-quality, reliable groundwater supply for its customers.

We completed a hydrogeologic study for each water system, integrating publicly available basin information with GSWC-provided records and well-specific field data. Work included collection and review of groundwater quality results, production and operating records, well construction and drilling logs, pump-setting information, and downhole video inspections. During the desktop review, we coordinated closely with GSWC operators to document system-specific operating practices and identify observed performance issues.

We then performed site visits at each well facility and conducted well performance testing to confirm operating conditions and quantify performance. Findings were synthesized to characterize historical and current basin conditions (groundwater levels and quality), evaluate each well's ability to meet GSWC performance objectives, and estimate remaining useful service life in the context of both capacity and water-quality constraints.

Where risk of declining performance or future replacement was indicated, we also evaluated feasible replacement-well opportunities, screening candidate locations for regulatory offset feasibility, the likelihood of meeting production and water-quality targets, and proximity to existing GSWC infrastructure to reduce overall capital costs for future well replacement projects.

2022 through 2023

Toby Moore

Water Resources Manager/Chief Hydrogeologist

toby.moore@gswater.com

Golden State Water Company

WELL FIELD ASSESSMENT + WATER QUALITY ASSESSMENT + REHAB/REPLACEMENT PROGRAM

GOLDEN STATE WATER COMPANY – GENERAL RATE CASE WELL CONDITION ASSESSMENT

Statewide, California

In 2019 and again in 2023, Andrew Kieta (with GSWC and another firm) conducted a comprehensive condition assessment of water supply wells across California in support of a general rate case proceeding. Scope of work included review of historical water level, production, and specific capacity data; documentation of well modifications; downhole video inspections; water quality analysis; construction review; age and condition evaluation; preliminary site assessments; and evaluation of current treatment infrastructure. Performed cost analysis for rehabilitation and replacement options to inform infrastructure investment recommendations. Developed recommendations for rehabilitation versus replacement based on cost-benefit comparison, potential for returning wells to desired production rates, and constructability factors including site space constraints. Produced individual well assessment reports with findings and recommendations. Deliverables were prepared to withstand rigorous regulatory scrutiny and support the client's rate case infrastructure investment strategy.

Work products included well-by-well condition summaries suitable for internal planning and external submittals, identification of key data gaps requiring follow-up investigation, and practical near-term operational recommendations to reduce performance risk prior to major capital work. The effort also supported development of defensible capital prioritization by tying recommended actions to observed condition, reliability impacts, and documented performance trends across systems.

2019 through 2023

Toby Moore

Water Resources Manager/Chief Hydrogeologist

toby.moore@gswater.com

Golden State Water Company

HISTORICAL DATA EVALUATION + REDEVELOPMENT AND REPLACEMENT PRIORITIZATION

TACOMA PUBLIC UTILITIES – SOUTH BANK WELLFIELD ASSESSMENT

Toledo, WA

Andrew (then with another firm) provided comprehensive hydrogeologic consulting services to support wellfield characterization and operational optimization. Scope of work included historical subsurface condition assessment and video documentation of nine wells to establish baseline conditions. Conducted short-term constant-rate aquifer pumping tests on seven of nine wells, utilizing both monitoring and active wells as observation points to collect drawdown and recovery data. Designed and implemented a discharge conveyance and containment concept appropriate for site conditions. Assessed existing pumping equipment to inform infrastructure recommendations. Aquifer testing yielded critical parameters—storativity and transmissivity—used to estimate aquifer properties, model groundwater conditions, and optimize wellfield operations. These hydrogeologic data directly informed wellfield management approach and long-term operational decision-making.

Work products included well-by-well baseline condition summaries and test result packages that supported near-term maintenance planning and longer-term capital prioritization. Findings were synthesized to identify performance-limiting factors (e.g., efficiency loss, interference effects, and operational constraints) and to recommend practical operating ranges and monitoring approaches to reduce reliability risk. The assessment also supported development of follow-on actions, including targeted data gap closure and refinement of future testing/monitoring protocols to improve comparability of results over time and strengthen wellfield management decisions.

2023 through 2025

Seth Doull, Principal Civil Engineer, Tacoma Public Utilities

sdoull@cityoftacoma.org

WELL FIELD ASSESSMENT + PUMPING TEST ANALYSIS + HYDROGEOLOGIC DATA ANALYSIS

3. Relevant Experience

Current and Past Project Examples

Successful approaches breed successful projects, and our extensive water infrastructure design experience has allowed us to identify and implement proven approaches. Through our past and current projects and extensive list of successfully completed projects for various clients over the past 100+ years, our team continues to show that our project management approach and technical capabilities allow us to meet our clients' expectations.

The table on the next several pages shows some of our current and past water related.

Client	Project	Description
WELLS		
California American Water	Well Rehabilitation Program	Annual well rehab program for 115+ groundwater supply wells
	Cottage Way Well	Below and above ground improvements for a new well site
	Dunnigan System Well	Improvement plans for equipping a newly constructed well
	Fruitridge Vista Well 14	Above ground improvements to rehabilitate an existing well
	Roseville Road Well	New above ground equipment and modifications to existing equipment for new well
	Countryside Well	Improvements to above and below ground well equipment
	Hurley Way Well	Above ground improvements for new well site
	Lincoln Oaks Oakberry Well	Well site rehabilitation to construct TCE treatment system
	Suburban-Rosemont Well Siting Study	Study to identify suitable locations for new wells
Placer County Water Agency	Middle Meadows Campground	Siting and design of new well
Sacramento Suburban Water District	Well 41 Iris/Albatross	Providing construction phase services for Well 41
	Well N10 Walnut Pump Replacement	Developing bid documents for converting the well to a vertical turbine pump
	Well N30 Condition Assessment	Condition assessment of existing well for water quality issues
El Dorado Irrigation District	Silver Lake Campground	Siting and design of new well
	TKWC Well 4	Siting and design of new 2,000gpm well
	COV Wells 18, 19, and 20	Design of 3 new wells with capacities of 800gpm and 2000gpm, respectively
PIPELINES		
California American Water	2021 Backyard Main Replacement	15,500 feet of new water mains and 330 service laterals
	Larkfield Pipelines	2,500 feet of new water mains and 50 service laterals
	Bradshaw Road Pipeline	1,400 feet of 12 inch transmission main pipeline
	Elverta Road Bridge Pipeline	Design of pipeline across new bridge
	Isleton Distribution System Improvements	Design of new pipelines and water service connections through levee
	2020 Priority Mains Replacement	13,500 feet of new water mains
	Vista Burns Backyard Main Replacement	13,700 feet of new front yard water mains
	Geyserville Water Main Replacement	11,000 LF of new 12-inch and 8-inch water mains
	Fruitridge Vista 5-year Meter Program	Master plan and design for installation of over 3,500 new meters
	Lower Wikiup Pipeline	900 linear feet of water pipeline in narrow right of way
Browns Valley Irrigation District	Sicard Pipeline	10 miles of cross-country water main
	Highway 20 Pipeline Realignment	5,600 feet of pipeline including three cased highway crossings
Placer County Water Agency	Electric Street Pipeline	3,500 feet of cross-country pipeline
	Dutch Flat Mutual Consolidation	2 miles of distribution pipe replacement
	Keena Bell Pipeline	2,100 feet of new pipeline
	Channel Hill Pipeline Improvements	1,200 feet of new water mains
	Red Ravine Siphon Project	1,000 feet of 24 inch raw water main
	Ophir Pipeline Extension	2,200 feet of water transmission main
	Covey Road Pipeline Replacement	650 feet of new 12 inch pipeline
	Loomis Basin Pipeline	Design of 14 repairs to existing 24 inch water pipeline
Calaveras County Water District	Highway 26 Transmission Line	7,300 feet of 12 inch water main
	Copper Cove Water System Improvements	2.5 miles of 20 inch transmission main and 3 miles of 12 inch mains
Northern California Tribe	Water Supply Project	7 miles of transmission mains
City of Roseville	Water Line Relocation for I-80 Auxiliary Lanes	Design of relocation plans for 3 conflicting water lines
	Transmission Mains Evaluation	Evaluation of all transmission mains within the City
City of Sacramento	Tahoe Park and Little Pocket Area Backyard Main Replacement	9 miles of distribution pipe replacement
City of Stockton	North Stockton Pipelines	Two parallel 5 mile cross-country mains for both water and sewer

WATER TREATMENT PLANTS		
Calaveras County Water District	Jenny Lind WTP Expansion	1 mgd treatment capacity increase
	Jenny Lind WTP Pretreatment	6 mgd clarification/sedimentation facility
Golden State Water Co.	Coloma WTP	Improvements for filter backwash process
Placer County Water Agency	Alta WTP Expansion	150 gpm treatment capacity increase
	Bowman WTP Solids Handling	Solids drying beds
	Monte Vista WTP	New backwash and filter to waste recovery system
	Auburn WTP	8 mgd water treatment plant
	Foothill WTP Filter Rehabilitation	Replaced filter media and underdrains for 15 MG WTP
	Applegate WTP	New backwash and filter to waste recovery system
	Colfax WTP	New backwash and filter to waste recovery system
	Alta WTP	New backwash and filter to waste recovery system
California American Water	Larkfield WTP	Design and CM for a new arsenic treatment system
Amador Water Agency	Ione WTP Expansion	1,000 gpm treatment capacity increase
	Ione WTP Solids Handling	Backwash waste treatment
	Tanner WTP Solids Handling	Backwash waste treatment
	Buckhorn WTP Solids Handling	Solids drying beds
Turlock Irrigation District	Regional Surface Water Supply Project	65 mgd water treatment plant
Yuba City	Yuba City WTP Expansion	15 mgd treatment capacity increase

WELL REHABILITATION AND NEW WELL DEVELOPMENT

Cal Am Well Site Condition Assessments

California American Water (Cal Am) | Fred Feizollahi, Engineering Manager (retired) | 4701 Beloit Drive, Sacramento, CA 95838 |

Our team completed California American Water's (Cal Am) well site condition assessment for their Sacramento District. This project included condition assessments for all 115 groundwater supply wells for their Sacramento District. The assessments included all above ground improvements including review of hydrogeologic performance of each well. Recommended improvements along with cost estimates for both above and below ground were developed for each well site. Anticipated life expectancies for each well were developed and utilized to support our future Well Rehab and Replacement Master Plan for Cal Am's Sacramento District.

Cal Am New Well Sites

California American Water (Cal Am) | Charlie Wolfe, Senior Project Manager | 4701 Beloit Drive, Sacramento, CA 95838 | (916) 291-8047 | charlie.wolfe@amwater.com

Our team has been assisting California American Water (Cal Am) with the planning, design, and equipping of existing and new potable water wells for almost 20 years. Recently completed three new well site projects for Cal Am: Cottage Way Well, Fruitridge Vista Well 14, and the Dunnigan Well, all within their Sacramento District. Currently working with Cal Am on six new well projects: West La Loma 2 Well in Rancho Cordova, Contempo Drive Well in Sacramento, White Rock Road Well in Rancho Cordova, Hurley Way Well in Sacramento, Bell Street Well in Sacramento, and Larkfield Well in Sonoma County. Involved in all aspects of these new well projects from well siting, planning, design, permitting, easement acquisition, bidding support, and construction support services.

The Phase I scopes include topographic survey, site plan, plan and profile design drawings for the water, storm drain, and sewer service connections to the existing utility systems, and permitting with the local planning and building agency for right-of-way and site improvements.

Phase II will address the above ground improvements necessary to complete the design and construct and equip the well for operation. Phase II includes the design of groundwater treatment, chemical feed systems, hydropneumatic storage tanks, pumps, motors, and related appurtenances, electrical and controls, perimeter walls and fencing with automatic slide gates, site paving and landscaping.

Verdantas supports Cal Am throughout the bidding period and provides engineering services during construction. These services include reviewing submittals and requests for information (RFIs), preparing design revisions, reviewing change order requests and payment applications, leading construction progress meetings with Cal Am and contractor, and preparing the record drawings. Verdantas provides oversight for subconsultant inspections, including general inspections, special inspections and materials testing.

Tahoe Keys Water Company Well and Tank Project

Tahoe Keys Water Company (TKWC) | Jennifer Lukins, Water System Manager | 356 Ala Wai Boulevard, South Lake Tahoe, CA 96150 | (530) 542-6444 | jennifer@lth2o.com

TKWC is implementing a new water production well in conjunction with a new tank and booster pump station (BPS) to improve the capacity and operational flexibility of their system. The project is needed to replace capacity lost due to contamination at their existing wells. The expectations for the project will allow TKWC to meet their peak demands in summer without having to rely on their interties with neighboring agencies, improve fire flow (FF) availability, and maintain water quality standards during the low demands of winter.

Project Description: Verdantas is currently providing engineering design service for the development of a new production well, including an architecturally friendly building that will blend into the existing community. This effort will include the design of the well pump and all above ground facilities to provide a complete and operational production well. In addition to the production well, Verdantas is providing the design of a water storage tank and associated booster pump station facilities including a backup generator and approximately 7,500 lineal feet of water main improvements.

Efforts completed to date, include site selection analysis, expedited design and construction of two monitoring wells necessary for water quality confirmation, water production capabilities and complete water quality profile. The production well design is complete and was designed to target the aquifer that did not require treatment and produces 2,000-gpm. The well site work will include underground utilities, buildings, above ground utilities, site grading, driveway, generator, control room with panels, chemical feed, and SCADA.

To meet the aggressive schedule the well drilling will be constructed in advance of the above ground improvements and the pipeline improvements will be constructed simultaneously with the production well facilities. The proposed storage tank will be a welded steel 700,000-gallon storage tank equipped with a 2,500-gpm pump station and will follow the well facility construction. The proposed pump station building will house four pumps, an electrical control room, and a chemical room ensuring efficient operation and management of the water distribution system.

Gold Village Well Site and Water System Improvements Project

County of Yuba | Kevin Perkins, Principal Planner | (530) 749-5470

The Yuba County Gold Village Wells project is an ongoing initiative aimed at developing a redundant water source for the community of Gold Village/River Highlands. The project is funded through the Small Community Drought Relief Program and aims to provide a clean and reliable water source to the community while improving the existing water system.
Verdantas provided well investigation and testing for four wells. A feasibility study was developed to assess the ability to provide a new, sustainable source of water to supplement the existing groundwater sources. Project includes designing a new 37’ diameter by 35’ tall potable water tank with a useable volume of approximately 255,000 gallons. Design includes site grading, drainage, electrical, SCADA, pipework and appurtenances, foundation, access road improvement, fencing, paved parking area, and obtaining all permits.

Well Rehabilitation Master Plan, Master Plan Update, Program Management and Construction Management

California American Water (Cal Am) | Deana Donohue, Former Engineering Manager | 4701 Beloit Drive, Sacramento, CA 95838 | (916) 799-0754 | deana.donohue@myriadeng.com

Verdantas developed a long-term and sustainable program that included routine well maintenance, rehabilitation for the 115 wells that are owned and operated by Cal-Am's Sacramento District. The well rehabilitation program's goal was to increase the performance and efficiency of existing well sites and repair and incorporate off-line well sites back into the associated systems. Condition assessments were performed for the above and below grade conditions at the well sites and necessary repairs and improvements were identified. Below ground conditions were assessed to identify areas of improvement to increase pumping capabilities and to maintain well efficiencies and water quality. To prioritize the below ground improvements, Verdantas utilized historical pump efficiency tests, water quality, and specific capacity analysis to create an assessment of each well. The wells were then separated into lead and backup classifications and a well rehabilitation frequencies plan for below ground improvements was created in accordance with the well classifications. This included identification of required below-ground well work, design of well modifications, cost estimating, inspection services, and construction management.

Verdantas assessed and documented above grade conditions at well sites and identified necessary repairs and improvements needed. Visual inspections were completed for each site in order to evaluate the condition of the mechanical equipment, chemical feed system, electrical equipment, SCADA equipment, site security, buildings, asphalt, concrete, tanks, and landscaping. Site improvements included new hydro-pneumatic tanks, replacement coatings for tanks and piping, new electrical panels and controls, and site surfacing. Complete photo documentation was compiled for each site along with equipment specifications. The final report included a prioritized list of recommended improvements for all sites along with site specific budgetary level cost estimates.

Our team served as the program manager for this long-term project and annually developed contract documents for the two categories of projects: well sustainability (above ground improvements) and well rehabilitation (below ground improvements). Design services included: preparation of plans and specifications for well site upgrades, including civil, mechanical, structural, and electrical and control improvements; permitting support with State and local agencies; bid support and engineering services during construction. Verdantas prepared detailed construction schedules to complete rehabilitation of the highest priority wells and provided construction management and planning services for the various well rehabilitation projects.

Verdantas coordinated with operations staff, so improvements did not impact ability to meet water supply demands of existing customers. Coordination of multiple concurrent projects being performed by multiple contractors at various locations. Typically, managed construction improvements at 10 to 14 different well sites annually. These challenges were overcome by constant communication with project team members, detailed project schedules, bi-weekly meetings at Cal Am's office and detailed budget tracking spreadsheets.

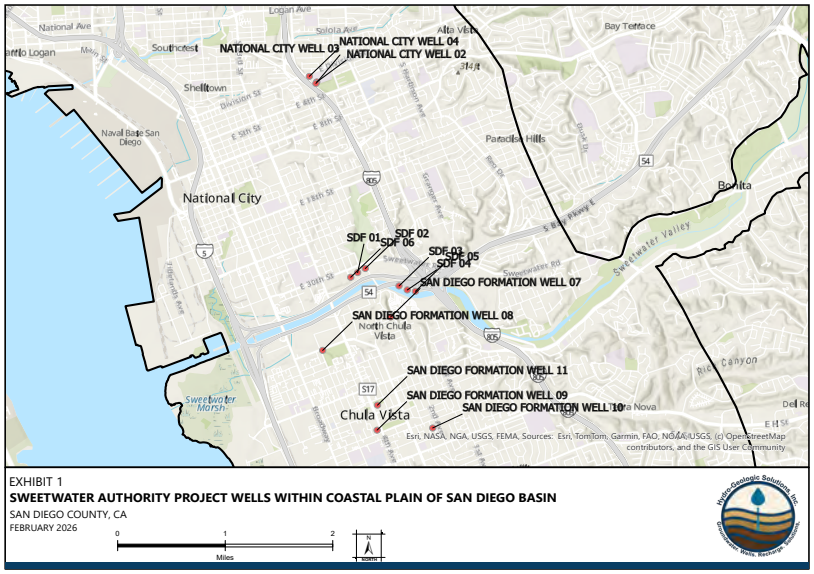
5. Approach

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

Technical Approach and Scope

Project Understanding

Hydro-Geologic Solutions recognizes that the Sweetwater Authority's Well Rehabilitation and Maintenance Program represents a foundational investment, not just in individual well condition, but in the long-term reliability of the Authority's most dependable supply source. Groundwater from the National City Wells and the Reynolds Desalination Facility wells currently supplies approximately 80 to 85 percent of the Authority's demand, making systematic program development a supply-critical undertaking that cannot afford gaps in data, logic, or documentation.



The Authority's 13-well fleet spans nearly seven decades of construction history, from NC Well #2 backup well (1957) to the most recent SDF wells completed in 2016, whose construction was supported by our project manager at their prior firm. This generational spread means the wellfield presents not one condition profile, but several, each with distinct deterioration mechanisms, remaining service life trajectories, and rehabilitation cost implications. NC Well #2, now operating in standby, and the five original SDF wells (1998), each with relatively short screen intervals and now approaching three decades of continuous service in a brackish formation, represent the most time-sensitive assessment priorities. The 2016-generation SDF wells, by contrast, are early in their service life but benefit from longer screen lengths and more modern construction methods, and a program should account for well stratification. Our approach is designed to leverage and organize existing information first (i.e., well construction logs, historical pump test records, operational data, maintenance history, and water quality results), before any field assessments are conducted. Front-end data compilation and QA/QC allows field visits to be targeted and efficient, resulting in performance baselines grounded in historical trends rather than single-point observations, and produces datasets immediately usable for well-by-well prioritization and multi-year budget planning.

HGS will deliver a program built on three integrated products: (1) well-by-well condition assessments with evidence-based rehabilitation prioritization tied to observed performance trends, remaining service life estimates, and deferred maintenance risk; (2) a preventive maintenance program with standardized inspection procedures, checklists, and SOPs designed for practical implementation by Authority field staff; and (3) a multi-year capital budget framework projecting rehabilitation and replacement costs through the planning horizon,

Project Challenges

Developing a structured, durable rehabilitation program across a well field this size and age range presents several predictable challenges. Our experience has shown that the following factors most commonly affect program quality and schedule; we will mitigate each proactively:

CHALLENGE
Multi-Generational Well Field with Divergent Risk Profiles

Thirteen wells spanning 1957 to 2016 present fundamentally different condition trajectories, failure modes, and remaining service lives. The Authority's own supply data shows NC Wells producing below rated capacity on average, a signal that warrants systematic investigation. Building a prioritization framework that correctly differentiates near-term rehabilitation urgency from long-term capital planning requires well-by-well performance analysis, not template checklists applied across your well field. Our approach establishes performance baselines first, then prioritizes wells based on evidence.

CHALLENGE
Records Consolidations and Baseline Performance

Wells installed across seven decades exist in varying record formats, and consolidating construction logs, historical pump test results, operational data, and maintenance histories into a single traceable framework is not an administrative task. Front-loading this at project initiation is essential: a program built on incomplete or unverified baselines may produce unreliable prioritization and cost estimates. We treat records consolidation as a technical deliverable, not background work.

CHALLENGE
Operational Coordination

The Authority cannot simultaneously take all 12 active wells offline for assessment. Field visit scheduling must be coordinated around pumping operations, particularly for the SDF wells feeding the Reynolds Desalination Facility, where interruptions directly affect treatment throughput. Our approach involves early coordination with Authority operations staff to develop a field access plan that sequences site visits around production requirements without compromising assessment quality or schedule.

These challenges will be addressed proactively through early coordination with Authority and the operators by applying a structured, task-based workflow with clear milestones and QA/QC.

Technical Approach

Hydro-Geologic Solutions will implement a structured, task-based approach that recognizes the Well Rehabilitation and Maintenance Program as a program-building exercise, not simply a condition survey. The distinction matters: our deliverables will be technically sound, operationally practical, and durable enough to guide the Authority's capital planning and field operations for years beyond project closeout. To achieve this, we will front-load data acquisition and coordination upon notice-to-proceed, establishing well-by-well performance baselines from historical records before field assessments begin, so field observations measure any performance changes throughout the project, not just current condition. We will apply consistent QA/QC protocols across all data sources, field observations, and deliverables to ensure the final program is traceable, complete, and ready for implementation without qualification. We will maintain active communication with the Authority throughout execution, including progress reporting, milestone check-ins, and a draft review meeting prior to final program submission. Verdantas will provide licensed PE-level electrical, controls, and mechanical engineering support for pump and motor assessment components, ensuring the program addresses both the hydrogeologic and electromechanical dimensions of well condition and rehabilitation planning.

Scope of Services

HGS will execute the Well Rehabilitation and Maintenance Program across four integrated tasks: data collection and project coordination (Task 1), field assessments and condition evaluation (Task 2), rehabilitation planning, maintenance strategy, and program development (Task 3), and final program preparation and delivery (Task 4). Tasks build directly on the previous tasks, resulting in sound field observations grounded in verified records, rehabilitation recommendations grounded in field data, and a final program that reflects the Authority's actual operational environment, not a generic template.

Task 1 | Data Collection, Review, and Project Coordination

Data Collection, Review, and Project Coordination

Task 1 establishes the informational foundation on which all subsequent field assessment, rehabilitation planning, and program development depends. The quality of the final program is directly proportional to the completeness and organization of the data compiled here — and we treat this task accordingly.

Kickoff Meeting and Communication Protocols. Upon notice-to-proceed, HGS will schedule and facilitate a kick-off meeting with Authority staff to confirm scope expectations, establish communication protocols, identify key staff contacts for each well site, and align on data delivery formats and schedule milestones.

Exhibit 2: Confirming existing infrastructure at a well head in Long Beach.

We come prepared with a data request list and draft project schedule, so the kickoff meeting produces decisions. We will use this meeting to identify any constraints on well access or operations that should be incorporated into the field assessment sequencing developed under Task 2.

SWEETWATER AUTHORITY — WELLFIELD SUMMARY MATRIX

Task 1 Deliverable | Data Collection, Review & Project Coordination | Hydro-Geologic Solutions, Inc.

Well ID	Well Group	Water Type	Year Constructed	Well Age (2026)	Operational Status	Approx. Well Depth (ft)	Pump Type	Rated Pump Capacity (gpm)	Screen Length (ft)	Pump Stages	Last Known Specific Capacity (gpm/ft ddn)	Last Rehab / Maintenance Event	Priority Flag / Notes
NATIONAL CITY WELLS — Fresh Groundwater / Direct Distribution (Chloramination Only)													
NC Well #2	National City	Fresh	1957	69	Standby	807	Turbine	600	53	4	TBC*	TBC*	⚠ Highest Priority — 69 yrs; oldest in wellfield
NC Well #3	National City	Fresh	1983	43	Active	810	Turbine	700	100	4	TBC*	TBC*	Moderate — 43 yrs
NC Well #4	National City	Fresh	2003	23	Active	690	Turbine	750	250	7	TBC*	TBC*	Lower — 23 yrs
SDF WELLS — Brackish Groundwater / Reynolds Desalination Facility (Richard A. Reynolds Groundwater Desalination Facility, Chula Vista)													
SDF #1	SDF	Brackish	1998	28	Active	710	Turbine	900	142	9	TBC*	TBC*	⚠ High Priority — 28 yrs; short screen; brackish env.
SDF #2	SDF	Brackish	1998	28	Demolished	—	—	—	—	—	N/A	N/A	Demolished — exclude from program
SDF #3	SDF	Brackish	1998	28	Active	760	Turbine	800	205	7	TBC*	TBC*	⚠ High Priority — 28 yrs; brackish env.
SDF #4	SDF	Brackish	1998	28	Active	606	Turbine	800	134	7	TBC*	TBC*	⚠ High Priority — 28 yrs; short screen; brackish env.
SDF #5	SDF	Brackish	1998	28	Active	460	Turbine	500	81	4	TBC*	TBC*	⚠ Highest Priority — 28 yrs; shortest screen (81 ft)
SDF #6	SDF	Brackish	2004	22	Active	790	Turbine	1200	440	1	TBC*	TBC*	Moderate — 22 yrs
SDF #7	SDF	Brackish	2016	10	Active	900	Turbine	1500	540	1	TBC*	TBC*	Lower — 10 yrs
SDF #8	SDF	Brackish	2016	10	Active	920	Turbine	1500	355	1	TBC*	TBC*	Lower — 10 yrs
SDF #9	SDF	Brackish	2016	10	Active	1010	Turbine	1500	610	1	TBC*	TBC*	Lower — 10 yrs
SDF #10	SDF	Brackish	2016	10	Active	860	Turbine	900	550	7	TBC*	TBC*	Lower — 10 yrs
SDF #11	SDF	Brackish	2016	10	Active	950	Turbine	1500	610	1	TBC*	TBC*	Lower — 10 yrs
WELLFIELD TOTALS / SUMMARY					12 Active / 1 Standby / 1 Demolished	460–1,010 ft	All Turbine	13150	4070	—	TBC*	TBC*	SDF #2 excluded (demolished)

**TBC = To Be Confirmed during Task 1 records collection and review. Specific capacity and maintenance history will be populated from Authority records and staff interviews. Source: Exhibit A – Sweetwater Authority Groundwater Well Information; Exhibit B – 2023 Water Resources Master Plan.*

Exhibit 3: Example of HGS field summary matrix based on Sweetwater Authority's Well Data.

Records Collection and Structured Review. HGS will collect and organize all available well documentation provided by the Authority, including well construction logs, driller's reports, pump installation records, historical performance data (pumping rates, static and pumping water levels, specific capacity test results), water quality monitoring records, electrical and mechanical equipment information, and any prior maintenance or rehabilitation records. These records will be compiled into a well-by-well data inventory and reviewed systematically to establish individual performance baselines, identify data gaps, and flag wells where available information is insufficient to support assessment without supplemental field investigation. For the oldest wells in the wellfield—NC Well #2 (1957) and NC Well #3 (1983) — records may span multiple formats and record-keeping eras; our review process is designed to accommodate this and produce a consistent, traceable baseline regardless of source format.

The records review will produce a well field summary matrix that tabulates key parameters across all 13 wells (e.g., construction year, depth, pump type, rated capacity, screen length and interval, last known specific capacity, and maintenance history) providing the Authority with a single-source reference document that does not currently exist in consolidated form. This matrix will serve as the backbone of the prioritization framework developed in Task 3.

Data Collection, Review, and Project Coordination

Operational History and Staff Interviews. The well record tells part of the story. Authority operations staff know the rest, which wells trip breakers, have been difficult to maintain, run below setpoint, and what workarounds have developed over time. HGS will conduct structured interviews with Authority operations and engineering staff to capture this institutional knowledge and incorporate it into the assessment framework. Observations that don't appear in formal records often represent the most diagnostically significant data points in a condition assessment.

Project Management and Progress Meetings. HGS will maintain an active project schedule throughout execution, with milestone tracking, monthly status updates, and documented communication logs. We will hold progress meetings at key milestones; following records review completion, following field assessments, and prior to final program submittal, to confirm direction, surface any scope questions early, and ensure the Authority's feedback is incorporated before deliverables are finalized. All schedule changes will be communicated proactively and documented in writing.

Task 1 Deliverables:

- **Wellfield data inventory and baseline performance matrix (all 13 wells)**
- **Records gap summary identifying wells requiring supplemental field investigation**
- **Draft project schedule with milestones through Task 4 final submittal**
- **Kickoff meeting summary and communication log**

Exhibit 4: PLC panel inspection at a well head in Long Beach.

Task 2 | Field Assessments and Condition Evaluation

Field Assessments and Condition Evaluation

Task 2 translates the records baseline established in Task 1 into direct field observation — verifying what the data suggests, identifying what the data cannot reveal, and producing well-by-well condition narratives that are grounded in both. Field assessments will be conducted across all 13 production wells, with site visit scheduling coordinated in advance with Authority operations staff to sequence visits around active pumping requirements and minimize supply disruption.

The Authority's wellfield presents two operationally distinct groups that warrant differentiated assessment approaches. The brackish SDF wells feed directly into the Reynolds Desalination Facility, where production interruptions have treatment throughput consequences. The National City Wells pump directly to distribution, where water quality compliance is tied to continuous disinfection. We will develop a site visit sequence that accounts for these operational dependencies and confirm access, safety, and discharge logistics for each site prior to mobilization.

Wellhead and Surface Infrastructure Inspection. HGS will conduct structured visual inspections of each wellhead, including pump discharge piping, surface casing, wellhead seal and cap condition, access hatches, vaults, and site perimeter. Inspection observations will be documented with standardized field forms and photographs for each well. Verdantas will provide licensed PE-level review of electrical service equipment, motor control centers, variable frequency drives, conduit and wiring condition, instrumentation, and SCADA interface components, confirming the electromechanical assessment is conducted at the appropriate engineering licensure level and produces findings that can support future equipment specifications and cost estimates.

Exhibit 5: Baseline performance testing a municipal well.

Operational Performance Observation. Where wells are operational during the site visit, HGS will observe available pump performance indicators including discharge pressure, flow rate, drawdown response, and any visible anomalies in operation such as cycling, vibration, or unusual discharge characteristics. These observations will be documented against the historical performance baselines established in Task 1, allowing field data to confirm or contradict trends identified in the records review. For wells where pump performance data is not directly observable during the visit, we will document the last known operating parameters and flag these wells for targeted follow-up coordination with operations staff.

Condition Assessment and Deficiency Identification. Drawing on the combined records review, field observations, and operational data, HGS will identify indicators of deterioration, fouling, corrosion, casing or screen damage, mechanical wear, and operational deficiencies for each well. The five original SDF wells (1998 construction, 81–205 ft screen lengths) and NC Well #2 (1957) warrant particular attention given their age and service history in the SDF's brackish environment, where mineral scaling and biofouling are well-documented degradation mechanisms.

Field Assessments and Condition

Task 2 | Field Assessments and Condition Evaluation

Condition Assessment and Deficiency Identification (continued). Where field observations indicate conditions that warrant additional investigation (e.g., downhole video, spinner flowmeter survey, Casing Inspection Thickness Measurement, or step-drawdown testing) we will identify and recommend these explicitly, with rationale and estimated cost, so the Authority can make informed decisions about supplemental investigation scope within the available budget.

Well-by-Well Narrative Findings. HGS will prepare a documented condition narrative for each of the 13 production wells summarizing observed surface and infrastructure conditions, operational performance indicators, identified deficiencies, and recommended follow-on investigation or immediate action items. These narratives will be structured consistently across all wells to enable direct cross-well comparison and will serve as the evidential basis for the prioritization framework developed in Task 3.

Task 2 Deliverables:

- **Field inspection forms and photographic documentation for all 13 production wells**
- **Well-by-well condition narratives including observed deficiencies and operational performance summary**
- **Recommendations for additional diagnostic testing where warranted, with rationale and preliminary cost basis**
- **Updated wellfield performance matrix incorporating field observations against Task 1 baselines**

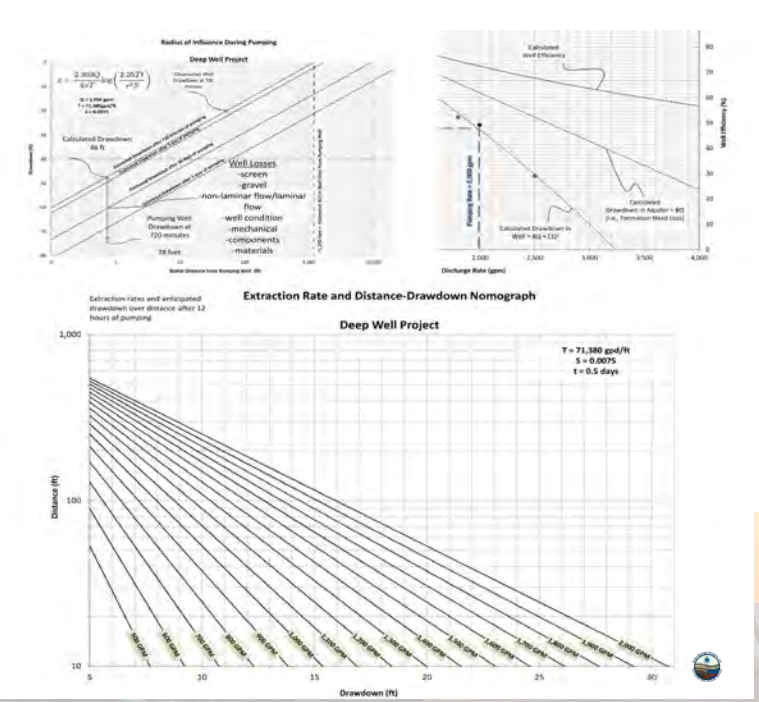


Exhibit 7: Example of in-house tools used for detailed aquifer testing analysis, evaluation of well efficiency losses, and performance verification. These nomographs can support both modeling input checks and practical desktop planning for wellfield operations.

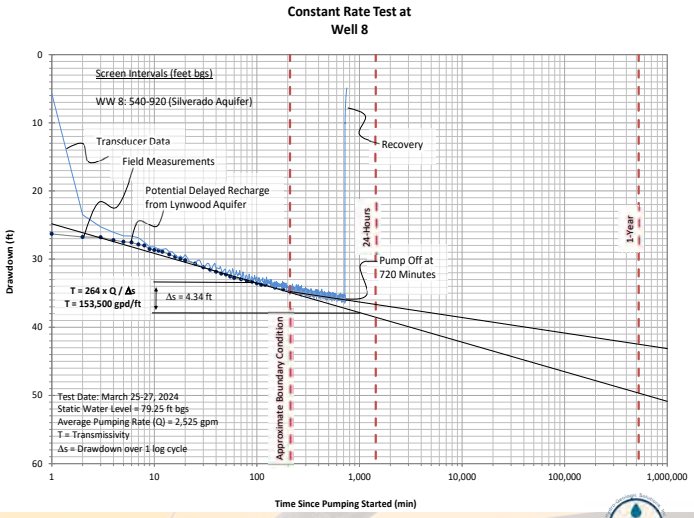


Exhibit 6: Example of pumping tests analysis in complex geology and aquifers. Hydro-Geologic Solutions utilizes software and tools developed in-house to expedite data input and analysis of aquifer tests, which minimizes level of effort of producing report and board ready figures.

Rehabilitation Planning, Maintenance Strategy, and Program Development

Task 3 | Rehabilitation Planning, Maintenance Strategy, and Program Development

Task 3 converts our team's field observations and records analysis into a structured and actionable program, turning data into decisions and distinguishing a credible program from a generic checklist. HGS and Verdantas will develop each component of the program from the specific conditions, performance history, and operational context of Sweetwater Authority's wellfield. This will not be from a template framework applied indiscriminately across wells with fundamentally different ages, designs, and risk profiles.

Well-by-Well Rehabilitation Recommendations and Prioritization. Based on the condition narratives developed in Task 2 and the performance baselines established in Task 1, HGS and Verdantas will prepare individual rehabilitation recommendations for each of the 13 production wells. Recommendations will identify the specific deficiencies observed, the probable cause or mechanism of deterioration where determinable from available data, the recommended rehabilitation approach or sequence, and the trigger conditions that should prompt action if not already warranted. Where additional diagnostic investigation was recommended in Task 2 — video survey, CITM, spinner flowmeter, step-drawdown testing — rehabilitation recommendations will account for the findings of that investigation before prescribing a rehabilitation path.

SWEETWATER AUTHORITY — FINAL REHABILITATION PRIORITY RANKING

Task 3 Deliverable | Rehabilitation Planning, Maintenance Strategy & Program Development | Hydro-Geologic Solutions, Inc.

Well Designation	Well Group	Final Prioritization Rank	Year Constructed	Last Well Rehabilitation Event	Recommended Rehabilitation Effort	Notes / Trigger Conditions
NC Well #2	National City	1	1957	TBC†	V, CITM, SP, M, CH-I, CH-II, R, E	Highest priority — 69 yrs; standby status; longest service life in wellfield
SDF #5	SDF	2	1998	TBC†	V, CITM, SP, M, BF, CH-I, CH-II, R, E	Highest priority — shortest screen (81 ft); 28 yrs brackish service; biofouling risk
SDF #1	SDF	3	1998	TBC†	V, SP, M, BF, CH-I, R, E	High priority — 28 yrs; short screen (142 ft); brackish environment
SDF #4	SDF	4	1998	TBC†	V, SP, M, BF, CH-I, R, E	High priority — 28 yrs; short screen (134 ft); shallowest well in SDF group
SDF #3	SDF	5	1998	TBC†	V, SP, M, BF, CH-I, R, E	High priority — 28 yrs; brackish environment; screen condition unknown
NC Well #3	National City	6	1983	TBC†	V, M, CH-I, R, E	Moderate priority — 43 yrs; fresh groundwater; performance trend review needed
SDF #6	SDF	7	2004	TBC†	V, SP, BF, R, E	Moderate priority — 22 yrs; longer screen (440 ft); establish condition baseline
NC Well #4	National City	8	2003	TBC†	V, R, E	Lower priority — 23 yrs; fresh groundwater; newer construction
SDF #7	SDF	9	2016	TBC†	V, R, E	Lower priority — 10 yrs; baseline documentation focus
SDF #8	SDF	9	2016	TBC†	V, R, E	Lower priority — 10 yrs; baseline documentation focus
SDF #9	SDF	9	2016	TBC†	V, R, E	Lower priority — 10 yrs; deepest well (1,010 ft); baseline documentation focus
SDF #10	SDF	9	2016	TBC†	V, R, E	Lower priority — 10 yrs; baseline documentation focus
SDF #11	SDF	9	2016	TBC†	V, R, E	Lower priority — 10 yrs; baseline documentation focus
SDF #2	*SDF*	—	*1998*	—	*Demolished — excluded from program scope*	*SDF #2 demolished; no assessment required*

LEGEND — Rehabilitation Effort Codes	
V	Downhole video survey — casing condition, screen integrity, sediment fill
CITM	Casing Inspection Thickness Measurement — assess casing wall integrity
SP	Spinner flowmeter survey — identify contributing zones and flow profile
M	Mechanical cleaning — brush, swab, airlift/surge redevelopment
BF	Biofouling treatment — disinfectant and/or polymer dispersant (SDF brackish wells)
CH-I	Phase I chemical treatment — polymer dispersant / surfactant
CH-II	Phase II chemical treatment — acid / chelant (scale removal)
R	Pump redevelopment and post-rehabilitation performance testing
E	Electrical & controls assessment — Verdantes Engineering (licensed PE)
CP	Casing patch / liner evaluation — if video confirms structural deficiency
† TBC	*Last rehabilitation event to be confirmed during Task 1 records collection from Authority*
Note	*Final prioritization ranks are preliminary and subject to revision following Task 1 records review and Task 2 field assessments*
Source	*Exhibit A – Sweetwater Authority Groundwater Well Information; Exhibit B – 2023 Water Resources Master Plan*

Exhibit 8: Example of final rehabilitation ranking table of Sweetwater Authority's Wells

Because the Authority does not maintain an existing scoring framework for this Program, HGS and Verdantas will apply a project-specific prioritization method that integrates well condition, performance decline, operational importance, and implementation practicality into a clear three-tier rehabilitation program (See Exhibit 10).

Preventive Maintenance Schedules and Inspection Procedures. HGS and Verdantas will develop preventive maintenance schedules for each well that define the type, frequency, and responsible party for routine maintenance activities. Schedules will distinguish between activities appropriate for Authority field staff and those requiring specialized contractor mobilization, so the program is practical to implement without external support for every maintenance event. Maintenance intervals will be based on manufacturer guidance, industry practice for the SDF's brackish groundwater environment, and the specific condition findings from Tasks 1 and 2 — recognizing that biofouling and mineral scaling cycles in brackish aquifers drive different maintenance cadences than fresh groundwater systems.

Equipment Upgrades and Replacements. Verdantas will provide PE-level review and recommendations for utility service existing conditions or new requirements, electrical equipment, motor control, including variable frequency drives, instrumentation, and SCADA components identified during Task 2 field assessments. HGS will integrate these findings with hydrogeologic performance data to develop coordinated recommendations where equipment condition and well performance are linked — for example, where pump wear is contributing to specific capacity decline, or where controls upgrades could enable better performance monitoring and early warning of deterioration.

Standardized Tools: Inspection Checklists, Maintenance Logs, and SOPs. The program's standardized tools are what Authority staff will actually use in the field. HGS and Verdantas will develop three core document sets: field inspection checklists structured by well type (NC Wells versus SDF wells, given their different operational environments and treatment pathways), maintenance logs and templates for documenting routine activities and anomalies in a consistent format that supports trend tracking over time, and standard operating procedures for inspection, routine maintenance, and emergency response protocols. All documents will be delivered in fully editable formats so the Authority can adapt them as operational conditions evolve without requiring consultant support to make basic revisions.

Cost Estimates for Rehabilitation Tasks. HGS and Verdantas will prepare well-by-well rehabilitation cost estimates for each recommended action, structured as line-item estimates that clearly separate labor, materials, equipment, and mobilization components. Estimates will be developed at a planning level appropriate for capital budgeting purposes — not construction-ready bid documents, but sufficiently detailed to support budget requests and procurement planning. Verdantas will provide cost input for electrical and mechanical components.

Rehabilitation Planning, Maintenance Strategy, and Program Development

Task 3 | Rehabilitation Planning, Maintenance Strategy, and Program Development

Short-Term and Long-Term Budget Projections. HGS and Verdantas will integrate the rehabilitation cost estimates and maintenance schedules into a multi-year budget projection framework: a 1–3 year near-term schedule aligned with the Authority's current $1.3M FY25-26 program allocation and anticipated $500,000/year implementation budget, and a 5–10 year long-term projection covering planned rehabilitations, major equipment replacements, and anticipated end-of-service-life scenarios for the older wells. The budget framework will be delivered as an editable Excel tool that the Authority can update annually as conditions change and work is completed.

Draft Review Meeting. Prior to finalizing Task 3 deliverables, HGS and Verdantas will present preliminary findings, prioritization recommendations, and program structure to Authority staff in a draft review meeting. This meeting is a checkpoint — not a formality. We will come prepared with clear questions on any outstanding operational data, staff preferences for SOP format and structure, and budget planning assumptions that require Authority input to finalize. Comments received will be documented and incorporated before deliverables are advanced to Task 4.

Task 3 Deliverables:

- **Well-by-well rehabilitation recommendations with three-tier prioritization matrix**
- **Preventive maintenance schedules by well (staff-executable and contractor-required activities distinguished)**
- **Equipment upgrade and replacement recommendations (hydrogeologic and electromechanical)**
- **Field inspection checklists (NC Wells and SDF Wells formats)**
- **Maintenance logs and documentation templates**
- **Standard operating procedures for inspection, routine maintenance, and emergency protocols**
- **Well-by-well rehabilitation cost estimates (planning-level, line-item)**
- **Multi-year budget projection tool (1–3 year and 5–10 year horizons, editable Excel)**
- **Draft review meeting summary and comment response log**

EXAMPLE OF WELL REHABILITATION PRIORITIZATION FRAMEWORK

Task 3 Deliverable | Rehabilitation Planning, Maintenance Strategy & Program Development | Hydro-Geologic Solutions, Inc.

Because the Authority does not maintain an existing scoring framework for this Program, HGS and Verdantas will apply a project-specific prioritization method that integrates well condition, performance decline, operational importance, and implementation practicality into a clear three-tier rehabilitation program.

STEP 1 — EVALUATE EACH WELL IN FOUR DECISION BUCKETS

#	Decision Bucket	What We Evaluate	Typical Indicators	Program Result
1	**Condition / Structural Risk**	Physical well condition, downhole integrity, structural soundness	Video survey findings, sediment fill, corrosion, casing/screen concerns, rehabilitation history	**Rehab need identified or diagnostic required**
2	**Performance / Efficiency**	Loss of well performance over time relative to historical baseline	Specific capacity decline trends, pumping behavior anomalies, production shortfalls, biofouling or encrustation indicators	**Urgency of action defined**
3	**Operational Importance**	Contribution to Authority system reliability and daily supply	Daily duty vs. standby role, NC Wells direct distribution vs. SDF/Desal dependency, redundancy if well is offline	**Rank influence and schedule priority**
4	**Implementation / Cost Practicality**	Feasibility and cost-effectiveness of rehabilitation at this time	Likelihood of successful rehab, level of effort required, need for specialized diagnostics, planning-level cost range	**Near-term action vs. deferred timing**

STEP 2 — ASSIGN PRIORITY TIER

Tier	Priority Level	Criteria Summary	Typical Well Profile	Timeframe
1	**Near-Term Rehabilitation**	Clear condition or performance need; good likelihood of rehabilitation benefit; high operational value to Authority	Oldest wells (NC #2, 1998 SDF wells); standby status; specific capacity decline; brackish formation fouling risk	**1–3 Years (2026–2028)**
2	**Planned Rehabilitation / Targeted Diagnostics**	Moderate issues identified; deferred action acceptable; or additional diagnostic investigation needed before full rehab commitment	Mid-age wells (NC #3, SDF #6); performance trend review needed; additional video or spinner survey warranted	**3–5 Years (2028–2030)**
3	**Routine Monitoring / Preventive Maintenance Focus**	Lower immediate need; recent construction; condition better managed through structured inspection and preventive	2016-generation SDF wells (#7–#11); 10 years old; baseline documentation and maintenance schedule primary focus	**Monitor / Defer (2030+)**

STEP 3 — CONVERT PRIORITY INTO IMPLEMENTATION ACTIONS

Well	Recommended Action	Trigger Condition	Planning-Level Cost Range	Staff vs. Contractor
NC Well #2	Downhole video, CITM, spinner; mechanical cleaning; chemical treatment; pump redevelopment and testing	69-yr-old well in standby; specific capacity trend and casing integrity unknown	**$55,000–$85,000**	Contractor-led; HGS field oversight
SDF #5	Downhole video, spinner; biofouling treatment; mechanical redevelopment; performance test	28 yrs in brackish SDF; shortest screen (81 ft); biofouling and encrustation probable	**$65,000–$95,000**	Contractor-led; HGS field oversight
SDF #6	Downhole video; spinner flowmeter; targeted biofouling treatment if warranted	22 yrs; longer screen (440 ft); condition baseline not established; diagnostics needed before full rehab	**$50,000–$75,000**	Contractor diagnostic; Authority scheduling
SDF #7–#11	Structured visual inspection; wellhead and electrical review; baseline performance documentation	10-yr-old wells; lower immediate need; establish inspection and maintenance baseline	**$25,000–$45,000 per well**	Authority staff (inspections); Verdantas (electrical review)

Note: Priority tier assignments and implementation actions shown above are preliminary and based on available published data (Exhibit A, Exhibit B — 2023 Water Resources Master Plan). Final prioritization will be determined following Task 1 records review and Task 2 field assessments. Cost ranges are planning-level estimates and will be refined following field assessment findings.

Exhibit 10: An example of Well Rehabilitation Prioritization Framework

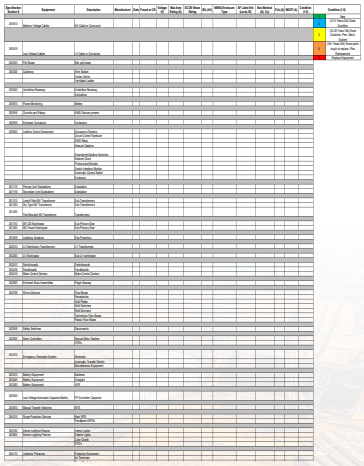


Exhibit 9: Example of current state analysis of electrical equipment.

Final Program Preparation and Deliverables

Task 4 | Final Program Preparation and Deliverables

Task 4 will assemble the findings, recommendations, tools, and documentation developed across Tasks 1 through 3 into the Authority's Well Rehabilitation and Maintenance Program, a single, complete, and fully actionable document package. The program is the Authority's to own and operate going forward, and HGS and Verdantas will structure every deliverable with that in mind: clear enough to execute, technically defensible enough to support procurement decisions and capital budget requests, and editable enough to be updated by Authority staff as conditions evolve without requiring a return to the consultant.

Draft Program Preparation. HGS and Verdantas will compile all Task 1 through 3 findings and deliverables into a cohesive Draft Well Rehabilitation and Maintenance Program structured for direct Authority use. The program will be organized to serve two audiences simultaneously, engineering and operations staff who need the technical detail, and Authority management who need the executive-level summary and budget planning framework to support capital program decisions. The draft will be submitted to Authority staff with a structured comment form to ensure feedback is captured systematically and addressed completely.

SWEETWATER AUTHORITY — ESTIMATED REHABILITATION COSTS AND SCHEDULE

Task 3 Deliverable | Rehabilitation Planning, Maintenance Strategy & Program Development | Hydro-Geologic Solutions, Inc.

The estimated total costs for rehabilitation, redevelopment, and repair for each of the priority-ranked wells are presented below along with recommended rehabilitation timing. Wells that have been rehabilitated within the past five (5) years are considered lower priority for imminent rehabilitation and are shaded accordingly.

Well Designation	Well Group	Final Prioritization Rank	Last Well Rehabilitation Event	Estimated Rehabilitation Cost	Recommended Rehabilitation Year
NC Well #2	National City	1	TBC[1]	$55,000–$85,000	2026
SDF #5	SDF	2	TBC[1]	$65,000–$95,000	2026
SDF #1	SDF	3	TBC[1]	$60,000–$90,000	2026
SDF #4	SDF	4	TBC[1]	$60,000–$90,000	2027
SDF #3	SDF	5	TBC[1]	$60,000–$90,000	2027
NC Well #3	National City	6	TBC[1]	$45,000–$65,000	2027
SDF #6	SDF	7	TBC[1]	$50,000–$75,000	2028
NC Well #4	National City	8	TBC[1]	$35,000–$55,000	2028
SDF #7	SDF	9	TBC[1]	$25,000–$45,000	2030
SDF #8	SDF	9	TBC[1]	$25,000–$45,000	2030
SDF #9	SDF	9	TBC[1]	$25,000–$45,000	2031
SDF #10	SDF	9	TBC[1]	$25,000–$45,000	2031
SDF #11	SDF	9	TBC[1]	$25,000–$45,000	2031
ESTIMATED PROGRAM TOTAL — 12 Active Production Wells and 1 Standby Well				$545,000–$810,000	2026–2031

[1] *Last rehabilitation event to be confirmed during Task 1 records collection. Cost estimates are planning-level ranges based on analogous projects and will be refined following Task 2 field assessments. Wells shaded in orange were constructed in 2016 and are considered lower priority; baseline documentation is the primary assessment objective. Source: Exhibit A – Sweetwater Authority Groundwater Well Information; Exhibit B – 2023 Water Resources Master Plan.*

Exhibit 11: Example rehabilitation cost and schedule for Sweetwater Authority's wellfield.

Comment Incorporation and Internal QA/QC. Following Authority review of the Draft Program, HGS and Verdantas will document all comments received, prepare a comment response log, and incorporate revisions into the Final Program. Internal QA/QC will confirm that all tables, figures, cost estimates, and supporting data are consistent with each other and with the underlying field and records documentation from Tasks 1 and 2. Verdantas will conduct a final review of all electrical, controls, and mechanical components of the program to confirm accuracy and completeness before submittal.

Final Presentation to Authority Staff. HGS and Verdantas will prepare and deliver a final presentation to Authority staff summarizing program findings, prioritization recommendations, maintenance program structure, and the multi-year budget framework. The presentation will be structured to support decision-making — not to walk through the report page by page, but to give Authority leadership and operations staff the information they need to move from program adoption into implementation. We will come prepared to answer questions and, if needed, walk through the prioritization rationale for specific wells.

Final Program Delivery — Content. The Final Well Rehabilitation and Maintenance Program will include:

- Executive Summary — Program objectives, wellfield overview, key findings, prioritization summary, and budget framework highlights; written for Authority management and Governing Board briefing use
- Wellfield Overview and Baseline Findings — Consolidated records review findings, wellfield performance baseline matrix, and data gap summary from Task 1
- Field Assessment Results — Well-by-well condition narratives, field inspection documentation, and photographic record from Task 2
- Well-by-Well Rehabilitation Plans — Individual rehabilitation recommendations, effort descriptions, cost estimates, and recommended timing for all 13 production wells
- Preventive Maintenance Program — Maintenance schedules, inspection procedures, and frequency tables distinguishing staff-executable and contractor-required activities by well group
- Standardized Field Tools — Inspection checklists (NC Wells and SDF Wells formats), maintenance log templates, and SOPs for inspection, routine maintenance, and emergency response
- Multi-Year Budget Planning Tool — Editable Excel workbook with 1–3 year near-term and 5–10 year long-term projections, structured for annual Authority budget cycle updates

Final Program Preparation and Deliverables

Task 4 | Final Program Preparation and Deliverables

Deliverable Formats. All program components will be submitted in both PDF format and fully editable electronic files — Word documents, Excel workbooks, and GIS files as applicable — organized in a clearly labeled folder structure that allows Authority staff to locate, update, and distribute individual components without navigating a monolithic document. This is not a symbolic commitment to editability; every template, checklist, SOP, and budget tool will be formatted and structured for practical field and office use from day one.

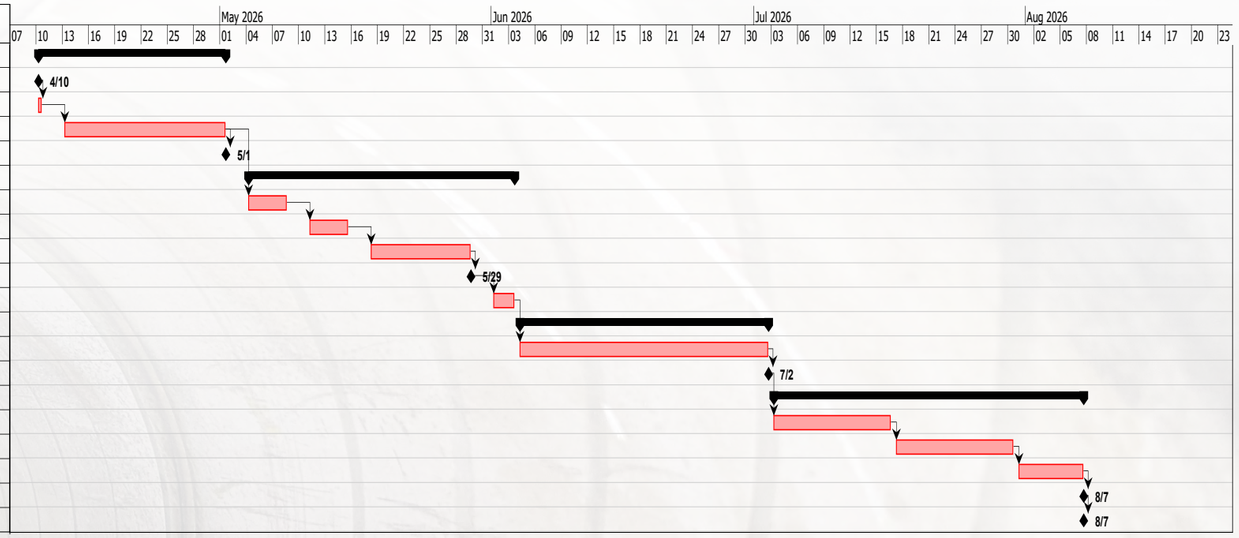
Task 4 Deliverables:

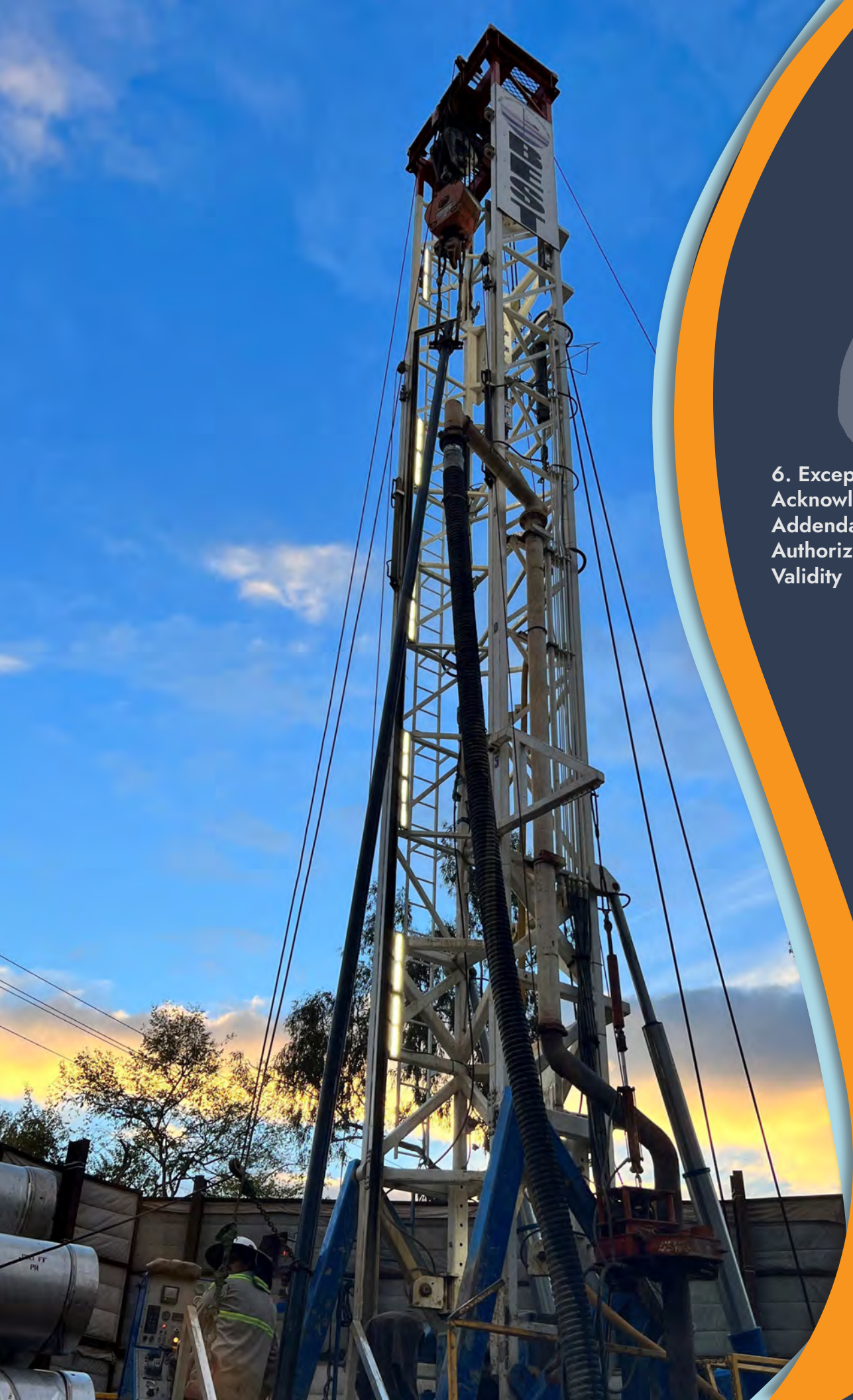
- **Draft Well Rehabilitation and Maintenance Program with comment form**
- **Comment response log documenting all Authority comments and HGS responses**
- **Final Well Rehabilitation and Maintenance Program — complete document package**
- **Final presentation to Authority staff (slide deck and supporting materials)**
- **Complete electronic deliverables package: PDF, editable Word/Excel, GIS files, organized folder structure with readme files**

Exhibit 12: Maximizing the Value of Well Testing Presentation at the American Water Works Association (AWWA) conference in 2025).

Project Schedule

	Name	Duration	Start	Finish
1	**Task 1 – Data Collection, Review, and Project Coordination**	**16 days**	**4/10/26, 8:00 AM**	**5/1/26, 5:00 PM**
2	Notice to Proceed	0 days	4/10/26, 8:00 AM	4/10/26, 8:00 AM
3	Kickoff Meeting	1 day	4/10/26, 8:00 AM	4/10/26, 5:00 PM
4	Data Collection, Records Review, and Staff Interviews	15 days	4/13/26, 8:00 AM	5/1/26, 5:00 PM
5	Progress Meeting No. 1	0 days	5/1/26, 5:00 PM	5/1/26, 5:00 PM
6	**Task 2 – Field Assessments and Condition Evaluation**	**23 days**	**5/4/26, 8:00 AM**	**6/3/26, 5:00 PM**
7	Field Mobilization Planning	5 days	5/4/26, 8:00 AM	5/8/26, 5:00 PM
8	Field Assessments – Single Mobilization (All Wells)	5 days	5/11/26, 8:00 AM	5/15/26, 5:00 PM
9	Field Assessment Documentation / Well Narratives	10 days	5/18/26, 8:00 AM	5/29/26, 5:00 PM
10	Progress Meeting No. 2	0 days	5/29/26, 5:00 PM	5/29/26, 5:00 PM
11	Additional Testing Recommendations	3 days	6/1/26, 8:00 AM	6/3/26, 5:00 PM
12	**Task 3 – Rehabilitation Planning, Maintenance Strategy, and Program Development**	**21 days**	**6/4/26, 8:00 AM**	**7/2/26, 5:00 PM**
13	Rehabilitation Planning, Maintenance Strategy, and Budgeting	21 days	6/4/26, 8:00 AM	7/2/26, 5:00 PM
14	Draft Review Meeting	0 days	7/2/26, 5:00 PM	7/2/26, 5:00 PM
15	**Task 4 – Final Program Preparation and Deliverables**	**26 days**	**7/3/26, 8:00 AM**	**8/7/26, 5:00 PM**
16	Prepare Draft Well Rehabilitation & Maintenance Program	10 days	7/3/26, 8:00 AM	7/16/26, 5:00 PM
17	Authority Review / Comment Period	10 days	7/17/26, 8:00 AM	7/30/26, 5:00 PM
18	Final Revisions	6 days	7/31/26, 8:00 AM	8/7/26, 5:00 PM
19	Final Presentation	0 days	8/7/26, 5:00 PM	8/7/26, 5:00 PM
20	Final Program Submitted	0 days	8/7/26, 5:00 PM	8/7/26, 5:00 PM





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6. Exceptions to RFP, Acknowledgment of Addenda, Proposal Authorization, 90 Day Validity

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

Exceptions to the RFP:

Hydro-Geologic Solutions, Inc. (HGS) hereby certifies that it takes no exceptions to this Request for Proposals, including no exceptions to the Authority's Professional Services Agreement (Exhibit C). HGS further certifies that its proposed subconsultant, Verdantas, Inc., likewise takes no exceptions to the RFP or the Agreement. No proposed alternative language is included, as no exceptions are requested.

Amendments to the RFP:

HGS acknowledges receipt of all RFP amendments issued prior to March 9, 2026.

Proposal Authorization and 90-Day Validity:

This proposal is signed by the undersigned, an individual having legal authority to bind Hydro-Geologic Solutions, Inc. to the terms of the Authority's Professional Services Agreement (Exhibit C). The undersigned further confirms that this proposal and fee submittal shall remain valid for ninety (90) days from the proposal due date (March 13, 2026).

By: _____

Susan Kang, Esq.
President
Hydro-Geologic Solutions, Inc.
Date: March 13, 2026

Appendix A: Resumes

Hydro-Geologic Solutions, Inc.
Groundwater. Wells. Recharge. Solutions.

EROS BILYEU, PG, CHG, CGWP, QSD/QSP

PRINCIPAL HYDROGEOLOGIST & PROJECT MANAGER

Eros is a California Certified Hydrogeologist with 18 years specializing in well design and construction oversight; aquifer/high-resolution basin characterization; and 3-D conceptual/numerical groundwater-flow modeling in basin-fill, karst, and fractured-bedrock settings. He has collaborated with federal, state, municipal, and defense/aerospace clients in Southern California and nationally. Building on this breadth of client work, he leads SGMA implementation in high-priority basins, translating policy into engineered projects with measurable outcomes (e.g., recharge programs delivering 12,000+ AFY; municipal wells producing up to ~4,000 gpm, basin-wide conceptual models). He has managed/overseen 60+ well and groundwater projects in California and across the U.S. His experience and projects span MAR/recharge basins; well siting/design; and construction management for all types of wells, groundwater and well assessments, groundwater management, and contaminant hydrogeology. His technical focus includes the design and installation of production, extraction, and ASR wells; multi-level/nested monitoring wells; and select horizontal wells. He integrates lithology, geophysics, aquifer testing (step/constant-rate; Cooper-Jacob/Theis), modeling (MODFLOW/GMS, RockWorks), and water-quality datasets to evaluate groundwater resources and delineate the vertical and lateral distribution of contaminants (PFAS and other COCs). He has also worked extensively with local, state, and federal agencies to align technical work with permitting and policy.

EDUCATION

BS, Geology, University of South Alabama

REGISTRATIONS/CERTIFICATIONS

Professional Geologist, CA #9351;

Certified Hydrogeologist, CA #1061

Qualified Stormwater Pollution Prevention Plan Developer and Practitioner (QSD/QSP), #27447

Certified Groundwater Professional (CGWP), #4016962

MODELING PLATFORMS

Groundwater Modeling System (GMS), Groundwater Vistas (GV), EVS, Rockworks, Golden Software Suite

PROJECT EXPERIENCE

Reynolds Desalter Expansion, Sweetwater Authority – Chula Vista, CA | Eros provided technical support for the Phase 2 expansion of the Richard A. Reynolds Groundwater Desalination Facility, a critical infrastructure project enhancing Sweetwater Authority's potable water supply through brackish groundwater desalination. The project involved the design, permitting, and construction oversight of five new San Diego Formation desalter wells, each drilled to approximately 800 feet and designed for sustained production capacities exceeding 1,300 gallons per minute.

He oversaw preliminary well design development, preparation of detailed plans and specifications, bid-phase technical support, and adaptive final design during construction based on field conditions and aquifer performance. The design incorporated stainless steel well screens and casings to maximize efficiency and longevity under high-salinity conditions. Eros coordinated aquifer testing, step-drawdown, and constant-rate pumping evaluations that demonstrated exceptional production rates—up to 2,500 gpm, surpassing design expectations and providing the Authority with expanded operational flexibility. His technical support provided seamless integration of the new wells into the Desalination Facility's expanded treatment and distribution network.

2022 Well Assessments, Golden State Water Company – Various Locations, CA | Provided state-wide assessments for GSWC wells. Historical groundwater level data, historical water quality data, well construction details, video surveys, geophysical logs, and well performances were reviewed and analyzed to determine current operating conditions of each well. Baseline well and aquifer testing was performed at operational wells to determine operating efficiency and specific capacity of wells. The data was further analyzed to determine if a well rehabilitation was feasible, or if a well replacement was warranted. Wells that were selected for replacement were then further analyzed for constructibility of the site and DDW regulatory offset requirements. Sites that were heavily urbanized around and had limited space for drilling and construction were selected to be moved to a new well site.

Bella Vista Well No. 2, Golden State Water Company – Morongo Valley, CA | Provided project management and technical oversight for Yeager Well No. 4. The project included well siting and data review, preparing a preliminary design report (PDR), preparing technical plans and specifications, permitting support, bid support services, well construction management, inspection, and testing services, providing permitting assistance, and Well Construction Summary Reporting. Provided QA/QC for reporting and responding to GSWC comments.

EROS BILYEU, PG, CHG, CGWP, QSD/QSP | PROJECT MANAGER, HYDROGEOLOGIST

City of Camarillo, North Pleasant Valley Desalter Facility Standby Well and Rehabilitation of Desalter Well B– Camarillo, CA | Eros supported the City of Camarillo in the design, permitting, and construction of a critical standby extraction well for the North Pleasant Valley (NPV) Desalter Facility, which provides a treatment capacity of approximately 4,500 acre-feet per year. The project was developed to enhance operational reliability and maintain potable supply continuity within the Pleasant Valley Groundwater Basin.

He optimized well design parameters, including casing materials, screen intervals, and aquifer zone selection, to address variable water quality conditions characterized by elevated concentrations of chloride, sulfate, and manganese. Eros coordinated with the Fox Canyon Groundwater Management Agency (FCGMA) to ensure full compliance with the Groundwater Sustainability Plan (GSP) and basin allocation framework.

He also ensured compatibility between well design and the NPV treatment system, integrating hydraulic and geochemical considerations to support long-term performance. The project provided the City with a robust, high-quality supply source capable of meeting operational and regulatory requirements for decades to come.

During this project Eros also directed the rehabilitation of desalter Well B and performed a preliminary and final analysis after the well rehabilitation activities were completed. The resulted achieved the desired scope and the well was brought in service again to meet the operational demands of the desalter facility.

Church Well 25, Golden State Water Company – Rancho Cordova, CA | The project included well siting and data review, preparing a preliminary design report (PDR), preparing technical plans and specifications, bid support services, well construction management, inspection, and testing, services, providing permitting assistance, preparing Drinking Water Source Assessment and Source Protection (DWSAP) documents, Well Construction Summary Reporting. Provided QA/QC for reporting and responding to GSWC comments.

Commission 20 Well Rehabilitation, Long Beach Utilities Department – Long Beach, CA | Eros provided hydrogeologic services for the rehabilitation of Commission Well 20 for the Long Beach Utilities Department. His work included permanent pump removal, mechanical rehabilitation via brushing and bailing, and comprehensive downhole video inspection to assess casing and screen conditions.

He directed staged redevelopment using swabbing and airlift techniques, followed by pump development, focused-intake testing, and dual-swab pumping to enhance well efficiency and restore production capacity. Eros also oversaw spinner flow surveys and conducted an analytical evaluation of the wellfield's radius-of-influence to assess hydraulic connectivity and optimize operational performance. The rehabilitation efforts successfully extended the well's service life and improved yield consistency.

Joshua Tree Production Well , Twenty-Nine Palms Band of Mission Indians – Joshua Tree, CA | Provided hydrogeologic and engineering design services for the drilling, construction, and testing of a new municipal production well serving the Twenty-Nine Palms Band of Mission Indians in the Joshua Tree area. Responsibilities included preparation of a comprehensive well design report, development of detailed plans and technical specifications, and assembly of a complete drilling and construction bid package. The work incorporated evaluation of site conditions, well siting constraints, anticipated subsurface conditions, and production objectives to support long-term water supply reliability.

Prepared preliminary and final well design profiles, casing and screen specifications, gravel-pack and annular seal details, and development and testing protocols, including step-drawdown and constant-rate pumping tests. Design considerations addressed construction sequencing, sanitary protection, alignment testing, and operational performance consistent with regulatory standards and tribal requirements. The completed design and bid documents positioned the tribe for competitive procurement and successful construction of a reliable groundwater supply well.

Los Angeles Refinery Wilmington Plant Well No. 8, Phillips 66 – Los Angeles, CA | Eros managed the siting, design, and construction of a high-capacity, 2,500 gpm industrial supply well at the Phillips 66 Los Angeles Refinery in Wilmington, California. The well was designed to provide non-potable water for process operations and fire protection systems, supporting the refinery's critical infrastructure resilience and operational efficiency. His scope encompassed a comprehensive siting investigation, development of detailed technical plans and specifications, bid-phase advisory, and construction inspection with full documentation of field activities. Eros also conducted advanced hydrogeologic analyses addressing boundary condition representation and leaky aquifer dynamics to ensure sustained hydraulic performance and long-term reliability. The project successfully delivered a robust and efficient well system aligned with industrial performance and regulatory requirements.

Design Services for Drilling a New Municipal Groundwater Production Well City of Adelanto – Adelanto, CA |Eros provided comprehensive hydrogeologic and engineering services for the City of Adelanto's new municipal groundwater production well. His responsibilities encompassed well siting analysis, aquifer testing, conceptual hydrogeologic modeling, and development of construction cost estimates.

He prepared/coordinated well siting studies, wellfield testing programs, and conceptual model evaluations to guide design and optimize production potential. Eros also led permitting coordination, prepared bidding documents and technical specifications, and provided construction management/oversight throughout drilling, development, and performance testing. The project established a technically sound and cost-effective framework for expanding the City's potable groundwater supply.

VARINDER OBEROI, PE

PRINCIPAL ENGINEER/HYDROLOGIST/GROUNDWATER MODELER

Varinder has over 30 years of combined professional experience in the water supply and resource management sector. He has performed basin assessments, water quality studies, aquifer characterization and sustainability studies. He has modified and developed both regional and local 3D groundwater flow and contaminant transport numerical models that have been used as critical tools in evaluating groundwater basins and estimating water budgets, optimizing supply well pumping, plume management, simulating surface water-groundwater interaction, evaluating saline intrusion, defining/siting/managing ASRs, and wetland mitigation. He has managed large projects and teams that cover the breadth of the water resource sector. Responsibilities have included client and interested parties interaction, project management, budget estimation, regulatory negotiation and permitting, and report presentation. He has experience working on projects in California, including the Central Valley, San Francisco Bay Area, and Southern California. Current clients include private utilities (Cal Water, LADWP), cities, irrigation districts (Woodbridge Irrigation District WID), and private developers. He has been the program manager to the City of Lodi for their groundwater management program since 2007. Additionally, Varinder has worked on several basins in Southern California including San Fernando Basin, San Gabriel Basin, Orange County Basin, several Los Angeles area basins, and Owens Valley Groundwater Basin.

EDUCATION

MS, Civil/Environmental Engineering (Minor – Hydrogeology), Syracuse University

B-Tech., Civil Engineering
IIT-Delhi, India

REGISTRATIONS/CERTIFICATIONS

Professional Engineer, CA #69037

MODELING PLATFORMS

Groundwater Modeling System (GMS), Groundwater Vistas (GV), Visual MODFLOW (VM), Surface-water Modeling System (SMS), Watershed Modeling System (WMS)

NUMERICAL GROUNDWATER FLOW/FATE AND TRANSPORT MODELS

MODFLOW2000, MODFLOW-NWT, MODFLOW- SURFACT, FEFLOW, FEMWATER, FLONET/TRANS, MODPATH, MT3DMS, RT3Dv2.5, SUTRA, PATH3D, SOLUTRANS, BIOPLUME III

ANALYTICAL GROUNDWATER FLOW, FATE/TRANSPORT AND CAPTURE ZONE MODELS

WinFLOW, QUICKFLOW, PRINCE, ODAST, TDAST, PLUME2D, PLUME3D, AT123D, BIOSCREEN, BIOCHLOR, Well Head Protection WHPA), CAPZONE, GWPATH

VADOSE ZONE AND AQUIFER CHARACTERISTICS

HELP, SESOIL (USING RISKPRO), VLEACH, AQTESOLV, AQUACHEM

PROJECT EXPERIENCE

Groundwater Program Manager | Groundwater and Plume Management, HCM Development, Numerical Groundwater Modeling, Multi-nested Monitoring Wells Design, Aquifer Testing of Supply Wells, Water Budget Analysis, SGMA Support Services, Monitoring Network Design, Groundwater Sampling and Reporting Services (Eastern San Joaquin Subbasin), City of Lodi – Lodi, CA | As the Program Manager for the City of Lodi, Varinder assisted the City in developing their long term groundwater management strategies. He developed a multi-layer City-wide transient model using the GMS modeling platform that incorporates the surface water / groundwater interaction of Mokelumne River, extraction from over 1,000 domestic and agricultural wells surrounding the City, extraction from City supply wells, and recharge from irrigation. The model has been applied to optimize pumping for the City's well field by limiting the overdraft of the groundwater basin underlying the City (groundwater management), and mitigating the migration of contaminant plumes (plume management). The model has also been applied to determine the locations for deep multi-nested monitoring wells, evaluate the impacts of drought conditions (management controls), and develop the Water Budget for the City GSA (SGMA). In the future, the model will be used to assist in the management of the City's groundwater supply system including new supply well locations, well design, siting and design of ASR wells, and managed aquifer recharge. The model has been used by the State Water Board as a training tool for its staff to demonstrate the effective application of a groundwater flow and contaminant transport model for plume management.

ULARA Groundwater Flow Modeling of the San Fernando Basin Modeling (Owner's Agent), Los Angeles Department of Water and Power (LADWP) – Los Angeles, CA | Varinder served as the groundwater modeler under the Owner's Agent contract, refining the conceptual hydrogeologic framework and updating the basin-wide numerical groundwater-flow model for the San Fernando Basin to support bringing municipal well fields back online. Work included: consolidating historic and recent pumping, water-level, and recharge data; revising layer geometry and hydraulic properties to reflect new stratigraphic control; updating boundary conditions and stresses; and recalibrating the model to multi-decadal observations. Scenario analyses evaluated phased wellfield reactivation, pumping redistribution, and operational constraints to maintain drawdown targets, protect remediation progress, and avoid adverse impacts to sensitive receptors. The resulting decision tool provided LADWP with defensible production ramp-up strategies, clear triggers for adaptive management, and documentation suitable for interested parties and regulatory coordination.

VARINDER OBEROI, PE | PRINCIPAL ENGINEER/HYDROLOGIST/GROUNDWATER MODELER

Quantitative Analysis of the Sylmar Basin, LADWP – Sylmar, CA | Varinder developed the stratigraphic and a numerical groundwater flow and contaminant transport model for the Sylmar Basin in Los Angeles County. The model was used to understand the groundwater flow within the Basin, and to develop long term groundwater management strategies for the Basin.

Cal Water Visalia Operating District – HCM, Aquifer Testing, Multi-layer Transient Model (Mid-Kaweah Subbasin, Cal Water – Visalia, CA |California Water Service Company (Cal Water) supplies groundwater to the City of Visalia and the community of Goshen, serving more than 130,000 residents and businesses. Since 2013, Varinder has provided hydrogeologic consulting services to support groundwater supply reliability, water quality protection, and regulatory compliance. Groundwater beneath Visalia has been impacted by multiple PCE plumes.

Varinder assisted Cal Water in evaluating the effects of these plumes on production wells and assessing drought-related impacts on groundwater availability. Services include hydrogeologic investigations, aquifer testing, modeling, well installation and monitoring, and SGMA compliance support.

He developed a Conceptual Hydrogeologic Model (HCM) to characterize the subsurface conditions and performed downhole testing with the U.S. Geological Survey and aquifer testing on Cal Water Well 32-01 to estimate aquifer properties and transient extraction responses. Using GMS™, Varinder constructed a multi-layer transient groundwater and contaminant transport model to: simulate the groundwater flow regime in the Mid-Kaweah Subbasin, evaluate pumping from 90 Cal Water wells and over 1,000 agricultural wells, assess recharge from canal and ditch leakage, quantify groundwater/surface-water interaction , simulate deep percolation from precipitation and irrigation based on land use. The model was applied to evaluate plume migration, assess the 2011–2016 drought's effect on well production and basin response, and optimize Cal Water's wellfield operations to meet groundwater management objectives.

Owens Valley Basin – Groundwater Supply Evaluation, Long-Term Aquifer Testing, Monitoring Program, Numerical Model, Inyo County – Inyo County CA | Performed a groundwater supply evaluation for a proposed development and evaluated its potential impacts on the quality of the local groundwater basin. The tasks including testing production wells in a hard rock environment, evaluating the performance of existing production wells using long-term aquifer tests, developing a groundwater flow model to evaluate the cumulative impact of current and proposed pumping on the sustainability of the local groundwater supplies, and developing a groundwater monitoring program to evaluate future impacts to the groundwater basin. The groundwater supply evaluation study was successfully used to obtain a Negative Declaration from the ICPD.

Quantitative Evaluation of Mining Operations to the Owens River Riparian Corridor and Fish Slough Wetlands, Desert Aggregates and ICPD – Inyo, CA | Varinder developed a multi-layered groundwater flow model to evaluate the potential hydrologic impacts of the proposed expansion of gravel mining operations on sensitive ecologic receptors along the Owens River riparian corridor and the Fish Slough wetlands in the Owens Valley Groundwater Basin. Processes such as ET, surface water-groundwater interaction, recharge from irrigation and watering of livestock, runoff from bedrock outcrops, mountain-front recharge, and recharge from canals, ditches, and other hydraulic features were also simulated. The model was simulated under differing climatic conditions such as drought and wet years. Results showed cumulative impacts could be mitigated by the proper placement of recharge basins.

Groundwater Flow & VOC Migration Modeling with Recharge / Water Budget, Orange County Water District – Orange County, CA |Developed a 3D model that was used to simulate surface water recharge through infiltration basins, rivers and precipitation to a multi-layer aquifer system, and evaluate the migration of VOCs in a 40 square mile area of the Orange County Groundwater Basin. Fluctuating groundwater recharge from surface water features, Santa Ana River, and recharge basins, precipitation recharge and evapotranspiration rates from surrounding areas were calculated and incorporated into the model. The model was successfully applied to assess the effectiveness of groundwater remedial options and allocate potential costs to PRPs.

Production Well Siting and Aquifer Assessment, Cal Water South San Francisco District –San Francisco, CA |Evaluated alternative locations for production wells for the Cal Water SSFD. Tasks included data compilation and evaluation, development of a conceptual hydrogeologic model, evaluation of potential source areas and estimated locations of chemicals of potential concern (COPCs), including 1,2,3-TCP, PCE, and nitrates, estimation of capture zones, estimation of the potential migration of COPCs, and evaluation of alternate locations so as satisfy the California DDW criteria for production wells.

Modeling and Quantitative Evaluation of Dewatering Alternatives, Confidential Developer – Fillmore, CA | Varinder evaluated dewatering alternatives for a proposed housing development in the Santa Clara River Basin flood plain in Southern California by developing a multi-layered numerical flow model. The model was developed to design and evaluate the effectiveness of dewatering alternatives and mitigation control measures, such as a levee and sub-drain system, during a simulated design flood. The results of the modeling were used by the Client in permitting the proposed development with local agencies.

ANDREW KIETA, PG

SENIOR HYDROGEOLOGIST

Andrew has nearly 15 years of experience providing hydrogeologic consulting services and water resource utility consulting, including extensive experience providing construction management services during drilling and construction of large-diameter municipal water supply wells, monitoring wells, well database management, raw water treatment, and field inspections. His background includes working as an internal hydrogeologic and water quality consultant for Golden State Water Company for four years. His expertise includes data management and analysis, well design, pump efficiency testing, and hydrogeologic reporting, which also includes providing professional support on water wells and distribution systems for the private sector and for municipalities. Andrew has provided production well support services on projects for the cities of Long Beach, Pasadena, and Santa Fe Springs; Phillips 66, Sacramento Suburban Water District, Sacramento County Water Agency; Twentynine Palms Band of Mission Indians; Indio Water Authority; Rancho California Water District; California Water Service Company; Eastern Municipal Water District; Niagara Bottling LLC; Golden State Water Company; Olam Farms; Angus Petroleum; Irvine Ranch Water District; and Camp Pendleton.

EDUCATION

BS, Geology and Integrated Earth Studies (Double Degree), California State Polytechnic University, Pomona, 2012

REGISTRATIONS/CERTIFICATIONS

Professional Geologist, CA #10036

PROJECT EXPERIENCE

Yeager-Vale Well No. 4 Design and Construction, Golden State Water Company – Morongo Valley, CA | Provided technical guidance and service and professional assessment during the project proposal and well siting phases of the project. Andrew used institutional knowledge and prior project work for GSWC to assist in the formulation of approach and subsequent drafting of the well siting study for the development of a new municipal supply well. The project is in the design phase and on-going.

Lakewood 22B Design and Construction, City of Lakewood – Lakewood, CA | Provided technical assistance and analysis for the initial well siting study including on-site evaluation of the site and analysis of regulatory setbacks. Lakewood 22B is part of a larger design project to replace an existing municipal supply well and a redevelopment of a city-owned property. The project is entering the design phase and is on-going

Well 5 Design and Construction, Sconza Chocolates – Oakdale, CA | Provided technical guidance and professional assessment during the well design and permitting phases as well as on-site inspection for the construction of the commercial water supply Well 5 for Sconza Chocolates. Andrew's inspection involved the oversight of a 67-foot 40-inch conductor borehole, conductor installation, and sanitary seal. He also provided expert analysis for a detailed lithologic log and subsurface characterization. Andrew provided on-site inspection for well construction and testing as well as final project reporting and analysis.

Well 84 Antelope/Don Julio Design and Construction, Sacramento Suburban Water District – Sacramento, CA | Provided technical assistance and on-site inspection for the construction of the municipal water supply Well 84 Antelope/Don Julio. Andrew's inspection involved the oversight of a 250-foot 1.5-meter conductor borehole, conductor installation, and sanitary seal. He also provided expert analysis for a detailed lithologic log and subsurface characterization. Following the successful completion of the well construction and testing, Andrew provided technical assistance in reporting for each phase of the project and final summary report.

On-Call Services, City of Downey – Downey, CA | Provided technical assistance and professional assessment for Well No. 10, and 14. On-site field inspection was also provided for aquifer testing and pumping development. Analysis included the review of the well structure and the effectiveness of recent rehabilitation efforts and summarized in a technical memorandum.

ANDREW KIETA, PG | SENIOR HYDROGEOLOGIST

Well 82 & 83 Antelope North/Poker Design and Construction, Sacramento Suburban Water District – Sacramento, CA | Provided technical assistance and on-site inspection for the construction of two municipal water supply wells, 82 & 83 Antelope North/Poker. Andrew's inspection involved simultaneous oversight of two 250-foot 1.5-meter conductor boreholes, conductor installations, and sanitary seals. Andrew also provided expert analysis for a detailed lithologic log and subsurface characterization. Project involved extend oversight in the recovery of 190 feet of the 1.5-meter "can" used in stabilizing the borehole. Recovery involved the oversight of over 36 boreholes using a Sonic drill rig and over 50 boreholes using a pneumatic hammer drilling rig. Andrew provided technical assistance to the contractor for soil recovery and drilling fluid as well as extensive daily reporting feedback to the client. He continued to provide technical assistance and onsite oversight until the completion of both well installations and development testing. Following the completion of Well 82 & 83, Andrew assisted in the final reporting and analysis.

Joshua Tree Well Siting Study and Exploratory Drilling Program, Twenty-Nine Palms Band of Mission Indians – Joshua Tree, CA | Provided technical assistance and analysis for the well siting study which involved the assessment of a 96-acre property and surrounding geology and subsurface characteristics. Andrew researched well completion reports, water quality reports, as well as geologic studies done by others to develop a preliminary design and exploratory drilling program. The project is moving into the exploration phase with the construction of a monitoring well to gather lithologic and groundwater quality data.

Well 2B Replacement, City of Vacaville – Vacaville, CA | Provided on-site hydrogeologic services for the construction of a new water supply well. Oversaw construction and testing and provided inspection services during drilling includes lithologic classification and interpretation, construction, and well development. Following the results of the zone testing and water quality analysis, Andrew assisted in identifying and modifying the preliminary well design to better suit the aquifers of interest. He also aided during the reporting phases of the project.

2022 Well Assessments, Golden State Water Company – Various, CA | Provided technical support and institutional knowledge for the evaluation of 15 critical water supply wells. Conducted a thorough evaluation of each well to determine their current condition and remaining service life. Each evaluation was based on categories such as age, sand production, water quality, and casing condition. Andrew evaluated the current condition of the well structure and performance as well as the regional groundwater levels and water quality and drafted reports summarizing his findings and replacement recommendations.

Well 110 Well Construction and Testing, Rancho California Water District – Temecula, CA | Provided on-site hydrogeologic services for critical phases in the construction of a new municipal water supply well. Work included field inspection during drilling, zone testing, well construction and provided support for the well design and reporting phases.

Monk Hill Well Assessments, Pasadena Water and Power – Pasadena, CA | Provided technical support and technical writing for the assessment of Pasadena Water and Power's Monk Hill subarea well field. The project involved reviewing historical documents and data to summarize the current condition of the Monk Hill well field. Andrew drafted a comprehensive report to also summarize the regional water level data and hydrogeologic environment. The report also provided a basis for determining future rehabilitation efforts and groundwater basin limitations.

Shakey's Well Design and Site Assessment, Pasadena Water and Power – Pasadena, CA | Provided technical support for the preliminary well design and the assessment of the Shakey's property to construct a municipal water supply well. Andrew reviewed the hydrological and geological environment of the well site and the surrounding area. He provided an assessment of the well site and a preliminary well design which involved assessing the subsurface conditions, potential water quality concerns, and regulatory requirements.

Behner Well Siting Study, Pasadena Water and Power – Pasadena, CA | Provided technical support for the assessment of the Behner property to determine the possibility of installing a municipal water supply well. Andrew reviewed the hydrological and geological environment of the well site and the surrounding area. The assessment also involved reviewing a nearby clean-up site and contamination plume. Andrew provided a summary report with figures, an assessment of the well site, and potential alternative well sites.

Well AA and Well T Condition Assessment, Indio Water Authority – Indio, CA | Provided technical support and completed a report for the assessment of the condition of Well AA and Well T, including providing recommendations for rehabilitation and water quality mitigation. The conditions assessments involved reviewing the hydrological and geological environment of the surrounding area, assessment of current and historical water level and water quality records, and formulation of a rehabilitation program along with recommendations for assessing and mitigating hexavalent chromium concentrations. Andrew also provided on-site hydrologic services, such as video surveys, well performance testing, and water quality monitoring.

Glen Road Plant Site and Bradshaw Well Field Evaluation, Golden State Water Company – Barstow, CA | Provided on-site evaluation and technical support for the assessment of wells in Golden State Water Company's Barstow System. The project involved thorough evaluation of the complete historical records of each Glen Road and Bradshaw wells (14 wells) to determine the current condition and performance. The purpose of the project was to determine the feasibility of improving the water supply of west Barstow by recommending the construction of a new water well and developing a rehabilitation program.

Robert Stroh, PG, CEG

Department Lead

Mr. Stroh has more than 30 years' experience in engineering geology and conducting geotechnical engineering evaluations. He has extensive experience in geotechnical and geologic investigations including: geologic field mapping; fault hazard investigations (neotectonics); soil stratigraphy, aerial photograph interpretation and geomorphology studies; seismic hazard; slope stability evaluations; geotechnical subsurface exploration, sampling and logging; rock core logging; grading quality control and soils testing; marine and coastal studies; geophysical evaluations including velocity, resistivity, and ground penetrating radar surveys. He is also accomplished in: geotechnical and geologic/geophysical and GIS computer software and their application to engineering geology and geotechnical engineering evaluations.

Firm

Verdantas Inc.

Office Location

San Diego, CA

Education

BS, Geological Sciences, San Diego State University

Licenses/Certifications

CA – Certified Engineering Geologist #2099
CA – Professional Geologist #6707
CFR 1910.120 OSHA 40-Hour Training

Years of Experience

36 Years of Industry Experience
20 Years at Verdantas

Project Experience

Yuma Monitoring Well | **Yuma, AZ**
Bob served as senior technical lead for a monitoring and deep test well project at MCAS Yuma Monitoring Well Project in support of the P 591 Water Treatment Plant program. The work supported long term water supply planning and treatment plant development at the installation. The scope of services included pre drilling planning and coordination, review of drilling scopes and subcontractor agreements, and technical oversight during well installation activities including logging of the deep well. The work encompassed support for monitoring and deep test well construction, field exploration activities, and documentation associated with drilling, installation, and testing. Additional responsibilities included senior technical review and project oversight, coordination with the owner and design team, and support for administrative and contractual tasks, including boring log review and project closeout following completion of the defined scope of work.

Elfin Forest Road Fire Hydrant and Lateral | **San Diego, CA**
Geotechnical observation and testing required for the pipe zone and trench backfill along with subgrade, base and asphalt concrete testing for the 30-foot long lateral located within Elfin Forest Road.

4S Ranch Wet Water Storage Pond Relining | **San Diego, CA**
Project Geologist for design report and provided on-site review and recommendations during rough, fine, and post grading operations. A storm event caused riling on the slope face requiring supplemental recommendations to comply with the geotechnical report. Geotechnical exploration and design report for replacement of PVC geomembrane liner from open reservoir, and structural wall system that separates the existing reservoir into two halves. Geotechnical observation and testing services during the rough, fine, and post grading operations.

4S Ranch Water Reclamation Facility Water Basin Improvements | **San Diego, CA**
Geotechnical exploration and report for removal of existing sloped perimeter walls along two water basins, to be replaced with vertical perimeter walls to accommodate a higher storage capacity.

New River Improvement Project - Reach One Strategic Plan | **Calexico, CA**
The New River Improvement Project will address public health problems by installing a trash screen just downstream from the Mexico border; piping polluted water away from Calexico to wetlands and aeration structures for remediation; and replacing polluted water in the river channel with treated wastewater from the city's treatment plant.

South Lake Reservoir | **San Marcos, CA**
Project Manager. Verdantas performed a geotechnical investigation for the proposed South Lake Park recreational improvement project, including geological mapping, a seismic refraction survey with several lines and exploration trenches to evaluate the rippability of the underlying bedrock.

Claude "Bud" Lewis Desalination Plant | **Carlsbad, CA**
Desalination plant with pretreatment filters, a post treatment facility, chemical storage area, a solid handling building, a 3.4 million gallon (MG) product water storage tank, a booster pump station, a reverse osmosis building, and associated improvements including retaining wall, screen walls, road widening, parking area, and landscaping, a 13-mile pipeline that connects to the Water Authority's regional distribution system; and upgrades to Water Authority facilities for distributing desalinated seawater throughout the region.

N-N Pipeline Replacement | **Bonsall, CA**
Project Geologist for the field exploration and design of the project. The existing N-N pipeline, over 1,300 linear feet. The proposed replacement project includes construction of a new 16 inch diameter HDPE pipeline using directional drilling.

LT2 Water Treatment Plant Improvements and Unit AA Raw Water Pipeline | **San Diego, CA**
Project Manager. The LT2 project included earthwork and grading for a new residuals handling building and several steel tank reservoirs ranging from 25 to 42 feet in diameter, along with approximately 500 feet of 48-inch corrosion-protected steel pipeline that connects to the Unit AA Raw Water Pipeline. The Unit AA Raw Water Pipeline, connecting the San Diego County Water Authority 2nd Aqueduct to the LT2 project, is approximately 3.25 miles long and was routed primarily within Elfin Forest Road and Via Ambiente with approximately 2,000 feet going through open terrain and under Escondido Creek in a 270-foot-long blast and excavated tunnel.

A.J. Speicher, PE, PMP, WELL AP

Associate Vice President; Mechanical, Electrical & Automation Engineering Practice Lead

A.J. Speicher, PE, has over 27 years of experience in facility design and construction, Building Automation System controls, project management, and commissioning. He has managed various aspects of cGMP validated projects, including detailed design specifications, site acceptance tests, HVAC system commissioning, and installation and operational qualifications. A.J. has designed and created AutoCAD control drawings, sequences of operation, and valve/damper schedules for Building Automation System (BAS) control systems. He has also assisted with the BAS "point-to-point" checkouts and maintained overall project delivery and profitability.

Firm

Verdantas Inc.

Education

B.S., Mechanical Engineering, The Pennsylvania State University

M.S., Mechanical Engineering, Villanova University

Licenses/Certifications

Professional Engineer – DE, PA, NJ, VA, IN, NY, WV, MN, NC, OH

U.S. Dept. of Energy Qualified Steam Specialist

AEE Certified Energy Manager

LEED Green Associate

Project Management Professional

BCA Certified Commissioning Provider

WELL Accredited Professional

Years of Experience

27 Years of Industry Experience
18 Years at Verdantas

Project Experience

Design of HVAC for Critical Environments

Swiftwater, PA
Provided project management and lead mechanical engineering services for the installation of a new central station air handling unit to serve a laboratory area. The design commenced with a 3D scan which was converted to a point cloud for design purposes. The new AHU contains a supply fan and return fan both with VFDs, hot water heating coils, chilled water cooling coils, and full mixing dampers. A.J. coordinated all the mechanical / electrical interfaces in addition to structural assessments for the floor loading.

Chiller Replacement Design

Swiftwater, PA
Provided project management and lead mechanical engineering services for the study and detailed design of the chilled water system replacement in a biotech R&D lab space. The study phase consisted of reviewing design options as related to air cooled and water-cooled chiller systems. A.J. also assisted with HSE compliance in calculating energy reduction estimates for the new system. A.J. coordinated a complete 3D laser scan for the project and conducted a fully virtual project pre-bid meeting with the contractors. A.J. lead the mechanical design efforts for new water-cooled chiller, cooling towers, pumps, and Building Automation System design efforts.

Steam / Condensate Campus Infrastructure Design Improvements

Swiftwater, PA
Provided project management and mechanical engineering services for the feasibility study and detailed design of high-pressure steam and condensate interconnects on an existing pharmaceutical campus. This project included the design of a steam pressure-powered pump, high pressure steam main design, pumped condensate design for new equipment into an existing steam

infrastructure system. The overall outcome of the project will allow all three central utility plants to be interconnected and better supply steam in a more reliable / energy efficient way across the entire campus.

Commissioning of BAS for LAB/Vivarium Spaces

Various Locations, PA
Provided commissioning, verification and documentation of the functionality of the mechanical and electrical equipment for the HVAC systems in several pharmaceutical buildings. Mechanical equipment included new rooftop air handling units, exhaust fans, bag in bag out filter housings, steam/condensate systems, chilled water / condenser water systems, etc. Services provided included looking to eliminate simultaneous heating/cooling when not required and implement other items to condition the air more intelligently. All energy reduction suggestions needed to meet site and FDA requirements before they could be implemented and tested.

Commissioning of Critical Facilities

Various Locations, PA
Provided commissioning services for two (2) projects with critical temperature and humidity requirements: The National Constitution Center, George Bush Gallery, Philadelphia, Pennsylvania and the Museum of Modern Art (MoMA), Celeste Bartos Film Preservation Center, Hamlin, Pennsylvania. The MoMA Film Preservation Center Rehabilitation Project included the commissioning of MEP systems serving two facilities: one which holds the cellulose tri-acetate film collection, laboratory spaces, and offices and another that holds the cellulose nitrate collection. The Nitrate film is relatively unstable and will break down if stored in spaces without proper ventilation, temperature and humidity control. We commissioned the low temperature cooling systems and air handling unit systems to maintain the spaces below 50 Deg F and between 20-50 %RH. The National Constitution Center included the commissioning of a new humidification system to serve a space that housed an original copy of the Bill of Rights. The NCC was the first institution in Pennsylvania to exhibit this historic document to the public. We commissioned the humidification system to maintain the tight space requirements. In addition, we verified space humidity in several locations in the viewing area along with adjacent spaces to confirm operation.

Robert W. Beccard, PE

Senior Consultant

Robert Beccard has over 45 years of experience in irrigation and hydraulic engineering for landscapes and agriculture. Bob manages irrigation engineering and water management projects and is experienced in all phases of project development, from conceptual through final design, and construction observation services. He has project experience in all 50 states within the United States and has also worked abroad in France and the Middle East. Bob's project experience includes parks, golf courses, state and national Veterans cemeteries evaluation of irrigation ditches and structures, agricultural irrigation, universities, sports fields, resorts, prisons, roadways, commercial and housing developments.

Firm

Verdantas Inc.

Education

M.S., Irrigation and Drainage Engineering, Colorado State University

B.S., Agricultural Engineering, University of Nebraska-Lincoln

Licenses/Certifications

Professional Engineer:
Colorado, Arizona, Nevada, Washington, Wyoming, South Dakota, Nebraska, Kansas, Missouri, Oklahoma, Texas

Years of Experience

45 Years of Industry Experience
38 Years at Verdantas

Qualifications

- Irrigation Engineering
- Hydraulic Engineering
- Project Management

Project Experience

Colorado State University ARDEC Well Rehabilitation | **Fort Collins, CO**

As Senior Consultant, Bob led the design team in providing engineering services to rehabilitate eight (8) existing wells at the Colorado State University Agricultural Research, Demonstration, and Education Center (ARDEC). The purpose was to restore the adjudicated flow of each well. The work effort included visual inspection of existing conditions, review of water rights, well permits and rehabilitation methods and preparation of separate construction documents for each well. Construction documents included well data, demolition, video inspection instructions, rehabilitation options based on the video inspection, and mechanical plans for new pump, piping, water measurement and controls.

Colorado State University Kerbel Well Rehabilitation | **Fort Collins, CO**

As Senior Consultant, Bob is currently leading a design team in providing engineering services to revive an existing well that provides water to Colorado State University Agricultural Research, Demonstration, and Education Center (ARDEC), The well is located off site and has collapsed requiring it be redrilled. The work effort includes visual inspection of existing conditions, review of the well permit, and preparation of site plans and mechanical and electrical construction documents. Mechanical plans include a new prefabricated pump system with water measurement and cloud based controls and piping to reconnect to existing delivery pipe.

Other Featured Projects

- Riverside National Cemetery, Riverside, California
- San Joaquin Valley National Cemetery, Gustine, California
- Sacramento National Cemetery, Sacramento, California
- Bakersfield National Cemetery, Bakersfield, California
- Willamette National Cemetery Expansion, Portland, Oregon
- Roseburg National Cemetery Renovation and Expansion, Roseburg, Oregon
- Eagle Point National Cemetery Expansion, Eagle Point, Oregon
- NRCS-OR Detering Orchards Water Management Plans, Harrisburg, Oregon
- Salem Memorial Hospital Water Feature, Salem, Oregon
- Plumb Ditch Company Infrastructure Improvements Study, Greeley, Colorado
- Creekside Park Restoration; Fort Collins, Colorado
- Spring Creek Gardens Irrigation and Pump Systems, Fort Collins, Colorado
- Fairgrounds Park, Loveland, Colorado
- Chimney Park Restoration, Windsor, Colorado
- Centennial Park Improvements, Greeley, Colorado
- Fort Logan Ditch Water Loss Study, Denver, Colorado
- South Platte Park Restoration, Denver, Colorado
- Denver Botanic Gardens Irrigation System Renovation, Denver, Colorado

J.D. Leonard, CID, CLIA

Senior Irrigation Specialist

Firm
Verdantas

Office Location
Fort Collins, CO

Education
B.S. Landscape Horticulture, Colorado State University

Licenses/Certifications
Certified Irrigation Designer (CID)

Training/Affiliations
Irrigation Association

EPA WaterSense Partner

American Legion dolor

Years of Experience
30+ Years of Industry Experience

25 Years at Verdantas

About

JD Leonard has over 30 years of experience designing landscape irrigation systems. He has a B.S. degree in landscape horticulture from Colorado State University and is an Irrigation Association Certified Irrigation Designer (CID) and Certified Landscape Irrigation Auditor (CLIA). His current responsibilities include designing irrigation and pumping systems for Verdantas' Veteran Affairs cemetery projects.

In addition to his design responsibilities, JD also provides project management and client coordination. He is knowledgeable of hydraulic analysis and modeling, water auditing, and irrigation scheduling.

In addition to VA cemetery projects, JD has also worked on K-12 facilities, university campuses, regional and community parks, sports complexes, streetscapes, and commercial properties in the United States, Kingdom of Saudi Arabia and China.

Qualifications

- Design of Irrigation and Pumping Systems
- Hydraulic Analysis and Modeling
- Water Auditing
- Irrigation Scheduling
- Project Management

Project Experience

- Riverside National Cemetery Phase 6 Expansion, Riverside, California
- San Joaquin Valley National Cemetery Irrigation and Pump Expansion, Gustine, California
- Sacramento National Cemetery Expansion, Sacramento, California
- US Air Force Academy Irrigation System Design, Colorado Springs, Colorado
- Fort Logan National Cemetery Expansions, Denver, Colorado

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- Pikes Peak National Cemetery, Colorado Springs, Colorado
- Fort Logan National Cemetery, Denver, Colorado
- Abe Lincoln National Cemetery Expansions, Elwood, Illinois
- Calverton National Cemetery Expansions, Calverton, New York
- Washington Crossing National Cemetery, Newtown, Pennsylvania
- Cape Canaveral National Cemetery, Mims, Florida
- Florida National Cemetery, Bushnell, Florida
- Dallas-Fort Worth National Cemetery Expansions, Dallas, Texas
- Houston National Cemetery Expansion, Houston, Texas
- Fairmont Cemetery, Denver, Colorado
- Evergreen and Fairview Cemeteries, Colorado Springs, Colorado
- Desert Hawk Golf Course, Pueblo West, Colorado
- White Mountain Golf Course, Rock Springs, Wyoming
- Pueblo City Park Golf Course, Pueblo, Colorado
- Bethke Elementary School, Timnath, Colorado
- Denver Botanic Gardens Irrigation Renovation, Denver, Colorado
- Denver Botanic Gardens Children's Garden Water Feature, Denver, Colorado

Troy Delzer, PE

Electrical Discipline Group Leader

Troy L. Delzer, P.E., is an Electrical Technical Leader with more than 25 years of experience in industrial facility power system design, power system studies, load calculations, code review, vendor and contractor coordination. Troy has completed numerous power system studies including short circuit analysis, equipment evaluation, protective device coordination and arc flash calculations utilizing SKM Power Tools. Troy has completed power system design and created detailed single lines for large industrial facilities and campuses. Designs included all aspects of electrical engineering from medium voltage service to low voltage power distribution, facility/site lighting, fire alarm and tele/data.

Firm

Verdantas Inc.

Education

B.S., Power Systems, South Dakota School of Mines and Technology

Licenses/Certifications

Professional Engineer – AL, AR, CT, DE, IN, MA, MN, MS, OH, PA, SC, NH, and WV

Years of Experience

28 Years of Industry Experience
8 Years at Verdantas

Project Experience

Unit Substation Replacements | **PA**
Electrical Engineer responsible for the design of replacement and upgrade of (11) indoor double ended unit substations 12,47kV to 480V varying from 750kVA to 2500kVA. Complete substation removal and installation including electrical design calculations to complete construction drawings and equipment specifications. Project work included replacement of main medium voltage lineup supporting multiple building loops for substations. Work included complete power study and arc flash labeling for over 1200 pieces of equipment.

Digital Currency Facility | **PA**
Electrical Engineer responsible for the design of complete digital currency facility and installation including electrical design calculations to complete construction drawings and equipment specifications. Electrical design and construction plans included (56) 34.5kV to 415V, 3750kVA service transformers supporting (112) 3000A low voltage switchboards. Desing includes low voltage power distribution, facility lighting, and process equipment feeders. Project work included coordination with medium voltage campus distribution. Work included multiple low voltage feeders to support new digital currency miners and support equipment.

Furnace Major Repair | **PA**
Electrical Engineer responsible for the design of major glass furnace renovations including electrical design calculations to complete construction drawings and equipment specifications. Electrical design and construction plans included new low voltage switchgear, low voltage power distribution, generator back-up, facility lighting, and process equipment feeder sizing

Manufacturing Headquarters | **PA**

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Electrical Engineer responsible for all areas of electrical engineering including load calculations, utility service sizing, emergency generator design, elevator coordination, facility layout, and equipment specification to meet client requirements and the NEC. Final work product included and equipment specifications and issued for construction drawings.

Facility Evaluation | **MN**
Responsible for electrical evaluation of facility as it applied to national, state and local code evaluation. Created EAC-electrical area classification plan for new 62,000 SF Oil Processing Facility per NFPA 497, NFPA 499, NFPA 30, and API 500.

Campus Power Study | **PA**
Responsible for power system study for eleven (11) campus facilities. Power system studies included equipment evaluation, short circuit calculation, protective device coordination study, arc flash calculations, and labeling. Study also included code evaluation and recommendations for corrections.

Corey Zachel, PE, LEED, AP

Senior Engineer

Corey Zachel is a Senior Electrical Engineer in the Integrated Design Group and oversees the production of electrical documents. He is a licensed Electrical Engineer whose experiences include design, energy audits, studies (feasibility, photometric, load, short circuit, coordination, arc flash, power factor), cost estimation, shop drawing reviews, project management, field supervision, permit applications and punch lists internationally. He has extensive experience with designs which are of electrical power generation equipment, lighting, lightning protection, electrical distribution, motor controlling, telecommunications systems, closed circuit television systems, security systems, video distribution, sound/ time systems, sound reinforcement systems, addressable/zoned/ voice fire alarm systems, and door access control systems. Corey has designed electrical systems for medical office buildings, process equipment, automotive manufacturing, parts manufacturing, aviation part and repair facilities, food process, restaurants, retail, libraries, gas stations, universities, PK-12 schools, greenhouses, career centers, housing facilities, performing arts facilities, office buildings, churches, wastewater treatment plants, fire protection pump houses, and bus garages all within code, green building, and industry standards. Corey has designed and been part of many teams on multiple projects for renewable energy production including photovoltaic, wind and biogas generator projects.

Project Experience

Arc Flash Study | **Hazelton, PA**
Arc Flash Study and report for their new headquarters.

Powertrain Facilities | **Spain/China**
Project support through Current State Amalysis Reports. Peer review and ISO checking.

Dearborn Campus Buildings 1, 3, & 5 | **Dearborn, MI**
Conducted a 15% concept master plan to major renovate the three buildings to replace the power systems and lighting to bring them to code and LEED silver potential.

Compliance Requirements Assessment | **Toledo, OH**
Conducted an emergency power system, egress lighting, and exit signage study for code compliance.

Compliance Requirements Assessment | **Bay City, MI**
Conducted an emergency power system, egress lighting, and exit signage study for code compliance.

Load Study | **Georgetown, KY**
Power system load study of a Trial Press building.

Firm

Verdantas Inc.

Education

B.S., Electrical Engineering, University of Toledo

Licenses/Certifications

Professional Electrical Engineer: OR, CA, CO, NC, NY, MI, OH

NCEES Record #31356

LEED Building Design and Construction Specialty, #88207, (2011- 2019)

Leadership in Energy and Environmental Design Accredited Professional, LEED AP, 2008

Years of Experience

25 Years of Industry Experience

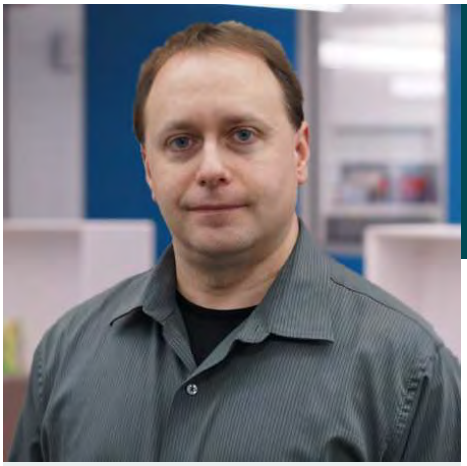
Primary Power Upgrade | **Springfield, OH**
Project designer and lead through planning and construction of a 15kV primary power upgrade

Preliminary Design | **East Liberty, OH**
Provided preliminary design estimates and value engineering items.

Preliminary Design | **Corpus Christi, TX**
Provided preliminary design estimates and value engineering items.

Arc Flash Study | **New Orleans, LA**
Arc Flash Study and report for New Orleans VA Medical Center.

Power System Projects | **18 Locations, North America & Canada**
Lead corporate electrical engineer for emergency power systems, normal power systems, grounding, process integration, TVSS, Lightning protection, and plant maintenance and sequence operation manuals.



John Stachyra, ISA CAP, CQIA

Senior Automation Specialist

John Stachyra has led a wide range of water and wastewater automation projects. Projects completed have included process coordination, multi-discipline team coordination, specification writing, control design, PLC, HMI, and SCADA programming, commissioning and operator training.

Firm

Verdantas

Office Location

Wilkes-Barre, PA

Education

A.S., Automated Systems and Robotics, Luzerne County Community College

A.S., Electronic Engineering, Luzerne County Community College

Licenses/Certifications

ISA Certified Automation Professional (CAP)

ISA84 SFS-SIS Fundamental Specialist

Years of Experience

27 Years of Industry Experience

16 Years at Verdantas

Project Experience

Water Intake, Transfer & Storage

Multiple Site in PA, WV | Automation Lead

Water Impoundment Storage & Transfer

Multiple Sites in PA, WV | Automation Lead

Water Pipeline Booster Stations

Multiple Sites in PA | Automation Lead

Water and Wastewater Lift Stations

Multiple Sites in PA | Automation Lead

Army Corp of Engineers Levee Pump Stations Controls

Wilkes-Barre, PA | Automation Lead

Sanofi Pasteur WWTP Expansion

Swiftwater, PA | Automation Lead

Hallstead WWTP Expansion

Hallstead, PA | Automation Lead

US Mint Industrial Treatment Plant Expansion

Philadelphia, PA | Automation Lead

Denver, CO | Automation Support

Sealy Industrial Treatment Plant

Hallstead, PA | Plant Automation

www.hydro-geologic.com

EXHIBIT B

CALIFORNIA FEE SCHEDULE

CLASSIFICATION	Fee
Principal Hydrogeologist	$200
Principal Engineer/Hydrologist	$200
Principal Policy, Communications, Engagement, Public Affairs, Strategist	$200
Senior Geologist/Hydrogeologist	$175
Field Inspector	$110
Consultants, Outside Services, Materials & Direct Charges	At Cost

1) Blueprints, reproductions, and outside graphic services will be charged at vendor invoice.
2) Auto mileage will be charged at the IRS standard rate.
3) Per diem, lodging, and meals billed at U.S. GSA CONUS rates (or actual cost with receipts, if required). Portal-to-portal travel billed at the applicable rate.
4) Field Inspector rate is applied to any classification performing field activities and travel to and from client meetings and project sites.

Fee Schedule subject to change January 1, 2027.

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VERDANTAS WEST AREA
2025 STANDARD BILLING RATE SCHEDULE

Professional Services	Hourly Rate
Senior Consultant I, Associate	$261.00
Senior Consultant II, Principal	$295.00
Senior Consultant III, Sr. Principal	$347.00
Project Manager	$214.00
Senior Project Manager	$238.00
Staff Engineer/Scientist/Geologist	$171.00
Senior Staff Engineer/Scientist/Geologist	$185.00
Project Engineer/Scientist/Geologist	$214.00
Senior Engineer/Scientist/Geologist	$238.00

Support	Hourly Rate
Field/Lab Technician I	$100.00
Field/Lab Technician II/Special Inspector	$109.00
Field/Lab Technician III/Special Inspector II	$119.00
Senior Technician/Senior Special Inspector	$128.00
Source Inspector	$152.00
System Operation & Maintenance Specialist	$166.00
Non-Destructive Testing (NDT) Specialist	$176.00
Prevailing Wage (Group 1) *	$183.00
Prevailing Wage (Group 2) *	$188.00
Prevailing Wage (Group 3) *	$192.00
City of Los Angeles Deputy Building/ Grading Inspector	$176.00

Support Cont'd	Hourly Rate
Administrative//Technical	$90.00
Editor/ Project Coordinator I	
Administrative//Technical	$119.00
Editor/Project Coordinator II	
Operations / Laboratory Manager	$204.00
Field/Lab Supervisor	$166.00

CAD/GIS/Data Management	Hourly Rate
CAD Designer I	$138.00
CAD Designer II	$152.00
Project Designer	$157.00
Senior Project Designer	$176.00
CAD Technician I	$119.00
CAD Technician II	$133.00
CAD Technician III	$143.00
GIS Analyst I	$143.00
GIS Analyst II	$152.00
Senior GIS Analyst	$200.00
GIS Technician I	$119.00
GIS Technician II	$138.00
Data Manager	$157.00
Senior Data Manager	$176.00

NOTES:

1. **Standard Billing Rates**: Our standard billing rates are reviewed no less than annually and may be adjusted at those times.
2. **Proposal Expiration:** Proposals are valid for at least 30 days, subject to change after 30 days; unless otherwise stated in an attached proposal.
3. ***Prevailing Wages:** Our fees for prevailing wage work are based upon California prevailing wage laws and wage determinations. Unless specifically indicated in our proposal, costs for apprentice are not included. If we are required to have an apprentice on your project, additional fees will be charged. Prevailing wage rates will increase by $8 on July 1st of each year.
4. **Expert Testimony**: Litigation, expert witness, and all other legal and court related appearances will be billed at twice the standard fee schedule rate. There is a minimum eight-hour charge per day and a minimum overall fee of $2,000.00 per case.
5. **Higher Hourly Rates**: Certain services, such as emergency/rapid response consulting, may be subject to higher hourly billing rates as agreed upon on a project-specific basis.
6. **Overtime**: Standard overtime rate is per California Labor Law and is billed at 1.5 or 2 times their hourly billing rate. Overtime rate for non-exempt field personnel working on a Verdantas observed holiday is billed at 2 times their hourly billing rate. Overtime rate for Prevailing wage work is per the California Department of Industrial Relations (DIR) determination and is multiplied at 1.5 to 2 times their hourly billing rate for overtime and double-time, respectively.
7. **Field Equipment and Supplies**: Field equipment and in-house supplies will be billed at fixed unit prices, subject to periodic updates.
8. **Subcontractors and Project Expenses**: Heavy equipment, subcontractor fees and expenses, project-specific permits and/or licenses, project-specific supplemental insurance, travel, subsistence, project-specific parking charges, shipping, reproduction, and other reimbursable expenses will be invoiced at cost plus 15%, unless billed directly to and paid by client or in accordance with the specific project agreement.
9. **Mileage:** The mileage for personal vehicles will be billed at the current United States Internal Revenue Service reimbursement rate.
10. **Minimum Field Hourly Charges:** For Field Technicians, Special Inspectors, or any on-site (field) materials testing services:
    2 hours: 2-hour minimum charge will be applied to any field visit for technicians or to any service canceled on the same day of service.
    4 hours: 4-hour minimum charge up to the first four hours of work.
    8 hours: 8-hour minimum charge for over four hours of work, up to eight hours.
    Project time accrued includes portal to portal travel time for technicians. For projects outside a 50-mile radius from the nearest Verdantas office location, excess mileage and travel time will be charged for special inspectors.
11. **Client Disclosures:** Client agrees to provide all information in Client's possession about actual or possible presence of buried utilities and hazardous materials on the project site, prior to fieldwork, and agrees to reimburse Verdantas for all costs related to unanticipated discovery of utilities and/or hazardous materials. Client is also responsible for providing safe and legal access to the project site for all Verdantas field personnel.
12. **Insurance & Limitation of Liability:** These rates are predicated on standard insurance coverage and a limit of Verdantas' liability equal to our total fees for a given project.

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CONSTRUCTION MATERIALS LABORATORY TESTING

METHOD	$/TEST
Streetlights/Signals	
LED Luminaires / Signal Modules / Countdown Pedestrian Signal Face Modules (Caltrans RSS 86)	By Quote
Spray Applied Fireproofing	
Unit weight (density, ASTM E605)	65
Sample Transport	
Pick-up and delivery (weekdays, per trip, <50 mile radius from our office)	110

METHOD	$/TEST
Bearing Pads/Plates and Joint Seal	
Elastomeric bearing pads (Caltrans SS 51-3)	1,060
Elastomeric bearing pad with hardness and compression tests (Caltrans SS 51-3)	1,315
Type A Joint Seals (Caltrans SS 51-2)	1,735
Type B Joint Seals (Caltrans SS 51-2)	1,640
Bearing plates (A536)	770

Notes

1. **Earth Material Samples:** Quoted testing unit rates are for soil and/or rock (earth) samples free of hazardous materials. Additional costs will accrue beyond these standard testing unit rates for handling, testing and/or disposing of soil and/or rock containing hazardous materials. Hazardous materials will be returned to the site or the site owner's designated representative at additional cost not included in listed unit rates. Standard turn-around time for geotechnical-laboratory test results is 10 working days. Samples will be stored for 2 months following completion of assigned tests, after which they will be discarded. Prior documented notification is required if samples need to be stored for a longer time. A monthly storage fee of $15 per bag and $6 per sleeve or tube will be applied. Quoted unit rates are only for earth materials sampled in California. There may be additional cost for handling imported samples.
2. **Construction Material Samples:** After all designated breaks for a given sample set meet specified compressive at design age or other client-designated strength, all "hold" cylinders or specimens will be automatically disposed of, unless specified in writing prior to the 28-day break. Unless specifically requested otherwise, all other construction materials will be disposed of after completion of testing and reporting.

EQUIPMENT LISTING

CLASSIFICATION	$/UNIT
1/4 inch Grab plates	5/ each
1/4 inch Tubing (bonded)	0.60/foot
1/4 inch Tubing (single)	0.40/foot
3/8 inch Tubing, clear vinyl	0.60/foot
4-Gas meter (RKI Eagle or similar)/GEM 2000	140/day
Air flow meter and purge pump (200 cc/min)	55/day
Box of 24 soil drive-sample rings	130/box
Brass sample tubes	11/each
Caution tape (1000-foot roll)	22/each
Combination lock or padlock	15/each
Compressed air tank and regulator	55/day
Concrete coring machine (≤6-inch-dia)	160/day
Consumables (gloves, rope, soap, tape, etc.)	40/day
Core sample boxes	30/each
Crack monitor Two-Dimensional	30/each
Crack monitor Thee-Dimensional	40/each
Cutoff saws, reciprocating, electric (Sawzall®)	80/day
D-Meter Walking Floor Profiler	110/day
Disposable bailers	25/each
Disposable bladders	20/each
Dissolved oxygen meter	75/day
DOT 55-gallon containment drum with lid	85/drum
Double-ring infiltrometer	135/day
Dual-stage interface probe	85/day
Dynamic Cone Penetrometer	430/day
Generator, portable gasoline fueled, 3,500 watts	90/day
Stainless steel bailer	60/day
Submersible pump with controller	180/day
Submersible pump/transfer pump, 10-25 gpm	65/day
Support service truck usage (well installation)	250/day
Survey/fence stakes	10/each
Tedlar® bags	25/each
Traffic cones (≤25)/barricades (single lane)	55/day
Turbidity meter	80/day
Tyvek® suit (each)	25/each

CLASSIFICATION	$/UNIT
Global Positioning System/Laser Range Finder	80/day
Hand auger set	90/day
HDPE safety fence (≤100 feet)	40/roll
Horiba U-51 water quality meter	135/day
Light tower (towable vertical mast)	150/day
Magnehelic gauge	15/day
Manometer	25/day
Mileage (will adjust with IRS published rate)	0.70/mile
Moisture test kit (excludes labor to perform test, ASTM E1907)	65/test
Nuclear moisture and density gauge	88/day
Electrical moisture and density gauge	88/Day
Pachometer	50/day
Particulate Monitor	135/day
pH/Conductivity/Temperature meter	60/day
Photo-Ionization Detector (PID)	150/day
Pump, Typhoon 2 or 4 stage	55/day
QED bladder pump w/QED control box	175/day
Quire fee – Phase I only	250/each
Resistivity field meter and pins	200/day
Slip / threaded cap, 2-inch or 4-inch diameter, PVC Schedule 40	20/each
Slope inclinometer	250/day
Soil sampling T-handle (Encore)	10/day
Soil sampling tripod	40/day
Speedy (R) moisture tester	10/day
Vapor sampling box	65/day
Vehicle usage (carrying equipment)	20/hour
VelociCalc	40/day
Visqueen (20 x 100 feet)	130/roll
Water level indicator (electronic well sounder) <300 feet deep well	100/day
ZIPLEVEL®.	40/day
Other specialized geotechnical and environmental testing and monitoring equipment are available, and priced per site	

Sweetwater Authority
Fee Proposal to Provide
Development of the Well Rehabilitation and Maintenance Program

		Hydro-Geologic Solutions, Inc.										Verdantas, Inc.								Hydro-Geologic Solutions Labor	Direct Costs	Verdantas Labor (No Markup)	Total Cost	
		Principal-in-Charge Susan Kang, Esq.		Principal Hydrogeologist/Project Manager Eros Bilyeu, PG, CHG, QSD, CGWP		Principal Engineer/Hydrologist/QAQC Senior Reviewer Varinder Oberoi, PE		Senior Hydrogeologist Andrew Kieta, PG		Field Inspector Engineer/Geologist		Senior Consultant II, Principal Engineer Mechanical/Electrical		Senior Engineer Mechanical/Electrical		Project Engineer Mechanical/Electrical		Senior Staff Engineer/Scientist/Geologist Mechanical/Electrical/Field Inspection						
		Hrly Rate:	$200	Hrly Rate:	$200	Hrly Rate:	$200	Hrly Rate:	$175	Hrly Rate:	$110	Hrly Rate:	$295	Hrly Rate:	$238	Hrly Rate:	$214	Hrly Rate:	$185					
		Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Amount	Amount	Amount	Wk-Hrs	Amount
1.0	**TASK 1 - Data Collection, Review, and Project Coordination**																							
1.1	Kickoff meeting to review scope, schedule, and data needs	1	$ 200	3	$ 600	1	$ 200	2	$ 350		$ -	1	$ 295	2	$ 476	1	$ 214		$ -	$ 1,350	$ 1,924	$ 985	11	$ 4,259
1.2	Collect and review existing documentation		$ -	18	$ 3,600	4	$ 800	15	$ 2,625		$ -	2	$ 590	7	$ 1,666	3	$ 642	1	$ 185	$ 7,025	$ -	$ 3,083	50	$ 10,108
1.3	Meet with Authority staff to understand operational history and known issues	1	$ 200	5	$ 1,000		$ -	4	$ 700		$ -	1	$ 295	2	$ 476	2	$ 428		$ -	$ 1,900	$ -	$ 1,199	15	$ 3,099
1.4	Ongoing project management (schedule tracking, quality oversight, regular coordination)	1	$ 200	22	$ 4,400	2	$ 400	6	$ 1,050		$ -	1	$ 295	4	$ 952	1	$ 214	1	$ 185	$ 6,050	$ -	$ 1,646	38	$ 7,696
1.5	Progress meetings at key milestones to report preliminary findings and confirm direction		$ -	7	$ 1,400	1	$ 200	2	$ 350		$ -	1	$ 295		$ -		$ -		$ -	$ 1,950	$ -	$ 295	11	$ 2,245
	Subtask 1 Total	***3***	***$ 600***	***55***	***$ 11,000***	***8***	***$ 1,600***	***29***	***$ 5,075***		***$ -***	***6***	***$ 1,770***	***15***	***$ 3,570***	***7***	***$ 1,498***	***2***	***$ 370***	***$ 18,275***	***$ 1,924***	***$ 7,208***	***125***	***$ 27,407***
2.0	**TASK 2 - Field Assessments and Condition Evaluation**																							
2.1	Visual inspection of wellheads, pumps, motors, electrical equipment, and appurtenances		$ -		$ -		$ -		$ -	60	$ 6,600	7	$ 2,065	23	$ 5,474	12	$ 2,568	8	$ 1,480	$ 6,600	$ 6,444	$ 11,587	110	$ 24,631
2.2	Evaluate site accessibility, safety conditions, and related infrastructure		$ -	3	$ 600		$ -	4	$ 700	4	$ 440		$ -	5	$ 1,190	2	$ 428	1	$ 185	$ 1,740	$ -	$ 1,803	19	$ 3,543
2.3	Observe operational characteristics (including available pump performance indicators)		$ -	4	$ 800		$ -	6	$ 1,050	6	$ 660	2	$ 590	8	$ 1,904	4	$ 856		$ -	$ 2,510	$ -	$ 3,350	30	$ 5,860
2.4	Review historical performance data (e.g., specific capacity, drawdown trends, etc.)		$ -	10	$ 2,000	2	$ 400	12	$ 2,100		$ -		$ -	3	$ 714	2	$ 428	2	$ 370	$ 4,500	$ -	$ 1,512	31	$ 6,012
2.5	Identify potential deterioration, fouling, corrosion, or structural deficiencies		$ -	4	$ 800		$ -	6	$ 1,050	10	$ 1,100	2	$ 590	3	$ 714	2	$ 428	2	$ 370	$ 2,950	$ -	$ 2,102	29	$ 5,052
2.6	Recommend additional testing where beneficial		$ -	3	$ 600	1	$ 200	2	$ 350		$ -		$ -	1	$ 238	2	$ 428		$ -	$ 1,150	$ -	$ 666	9	$ 1,816
2.7	Prepare narrative findings for each well summarizing observed conditions, issues, and preliminary needs		$ -	14	$ 2,800	2	$ 400	22	$ 3,850		$ -		$ -	5	$ 1,190	8	$ 1,712	1	$ 185	$ 7,050	$ -	$ 3,087	52	$ 10,137
	Subtask 2 Total		***$ -***	***38***	***$ 7,600***	***5***	***$ 1,000***	***52***	***$ 9,100***	***80***	***$ 8,800***	***11***	***$ 3,245***	***48***	***$ 11,424***	***32***	***$ 6,848***	***14***	***$ 2,590***	***$ 26,500***	***$ 6,444***	***$ 24,107***	***280***	***$ 57,051***
3.0	**TASK 3 - Rehabilitation Planning, Maintenance Strategy, and Program Development**																							
3.1	Well-by-well rehabilitation recommendations and prioritization		$ -	20	$ 4,000	3	$ 600	20	$ 3,500		$ -	1	$ 295	8	$ 1,904	3	$ 642		$ -	$ 8,100	$ -	$ 2,841	55	$ 10,941
3.2	Preventive maintenance schedules and inspection procedures		$ -	16	$ 3,200	2	$ 400	14	$ 2,450		$ -	1	$ 295	4	$ 952	6	$ 1,284	1	$ 185	$ 6,050	$ -	$ 2,716	44	$ 8,766
3.3	Identify equipment upgrades or replacements		$ -	6	$ 1,200	1	$ 200	5	$ 875		$ -	3	$ 885	12	$ 2,856	4	$ 856	1	$ 185	$ 2,275	$ -	$ 4,782	32	$ 7,057
3.4	Develop standardized tools (Inspection checklists, Maintenance logs/templates, Standard Operating Procedures (SOPs))		$ -	12	$ 2,400	2	$ 400	8	$ 1,400		$ -	1	$ 295	2	$ 476	5	$ 1,070	5	$ 925	$ 4,200	$ -	$ 2,766	35	$ 6,966
3.5	Prepare cost estimates for rehabilitation tasks		$ -	6	$ 1,200	1	$ 200	5	$ 875		$ -	2	$ 590	2	$ 476	5	$ 1,070	5	$ 925	$ 2,275	$ -	$ 3,061	26	$ 5,336
3.6	Develop short-term (1–3 year) and long-term (5–10 year) budget projections		$ -	6	$ 1,200	1	$ 200	3	$ 525		$ -	1	$ 295	1	$ 238	1	$ 214		$ -	$ 1,925	$ -	$ 747	13	$ 2,672
3.7	Conduct a draft review meeting to present preliminary findings and receive feedback	3	$ 600	6	$ 1,200	2	$ 400	10	$ 1,750		$ -	4	$ 1,180	4	$ 952		$ -		$ -	$ 3,950	$ -	$ 2,132	29	$ 6,082
	Subtask 3 Total	***3***	***$ 600***	***72***	***$ 14,400***	***12***	***$ 2,400***	***65***	***$ 11,375***		***$ -***	***13***	***$ 3,835***	***33***	***$ 7,854***	***24***	***$ 5,136***	***12***	***$ 2,220***	***$ 28,775***	***$ -***	***$ 19,045***	***234***	***$ 47,820***
4.0	**TASK 4 - Final Program Preparation and Deliverables**																							
4.1	Prepare Draft Program for Authority review		$ -	18	$ 3,600	4	$ 800	18	$ 3,150		$ -	2	$ 590	3	$ 714	3	$ 642		$ -	$ 7,550	$ -	$ 1,946	48	$ 9,496
4.2	Incorporate comments and revisions	1	$ 200	12	$ 2,400	3	$ 600	10	$ 1,750		$ -	1	$ 295	2	$ 476	2	$ 428		$ -	$ 4,950	$ -	$ 1,199	31	$ 6,149
4.3	Conduct final presentation to Authority staff	1	$ 200	4	$ 800	1	$ 200	3	$ 525		$ -	4	$ 1,180	4	$ 952		$ -		$ -	$ 1,725	$ 1,924	$ 2,132	17	$ 5,781
4.4	Deliver Final Program including (at minimum): executive summary, basin-wide findings/evaluations, well-by-well rehab plans, maintenance schedules/SOPs, budget planning tools, and all supporting tables/figures/templates	1	$ 200	4	$ 800	2	$ 400	5	$ 875		$ -	1	$ 295	5	$ 1,190	5	$ 1,070		$ -	$ 2,275	$ -	$ 2,555	23	$ 4,830
4.5	Submit deliverables as PDF plus fully editable files (Word/Excel/GIS as applicable)		$ -	2	$ 400		$ -	2	$ 350		$ -		$ -	2	$ 476	2	$ 428		$ -	$ 750	$ 1,000	$ 904	8	$ 2,654
	Subtask 4 Total	***3***	***$ 600***	***40***	***$ 8,000***	***10***	***$ 2,000***	***38***	***$ 6,650***		***$ -***	***8***	***$ 2,360***	***16***	***$ 3,808***	***12***	***$ 2,568***		***$ -***	***$ 17,250***	***$ 2,924***	***$ 8,736***	***127***	***$ 28,910***
	GRAND TOTAL NOT-TO-EXCEED (TASKS 1 THROUGH 4):	9	$ 1,800	205	$ 41,000	35	$ 7,000	184	$ 32,200	80	$ 8,800	38	$ 11,210	112	$ 26,656	75	$ 16,050	28	$ 5,180	$ 90,800	$ 11,292	$ 59,096	766	$ 161,188

Direct Cost Worksheet

Round Trip Miles	2026 Milage Rate	ME&I GSA Rate	Lodging GSA Rate	Travel	Equipment Rental		SUM
200	$ 0.725	$ 86.00	$ 199.00				
800	$ 580	$ 344	$ -	$ 1,000		$ -	$ 1,924
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
800	**$ 580**	**$ 344**	**$ -**	**1000**		**$ -**	**$ 1,924**
800	$ 580	$ 1,376	$ 2,388	$ 1,500	$ 600	$ -	$ 6,444
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
800	**$ 580**	**$ 1,376**	**$ 2,388**	**$ 1,500**		**$ -**	**$ 6,444**
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
	$ -	**$ -**	**$ -**			**$ -**	**$ -**
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -			$ -	$ -
800	$ 580	$ 344	$ -	$ 1,000		$ -	$ 1,924
	$ -	$ -	$ -			$ -	$ -
	$ -	$ -	$ -	$ 1,000		$ -	$ 1,000
800	**$ 580**	**$ 344**	**$ -**	**$ 2,000**		**$ -**	**$ 2,924**
2,400	$ 1,740	$ 2,064	$ 2,388	4500		$ -	$ 11,292

Notes and Assumptions

1 *Hydro-Geologic Solution Field inspector rates are limited to field work and travel time only for this project and apply to any individual conducting field related tasks or traveling to and from client meetings and project sites.*

2 *Cost includes three (1) mobilizations for 4 project team members for field visits and (2) mobilization for the 4 key project team members for an in person Kickoff Meeting, final presentation. The remainder of meetings shall include at minimum the project manager in person (if requested by the Authority) and other key project team members virutally.*

3 *There is no markup by Hydro-Geologic Solutions for the services of Verdantas or direct costs.*

SWEETWATER AUTHORITY
Cost Proposal for Professional Services
Development of the Well Rehabilitation and Maintenance Program

		Project Engineer	Principal Hydrogeologist	Senior Hydrogeologist	Project Hydrogeologist	Staff Hydrogeologist	GIS Technician	Project Coordinator	Labor	Direct Costs	Total Cost
	Hourly Rate:	$190	$240	$190	$155	$145	$120	$105			
1.0	**DATA COLLECTION, REVIEW, AND PROJECT COORDINATION**										
1.1	Provide general project management and coordination, attend virtual kick-off meeting, and up to four (4) project progress meetings.	8	12	24				4	$ 9,380	$ -	$ 9,380
1.2	Compile and review available existing well data and documentation and meet with Authority staff re: operational history and known issues.	8	8	12	12	24	4		$ 11,540	$ 210	$ 11,750
2.0	**FIELD ASSESSMENTS AND CONDITION EVALUATION**										
2.1	Conduct field visits at each well site to perform visual inspection of aboveground equipment and evaluate safety conditions and related infrastructure.	12	12	12					$ 7,440	$ 445	$ 7,885
2.2	Perform well and equipment condition assessments, including development of well histories, as-built and modification details, performance dynamics, estimation of remaining service well life, and recommendations for additional testing (as needed).	20	16	16	24	40	4		$ 20,680	$ -	$ 20,680
3.0	**REHABILITATION PLANNING, MAINTENANCE STRATEGY, AND PROGRAM DEVELOPMENT**										
3.1	Prepare well maintenance program framework, including the results of each well condition and performance assessment, well maintenance recommendations, a prioritized list of short- and long-term well rehabilitation and maintenance needs, and short- and long-term planning-level cost projections.	16	24	24	40	40	8		$ 26,320	$ -	$ 26,320
3.2	Develop preventative well maintenance schedules and inspection procedures and protocols, including inspection checklists, maintenance logs and templates, and SOPs for well maintenance and monitoring activities.	8	8	12	12	12	4		$ 9,800	$ -	$ 9,800
3.3	Conduct virtual draft review workshop to present preliminary findings and recommendations to Authority personnel, and receive comments.		4	8	4				$ 3,100	$ -	$ 3,100
4.0	**FINAL PROGRAM PREPARATION AND DELIVERABLES**										
4.1	Prepare Well Rehabilitation and Maintenance Program documents, including executive summary, basin-wide findings and well evaluations, rehabilitation plans, maintenance scheduled, SOPs, budget planning tools, and supporting materials.	8	12	24	48	48	8		$ 24,320	$ -	$ 24,320
4.2	Conduct in-person workshop to present findings and recommendations to Authority personnel.		8	12		8			$ 5,360	$ 210	$ 5,570
	TOTAL HOURS AND COST:	***80***	***104***	***144***	***140***	***172***	***28***	***4***	***$ 117,940***	***$ 865***	***$ 118,805***

DRP ENGINEERING, INC. KYLE GROUNDWATER, INC.

FEE SCHEDULE

Labor Classification	Hourly Rate
Principal Hydrogeologist	$240
Senior Hydrogeologist	$190
Project Engineer (DRP)	$190
Project Hydrogeologist	$155
Staff Hydrogeologist	$145
GIS Technician	$120
Project Coordinator	$105
Clerical	$80

Non-Labor Charges:

Mileage = $0.70 per mile (i.e., the allowable IRS rate)

Field visit (day) = $35

Field visit (overnight) = $200

Transducer rental = $100 per day

Rates subject to change effective January 1, 2027.

No markup applied to direct expenses.

KYLE Groundwater, Inc.
2377 W. Foothill Blvd., Suite 7
Upland, CA 91786
(626) 379-7569

Proposal

Professional Services for Development of a Well Rehabilitation and Maintenance Program

PREPARED FOR:

Sweetwater Authority

March 13, 2026

KYLE Groundwater
2377 W. Foothill Blvd., Suite 7
Upland, CA 91786 | 626-379-7569
www.kylegroundwater.com

March 13, 2026

Ms. Xochitl Aranda, PE
Director of Engineering and Operations
Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910

Re: Proposal for Professional Services
Development of the Well Rehabilitation and Maintenance Program

Dear Ms. Aranda:

KYLE Groundwater, Inc. (KGI) is pleased to provide Sweetwater Authority (Authority) with this proposal to provide professional services during development of a well rehabilitation and maintenance program. This proposal is in response to the RFP issued on February 6, 2026.

We offer a group of highly qualified personnel with a deep understanding of well diagnostics, rehabilitation processes, and requirements. Our PIC has designed and installed more than 160 water supply wells located throughout California and Mexico, and has a thorough understanding of the hydrogeology and physical processes governing groundwater flow to water wells. Within the past five years alone he has served as project manager for the evaluation and/or rehabilitation of more than 100 wells for a variety of public and private clients. Additionally, he has completed large-scale well rehabilitation prioritization studies for Golden State Water Company, Palmdale Water District, Long Beach Utilities Department, Mission Springs Water District, the City of Santa Clara, and Riverside Public Utilities. We have chosen DRP Engineering, Inc. (DRP) as our subconsultant to assist with engineering related evaluation of above-ground equipment, as we have a long history of working together on a variety of water supply projects in California, allowing for an efficient, integrated, and effective team.

As principal-in-charge (PIC) for this project, I can pledge that we are submitting this proposal as a statement of our commitment to provide the experienced leadership and expertise necessary to ensure a successful project for the Authority. It is our mission to surpass project goals and exceed our clients' expectations by applying innovative thinking to develop optimal technical solutions. Our general methodology is to combine our years of hard-earned experience with a scientifically based approach to produce a quality work product.

We acknowledge the scope of work in its entirety as it is presented within the RFP, and provide our assurance that we fully understand the nature of the project, and the services required. This proposal is a firm offer for acceptance, valid for a period of 90 days from the proposal submittal date. We appreciate the opportunity to develop a mutually beneficial working relationship with Sweetwater Authority.

Sincerely,

Russell Kyle, PG, CHG
President / Principal Hydrogeologist

KYLE Groundwater, Inc.
2377 W. Foothill Blvd., Suite 7
Upland, CA 91786
(626) 379-7569

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Attachment A – Resumes

SECTION 1 – IDENTIFICATION OF RESPONDER

KYLE GROUNDWATER, INC.

KYLE Groundwater, Inc. (KGI) is a California Corporation located in Upland. Our company was founded in early 2018 by Mr. Russell Kyle and Ms. Kimberly Makar, in response to demand for experienced and innovative hydrogeological solutions from our Southern California clients. Since that time, we have established a large local client base of water agencies and purveyors, and are continuing to grow. We have a reputation for approaching each of our projects with fresh eyes and providing a superior and customized work product. Mr. Kyle, a Professional Geologist and Certified California Hydrogeologist, holds the philosophy that an honest, well-thought-out, innovative, and scientifically based approach coupled with a high-quality work product, leads to project success. The number and variety of successful projects over the course of his career is testament to that fact. Mr. Kyle has provided hydrogeologic design, construction, and inspection services for over 160 new water supply wells and has successfully evaluated and rehabilitated more than 150 wells to stabilize structural abnormalities, recover lost production and improve poor water quality.

KYLE Groundwater, Inc., a California Corporation
2377 W. Foothill Blvd., Suite 7
Upland, CA 91786
Employees: 6

Russell John Kyle, PG, CHG
President / CEO
626-379-7569
russell.kyle@kylegroundwater.com

Services offered by KGI include, but are not limited to:

Water Wells
- Siting
- Feasibility Studies
- Design
- Technical Plans & Specifications
- Construction Management
- Inspection
- Peer Review

Permitting Support
- Water Supply Studies
- Source Assessments (DWSAP)
- Domestic Water Supply Permit
- NPDES
- Control Zone Compliance
- Setback Compliance

Groundwater Basin Studies
- Regional Studies
- Groundwater Quality Characterization
- Perennial Yield Estimates
- Artificial Recharge Feasibility
- Well Field Optimization
- Groundwater Protection
- Well Maintenance Programs

Groundwater Exploration
- Exploratory Drilling
- Test Wells
- Monitoring Wells
- Depth-Specific Sampling
- Well Canvassing

Well Rehabilitation and Redevelopment
- Well Condition Assessment
- Well Efficiency Testing
- Down-Hole Video Interpretation
- Flow Profiling
- Water Quality Assessment
- Mechanical and Chemical Treatment
- Well Modification
- Well Repair
- Liner Design
- Technical Plans & Specifications
- Construction Management
- Construction Observation

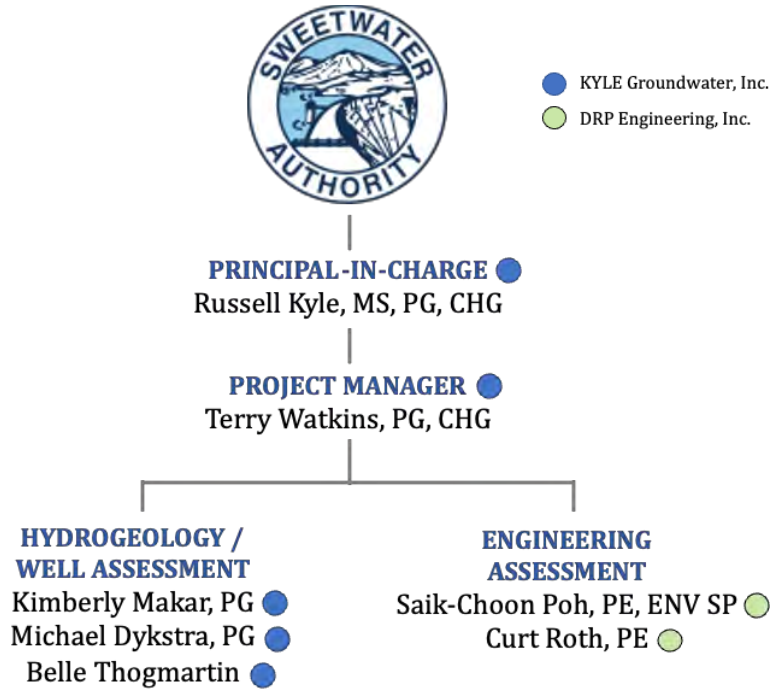
SECTION 2 – FINANCIAL RELATIONSHIPS DISCLOSURE

To the best of our knowledge, no member of our team has held any financial relationships with current members of the Sweetwater Authority Board, nor staff and/or entities for which said members are employed and have an interest, past or present.

SECTION 3 – TEAM ORGANIZATION AND KEY PERSONNEL

This section outlines our team organizational structure, as well as the qualifications and responsibilities of key team members. Bringing 30 years of local water supply experience to this project, Mr. Russell Kyle will serve as our Principal-in-Charge (PIC), and Mr. Terry Watkins will serve as Project Manager (PM) and will coordinate directly with the Authority and other team members throughout the course of the project. Our team has broad experience with completing regional-scale wellfield assessment projects for a variety of public and private clients, including Golden State Water Company, Palmdale Water District, Mission Springs Water District, Long Beach Utilities Department, City of Santa Clara, and California Water Service Company. We have subcontracted with DRP Engineering, Inc., (DRP), a professional consulting firm providing civil and environmental engineering design services throughout Southern California, to provide an engineering assessment of above-ground equipment at each well site. The DRP engineering team includes Mr. Saik-Choon Poh (Engineering Principal) and Mr. Curt Roth (Engineering Project Manager). All work will be conducted by or under the direct supervision of a California Professional Geologist (PG), Certified Hydrogeologist (CHG), and/or Professional Engineer (PE).

Each member of our project team is identified in the organizational chart below along with their respective roles for this project. Brief biographical sketches are provided on the following pages, and resumes for key personnel are included in Attachment A. Each member of our team will be available for the duration of the project and will not be reassigned without prior written approval from the Authority.



RUSSELL KYLE, PG, CHG

PRINCIPAL HYDROGEOLOGIST (KGI) – UPLAND, CA

Licenses and Certifications: Professional Geologist, No. 7648
Certified Hydrogeologist, No. 822

Mr. Kyle has 30 years' experience with a wide variety of groundwater resource related projects for public and private clients within the western United States, Mexico, and Africa, with a focus on groundwater resources development in Southern California. The scope of his technical experience includes groundwater basin evaluations, water supply studies, well siting investigations, artificial recharge feasibility evaluations, well field condition assessments, well rehabilitation, desalination feedwater supply studies, and geophysical surveys. Over the course of his career, he has been responsible for siting and installation of more than 150 water supply wells and 70 monitoring wells and exploratory borings, including management of field inspectors, coordination with drilling contractors and regulatory agencies, permitting, well design, and construction management. He has completed more than 150 high-profile well assessment, rehabilitation, and redevelopment projects within Southern California within the past 5 years, and is currently working on a variety of phases supporting installation of 10 municipal water supply wells. Mr. Kyle is active within the water resources community as past-Chair to the AWWA CA NV Water Well Technology Committee, voting member of the AWWA National Well Standards Committee, and as part of an expert technical advisory panel assisting with development of an updated version of the California Department of Water Resources Well Standards.

References:

Mr. Scott L. Rogers, PE
Engineering Manager – Palmdale Water District
661-456-5319
srogers@palmdalewater.org

Mr. Brian Macy, PE
General Manager – Mission Springs Water District
760-898-6348
*b*macy@mswd.org

Mr. Clyde Arucan, PE
Manager, Capital Delivery – California Water Service Company
310-257-1447
carucan@calwater.com

Mr. Ashish Marwah
Assistant Engineer – Jurupa Community Services District
951-685-7434 x147
amarwah@jcsd.us

Mr. Mark Insco, PE
Engineering Manager – Golden State Water Company
916-534-0541
markinsco@gswater.com

Mr. Nik Baykal, PE
Civil Engineer – Long Beach Utilities Department
562-570-2347
nikolas.baykal@lbwater.org

TERRY WATKINS, PG, CHG

PROJECT MANAGER (KGI) – UPLAND, CA

Licenses and Certifications: Professional Geologist, No. 9048
Certified Hydrogeologist, No. 1038

Mr. Watkins has over 22 years of experience in a variety of groundwater projects, including geohydrologic investigations, groundwater quality studies, artificial recharge projects, site feasibility and test drilling programs, and seawater desalination programs, in addition to water well construction supervision and management. Mr. Watkins specializes in groundwater well design and construction management, overseeing site evaluation and selection, preliminary well design, development of technical specifications, final well design, aquifer pump test analysis, development of well rehabilitation programs, and providing construction management. He has performed project management and construction management and supervision on several multi-well projects throughout California and Mexico including municipal water supply wells, ASR wells, injection wells, and monitoring wells.

KIMBERLY MAKAR, PG

PROJECT GEOLOGIST / WELL ASSESSMENT (KGI) – UPLAND, CA

Licenses and Certifications: Professional Geologist, No. 10044

Ms. Makar is a geologist with 13 years of experience in the water resource and mining industries. She began her career as a manager of the dewatering program at an open-pit copper mine in Nevada, for which she was responsible for developing and executing multi-million-dollar groundwater dewatering programs. Since 2014 she has been providing professional consulting services to the water resources industry in Southern California with an emphasis on new well installation and well rehabilitation. Ms. Makar served as field coordinator during a number of recent well construction and rehabilitation projects for agencies such as Long Beach Utilities Department, Jurupa Community Services District, Mission Springs Water District, Lake Arrowhead Community Services District, and Morongo Band of Mission Indians, and leads our permitting and field coordination efforts during planning and construction of municipal water supply wells.

MICHAEL DYKSTRA, PG

HYDROGEOLOGIST / WELL ASSESSMENT (KGI) – UPLAND, CA

Licenses and Certifications: Professional Geologist, No. 10239

Mr. Dykstra has 10 years' experience in the Southern California housing construction industry, where he worked closely with project managers to ensure projects were completed properly and in a timely manner. He received a Bachelor of Science degree in Geology from California State Polytechnic University – Pomona in 2017 and is currently seeking a Master of Science degree in the same subject. Since January 2020, Mr. Dykstra has been providing professional consulting services and support to the water resources industry in California, which includes field observation for new water supply wells and well rehabilitations, and hydrogeologic support for groundwater quality studies, permitting, well siting, and design. He has been an integral part of many projects water resource development projects throughout Southern and Northern California.

SAIK-CHOON POH, PE, ENV SP

ENGINEERING PRINCIPAL / ABOVE-GROUND ASSESSMENT (DRP) – MONTEREY PARK, CA

Mr. Poh is a registered engineer in the State of California (Registration No. C 69223), specializing in environmental and civil engineering. He is experienced in production wells, water pipeline, and groundwater treatment facility projects. Mr. Poh has served as a senior manager in the water industry for 22 years and has successfully managed and led project teams that have developed and delivered a wide range of projects from feasibility studies, master plans, predesigns, detailed designs and services during construction on a variety of projects.

CURT ROTH, PE

ENGINEERING PROJECT MANAGER / ABOVE-GROUND ASSESSMENT (DRP) – MONTEREY PARK, CA

Curt Roth, PE., with DRP Engineering, will be responsible for leading the engineering effort in development of preliminary site layouts for the new well, along with other engineering support as the need arises. Mr. Roth brings 26 years of experience in environmental and civil engineering. He is experienced in water, storm water, recycled water and wastewater conveyance as well as all aspects of water and storm water treatment, and adds tremendous experience with regard to design, construction, and operation of production wells.

SECTION 4 – REQUIRED QUALIFICATIONS AND EXPERIENCE

Our team members have the experience and expertise necessary to deliver the highly-specialized hydrogeological and engineering services needed for this project, and have worked together on numerous projects within the past ten years. The following pages include a selection of reference projects that demonstrate a proven track record with recent project-relevant experience. Key members of our team outlined in this proposal held significant roles within these reference projects. The client references listed in this section can attest to the quality of our services, delivery capability, and our level of ownership. In addition to the projects presented on the following one-page project summaries, key members of our project team were also instrumental in the assessment, rehabilitation, and/or repair of the following wells. This experience highlights the depth of knowledge and expertise held by our team with respect to well assessment and rehabilitation.

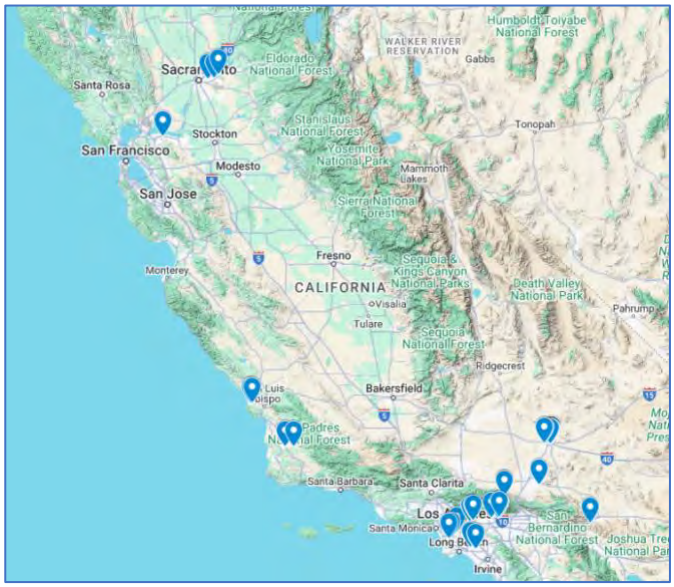
Recent Well Condition Assessment and Rehabilitation Experience (155 Wells)

California Water Service Company	DOM 219-02, DOM 272-01, and ORO 17-01
City of Banning	Well C-6 and Well M-10
City of Hemet	Well 2A, Well 12, Well 15, and Well 16
City of Santa Clara	Well 05-02, Well 16-02, Well 21, Well 26, Well 32, and Well 34
City of Torrance	Well 9
Desert Water Agency	Well 23, Well 44, and Well 45
Gage Canal Company	Well 26-1 and Well 46-1R
Golden Era Productions	Well 1
Golden State Water Company	System-Wide Well Evaluation (52 wells)
Golden State Water Company	Well MEB-11 and Bella Vista 1
Indio Water Authority	Well U, Well 3B, Well S, and Well 13B
Lake Arrowhead Community Services District	Well 1, Well 2A, Well 4, and Well 5
Long Beach Utilities Department	CTZ-9 and WIL-1A
Long Beach Utilities Department	COM-15 and COM-18
Long Beach Utilities Department	CTZ-7A, WIS-1A, COM-16, COM-20, COM-21, COM-22A, DEV-9
Mission Springs Water District	System-Wide Well Evaluation (16 wells)
Mission Springs Water District	Wells 28, Well 34, and Well 35
OCS Construction	USBP Station Well
Olam Farms	Well 7B and Well 14
Palmdale Water District	System-Wide Well Evaluation (22 wells)
Palmdale Water District	Well 4A, Well 7A, Well 14A, Well 15, Well 26, and Well 28
Riverside Public Utilities	Styles Well and Van Buren Well 2
Shalom Institute	Upper Well and Lower Well
Soboba Band of Luiseno Indians	Well DW-5
Suburban Water Systems	Plant 409
Three Valleys Municipal Water District	Well 1
United Water Conservation District	Well 13, Well 14, and Well 17

GOLDEN STATE WATER COMPANY
COMPANY-WIDE WELL CONDITION ASSESSMENT

Location:	Throughout California
Personnel:	Russell Kyle, Project Manager/Hydrogeologist Kimberly Makar, GIS/Hydrogeologic Support Michael Dykstra, Hydrogeologic Support Curt Roth (DRP Engineering), Above-Ground Engineering Review
Client:	Golden State Water Company
	Mark Insco, PE
	markinsco@gswater.com
	(916) 534-0541
Completion Date:	January 2026
Total Cost:	$132,000

Golden State Water Company (GSWC) meets the water demand of its approximately 265,500 service connections through a variety of sources, with a significant portion being from pumped groundwater. There are three regions serving communities throughout California, within which there are numerous individual systems. The primary goal for this project is to manage maintenance of local water supply sources throughout its many California water systems. The planning documents stemming from this study will guide GSWC in decision making for future well maintenance and well replacement projects designed to optimize and maintain production capacity.

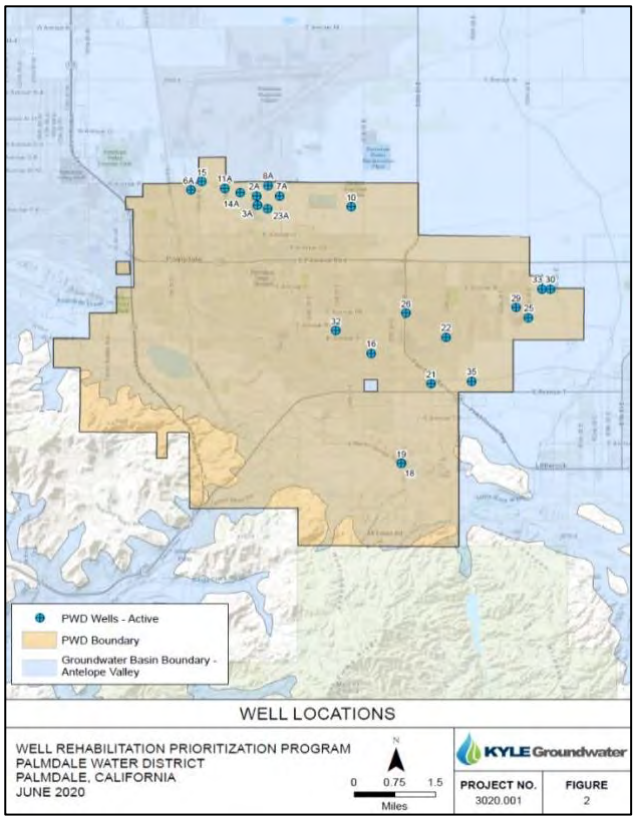


To meet GSWC's project goals, KGI has been tasked with assessment of 52 groundwater wells located throughout California, and across 16 systems, including data gathering and review. Well histories and condition assessments were prepared for all wells based on the available information, including visual information from historical downhole video surveys, and an evaluation of historical trends in well production parameters, including instantaneous pumping rate, specific capacity, and power consumption, and the remaining useful life of each well will be estimated. Each well site was visited and thoroughly documented, and each system's operations personnel were interviewed to query first-hand information that may not be available in written form.

KGI has completed condition assessments for each well, and provided summary technical memoranda for each of the 16 systems evaluated. The results of this project will serve as a basis for an upcoming rate case.

PALMDALE WATER DISTRICT
WELL REHABILITATION PRIORITIZATION PROGRAM

Location:	Palmdale, CA
Personnel:	Russell Kyle, Project Manager/Hydrogeologist Kimberly Makar, GIS/Hydrogeologic Support Michael Dykstra, Hydrogeologic Support
Client:	Palmdale Water District
	Scott Rogers, PE
	srogers@palmdalewater.org
	661-456-1020
Completion Date:	2020
Total Cost:	$140,000



Palmdale Water District (PWD) meets the water demand of its almost 28,000 service connections through a combination of treated surface water from the State Water Project (SWP), and groundwater pumped from water supply wells. PWD's twenty two (22) active groundwater production wells account for approximately 40 percent of water supplied to its customers, the majority of which is pumped directly into the distribution system following disinfection. PWD's primary goal for this project is to prepare a roadmap to maximize local water supply sources and reduce reliance on costly imported water. This planning document will guide PWD in decision making for future well maintenance and well replacement projects designed to optimize and maintain production capacity. It will identify those wells that are in most need of rehabilitation and that offer the best chance for success at the lowest cost. It will also identify wells that should be operated to failure while planning for replacement.

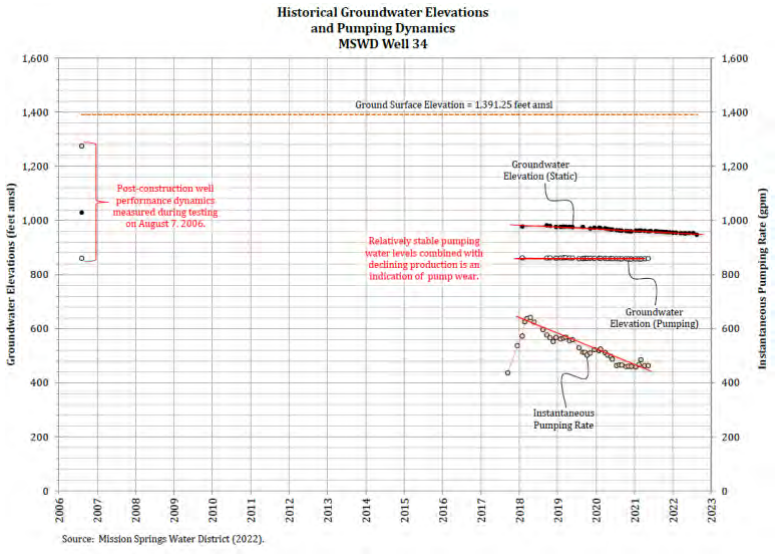
KGI developed a rehabilitation and replacement prioritization plan for the PWD well field, consisting of the previously mentioned 22 active groundwater production wells. This project involved a thorough evaluation and ranking of each well as to overall condition, rehabilitation feasibility and estimated remaining well life. Additional components of the project included development of modular technical specifications for well rehabilitation, and rehabilitation of up to three wells, including technical specifications and bid support.

MISSION SPRINGS WATER DISTRICT
WELL REHABILITATION PRIORITIZATION PROGRAM

Location:	Desert Hot Springs, CA
Personnel:	Russell Kyle, Project Manager/Hydrogeologist Kimberly Makar, GIS/Hydrogeologic Support Michael Dykstra, Hydrogeologic Support
Client:	Mission Springs Water District
	Brian Macy, PE
	bmacy@mswd.org
	(760) 898-6348
Completion Date:	Est., June 2026
Total Cost:	$90,300

Mission Springs Water District (MSWD) meets the water demand of its approximately 13,500 service connections entirely through use of pumped groundwater. The MSWD service area encompasses approximately 135 square miles, including the City of Desert Hot Springs, a portion of the City of Palm Springs, and ten smaller communities in Riverside County, including North Palm Springs, West Palm Springs, and Palm Springs Crest. Groundwater pumped from MSWD's thirteen active wells is primarily produced from the Mission Creek subbasin via eight water supply wells, and to a lesser extent, from the Indio subbasin via three active wells, and from San Gorgonio Pass subbasin via two active wells. The MSWD wellfield ranges in age from 1958 through the present, with an average age of approximately 36 years.

MSWD's primary goal for this project is to manage maintenance of local water supply resources and retain water independence. The intent of the prioritization plan is to guide MSWD in decision making for future well maintenance and well replacement projects designed to optimize and maintain production capacity. The plan will identify those wells that are in most need of rehabilitation and that stand the best chance for success at the lowest cost. It will also identify wells that should be operated to failure while planning for replacement.



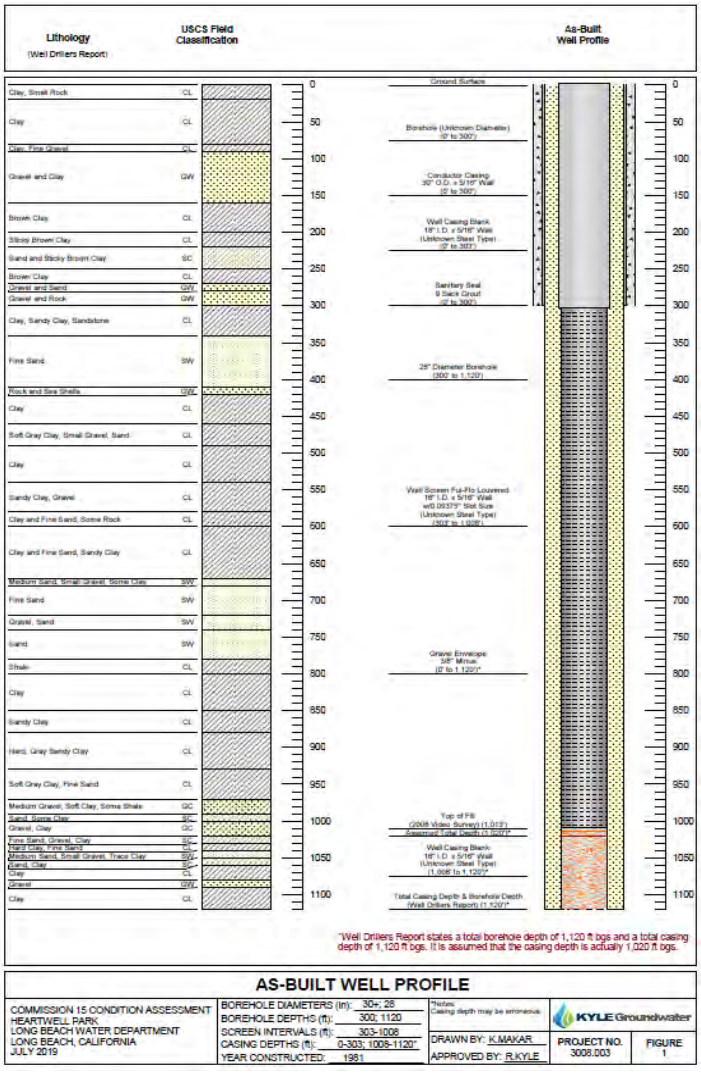
KGI is in the process of developing the well rehabilitation and replacement prioritization plan for MSWD but has been tasked with multiple well condition assessments and well rehabilitation tasks during the course of the project in response to emergency conditions, including the feasibility of returning three (3) inactive well to service. The wellfield condition assessment is well underway and will be completed once all rehabilitation tasks are finished.

LONG BEACH UTILITIES DEPARTMENT
WELL ASSET MANAGEMENT PROJECT

Location:	Long Beach, CA
Personnel:	Russell Kyle, Hydrogeologist
Client:	Stanley Consultants / Long Beach Utilities Department
	Heather Rhee, PE
	heather.rhee@lbwater.org
	(562) 570-2312
Completion Date:	December 2025
Total Cost:	$129,450

Local groundwater production is a critical component of Long Beach Utilities (LBU) water supply portfolio and developing and maintaining a maximum well field capacity has been identified as a crucial water resource strategy. The objective of the Well Asset Management Project is to develop the tools and procedures necessary to effectively monitor well field operations, assess critical factors affecting current and future production, and provide the foundations for intelligent decision-making regarding operation and maintenance of each well. In this way, local groundwater resources can be utilized to the fullest extent possible. Critical components of this project include development of a digital tool to provide insight into the current condition of LBU's well field. The digital tool will be utilized to effectively manage and maintain the groundwater supply system, provide better groundwater production goals, and reliably forecast future aquifer pumping.

An annual water audit and workshop will provide a comprehensive evaluation of the current condition of each well, allow recommendations for future pumping and well maintenance activities on a well by well basis. The annual workshop will be inclusive of all stakeholders.



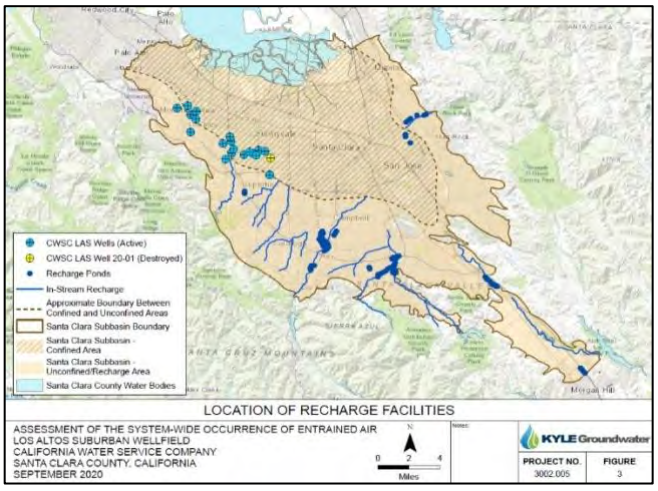
CALIFORNIA WATER SERVICE COMPANY
WELL AND WELL FIELD EVALUATION – SUNNYVALE, CALIFORNIA

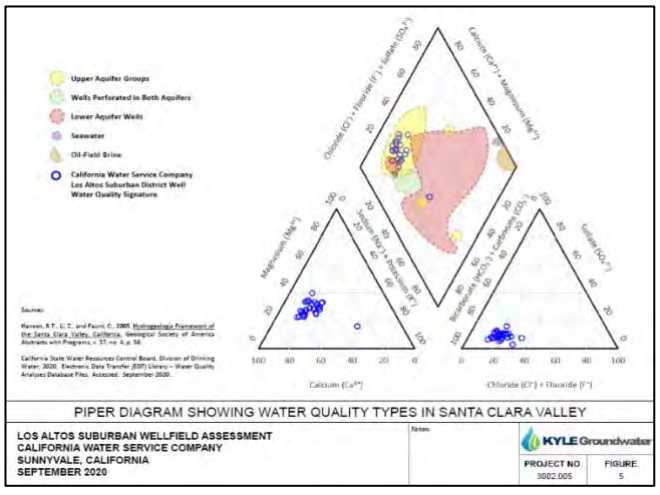
Location:	Sunnyvale, California
Personnel:	Russell Kyle, Project Manager/Hydrogeologist Kimberly Makar, Permitting/GIS Michael Dykstra, Hydrogeological Support
Client:	California Water Service Company
	Julie Huynh
	jhuynh@calwater.com
	408-367-8394
Completion Date:	January 2021
Total Cost:	$22,200

KGI has an on-call as-needed professional services contract with California Water Service Company (CWSC) to address task orders throughout the State. Recent projects have included a regional evaluation of entrained air within the Los Altos Suburban (LAS) District wellfield in Santa Clara County, and preparation of a Preliminary Design Report (PDR) for a proposed replacement well in Sunnyvale, California.

Entrained air can result in customer complaints due to aesthetic concerns, water quality problems, inefficient pumping, and possible damage to pumping components from cavitation. KGI was asked to assess the possible sources of this entrained air. The source of entrained air was found to be unrelated to well design and the result of rapid artificial recharge within close proximity to the wells. This was confirmed through an evaluation of the concentrations of dissolved air within each well, and a comparison of general water quality characteristics of the groundwater that was found consistent to that of imported water used for recharge.

Multiple recommendations were presented to CWSC for possible measures that can be employed to mitigate entrained air, including wellhead treatment, and altering the flow profile within individual wells.





SECTION 5 – PROPOSED SCOPE OF SERVICES

The Authority meets the water demand of its approximately 33,600 residential, commercial, and industrial service connections through a variety of sources, including surface water, groundwater, and imported water sources. Fresh groundwater is pumped from the San Diego Formation by way of three (3) water supply wells, designated the National City wells, and is suitable for direct utilization. Brackish groundwater is pumped from the San Diego Formation and Sweetwater River alluvium by way of ten (10) water supply wells, designated the SDF wells, and treated at the Reynolds Groundwater Desalination Facility to remove dissolved solids. This project includes assessment of all 13 active groundwater wells, one of which is an assigned backup well.

It is our understanding that the Authority's primary goal for this project is to evaluate the condition and operational performance of each of its groundwater sources in an effort to assure long-term reliability of local groundwater supplies. The planning documents stemming from this study will guide the Authority in decision making and budgetary planning for future well maintenance and well replacement projects designed to optimize and maintain production capacity. It will identify and prioritize those wells that are in most need of rehabilitation or repair, and that stand the best chance for success at the lowest cost. It will also identify wells that are in imminent danger of failure, such that early planning for replacement can be initiated.

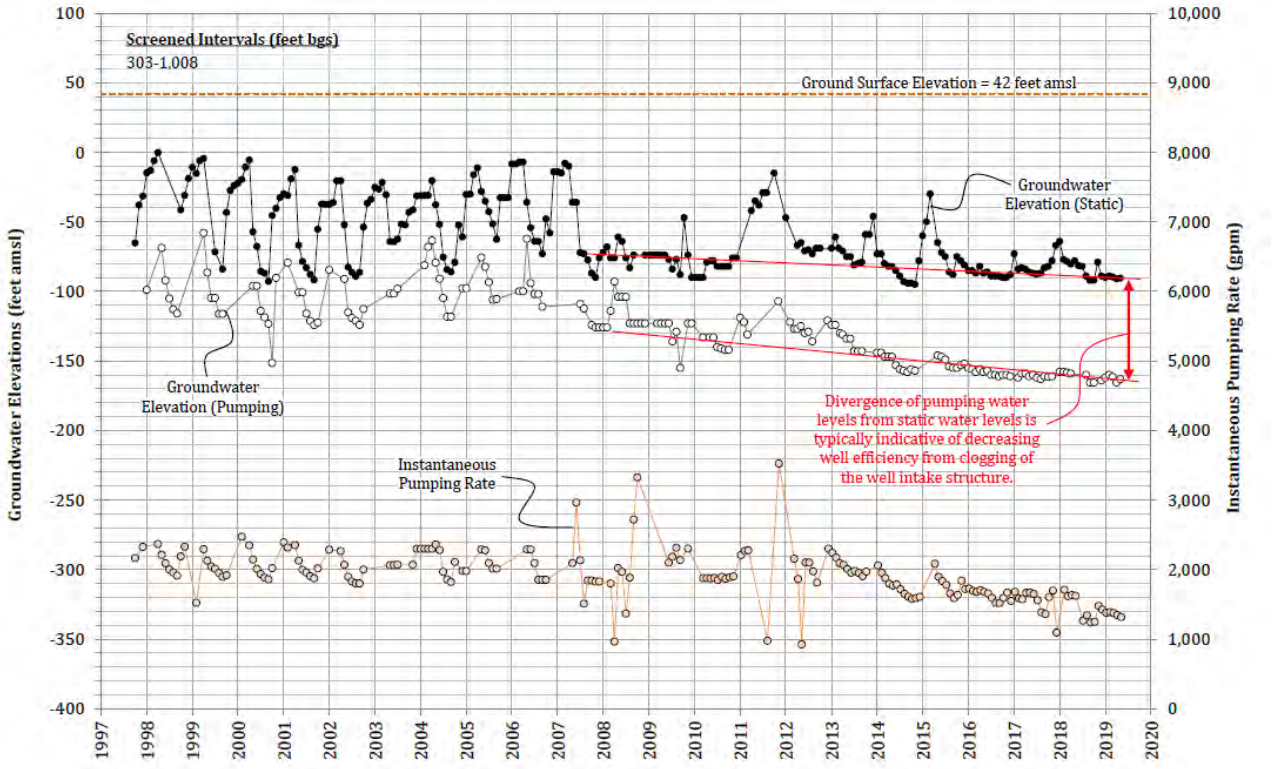
Our systematic approach to well rehabilitation prioritization planning is based on sound scientific principles that have been honed through years of experience with similar projects. The first step is to acquire all available well data from which to develop comprehensive histories for each well and pump system, including tabular and graphical summaries of as-built construction details, modifications, operational details, and performance dynamics.

It is critically important to visit and thoroughly document each well site, and to meet with operations personnel to query first-hand information that may not be available in written form, including operational concerns such as sand or gravel production, air entrainment, breaking of suction, evidence of biofouling or encrustation on pumping components, known structural issues, motor vibration, and the nature and results of past well rehabilitation efforts.

Condition assessments will then be prepared for each well based on the available information, primarily including visual information from historical downhole video surveys, and an evaluation of historical trends in well production parameters, including instantaneous pumping rate, specific capacity, and power consumption. The remaining service life of each well will be estimated based on age, design, materials of construction, groundwater quality, pumping dynamics, and operational protocols. Pumping dynamics will be evaluated in the context of regional

static and pumping groundwater elevations to identify causes of production loss and/or water level decline, as applicable. The three primary causes of declining well production are typically as follows:

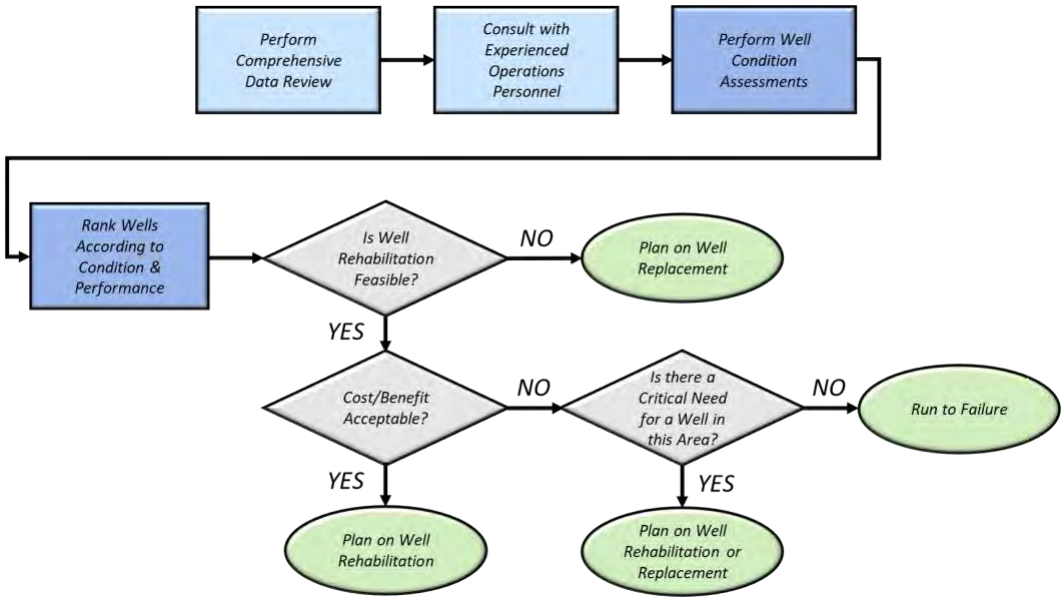
1. Wells that exhibit stable static water levels, declining pumping water levels, and declining specific capacity are likely impacted by local degradation effects (i.e., well clogging, etc.).
2. Wells that exhibit declining static and pumping groundwater levels are likely impacted by regional groundwater level decline.
3. Wells that exhibit stable water levels and specific capacity, but declining production and/or increasing power consumption may be experiencing pump-related issues.



The condition of each well will be ranked relative to other wells based on a variety of criteria that will be assigned a raw criteria score and criteria weighting factor. The product of individual criteria scores and their respective weighting factors will result in a total weighted score and an overall ranking as to the condition of each well. Those wells considered to be in the worst condition and with the greatest risk of structural failure would be ranked higher than wells in relatively good condition. The wells will be further evaluated and ranked as to the probability of successful rehabilitation efforts and whether or not the benefit of rehabilitation and/or repair outweighs risk and projected costs. The probability of success will be based on many factors, including the degree of clogging, how long the condition has remained unchecked, suitability of the well design and condition to withstand rehabilitation efforts, the degree of complexity and expense, and whether or not prior rehabilitation events have been successful. Those wells ranked higher on this list will be the wells that are most in need of rehabilitation that have the greatest probability of success at the least cost.

A final consideration will be the importance of any particular well within the system, as determined by Authority staff, such as a well that serves as critical supply to a treatment plant and/or particular pressure zone. In these cases, wells ranked lower on the list may take precedence over other wells when considering rehabilitation.

A subset of wells will ultimately be identified as having limited remaining useful service life, significant structural issues, and/or for which well rehabilitation efforts would be impossible or prohibitively expensive. In these cases, the recommendation would be to run the well to failure and proactively plan for well replacement.



1.0 Data Collection, Review, and Project Coordination

The KGI team will prepare for and attend a kickoff meeting with Authority personnel to discuss the proposed scope of work. The primary objective of the project kick-off meeting will be to meet face-to-face with key members of the project team to make sure that the intent, objectives, tasks, budgets, schedules, milestones, deliverables, and data needs are properly understood and addressed. The kick-off meeting also introduces and identifies those individuals responsible for implementing each part of the work and provides a forum for discussion of critical-path tasks, and how those tasks can be efficiently executed. A baseline project schedule will be presented at the meeting and updated on a regular basis, as needed. Pertinent members of the project team will attend up to four (4) monthly project progress meetings, as necessary, throughout the duration of the project. Meeting agendas will be prepared for all project meetings and meeting minutes will be provided to the Authority within five (5) working days. Monthly project progress reports will be submitted with all invoices, including a discussion of task progress, anticipated issues, and project schedule.

Sound hydrogeological and engineering criteria will be used throughout administration of the project, and all data, calculations, conclusions, and interpretations will be vetted through a rigorous multi-level QA/QC process. Our project manager and applicable team members will identify problems as they arise and will provide timely recommendations regarding an appropriate response. Essential factors which determine the success of any given project include scope, schedule, and budget. We will effectively manage these three fundamental factors to bring

the project to a successful conclusion both on schedule and within budget. Comment spreadsheets will be provided with each deliverable as a means of tracking comments received and actions taken.

KGI will acquire readily available well and pump information pertaining to the 13 wells identified as part of this study, including previous reports and studies, location of facilities, site plans, details of well construction, static and pumping groundwater levels, instantaneous pumping rates, production records, specific capacity data, historical plant efficiency tests, aquifer test results, flowmeter surveys, groundwater quality data, electrical and mechanical details, and existing well pump as-built information. Details of prior well modification, repair, and rehabilitation efforts, if any, will also be reviewed. Historical video surveys will be obtained and reviewed in an effort to directly evaluate any physical processes that may be occurring, and any structural issues that may be present.

2.0 Field Assessments and Condition Evaluation

The KGI team will visit each well site to document the aboveground facilities, and to meet with and interview Authority personnel to query first-hand operational information. For purposes of this proposal, we assume that all site visits and interviews can be completed in one to two days.

Example of Well Condition and Performance Ranking Criteria

	Criteria	Weighting Factor	0	1	2	3
Design and Construction	Well Age	3	< 10 Years	10 - 29 Years	30 - 44 Years	> 45 Years
	Steel Type	3	Stainless Steel	Hard Red / Kai-Well	Copper-Bearing / HSLA	Mild Steel / Unknown
	Screen Type	2	Louvered	Stainless Steel Wire-Wrap	Knife-Cut / Mill Slot / Moss Perforations	Mild Steel Wire-Wrap
	Screen Opening Size	2	> 0.080-inch	0.060 - 0.080-inch	0.050 - 0.060-inch	< 0.050 inch
	Remaining Service Life	3	> 30 Years	15 - 29 Years	5 - 14 Years	< 5 Years
	Drilling Method	1	-	Cable Tool	Reverse-Circulation Rotary	Direct-Circulation Mud Rotary
Physical Condition	Structural Concerns / Risk of Collapse	3	None / Unknown	Minimal (Few Holes, Existing Patches, Minor Spalling, Enlarged Perforations)	Moderate (Many Holes, Existing Lined Sections, Moderate Spalling, Minor Screen Deterioration)	Severe (Large Ruptures, Heavy Spalling, Casing Deformation, Severe Screen Deterioration)
	Fill and/or Debris	1	< 9 feet	10 - 19 feet	20 - 49 feet	> 50 feet
	Encrustation and/or Biofouling	2	No Significant Encrustation and/or Biofouling Present	Minimal (Superficial Buildup, Minimal Nodules, Little to No Bacterial Activity)	Moderate (Significant Encrustation, Nodules, and Bacterial Activity)	Severe (Major Obstruction of Well Screen, Abundant Nodules, Widespread Biological Activity)
Performance Characteristics	Water Level Trends	2	No Divergence of Static and Pumping Water Levels	Slight Divergence of Static and Pumping Water Levels	Moderate Divergence Static and Pumping Water Levels	Major Divergence Static and Pumping Water Levels
	Flow Rate and/or Specific Capacity Trend (Prior 5-year Period)	1	No Decline in Instantaneous Pumping Rate and/or Specific Capacity	Slight Decline in Instantaneous Pumping Rate and/or Specific Capacity	Moderate Decline in Instantaneous Pumping Rate and/or Specific Capacity	Major Decline in Instantaneous Pumping Rate and/or Specific Capacity
	Sand and/or Gravel Production	3	None / Unknown	Minimal (Minor or Isolated Sand Production)	Moderate (Significant and/or Sustained Sand Production)	Severe (Heavy Production of Sand and/or Gravel Envelope)
	Water Levels Below Screen / Air Entrainment	2	None / Unknown	Minimal (Water Levels Below Top of Screen)	Moderate (Evidence of Cascading Water Conditions)	Severe (Cascading Water Conditions when Idle, Reported Air Entrainment)

KGI will develop detailed well histories for each well, including as-built diagrams exhibiting original construction details, well modifications, structural issues, borehole lithology, and geophysics. Pumping dynamics, if available, will be presented in graphical form, and evaluated in the context of regional static and pumping groundwater elevations to identify causes of production loss and/or water level decline, as applicable. KGI will utilize information obtained in Task 1.0 to estimate the current physical condition of each well, including structural integrity, estimated degree of corrosion, mineral encrustation, and/or bacterial activity, estimated future production, and estimated remaining useful service life. The above-ground facilities will be reviewed by our engineering partner to assess and provide opinions as to current condition, and need for repairs and/or upgrades.

3.0 Rehabilitation Planning, Maintenance Strategy, and Program Development

Based on the results of the data review and above-ground equipment inspection, the KGI team will develop findings and conclusions for each well assessment, and will provide recommendations regarding short- and long-term projects to be implemented with the goal of maintaining and optimizing groundwater production, including an estimate of remaining useful service life, and identification of wells in need of repair or replacement. Inspection checklists, maintenance logs, monitoring templates, and standard operating procedures (SOPs), including operational recommendations, will also be developed and provided to the Authority for use during operation and maintenance of the wells. High-level short- and long-term budget projections will also be made based on findings from the condition assessment, and recommendations as to necessary well rehabilitation and repair.

The KGI team will prepare for and attend a review meeting with the Authority to present the draft findings and receive feedback prior to preparing the final maintenance program documents.

Example of Final Well Ranking

Well Designation	Design and Construction						Physical Condition			Performance Characteristics				Supplemental Criteria			Total Weighted Score	Final Ranking
	Well Age	Steel Type	Screen Type	Screen Opening Size	Remaining Service Life	Drilling Method	Structural Concerns / Risk of Collapse	Fill and/or Debris	Encrustation and/or Biofouling	Water Level Trends	Specific Capacity / Production Trend	Sand and/or Gravel Production	Water Levels Below Screen / Air Entrainment	Probability of Successful Well Rehabilitation and/or Repair	Cost of Well Rehabilitation and/or Repair	Relevance to the System		
	3	3	2	2	3	1	3	1	2	2	1	3	2	3	3	3		
Indian Hill #3	3	3	2	0	3	1	3	3	3	1	1	3	2	0	1	3	**78**	**1**
Del Monte #2	3	1	2	0	3	1	2	3	2	0	0	3	3	0	3	3	**72**	**2**
Alamosa #2	3	1	2	0	3	1	2	3	2	0	3	3	2	0	3	1	**67**	**3**
College #1	3	2	2	2	3	1	2	1	1	0	3	1	3	1	1	2	**66**	**4**
Mills #1	3	1	2	0	3	1	2	2	1	0	3	2	3	0	3	1	**63**	**5**
Indian Hill #4	1	2	0	2	0	2	0	0	2	0	0	1	0	0	2	3	**37**	**6**
Pomello #5	0	0	0	0	0	2	0	0	0	1	1	1	1	2	2	2	**28**	**7**

Notes:

Weighting factors range from 1 to 3 (3 being considered most important).

Well condition and performance criteria scores range from 0 to 3 (3 being considered the most problematic).

Supplemental criteria scores range from 0 to 3 (3 being considered the most likely for successful rehabilitation at least cost).

Total weighted criteria scores calculated as product of weighting factor and criteria scores.

Higher rank equates to poorer well condition and/or performance.

Red shaded cells indicate wells that are operating beyond theoretical service life.

4.0 Final Program Preparation and Deliverables

KGI will incorporate feedback and comments to the draft maintenance program and will compile all findings and conclusions, and recommendations within a comprehensive Well Rehabilitation and Maintenance Program document, including a prioritized ranking of each of the subject 13 wells. The final report will include an executive summary, findings, conclusions, and recommendations, detailed well histories, well performance assessments, specific rehabilitation and repair recommendations, planning level cost projections, maintenance schedules, SOPs, and all supporting data, tables, figures, templates, and evaluation criteria.

KGI will submit an electronic (i.e., PDF) copy of the draft Well Rehabilitation and Maintenance Program for review by Authority personnel. Comments will be incorporated into a final version of the Well Maintenance Program document along with fully editable electronic files (i.e., Word, Excel, and GIS). KGI will prepare for and attend an in-person workshop-style presentation of findings and recommendations to Authority personnel.

SECTION 6 – EXCEPTIONS TO THE RFP

We have thoroughly reviewed the RFP and sample professional services agreement, and take no exceptions.

SECTION 7 – AMENDMENTS TO THE RFP

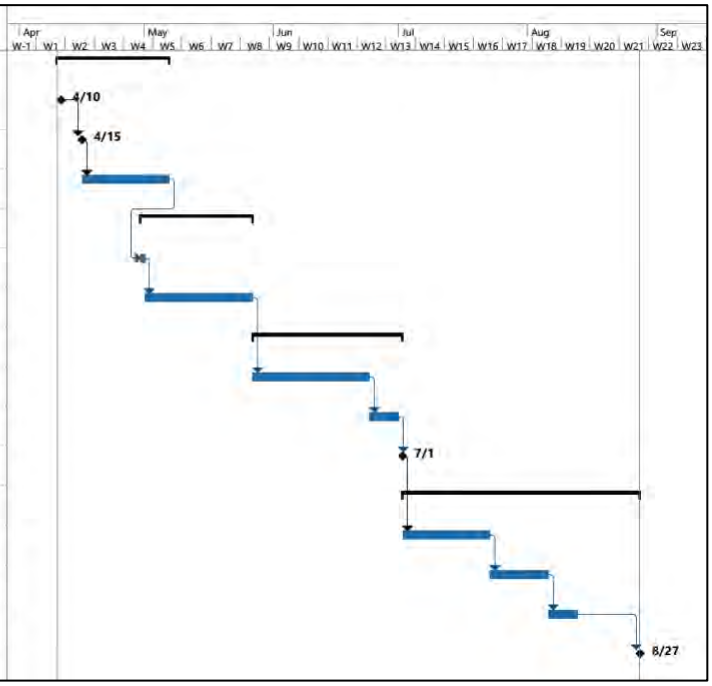
We acknowledge Q and A documents received on February 16, 2026, and March 4, 2026, and the bid update received on March 4, 2026.

SECTION 8 – PROPOSED SCHEDULE OF IMPLEMENTATION

We have developed a realistic preliminary project schedule based on our team's experience in delivering projects of a similar type, and the scope of work identified in the RFP (see below). Our team has recent first-hand experience and a deep understanding of the well assessment and prioritization process. We assume an estimated contract execution of April 10, 2026, a project start date of April 15, 2026, and project completion by late August 2026. This schedule is contingent upon expeditious consultant selection and contract execution. It is acknowledged that time is and will be of the essence throughout the course of the work. Correspondingly, all schedule modifications will be treated in a manner reflecting this consideration. Our project team currently has the resources to accomplish the anticipated work within the schedule shown.

Preliminary Project Schedule
Sweetwater Authority – Development of a Well Rehabilitation and Maintenance Program

ID	Task Name	Duration	Start	Finish
1	**Task 1 - Data Collection, Review, and PM**	**19 days**	**Fri 4/10/26**	**Wed 5/6/26**
2	Contracts Completed	1 day	Fri 4/10/26	Fri 4/10/26
3	Project Kick-Off Meeting	1 day	Wed 4/15/26	Wed 4/15/26
4	Compile and Review Data	15 days	Thu 4/16/26	Wed 5/6/26
5	**Task 2 - Field Assessments and Condition Evaluation**	**19 days**	**Thu 4/30/26**	**Tue 5/26/26**
6	Field Visits	1 day	Thu 4/30/26	Thu 4/30/26
7	Well and Equipment Condition Assessments	18 days	Fri 5/1/26	Tue 5/26/26
8	**Task 3 - DRAFT Well Maintenance Documents**	**26 days**	**Wed 5/27/26**	**Wed 7/1/26**
9	Prepare Well Maintenance Framework	20 days	Wed 5/27/26	Tue 6/23/26
10	Develop Inspection Logs, SOPs, etc.	5 days	Wed 6/24/26	Tue 6/30/26
11	Draft Review Workshop	1 day	Wed 7/1/26	Wed 7/1/26
12	**Task 4 - Final Program Preparation**	**41 days**	**Thu 7/2/26**	**Thu 8/27/26**
13	Prepare Draft Well Maintenance Documents	15 days	Thu 7/2/26	Wed 7/22/26
14	Authority Review	10 days	Thu 7/23/26	Wed 8/5/26
15	Prepare Final Well Maintenance Documents	5 days	Thu 8/6/26	Wed 8/12/26
16	Attend In-Person Presentation	1 day	Thu 8/27/26	Thu 8/27/26



ATTACHMENT A

Resumes

KYLE Groundwater

RUSSELL KYLE, PG, CHG

TITLE
President / Principal Hydrogeologist

REGISTRATIONS/ CERTIFICATIONS
Registered Professional Geologist, California No. 7648

Certified Hydrogeologist, California No. 822

EDUCATION
MS, Environmental Hydrogeology, California State University – Los Angeles, 2006

BS, Geology, California Polytechnic University – Pomona, 1996

PROFESSIONAL AFFILIATIONS
American Water Works Association – past Chair of CA/NV Water Well Technology Committee

Voting Member of the American Water Works Association National Well Standards Committee

Mr. Kyle has 30 years' experience with a wide variety of groundwater resource related projects for public and private clients within the western United States, Mexico, and Africa, with a focus on groundwater resources development in Southern California. The scope of his technical experience includes groundwater basin evaluations, water supply studies, well siting investigations, artificial recharge feasibility evaluations, well field condition assessments, well rehabilitation, desalination feedwater supply studies, and geophysical surveys. Over the course of his career he has been responsible for installation of more than 160 water supply wells and 70 monitoring wells and exploratory borings, including management of a team of field inspectors, coordination with drilling contractors and regulatory agencies, well design, and construction management. He has prepared condition assessments and/or well rehabilitations on hunderds of wells. Recent notable well rehabilitation projects include development of well rehabilitation, replacement, prioritization plans for Golden State Water Company, Mission Springs Water District, Palmdale Water District, Long Beach Utilities Department, and California Water Service Company. He is also active within the water resources community and is currently a member and past Chair to the AWWA CA-NV Water Well Technology Committee, and as a voting member of the AWWA National Well Standards Committee. Mr. Kyle also served on multiple Technical Action Committees working to develop the new California Department of Water Resources water well standards.

EXPERIENCE

WELL CONDITION ASSESSMENT AND REHABILITATION

Company-Wide Well Condition Assessment – Golden State Water Company – California. Mr. Kyle developed a rehabilitation and replacement prioritization plan covering 52 wells across 16 individual systems throughout the State of California. Well histories and condition assessments were prepared for all wells based on the available information, resulting in a prioritization of wells in the context of rehabilitation feasibility and estimated remaining well life. Each well site was visited and thoroughly documented, and each system's operations personnel were interviewed to query first-hand information that may not be available in written form. Planning documents stemming from this study will guide GSWC in decision making for future well maintenance and well replacement projects designed to optimize and maintain production capacity.

Development of a Rehabilitation Prioritization Plan – Palmdale Water District – Palmdale, California. Mr. Kyle developed a rehabilitation and replacement prioritization plan for the Palmdale Water District well field, consisting of 22 actively pumping wells. This project involved a thorough evaluation and ranking of each well as to rehabilitation feasibility and estimated remaining well life. Additional components of the project included development of modular technical specifications for well rehabilitation, and rehabilitation of up to three (3) wells, including technical specifications and bid support.

Development of a Rehabilitation Prioritization Plan – Mission Springs Water District – Palm Desert, California. Mr. Kyle is leading the development of a rehabilitation and replacement prioritization plan for MSWD's well field, consisting of 13 actively pumping wells. The primary goal for this project is to manage maintenance of local water supply sources, and retain water independence. When completed, this

planning document will guide MSWD in decision making for future well maintenance and well replacement projects designed to optimize and maintain production capacity. It will identify those wells that are in most need of rehabilitation and that stand the best chance for success at the lowest cost. During the course of this project, KGI has been tasked with providing emergency well rehabilitation design, construction management, and inspection services for several wells.

Development of a Rehabilitation and Monitoring Program – Riverside Public Utilities - City of Riverside, California. Mr. Kyle provided project management and technical support for development of a rehabilitation program for the City of Riverside Public Utilities well field, consisting of 55 actively pumping wells. This project involved a thorough evaluation and ranking of each well as to rehabilitation feasibility and estimated remaining well life. An additional component of the project was an evaluation of the City's current monitoring network and protocols, and development of a ground water monitoring program.

Development of a Rehabilitation Prioritization Plan – Long Beach Utilities Department – Long Beach, California. Mr. Kyle was project maneger during development of a rehabilitation and replacement prioritization plan for LBUD's well field, consisting of 31 actively pumping wells. This project involved a thorough evaluation and ranking of each well, including well and surface facilities, as to rehabilitation feasibility, estimated remaining well life, and production forecasting.

Development of a Well Maintenance Program – Long Beach Utilities Department – Long Beach, California. The objective of LBUD's well maintenance program was to develop a framework that would serve as a foundation for developing a more effective program for long-term operation, monitoring, and maintenance of wells such that local groundwater resources can be optimized, and utilized to the fullest. The primary recommendation to LBUD included development of a rigorous groundwater monitoring program to ensure that a standard methodology is employed for the collection of data and such that a solid baseline can be developed from which to make informed decisions regarding well maintenance. Critical components of this program would include a field monitoring protocol and data management plan (i.e., field monitoring procedures, quality assurance and control processes, data management, and development of a coherent relational database). Ultimately, this project evolved into development of a digital twin of the LBUD system, from which well performance review and condition assessment could be partially automated, culminating with an annual workshop of stakeholders at which operational and maintenance decisions would be made.

TERRY WATKINS, PG, CHG

TITLE
Senior Hydrogeologist

REGISTRATIONS/ CERTIFICATIONS
Registered Professional Geologist, California No. 9048

Certified Hydrogeologist, California No. 1038

EDUCATION
BS, Geology, California Polytechnic University – Pomona, 2003

PROFESSIONAL AFFILIATIONS
American Water Works Association –CA/NV Water Well Technology Committee Member

Alternate Voting Member of the American Water Works Association National Well Standards Committee

Mr. Watkins has over 22 years of experience in a variety of groundwater projects, including geohydrologic investigations, groundwater quality studies, artificial recharge projects, site feasibility and test drilling programs, sea water desalination programs, in addition to water well construction supervision and management. Mr. Watkins specializes in groundwater well design and construction management, overseeing project aspects ranging from site evaluation and selection, preliminary well design, development of technical specifications, final well design, aquifer pump test analysis, development of well rehabilitation programs, and providing construction management. He has performed project management and construction management and supervision on several multi-well projects throughout California including municipal water supply wells, ASR wells, injection wells, and monitoring wells.

EXPERIENCE

GROUNDWATER WELL DESIGN AND CONSTRUCTION

Three Valley Municipal Water District – Well Site Evaluation and Construction of New Miragrand Well - Claremont, California. Mr. Watkins oversaw and managed a detailed site assessment and evaluation study with the purpose of identifying potential location for future groundwater wells that would maximize production and not require treatment. Following an initial review, 19 sites were selected for additional evaluation. The final report provided the five (5) best locations that the District should consider for future CIP projects.

Mr. Watkins later served as the project manager for a new potable supply well. This work included development of the preliminary design, drafting of technical plans and specifications, assisting with the bidding process, construction management during drilling, final well design, well performance testing and utilization recommendations. This project provided unique challenges in that it was located in an affluent residential community whose neighbors did not want construction activity to disturb them. Close coordination and additional noise mitigation procedures were utilized to complete this work with minimal disruption to nearby residents.

City of Lakewood Well No. 28 - Lakewood, California. Mr. Watkins was the project manager for a new well constructed for the City of Lakewood, designated Well No. 28. Tasks included in this work included preliminary design, development of contract documents, contractor bid support, construction management and field supervision, draft preliminary and final DWSAP documents, aquifer pump test analysis, and reporting. The well was completed under budget, ahead of schedule, and exceeded production expectations, producing 2,500 gpm with a specific capacity over 100 gmp/ft.

Chino Basin Desalter Authority - Chino II Desalter Expansion - Chino, California. Mr. Watkins served as the project and construction manager for the design, drilling, and construction of three (3) new desalination feed water wells in the Chino Groundwater Subbasin. This work included oversight and development of technical plans and specifications, drilling and construction, well design, development, and testing. This project also involved careful coordination with local regulators as one of the three wells serves as a groundwater contamination mitigation well. Each of these wells had production objectives of 2,500 gpm, however, upon project completion, they each

produced in excess of 3,500 gpm. This project also included the drilling and construction of complimentary groundwater monitoring wells used to track changes in groundwater level and groundwater quality resulting from the operation of the new feedwater wells.

City of Oceanside – Pure Water Injection and Monitoring Wells - Oceanside, California. Mr. Watkins served as the project manager for the City of Oceanside Pure Water Project that involve the drilling and construction of three new injection wells and 2 new monitoring wells. This indirect potable reuse (IPR) project involves injection of 3,360 acre-ft/yr (3MGD) of treated recycled water into the three injection wells. The water is then captured by the existing well field down gradient and surrounding the treatment facility. This project was particularly challenging due to its location within a highly developed residential area, with one injection well being drilled and constructed at the end of a cul-de-sac. Careful coordination was required with City and the drilling contractor to get this project successfully completed with minimal disturbance to the nearby residents. The result was injection wells capable of up to 4.5 MGD, exceeding project objectives.

Orange County Water District - Alamitos Barrier Improvement Project – Seal Beach, California. The Alamitos Barrier uses a network of 43 injection wells near the coast in southeastern Los Angeles County, and northwestern Orange County. The wells inject freshwater into the local basin to prevent seawater intrusion, protecting local groundwater supplies. Mr. Watkins oversaw efforts to design, oversee drilling and construction, and perform testing and reporting for 17 new injection wells, four (4) nested monitoring wells, and two shallow piezometer wells. Project was completed under budget and on-time, meeting and exceeding client expectations.

Elsinore Valley Municipal Water District - Multiple Well Rehabilitation Projects - Lake Elsinore, California. As part of an on-call contract, Mr. Watkins led efforts to rehabilitate nine (9) existing groundwater supply wells ranging in depth from 105 to 1,700 ft in depth. Following initial site assessments, unique rehabilitation strategies were developed for each well. Throughout the project, challenges arose that required experience-based decisions, including well modifications to prolong well production life, and operational evaluations and modifications to mitigate entrained air in well discharge. Detailed rehabilitation implementation programs and careful coordination with contractors resulted in the improved well production and serviceable well life of all 9 wells.

US Water Partnership/US Embassy Science Fellowship - Technical Capability Educational Program – Belmopan Belize. Mr. Watkins was selected by the US Water Partnership, in cooperation with the US Embassy to provide a one-week educational seminar in the country of Belize through the Belize Ministry of Rural Development. This work involved in-country training and observation of water well drilling and maintenance practices utilized by both the Belizean Government and private contractors. Mr. Watkins provided a one-day seminar that included multiple presentations followed by a question and answer session. Several days were spent on a drilling rig operated by the government to review practices and provide recommendations for more efficient operations. Finally, a demonstration for proper well disinfection was provide. Approximately 25 to 30 Belizean locals participated in the weeklong training, after which each received a certificate of completion from the Ministry of Rural development.

KIMBERLY MAKAR, PG

PROJECT ROLE
Hydrogeology/
Field Inspection

REGISTRATIONS/ CERTIFICATIONS
Professional Geologist,
California No. 10044

EDUCATION
Bachelor of Science,
Geosciences, University of
Arizona, 2011

Ms. Makar is a California Professional Geologist with 13 years of experience in the water resource and mining industries. She began her career as a manager of the dewatering program at an open-pit copper mine in Nevada, for which she was responsible for developing and executing multi-million-dollar groundwater dewatering programs. Since 2014 she has been providing professional consulting services to the water resources industry in Southern California with an emphasis on new well installation, well rehabilitation, and permitting.

SELECTED EXPERIENCE

Well No. 15 – Montebello Land and Water Company – Montebello, California. Ms. Makar provided field inspection for a new water supply well located in Montebello, within the Central Basin. She provided field inspection during pilot borehole drilling, well construction, well development, step-drawdown and constant rate aquifer tests, gyroscopic alignment survey, downhole video survey, and final well disinfection.

DOM 300-01 – California Water Service Company – Compton, California. Ms. Makar assisted on the production of the preliminary design report, construction logistics, preliminary design, and required permits. She also assisted on the preparation of the preliminary Drinking Water Source Assessment Program (DWSAP) documents. Ms. Makar provided field inspection during all construction phases of the project.

Well No. 8 – South Montebello Irrigation District – Montebello, California. Ms. Makar provided field inspection for a new water supply well located in South Montebello, within the Central Basin. She provided field inspection during well development, step-drawdown and constant rate aquifer tests, gyroscopic alignment survey, downhole video survey, and final well disinfection.

Rehabilitation of Citizens Well 9 and Wilson Well 1A – Long Beach Water Department – Long Beach, California. Ms. Makar is serving as lead inspector during rehabilitation of two municipal water supply wells. The project includes physical and chemical cleaning of each well, redevelopment and testing, and retrofitting of the well pump, motor, and electrical.

Permitting of Three Potential Well Sites – Long Beach Water Department – Long Beach, California. Ms. Makar served as the lead in completing permitting documents required for three potential new well sites for the Long Beach Water Department (LBWD). For all three sites, Ms. Makar completed preliminary Drinking Water Source Assessment Program (DWSAP) documents, horizontal distance setback tables, plot plans showing 50-foot increment radii up to 200 feet, and Domestic Water Supply Permit Amendment applications. Of the three sites, LBWD has chosen to move forward with the construction phase of two of the sites.

Collection Main and New Well Site Study – Long Beach Water Department – Long Beach, California. The Long Beach Water Department (LBWD) currently owns and operates 28 groundwater supply wells located throughout the city, in addition to a new well currently being equipped, and a second well recently constructed. LBWD's goal is to optimize local water supply sources and maintain a production well field with suitable capacity through the year 2032. Ms. Makar provided technical support to identify and evaluate areas favorable for installation of new production wells within the Central and West Coast Basins, and within relative proximity to the existing collection main pipeline. Identified sites were ranked based upon a scientific approach and weighted decision matrix and an evaluation of how each potential well site will impact the collection main system.

MICHAEL DYKSTRA, PG

PROJECT ROLE
Field Inspection/
Project Support

REGISTRATIONS/ CERTIFICATIONS
Professional Geologist
California No. 10239

EDUCATION
Bachelor of Science, Geology, California State Polytechnic University - Pomona, 2017

Master of Science, Geology, California State Polytechnic University - Pomona, Est. 2024

Mr. Dykstra has 10 years' experience in the Southern California housing construction industry, where he worked closely with project managers to ensure projects were completed properly and in a timely manner. He received a Bachelor of Science degree in Geology from California State Polytechnic University – Pomona in 2017 and is currently seeking a Master of Science degree in the same subject. Since January 2020, Mr. Dykstra has been providing professional consulting services and support to the water resources industry in California, which includes field inspection for new water supply wells and well rehabilitations, and hydrogeologic support for groundwater quality studies, permitting, well siting, and design.

SELECTED EXPERIENCE

DOM 300-01 – California Water Service Company – Compton, California. Mr. Dykstra performed field inspection during all phases of construction for a new water supply well in Compton, CA, which included lithologic logging during pilot hole drilling, geophysical surveys, zone testing, pilot borehole reaming, well construction, well development, aquifer pumping tests, downhole video survey, and final well disinfection.

Well No. 8 – South Montebello Irrigation District – Montebello, California. Mr. Dykstra provided field inspection for a new water supply well located in South Montebello, within the Central Basin. He provided field inspection during well development, step-drawdown and constant rate aquifer tests, gyroscopic alignment survey, downhole video survey, and final well disinfection.

Development of a Rehabilitation Prioritization Plan – Palmdale Water District – Palmdale, California. Mr. Dykstra assisted in the development of a rehabilitation and replacement prioritization plan for the Palmdale Water District well field, consisting of 22 actively pumping wells. This project involved a thorough evaluation and ranking of each well as to rehabilitation feasibility and estimated remaining well life. Additional components of the project included development of modular technical specifications for well rehabilitation, and rehabilitation of up to three (3) wells, including technical specifications and bid support.

Rehabilitation and Redevelopment of Well 46-1R – Gage Canal Company – San Bernardino, California. KGI performed a condition assessment of a water supply well in response to excess sand production causing fouling of an adjacent treatment plant. A custom program of redevelopment was developed with the goal of mitigating sand production. Mr. Dykstra performed field inspection during all phases of the rehabilitation and redevelopment of this well. Ultimately, redevelopment was deemed a success, significantly reducing sand production and increasing the specific capacity of the well to values greater than when the well was originally constructed in 2007.

Rehabilitation and Redevelopment of Well 7A – Palmdale Water District – Palmdale, California. KGI performed a well performance and condition assessment of Well 7A in response to severe structural failure of the well screen. Detailed technical specifications were developed with the goal of installing a partial well liner, allowing the well to continue to operate while planning for replacement. Mr. Dykstra is currently providing field inspection for the rehabilitation of Well 7A.

22 Years Experience

SAIK-CHOON POH, PE, ENV SP

PROJECT PRINCIPAL

EDUCATION

M.ENG. ENVIRONMENTAL AND WATER QUALITY ENGINEERING
(Massachusetts Institute of Technology)

BS, CIVIL ENGINEERING
(Loyola Marymount University)

REGISTRATION

PE Civil, CA No. C69223

CERTIFICATION

National Association of Sewer Service Companies (NASSCO) - PACP, MACP, LACP

Envision™ Sustainability Professional (ENV SP) # 47292, Institute for Sustainable Infrastructure, Valid through 01/02/2023

BENEFIT TO CLIENT

Experience administering large, complex contracts

Extensive knowledge and familiarity with water, stormwater, and sewer pipeline/facilities construction and rehabilitation

Experience with BMP design

Experience working with multiple agencies and municipalities across Southern California

DRP ENGINEERING, INC
1111 Corporate Center Drive, Suite 303
Monterey Park, CA 91754

Saik-Choon Poh is a seasoned principal engineer with over 22 years of experience within the industry. Mr. Poh has provided his engineering expertise for numerous local agencies throughout Southern California. He specializes in environmental and civil engineering and he is experienced in water, stormwater, and wastewater conveyance and treatment facilities. As a key member of project teams, he has been responsible for directing work and coordinating closely with clients, subcontractors, contractors, and staff in multiple offices.

LONG BEACH WATER DEPARTMENT - FY2021 NEW WELLS

Mr. Poh served as the project manager for the FY2021 New Wells Project. The project consists of the preparation of a feasibility assessment of multiple potential well sites to determine four new groundwater well locations. As part of the project, two existing water wells are to be decommissioned and demolished. Mr. Poh is leading the design for the drilling and equipping of four new groundwater wells aiming to operate at 2500 gpms.

JURUPA VALLEY - WELL NOS. 14, 15, AND 22 PIPING AND TREATMENT INSTALLATION PROJECT

Mr. Poh served as the Project Principal for the Well Nos. 14, 15, and 22 Piping and Treatment Installation Project for Jurupa Community Services District (JCSD). This project materialized because JCSD sought to address PFAS concerns in their groundwater supply, ahead of future regulations. The new treatment system intends to treat PFAS within groundwater from three different wells, prior to being sent to another treatment system. Mr. Poh led our team in providing design services for the implementation of a new PFAS treatment system. The project encompassed the design of a PFAS treatment system that included twelve (12) treatment vessels, three (3) prefilters, discharge line, other associated pipeline, structural supports, foundation, and site clearing. In addition, the project was located within an existing JCSD Treatment Plant and required our team to prepare site grading.

GOLDEN STATE WATER COMPANY - BISSELL WELLHEAD TREATMENT SYSTEM

Mr. Poh was the Project Manager/Lead Design and Process Engineer for this treatment plant expansion project consisting of the design of a manganese treatment system (pressurized Pyrolusite media filters), sand separator, staticmixer, and backwash equalization tank. Responsibilities included managing production of detailed design drawings, including coordinating work and supervising team of engineers and designers, specification writing, performing hydraulic calculations, managing budget, and coordinating with client.

SAIK-CHOON POH, PE, ENV SP

PROJECT PRINCIPAL

LONG BEACH WATER DEPARTMENT - S-18 SEWER LIFT STATION REHABILITATION UPGRADES

Mr. Poh served as both the Project Manager during the design phase and the Construction Manager / Engineer of Record for the S-18 Sewer Lift Station Rehabilitation Upgrade project. The S-18 SLS Project sought to rehabilitate an aging sewer lift station and accommodate for future flows. Having served as the Project Manager during the design phase, Mr. Poh had an in-depth understanding of the project. As the construction manager and inspector, he verified the compliance of construction materials with project plans and specifications. Inspector's duties included: processing change orders, reviewing contractor's progress payment requests, verifying quantities and work progress are within the outlined agreed upon schedule of values. Documented daily construction activities, time and materials and extra work. Disputed extra work, including labor, equipment, and materials. Schedule and coordinated testing labs to meeting construction schedules. Supervised and provided orientation to test lab inspectors and technicians. Reviewed testing lab contracts and invoices and monitored the approved lab authorization and budgets. Assisted construction manager in completing cost estimates and progress of extra work. Coordinated field activities with the contractor, tenant, testing lab and other stakeholders or agencies.

LONG BEACH WATER DEPARTMENT - S-12 SEWER LIFT STATION REHABILITATION UPGRADES

Mr. Poh served as the Construction Manager and lead the inspection of the construction activity associated with the S-12 Sewer Lift Station Rehabilitation Upgrade. Construction management encompasses verification of the compliance of construction and materials with project plans and specifications., approving submittals, processing change orders, reviewing contractor's progress payment requests, verifying quantities and work progress were in alignment with the agreed schedule of values. Documented daily construction activities, time and materials and extra work. Disputed extra work, including labor, equipment and materials. Scheduled and coordinated testing labs to meet construction schedules. Supervised and provided orientation to test lab inspectors and technicians. Reviewed testing lab contracts and invoices and monitored the approved lab authorization and budgets. Assisted construction managers in completing cost estimates and progress of extra work. Coordinated field activities with the contractor, tenant, testing lab and other stakeholders or agencies.

LONG BEACH WATER DEPARTMENT - S-1 SEWER LIFT STATION REHABILITATION UPGRADES

Mr. Poh served as the construction manager and managed the inspect of S-1 Sewer Lift Station Rehabilitation project. LBWD intended to rehabilitate an aging lift station within a residential neighborhood. Special concerns during the construction and design phase for the rehabilitation of S-1 SLS included the lift station being in a high-density/commercial area, only accessible through a narrow concrete alleyway, traffic control, street closures, coordinating to minimize disruption to community, and staging of equipment. To accommodate for these concerns, noise reduction measures and close coordination with impacted businesses and residents were implemented.

26 Years Experience

CURT ROTH, PE

PROJECT MANAGER

EDUCATION

MS, ENVIRONMENTAL ENGINEERING
(University of California Berkeley)

BS, CIVIL ENGINEERING
(Loyola Marymount University)

REGISTRATION

PE Civil, CA No. C61087

BENEFIT TO CLIENT

Extensive knowledge and familiarity with water, stormwater, and sewer pipeline construction and rehabilitation

Experience with BMP design

Experience working with multiple agencies and municipalities across Southern California

Specialized expertise in designing, constructing and operating Pilot treatment Facilities

Experience interfacing between multiple Agencies

DRP ENGINEERING, INC
1111 Corporate Center Drive, Suite 303
Monterey Park, CA 91754

Curt specializes in environmental and civil engineering. He is experienced in water, storm water, recycled water and wastewater conveyance as well as all aspects of water and storm water treatment. Mr. Roth adds tremendous experience designing, constructing and operating new and innovative systems for the treatment of water and sanitary systems.

WELL 14, 15, AND 22 PIPING AND TREATMENT INSTALLATION PROJECT, JURUPA COMMUNITY SERVICES DISTRICT

Mr. Roth served as the Project Manager for the design of the project and is currently providing engineering support services during construction of the Project. The project encompasses the design and construction of a new PFAS treatment system located within JCSD's existing treatment plant. This project materialized because JCSD sought to address PFAS concerns in their groundwater supply, ahead of future regulations. The new treatment system intends to treat PFAS within groundwater from three different wells, prior to being sent to another treatment system. The treatment system included twelve (12) treatment vessels, three (3) prefilters, discharge line, other associated pipeline, structural supports, foundation, and site clearing.

PIONEER WELLHEAD TREATMENT SYSTEM EXPANSION, 'GOLDEN STATE WATER COMPANY, NORWALK, CA

Mr. Roth was the Project Manager, Lead Design and Process Engineer for the treatment plant expansion project consisting of the design of a granular activated carbon (GAC) system for the removal of volatile organic contaminants. Responsibilities included managing of production of detailed design drawings, performing hydraulic calculations for GAC backwashing drain line; performing water quality characterization; including coordinating work and supervising team of engineers and designers, specification writing, performing hydraulic calculations, managing budget, and coordination with client.

GOLDEN STATE WATER COMPANY - 2005 AND 2006 CAPITAL IMPROVEMENT PROGRAM

Mr. Roth served as a project manager for various projects within the 2005 through 2007 Capital Improvements Program for the Golden State Water Company (formerly Southern California Water Company). Involvement included the design of fifty water main replacement projects, four backwash drain lines, four wellhead designs, and two well treatment systems within a period of 12 months. Also provided a technical support role on several other facility upgrade designs and planning studies. Responsibilities included scheduling the work, managing the design staff, obtaining permits, and providing technical review and decision making.

CURT ROTH, PE

PROJECT MANAGER

GOLDEN STATE WATER COMPANY - CAPITAL IMPROVEMENT PROGRAM REGION 2 AND 3
Curt acted as the Project Manager for various pipeline replacement projects within the Capital Improvement Program (CIP), including approximately 20,000 linear feet of 12-inch, 8-inch, and 6-inch water main located throughout the Client's water system in Southern California. Involvement included the design of fifty water main replacement projects, four backwash drain lines, four wellhead designs, and two well treatment systems within a period of 12 months. Also provided a technical support role on several other facility upgrade designs and planning studies.

LONG BEACH WATER DERPATMENT – LBWD 2021 WATER MAIN IMPROVEMENT
Mr. Roth served as the Project Manager for the LBWD 2021 Water Main Improvement project for LBWD. As part of the project, Mr. Roth led the design of five different project sites for water replacement or improvements throughout the City of Long Beach. The water main replacement encompasses the design of approximately 3,200 linear feet of new water main that will serve to loop the existing LBWD water mains to improve reliability of the existing water mains. In addition, DRP provided design recommendations for alternative alignments to improve ease of construction and mitigate permitting requirements.

LONG BEACH UTILITIES DEPARTMENT – S-18 SEWER LIFT STATION REHABILITATION UPGRADE
Mr. Roth is served as the design lead for the design of the S-18 sewer lift station rehabilitation project. He led the team in performing field assessments of the existing odor control units, corrosion caused by H2S, VFDs & pump clogging, condition assessment of wet well (concrete degradation and lining) dry wet, FOG. Based on the PDR's recommendations that our team provided to LBUD, the engineering design included the replacement and upgrade of odor control unit, wet well, new lining of the wet well and electrical gears. Mr. Roth also led the team in the design of a new force main and the necessary bypass system to be implemented during construction. During the construction phase, he served as the construction management. Main concerns during construction include coordination with stakeholders, ensuring no wastewater backups, preparing sewer bypass in a major intersection, coordination power shutdown, and mitigation disruption to the adjacent community.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS – SATIVA LOS ANGELES COUNTY WATER DISTRICT TECHNICAL SUPPORT AND FINANCIAL AUDIT & SATIVA WATER SYSTEM EVALUATION AND APPRAISAL SERVICES
Mr. Roth served as the project manager to provide technical support services to Sativa Los Angeles County Water District. LACPW had taken over management of the Sativa Los Angeles County Water District and sought to evaluate the condition of the Sativa system and make critical operational changes and infrastructure improvements before transferring or selling Sativa's assets and water rights to a qualified water system operator. DRP took on the role of technical support to provide Project Management, financial audit, prepared Water System Evaluation reports, prepared RFPs, support bid activities, and closely coordinated with California Public Utilities Commission (CPUC). Upon completion of this contract, LACPW retained DRP on a separate contract to provide an additional year of operation support. DRP provided a T2 and D5 certified distribution operator to assist in the "day to day" operations during the transition and operation of the Sativa distribution system.

SUBURBAN WATER SYSTEMS – VARIOUS PIPELINE PROJECTS INWHITTIER, LA MIRADA, AND SAN JOSE HILLS DISTRICTS FOR 2023
Mr. Roth is currently surveying as the Project Manager for the design of water main replacements throughout the City of Whittier for Suburban Water Systems, as part of their annual capital improvement projects. The replacement project included five different project sites that totaled to approximately 27,000 linear feet of 4- to 12-inch PVC an AC pipelines. SWS also required an expedited project schedule, with each subsequent deliverable less than 1-month apart. Mr. Roth led the DRP to meet SWS's requested deliverable schedule on time and within budget.

MARCH 13, 2026

REQUEST FOR PROPOSALS FOR DEVELOPMENT OF THE WELL REHABILITATION AND MAINTENANCE PROGRAM

FOR THE SWEETWATER AUTHORITY INVITATION # 2026-001

14051 Burbank Blvd Ste 300, Sherman Oaks, CA 91401
Phone (818) 506-0418 Fax: (818) 506-1343
www.rcslade.com, info@rcslade.com

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

SECTION 1 – COVER LETTER

Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910

March 13, 2026

Re: Proposal for Development of the
Well Rehabilitation and Maintenance Program
Sweetwater Authority, San Diego County, CA
Invitation# 2026-001

Job No. 855-SDE03

In response to the Sweetwater Authority's recent Request for Proposal (RFP), dated February 29, 2025, Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS), is pleased to present this proposal for providing professional hydrogeology consulting services to the Sweetwater Authority for developing a Well Rehabilitation and Maintenance Program (project) the Authority's municipal production wells. For this project, RCS will serve as the lead firm and will subcontract Hazen and Sawyer to conduct the asset management elements of the project as stipulated in the RFP.

RCS is a local hydrogeological consulting firm focused solely on the development, protection, and management of groundwater resources throughout California. RCS has provided hydrogeologic services for the siting, design, construction, testing, permitting, and rehabilitation of scores of municipal-supply production wells, injection wells, and monitoring wells throughout California. Hazen and Sawyer is an international environmental consulting firm with over seventy five years of experience in the water resource sector.

As described in this Proposal, our team is highly qualified to provide the required services to the Sweetwater Authority (Authority) for well rehabilitation evaluation and planning. Over the last ten years, our team has routinely provided the same services listed in the RFP to other Municipalities, Agencies, Districts, and Private Parties throughout California. Recently, RCS provided professional services to the Authority for the preparation of Drinking Water Source Assessment and Protection (DWSAP) Program documentation for five Authority wells.

RCS has its sole office located in Sherman Oaks, California, and our field staff all live in the Greater Los Angeles area. Mr. Sean Fulcher, Senior Geologists of our firm was also the lead geologist in charge of preparing this proposal, with oversight by Mr. Hicke, the Firm's president. Mr. Fulcher will act as the main point of client contact for the proposal during its review and award period.

RCS appreciates the opportunity of submitting our response to the Authority's RFP and very much look forward to the opportunity of providing our services.

Respectfully submitted,

Anthony Hicke, PG, CHG
President & Principal Groundwater Geologist
Richard C. Slade and Associates LLC

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SECTION 2 – IDENTIFICATION OF RESPONDER

As required by the RFP, below is the required *Identification of Responder* information:

Information	RCS
Legal name and address of company	Richard C. Slade & Associates LLC 14051 Burbank Blvd, STE 300 Sherman Oaks, CA 91401
Legal form of company:	Limited Liability Company (LLC)
Parent companies:	None
Addresses of office(s) and number of employees:	One office only – ten employees Eight employees work out of our Van Nuys Office 14051 Burbank Blvd, STE 300 Sherman Oaks, CA 91401 Two employees are remote workers (out of State)
Name, title, address, telephone number, and email of a person to contact concerning the proposal:	Sean Fulcher, PG, CHG Senior Groundwater Geologist 14051 Burbank Blvd, STE 300 Sherman Oaks, CA 91401 Office: (818) 506-0418 Mobile: (310) 346-1124 email: Sean.Fulcher@rcslade.com

SECTION 3 – FINANCIAL RELATIONSHIPS DISCLOSURE(S)

Richard C. Slade & Associates LLC has no existing or past financial relationships with current members of the Authority's Governing Board, staff, and entities for which said members are employed or have an interest.

Hazen and Sawyer are subconsultants to RCS for this contract.

SECTION 4 – ORGANIZATION AND KEY PERSONNEL

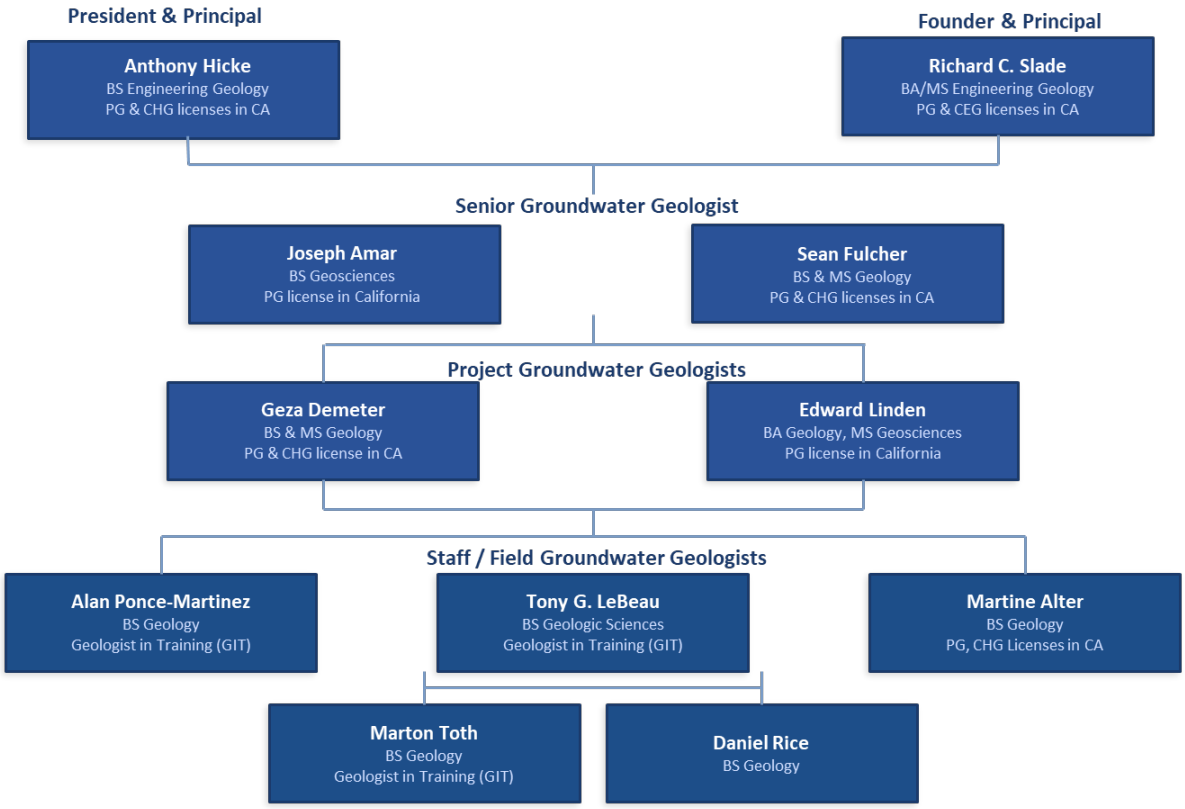
RCS Company Background

Richard C. Slade & Associates LLC (RCS), Consulting Groundwater Geologists, was founded in 1983 by Mr. Richard C. Slade, who has over 50 years of hydrogeologic experience in California. Mr. Anthony Hicke is President of the firm, a Principal Groundwater Geologist, and has 24 years of experience with RCS; he is a licensed Professional Geologist and Certified Hydrogeologist in California. Mr. Slade maintains licenses as a Professional Geologist and Certified Engineering Geologist in California. In addition, the RCS firm maintains seven additional, full-time, professional groundwater geologist employees.

RCS is an industry leader in providing rehabilitation consultation services for municipal-supply water wells in Southern California. Similar to the proposed project, RCS and Hazen teamed for a rehabilitation project for the City of Chino in which three wells were rehabilitated; RCS was a subcontractor to Hazen for that work

RCS, a privately held company, is on a sound and stable financial footing and has continuously been in business in Southern California since its founding by Mr. Slade in 1983. RCS has its office located in Southern California (in the Sherman Oaks area of Los Angeles), and all field personnel live within the Los Angeles area. RCS and its staff have never been disciplined as a Consultant by any government body or professional association.

RCS Organizational Chart



RCS Key Personnel

For this project Mr. Sean Fulcher will serve as the project manager and point of contact with the Authority. Dr. Sean Pour will serve as assistant project manager aiding in administration of the proposed tasks for Hazen and Sawyer. Mr. Geza Demeter and Mr. Anthony G. Lebeau will participate in field tasks and data evaluation for this project. Additional resumes for supporting Hazen and Sawyer staff are provided in Appendix 1.

SENIOR GROUNDWATER GEOLOGIST

SEAN FULCHER, PG, CHG – 12 YEARS EXPERIENCE

Mr. Sean Fulcher joined RCS in 2017 as a Groundwater Geologist and specializes in well rehabilitation, well construction, aquifer testing, and groundwater modeling. Mr. Fulcher has provided services for well rehabilitation in impacted groundwater environments. Mr. Fulcher has supported the Irvine Ranch Water District (IRWD) rehabilitation program – servicing over 30 wells. Areas of additional responsibility for Mr. Fulcher include electronic data management and analysis, and geochemical evaluation of aquifer conditions.

PROJECT GROUNDWATER GEOLOGIST

GEZA DEMETER, PG, CHG – 10 YEARS EXPERIENCE

Mr. Geza Demeter joined RCS in 2018 as a Groundwater Geologist. Major areas of expertise include project management, technical report writing, and field monitoring during the drilling, construction, and testing of municipal- and irrigation-supply water wells. Mr. Demeter has also provided similar office and field services during rehabilitation and redevelopment of existing water-supply water wells. Mr. Demeter serves as the project manager for the IRWD well rehabilitation program – having rehabilitated 30 wells to date. Mr. Demeter also worked closely with Hazen during the rehabilitation of the Chino Wells. Areas of additional responsibility for Mr. Demeter include electronic data management and analysis, and Geographic Information Systems (GIS) analysis to evaluate hydrogeologic conditions.

STAFF GROUNDWATER GEOLOGIST

TONY G. LEBEAU, GIT – 5 YEARS EXPERIENCE

Mr. Tony G. LeBeau joined RCS in 2021 as a Groundwater Geologist. Major areas of expertise include project management, technical report writing, and field monitoring during the drilling, construction, and testing of municipal and irrigation-supply water wells. Mr. LeBeau has provided similar office and field services during rehabilitation and redevelopment of existing water-supply wells. His experience includes office and field services for the preliminary design and monitoring of construction of new municipal-supply water wells, and also for the destruction of existing but abandoned water wells. Areas of additional responsibility include writing technical reports for clients, electronic data management and analysis, and the use of Geographic Information Systems (GIS) to help evaluate hydrogeologic conditions.

Hazen and Sawyer Company and Key Personnel

Founded in 1951, Hazen and Sawyer has become a nationally recognized leader in water, wastewater, and stormwater engineering. With over seven decades of experience, Hazen and Sawyer has built a reputation for technical excellence, innovative solutions, and dedicated client service for all things water. The firm's expertise encompasses a wide range of specialties, such as advanced treatment technologies, asset management, regulatory compliance, hydrology and hydraulic modeling, and public outreach.

ASSET MANAGEMENT

SEAN POUR – 11 YEARS EXPERIENCE

Dr. Sean Pour is the West Region Asset Management lead, and he has helped dozens of utilities become more proactive in planning maintenance, rehabilitation, and replacement activities. His initial experience was as a researcher, developing predictive models to leverage historical data and gain insights into future asset performance. Sean specializes in analyzing condition data to improve the accuracy of the estimation of remaining effective life and risk. His comprehensive and collaborative approach ensures that clients are equipped with the strategies and tools necessary for effective asset management and long-term operational success.

CONDITION ASSESSMENT

STEVE CONNER – 30 YEARS EXPERIENCE

Mr. Steve Conner is a licensed Professional Engineer with a BS in Civil Engineering from UC Irvine and over 30 years of experience in water and wastewater infrastructure at Hazen and Sawyer. His expertise spans pump stations, pipeline design, well equipping, trenchless rehabilitation, and steel and concrete tanks. He has served in roles ranging from Project Manager to Pump Station Engineer and QA/QC Lead across a wide range of projects, including districtwide lift station condition assessments, pump rehabilitation programs, climate resiliency studies, and post-disaster reconstruction — with clients including Eastern Municipal Water District, West Basin Municipal Water District, Santa Clara Valley Water District, and the City of Santa Rosa, among others.

SENIOR ASSOCIATE

STEVEN HUTCHINGS – 30 YEARS EXPERIENCE

Mr. Steven Hutchings is a Senior Associate at Hazen and Sawyer with more than 30 years of experience specializing in asset management, maintenance and reliability, and risk-based equipment condition assessments for water and wastewater facilities. He carries dual certifications as a Certified Reliability Leader and Certified Maintenance & Reliability Professional. His expertise spans reliability centered maintenance, preventive maintenance optimization, failure mode and effects analysis, CMMS evaluation, and asset management maturity assessments.

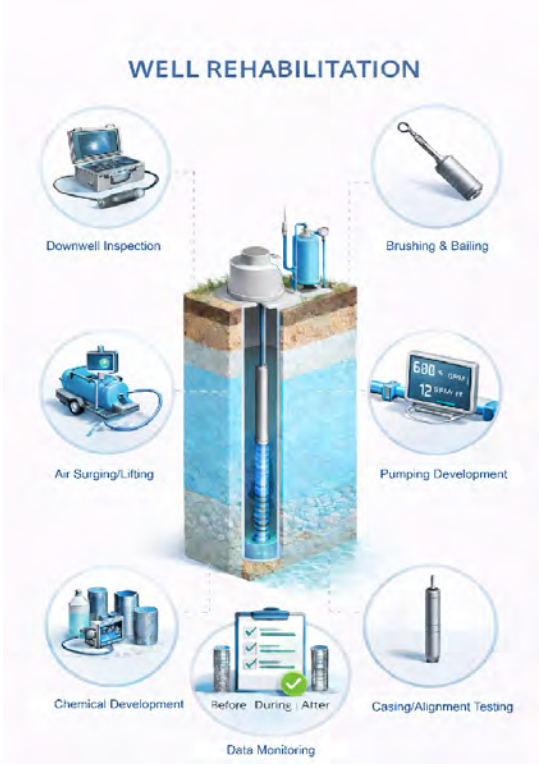
SECTION 5 – QUALIFICATIONS AND EXPERIENCE

Examples of recent ongoing/completed projects by RCS for water purveyors and City municipalities are provided below. Each of the example projects below are composed of Tasks and Works Scopes that are the same or similar to the Scope of Services required in the RFP and proposed herein. These example projects demonstrate the exceptional planning and assessment services that will be provided by the RCS and Hazen and Sawyer team. Similar to the proposed project, RCS and Hazen teamed for a rehabilitation project for the City of Chino in which three wells were rehabilitated; RCS was a subcontractor to Hazen for that work.

For over 40 years, RCS has provided assessments to determine the need for and timing of well rehabilitation, field services, and reviews of well rehabilitation projects across Southern California. Currently, RCS has a long-standing, ongoing on-call rehabilitation contract with the Irvine Ranch Water District (30 wells to date), and a similar contract with the City of Newport Beach (four wells), as examples. RCS has also completed the well rehabilitation work in wells with impacted groundwater for the Santa Clarita Valley Water Agency (four wells to date, with two additional wells rehabilitations projected to begin in late 2026). RCS is experienced with all current mechanical methods and chemical rehabilitation methods being used for well rehabilitation work in the industry today

Likewise, Hazen and Sawyer has performed above-ground condition assessments at wellheads and pump stations for water agencies throughout Southern California, including the Irvine Ranch Water District Wellheads Condition Assessment (21 wells), the Eastern Municipal Water District District-Wide Lift Station Condition and Risk Assessment (38 stations), the Elsinore Valley Municipal Water District Booster Pump Station Condition Assessment, and the Rancho California Water District Pump Station Asset Management Program.

These experiences inform both our team's technical approach and practical understanding of how assessment findings translate into actionable planning and budgeting decisions for groundwater utility clients.



1. CITY OF CHINO – RCS & HAZEN

MUNICIPAL SUPPLY WELL REHABILITATION PROJECT, CITY OF CHINO, SAN BERNARDINO COUNTY, CA. 2021-2023

RCS Project Team:

- Geza Demeter (Project Manager)
- Tony G. LeBeau

Hazen and Sawyer Team:

- Nathan Boyle
- Tori Yokoyama
- Steve Conner

Key Project Work

- Prepared and completed well assessment plan
- Developed rehabilitation scope of work for each well
- Prepared Technical Specifications for rehabilitation/ of existing wells
- Conducted bid support
- Monitored and evaluated well rehabilitation

Rehabilitation of City of Chino Well Nos. 12, 14, and 17 was a City- and grant-funded well rehabilitation project focused on augmenting water supply using treated water from impacted wells. Well Nos. 12 and 14 had not been operational since 2018 and 2008, respectively, due to dissolved-phase volatile organic compounds (VOCs) exceeding Primary Maximum Contaminant Levels (MCLs). Well No. 17 had been idle and had not been put into service since it was constructed in 2006.

Each well required rehabilitation to meet new production requirements to the treatment facility being developed in tandem. RCS evaluated each well, and designed an appropriate rehabilitation program for the wells to meet criteria of the treatment facility. RCS also provided field oversight and monitoring activities for contractor rehabilitation operations for each well.

Rehabilitation operations for these wells consisted of chemical and mechanical redevelopment to clean the casing and gravel pack, downwell surveys, including an Electro-Magnetic Defecto-Scope (EMDS) survey to document the current casing wall thickness of each well, and pumping redevelopment and testing to determine the current pumping capacity of each well.

For all three wells, the final pumping rate at the end of development met the target rate for the needs of the treatment plant. Specific capacities of the wells met or, in the case of Well 12, exceeded the initial specific capacity and pumping rate reported at the time of well construction.

Reference: Natalie Avila, Associate Engineer, 909.875.1804 x709, navila@WVWD.org

2. IRVINE RANCH WATER DISTRICT (IRWD) - RCS

REHABILITATION OF MUNICIPAL-SUPPLY WATER WELLS IRVINE RANCH WATER DISTRICT, ORANGE COUNTY, CA. 2008-PRESENT

RCS Project Team:

- Geza Demeter (Project Manager)
- Joe Amar
- Sean Fulcher
- Tony G. LeBeau

In 2008, IRWD embarked on an ambitious well rehabilitation program, engaging RCS to provide technical expertise to ensure its success. RCS distinguished itself from the outset by developing a rigorous prioritization framework tool that evaluated each well across multiple critical factors including pumping rates, specific capacities, casing condition, water quality, and overall system importance. This evaluation tool allowed strategic planning and sequencing of rehabilitation efforts for maximum operational benefit.

Building on this strong foundation, RCS went on to provide exceptional technical leadership across the rehabilitation of 30 wells, delivering site specific Technical Specifications and rigorous field monitoring and evaluation throughout contractor operations. RCS's comprehensive scope of work encompassed mechanical and chemical development to restore casing and gravel pack integrity and precision installation of casing liners to effectively mitigate sand content. RCS developed comprehensive and tailored pumping plans to accurately measure well performance parameters under variable pumping scenarios. The quality and effectiveness of RCS's work have been instrumental to the program's ongoing success, and IRWD continues to rely on RCS's expertise as the rehabilitation program moves forward in the coming years.

Key Project Work

- Developed a well prioritization and rehabilitation program
- Monitored and evaluated well rehabilitation
- Provided technical support for the assessment, bidding, funding, and field services
- Prepared technical memoranda, preliminary design reports, and final summary of well rehabilitation and rehabilitation operations

Reference: Tiffany Foo, Senior Engineer; 949.453.5329, foo@irwd.com

3. IRVINE RANCH WATER DISTRICT - HAZEN

WELLHEADS CONDITION ASSESSMENT, IRVINE RANCH WATER DISTRICT, IRVINE, CA 2020-2021

Hazen and Sawyer Project Team:

- Sean Pour (Project Manager)
- Steve Conner
- Alan Mlakar

Hazen and Sawyer worked with IRWD to evaluate the condition of assets across 21 wellhead sites within the Dyer Road and IDP service zones. The comprehensive assessment involved cataloging and evaluating 1,050 assets spanning mechanical, electrical, instrumentation and controls (I&C), civil, HVAC, and structural disciplines, providing IRWD with critical information to make informed decisions on how to prioritize rehabilitation and capital improvement projects.

The Hazen and Sawyer team developed an asset register framework, assigned condition scores on a 1-to-5 scale based on visual inspections and performance data, and identified 168 assets in fair or poor condition, requiring near-term attention. This analysis revealed systemic issues across multiple well sites, including obsolete HVAC cooling units creating corrosion risk, outdated Modicon 984 Series PLCs with limited spare parts availability, obsolete electrical equipment lacking Arc Flash labels, and aging mechanical assets such as valve actuators and air release valves approaching end of useful life. The assessment also identified 18 assets no longer in existence and 70 previously unrecorded assets, resulting in a significantly updated and more accurate inventory.

Application Capabilities

- Condition Assessment: Field-assigned condition scores override previous scores when a new assessment is conducted and entered in Survey123 electronic forms.
- Aging/Deterioration: Assets age dynamically according to pre-determined and customizable deterioration curves. In the absence of R&R or condition assessment activities, assets naturally degrade over time, with an estimated condition score assigned to each asset.

The project delivered condition scores for all inspected assets, field photographs including 360-degree wellhead images, and a prioritized list of assets in poor or fair condition organized by discipline and well site. Hazen and Sawyer also created an interactive Power BI dashboard, enabling IRWD staff to easily visualize asset condition data by well site, discipline, and condition rating. The results of this assessment provided IRWD with the key information needed to plan for the rehabilitation and replacement of assets across their wellhead sites, supporting long-term system reliability and informed capital investment decisions.

Reference: Jason Manning, Director of Maintenance*, manning@irwd.com*

4. SANTA CLARITA VALLEY WATER AGENCY (SCVWA) - RCS

MUNICIPAL SUPPLY WELL REHABILITATION
SANTA CLARITA VALLEY WATER AGENCY (SCVWA), LOS ANGELES COUNTY, CA
2023 TO 2025

RCS Project Team:

- Geza Demeter (Project Manager)
- Tony G. LeBeau
- Anthony Hicke
- Joe Amar

Key Project Work

- Technical rehabilitation assessment of multiple wells
- Developed comprehensive rehabilitation and discharge plan
- Technical Specifications for well rehabilitation
- Monitored and evaluated well rehabilitation
- Provided technical support for discharge monitoring and

Saugus Well Nos. 1 and 2 serve a critical dual role in SCVWA's water management strategy, functioning as both supply wells and containment wells for perchlorate groundwater plumes. Despite the installation of casing liners in Saugus Wells 1 and 2 in 2014 and 2012 respectively, both wells experienced measurable production declines. Sourced groundwater by these wells contained elevated perchlorate, VOCs, and arsenic. With both wells scheduled for imminent connection to the new Saugus Perchlorate Treatment Facility (SPTF), timely assessment, bidding, and project execution was paramount. Moreover, stringent requirements by the SPTF for both water composition and turbidity posed challenges to discharge management.

SCVWA turned to RCS to navigate this complex assignment. RCS conducted a thorough technical assessment of each well and devised a pragmatic, time-sensitive rehabilitation program to minimize disruption to local businesses while reducing well rehabilitation time to the greatest extent possible. RCS in conjunction with the SPTF, expertly managed the complex discharge requirements through comprehensive on-site treatment design. As part of the on-site treatment design, extracted groundwater went through a multistage process with a standardized operating procedure. RCS developed and oversaw specialized monitoring and treatment protocols to ensure all discharge fluids met requirements prior to discharge to the SPTF.

At the conclusion of rehabilitation, specific capacities for both Saugus Wells 1 and 2 increased dramatically, with pumping capacities restored to levels equivalent to those reported immediately after original well construction. These outcomes stand as a testament to the quality, precision, and effectiveness of RCS's technical approach.

References: *Ryan Bye, Water Systems Supervisor; 661.388.4988,* RBye@SCVWA.org

5. RANCHO CALIFORNIA WATER DISTRICT - HAZEN

ASSET MANAGEMENT PLAN FOR PUMP STATIONS, RANCHO CALIFORNIA WATER DISTRICT, TEMECULA, CA 2021-2022

Hazen and Sawyer Project Team:

- Sean Pour (Project Manager)
- Steve Conner
- Alan Mlakar

Application Capabilities

- Condition Assessment: Field-assigned condition scores override previous scores when a new assessment is conducted and entered in Survey123 electronic forms.
- Aging/Deterioration: Assets age dynamically according to pre-determined and customizable deterioration curves. In the absence of R&R or condition assessment activities, assets naturally degrade over time, with an estimated condition score assigned to each asset.

Hazen and Sawyer took a data-driven approach to developing an Asset Management Plan (AMP) for the 38 pump stations owned and maintained by Rancho California Water District (RCWD). The project entails helping RCWD to implement asset management practices and tools to prioritize maintenance, rehabilitation, and replacement activities of the pump stations to increase reliability, minimize RCWD's risk exposure and minimize impacts to rate payers. As the first step, our team developed an inventory of pump station assets and set up electronic forms and performed a visual condition assessment of the pump stations. The field inventory and condition assessment included experienced staff in each major discipline (civil, mechanical, structural, electrical, and I&C) to assess the condition and identify critical issues quickly. Hazen and Sawyer utilized a structured condition scoring system, which is transparent, repeatable, and useful for later analysis, with each score's definition. Using the condition assessment results, our team determined remaining useful life and probability of failure for each asset and then combined with consequence of failure, determined the risk of each asset to use for prioritization of rehabilitation and replacement projects. An asset management plan was developed for RCWD's pump stations that included the approach and results of the condition assessment, risk assessment, and life cycle cost projection.

Guided by RCWD's goals to maximize the value of the collected asset data, reduce manual processes, and use real-time data to predict and plan asset lifecycle strategies, Hazen and Sawyer developed a digital, interactive software application powered by Microsoft Power BI. Using data from the asset database, and real-time data collected in the field (using Survey123 electronic forms), the AMP BI application applies asset management algorithms and generates condition and risk scores.

Reference: Jeff Kirshberg, Water Resources Manager, 951.296.6973, kirshbergj@ranchowater.com

6. CITY OF ANAHEIM - RCS

MUNICIPAL SUPPLY WELL REHABILITATION PROJECT, THE CITY OF ANAHEIM, ORANGE COUNTY, CA 2021-2023

RCS Project Team:

- Joe Amar (Project Manager)
- Geza Demeter
- Tony G. LeBeau

Key Project Work

- Reviewed well rehabilitation plans
- Well rehabilitation planning
- Monitored and evaluated well rehabilitation
- Developed environmentally sensitive discharge system

As part of a multi-phase groundwater treatment plant design-build project for the City of Anaheim, several wells required rehabilitation assessment and field services. For this project, RCS working with Psomas, completed rehabilitation planning, field services, and well testing for Well Nos. 41 and 43 which have served as municipal supply wells since their construction in 1980s. Well No. 43 is located near the banks of Anaheim Lake with riparian habitat protections.

Well rehabilitation for the wells followed a comprehensive stepwise process of downwell assessment, liner installation, followed by well specific mechanical and chemical development. Results of this rehabilitation work in Well No. 43 helped reach specific capacity of 66.6 gpm per foot of drawdown, well above expectations.

The onsite discharge location for Well No. 43 created excessive suspended sediment loads in the adjacent riparian habitats. RCS devised a discharge system to convey potable discharge water further into Anaheim Lake with a diffuser system to reduce turbid water generation

Implementation of the new extended discharge system was successful, allowing pumping test fluids to safely enter Anaheim Lake. Due to this design, project schedules were met without costly delays due to additional onsite construction.

Reference: Divya Agrawalla, Principal Civil Engineer, 657.766.8197, dagrawalla@anaheim.net

7. CITY OF SEAL BEACH - RCS

BEVERLY MANOR WELL REHABILITATION, CITY OF SEAL BEACH, LOS ANGELES COUNTY, CA. 2021-2023.

RCS Project Team:

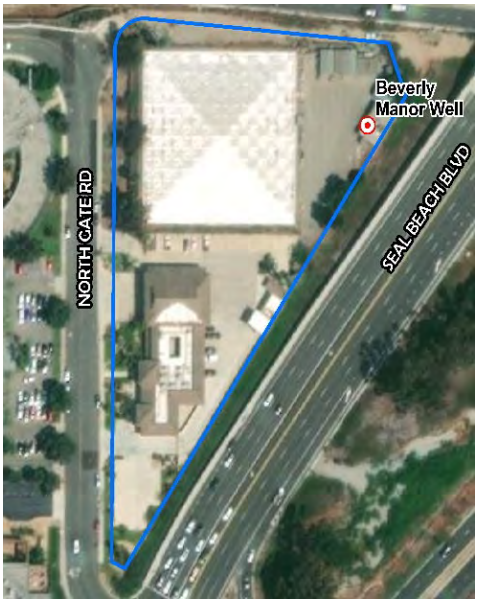
- Joe Amar (Project Manager)
- Tony G. LeBeau
- Richard Slade

The Beverly Manor Well was originally constructed by the City of Seal Beach in 1968 using low carbon steel casing. The well served as municipal supply well accounting for a significant portion of the City of Seal Beach potable water supply. Upgrades to the water supply system demanded rehabilitation of the well. Given the well's age and lack of discharge points, a detailed technical and logistical assessment was needed.

Key Project Work

- Prepared and completed well rehabilitation assessment
- Prepared Technical Specifications for rehabilitation/ of existing wells
- Conducted bid support
- Monitored and evaluated well rehabilitation

RCS met both projects' challenges by first conducting downwell assessment of the well casing using a Pulsed Eddy Current (PEC) survey, video survey, and gyroscopic surveys. The discharge point was remedied by working in conjunction with the City of Seal Beach to locate a suitable local stormwater catchment. Due the proximity of the stormwater catchment with Caltrans infrastructure, an easement permit was required. RCS assisted the City of Seal Beach in obtaining the encroachment permit. Based on this information, RCS developed site specific Technical Specifications resolving both downwell conditions and discharge issues.



The Beverly Manor Well underwent a thorough development regime of mechanical, chemical, and pumping development. Before rehabilitation, the operational pumping rate for the well was 1,200 gpm. During pumping development, the well was pumped at 3,500 gpm and had a pumping drawdown of 35 feet. The constant rate test conducted at the conclusion of rehabilitation activities was performed at 2,500 gpm and had a drawdown of 26 feet. The rehabilitation activities showed the well far exceeded the target operational rate of 1,200 gpm.

Reference: Iris Lee, Public Works Director; 562.431.2527, ilee@sealbeachca.gov

SECTION 6 – APPROACH TO COMPLETE TASKS

RCS METHODOLOGY

Dedicated to the science and principles of hydrogeology, RCS utilizes robust data collection, analysis, and modeling to accurately understand and interpret hydrogeological data for each well design and construction project. This sound foundation, based on scientific principles and reasoning, has allowed RCS to successfully rehabilitate scores of municipal wells in California.

RCS incorporates a detailed, pragmatic approach utilizing the latest methods, technology, and scientific concepts to deliver practical, robust, and cost-effective solutions. RCS understands that project requirements, parameters, and resources may vary over time, requiring timely adaptation and execution to meet project goals. As a result, RCS has invested in and developed data management and remote data acquisition technologies to better suit each project.

RCS prides itself on its ability to create top-quality work products and deliverables. All documents produced by RCS are held to a strict internal review policy, in which two internal reviews are conducted (one for editorial control, and one for technical content). Also, RCS routinely holds a weekly, internal "all-hands" staff meeting to discuss all active projects. This serves as an additional layer of quality control in which ongoing projects are discussed with all staff and, as such, each staff geologist is encouraged to identify possible upcoming issues and process improvements for ongoing projects. RCS finds that this approach invites "out-of-the-box" thinking and creativity.

GENERAL PROJECT APPROACH

TASK 1 – DATA COLLECTION, REVIEW, AND PROJECT COORDINATION

For Task 1, our team will first complete a kickoff meeting to review scope, schedule, and data needs for the project while establishing communication channels for the duration of the project. A plan for meetings updating the Authority on progress will also be discussed and established. Project management tasks and additional meetings including schedule tracking, quality oversight, and regular project coordination will be completed under this task. Our team will also hold progress meetings at key milestones to report preliminary findings and confirm direction. Project milestone meetings for this project are the following:

- Project kickoff (Task 1)
- Institutional knowledge meeting (Task 1)
- Condition assessment results workshop (Task 2)
- Draft Rehabilitation Plan and Maintenance Program (Task 3)
- Draft Rehabilitation Plan and Maintenance Program Report (Task 4)
- Final Rehabilitation Plan and Maintenance Program Report (Task 4)
- Final Presentation to Authority Staff (Task 4)

For the data review subtask listed in the RFP, our team will review, categorize, and apply QA/QC protocols to verify data quality once all available data is received for the 13 well sites. After this process the data will be categorically

reviewed and cross-referenced with internal and external databases for well performance parameters. Available historical water quality data for each well will be reviewed and evaluated to characterize scaling potential — including carbonate, sulfate, and silica scaling indices — and to assess the effects of brackish groundwater chemistry on long-term casing integrity. This evaluation will identify wells where aggressive water chemistry may have accelerated internal casing corrosion or encrustation, informing both rehabilitation recommendations and the selection of appropriate casing inspection methods during field assessments.

This review of operational data will be incorporated into a detailed review of received data relevant to the above-ground equipment at each of the 13 well sites. This includes as-built and design drawings, equipment records, historical maintenance and repair logs, pump performance data, electrical as-built information, and any prior inspection or condition assessment records available from the Authority.

These data reviews will allow our team to assess preliminary well performance factors and the development of a preliminary asset register for the above-ground equipment at each well — capturing key physical attributes such as asset type, manufacturer, model, installation year, and material — before the first site visit. From this data review, we will also identify data gaps and allow the field assessment plan to be tailored to the specific characteristics and condition history of each well site.

Assumptions:

- The Authority will provide timely access to all existing well construction logs, historical pumping and performance data, water quality test results, maintenance records, and electrical/mechanical information as referenced in Task 1 of the Scope of Services.
- All requested data will be made available within one (1) week of the project kickoff meeting. Delays in data delivery by the Authority may impact the project schedule.
- Authority staff will be reasonably available for meetings, site visits, and review of draft deliverables throughout the project duration.
- The Authority will designate a single point of contact to coordinate all project communications and facilitate timely review and approvals.

TASK 2 – FIELD ASSESSMENTS AND CONDITION EVALUATION

For this task, our team will perform a comprehensive visual condition assessment of all above-ground assets at each of the 13 well sites using Hazen and Sawyer discipline specialists covering structural, civil, mechanical, electrical, instrumentation and controls (I&C), and HVAC. Hazen and Sawyer will lead the visual condition assessment using a methodology built around an objective, repeatable scoring framework minimizing subjective bias through quantitative measures and binary yes/no questions. Every asset is assigned a condition score on a 1-to-5 scale — from Excellent to Poor — with clearly defined criteria applied consistently across all disciplines and all 13 sites. This structure ensures the results are comparable across the well system, defensible for capital planning purposes, and repeatable by Authority staff in future assessment cycles. Hazen and Sawyer will develop discipline-specific electronic condition assessment forms using ArcGIS and Survey123, deployed on mobile devices in the field. These forms are designed to automate data collection, enforce consistency across inspectors and sites, and eliminate paper-based data entry.

RCS will review, QA/QC, and analyze historical well performance data, as available. Historical well performance data provided by the Authority will undergo qualification to verify SCADA system operations and data quality. In-field observation of select wells will be completed to verify current performance parameters. Analysis of historical and field observed well performance will use analytical methods for calculating hydraulic performance both temporally and spatially to understand current system performance, system dynamics, and performance trends.

Based on field observations and historical data analysis, downwell condition data gaps may exist. RCS as a proactive approach, RCS has provided Subtask 2.7 as an optional field service to observed downwell surveys (e.g., video surveys) and pump extraction for a total of three wells.

Assumptions:

- All thirteen (13) wells listed in the RFP will be visited during coordinated field mobilization efforts to minimize travel costs and disruptions to Authority operations.
- The Authority will provide access to all well sites, including secured or restricted areas, during normal business hours (Monday–Friday, 7:00 AM–5:00 PM). After-hours or weekend site access, if needed, will be coordinated separately.
- Field assessments are visual and observational in nature. No downhole video inspection, pump testing, water quality sampling, or geophysical logging is included in this proposal. Following the observational field assessment, if additional down well surveys are deemed necessary, those surveys will need to separately authorized and will represent an additional cost not included in this proposal.
- Authority operations staff will be available during field visits to provide operational context and answer questions about each well's performance history.
- Wellheads and associated electrical/mechanical equipment will be safely accessible for visual inspection. If confined space entry or specialized safety equipment is required, this will be evaluated as an additional cost.

Deliverables:

- Field Condition Assessment of Above-Ground Assets at 13 Wells
- Asset Register Updated with Condition Scores (Excel)
- Field Condition Assessment Photographs
- Condition Assessment Results Workshop (2-hour, in-person)

TASK 3 – REHABILITATION PLANNING, MAINTENANCE STRATEGY, AND PROGRAM DEVELOPMENT

Building on the field assessment findings, the RCS and Hazen and Sawyer team will develop rehabilitation recommendations, maintenance program materials, and cost and budget planning tools for the above-ground equipment at all 13 well sites. As part of the maintenance program, inspection checklists, maintenance logs and templates, and standard operating procedures will be developed. Our team will also deliver a Microsoft Power BI asset management dashboard as an enhanced planning deliverable that extends the value of the program well beyond the initial assessment cycle.

Using field assessment findings with historical performance data, a tiered well rehabilitation priority will be defined. RCS proposes a structured well rehabilitation priority built on four core elements: (1) a comprehensive condition and

performance baseline for all 13 wells; (2) a weighted, multi-criteria prioritization framework that ranks each well by risk and urgency; (3) a tiered maintenance strategy aligning preventive and corrective activities to each well's condition; and (4) analysis of actionable short-term and long-term corrective activities to expected outcomes.

Based on the analysis of field assessment findings and well rehabilitation priority, well rehabilitation maintenance strategy with 3- and 10- year budget projections will be provided. These cost estimates and projections will be based on the field assessment as well analysis of historical well performance, and site-specific rehabilitation needs.

Prior to finalizing the Task 3 deliverables, our team will prepare and submit a Draft Rehabilitation Plan and Maintenance Program for Authority review. We will participate in the draft review meeting to present preliminary above-ground findings, walk through the rehabilitation recommendations and budget projections, demonstrate the Power BI dashboard prototype, and receive structured feedback from Authority staff before finalization.

Assumptions:

- Rehabilitation recommendations and priority rankings will be based on available data and field observations. Definitive structural integrity assessments (e.g., downhole video) may be recommended but are not included in this scope.
- Cost estimates for rehabilitation tasks will be based on current regional market pricing and standard industry unit costs. They are planning-level estimates (Class 4 or 5, ±30–50%) and are not intended to serve as construction-level engineer's estimates.
- Short-term (1–3 year) and long-term (5–10 year) budget projections will be developed using escalation factors consistent with current industry trends.
- Standardized tools (inspection checklists, maintenance logs, SOPs) will be developed as Microsoft Word and Excel templates, consistent with the Authority's existing document formats where provided.
- The Authority will provide review of the draft deliverables within one (1) week from receipt.
- One (1) draft review meeting will be held to present preliminary findings and receive feedback prior to finalizing the program.

Deliverables:

- Remaining useful life analysis (by asset, site, and discipline)
- Unit cost library (rehabilitation, replacement, and maintenance costs by asset class)
- Inspection checklists (per well, per discipline)
- Maintenance log templates (editable, by asset class)
- Standard operating procedures (SOPs) for routine inspection and preventive maintenance
- Power BI Dashboard prototype
- Participation in draft review meeting (2-hour, in-person)

TASK 4 – FINAL PROGRAM PREPARATION AND DELIVERABLES

After review of the Task 3 deliverables, our team will prepare a complete draft Well Rehabilitation Program for review and comment by the Authority. This draft Well Rehabilitation Program will include the above-ground condition assessment results, per-well rehabilitation plans and equipment upgrade recommendations, preventive maintenance schedules and SOPs, inspection checklists and maintenance log templates, cost estimates, and short- and long-term budget projections — all integrated with the system-wide program structure.

Following review and comment, the draft Well Rehabilitation Program will be finalized to include:

- Executive summary
- System-wide findings and evaluations
- Well-by-well rehabilitation plans
- Maintenance schedules and SOPs
- Budget planning tools
- Supporting data tables, figures, and templates

PROJECT SCHEDULE

Execution of Tasks 1 through 4 are estimated to be completed approximately 4 months from the kickoff meeting. Our team understands the final deliverables of Task 4 are needed "by the end of August 2026" per the RFP. In order to meet that deadline contracting would need to be completed and a "notice to proceed" would need to be issued by the Authority no later than May 1, 2026. If additional site evaluation such work in Subtask 2.7 is requested, additional time may be needed.

SECTION 7 – EXCEPTIONS TO THE RFP

RCS respectfully requests an exception to the insurance requirements described in Exhibit C of the RFQ, titled "Agreement for Services Template". Section 6.5 on Page 5 of the document states the following:

> 6.5 Acceptability of Insurers: Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California and maintain an agent for process within the state, unless waived, in writing, by the Authority Risk Manager. Carrier(s) shall have an A.M. Best rating of not less than an A: VII or better, or as otherwise approved by the Authority Risk Manager.

RCS requests that the A.M. Best rating of "A: VII" be changed to "A: V". Our insurer, Terra Insurance Company, has an A.M. Best Rating of A, with a Financial Class Size rating of V. Terra is one of the highest rated professional liability carriers in America, according to various A.M. Best rating analytics. Included in the Appendix is a letter prepared by Terra Insurance Company explaining their rating and their strength as an insurer.

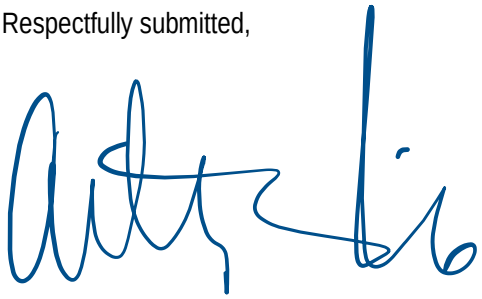
SECTION 8 – AMENDMENTS TO THE RFP

RCS notes that no Amendments to the RFP were issued, and RCS acknowledges the "Answers to Questions Set 1 and Set 2 issued on February 16, 2026 and March 4, 2026, respectively.

SECTION 9– PROPOSAL AUTHORIZATION

Anthony Hicke, President of Richard C. Slade & Associates LLC, the undersigned, is duly authorized to bind Richard C. Slade & Associates LLC to the terms and conditions of this proposal. This proposal and its costs are valid for a period of ninety (90) days from the date of this proposal.

Respectfully submitted,



Anthony Hicke, PG, CHG
President & Principal Groundwater Geologist
Richard C. Slade & Associates LLC

APPENDICES

Letter From Terra Insurance

TERRA
INSURANCE COMPANY

September 17, 2025

Anthony Hicke, PG, CHG
Richard C. Slade & Associates, LLC
14051 Burbank Blvd., Suite 300
Sherman Oaks, CA 91401

Re: Terra Insurance Company A.M. Best Rating

Dear Mr. Hicke**:**

This letter responds to your inquiry regarding the A.M. Best rating held by Terra Insurance Company. You stated that your client, Sweetwater Authority, requires an A.M. Best rating of A, Class VII, or better. Terra is the highest rated professional liability carrier in America, according to A.M. Best, based on its very high BCAR (Best Capital Adequacy Ratio) score, as well as other Best rating metrics, like its very strong operating performance and very strong balance sheet. Terra's A.M. Best qualitative rating is "A, Excellent" and its size rating is "V". Terra also has been issued a credit rating by Best of "a+", which is the 5th highest in the Best rating system of 21 credit rating categories. Terra's qualitative rating of "A" is the third highest that A.M. Best assigns, of 13 rating categories. In A.M. Best's 2024 Property & Casualty rating unit composite comprised of hundreds of insurers, there are only seven other companies besides Terra, that have a "+2 (Very Strong)" operating performance assessment by Best.

Furthermore, Terra is reinsured by Everest Reinsurance Company, which is rated "A+", Class "XV", by A.M. Best. We believe that our "A" rating from Best, combined with our very high BCAR score, other Best rating metrics including our credit rating, and the nature of our reinsurance structure should satisfy any concern your client may have concerning Terra as an insurer.

Added Strength of Terra's Qualitative Best Rating and BCAR

The Best rating system expresses A.M. Best Company's opinion of an insurer's financial strength and ability to meet its ongoing obligations to policyholders. According to A.M. Best, an insurer with an "A" qualitative rating is one that has an excellent ability to meet its ongoing insurance obligations.

BCAR is an important qualitative measure of an insurance company's strength, reliability and ability to meet its financial obligations. BCAR analyzes an insurance company's underwriting, credit and investment risks. Insurance companies in the Best rating system are assigned a score pursuant to the BCAR analysis.

A.M. Best confirmed that for year-end 2016 (the final year that the original BCAR scoring model was in effect), Terra's BCAR score was **637**, and is shown as such in Best's current 2017 rating guide for the original BCAR model. By contrast, no other carrier comes close to

2 Fifer Avenue, Suite 100 / Corte Madera, CA 94925 / Tel 415.927.2901 / 800.872.0077 / Fax 415.927.3204

Terra according to Best's BCAR analysis. The following shows competing carriers' BCAR scores for 2017, rounded to the nearest whole number:

Terra Insurance Company:	**637**
Houston Casualty Company:	289
CNA Financial Corp.:	289
RLI Corp.:	287
Hudson Insurance Group:	283
Markel Group Inc.:	235
Admiral Insurance Group:	219
ACE American Insurance Company:	207
AXA XL:	201
Liberty Mutual Group Inc.:	184
American International Group, Inc.:	173
Lexington Insurance Company (an AIG company):	173

As you can see, Terra had (and continues to have) the highest BCAR score of any of its competitors by a significant margin. Given Terra's consistently high BCAR score (for instance, its BCAR score in 2001 was 455), there should be no concern about Terra's financial strength and capital adequacy, and especially, its ability to meet its ongoing obligations.

By contrast, failed competing large insurance companies such as DPIC and Reliance, (which once possessed financial size quantitative ratings of XIV, and qualitative ratings of "A+" and "A-", respectively), never had a BCAR score that exceeded 120 (DPIC's highest BCAR score was 119 and Reliance's highest BCAR score was 86). In fact, both DPIC's and Reliance's BCAR scores hovered well below 100 in the years before their financial collapse (i.e., their BCAR scores were 86.9 and 77.8, respectively). As such, it is evident that a high size rating in and of itself (like a VI to XV) does not make an insurance carrier financially strong. "Bigger" is not necessarily "better".

Furthermore, as explained below, Terra uses reinsurance to limit its exposure on any single loss, such that its surplus is further shielded from catastrophic depletion.

A.M. Best's New Stochastic Model Ratings

In addition, Terra's BCAR score using A.M. Best's new stochastic modeling rating system is more than 3 times as great as what A.M. Best considers "excellent". A.M. Best considers any score above 0% to be "good", and scores above 25%, are considered as "excellent." Under this new modeling system, which went into effect in 2017, which is on a scale of 0% to 99%, Terra's current BCAR score is 80.73% based on a confidence level of 99.6%. This high confidence level is also reflected in a new benchmarking study of Terra compared to its complete peer group and its primary 11 competitors. Terra outperformed the entire peer group and all its peers in almost every significant risk category.

In fact, Terra's BCAR score is the highest of all professional liability providers in the U.S. This is evidenced in the table below, which shows A.M. Best's stochastic modeling for BCAR at a 99.6% confidence level, with the most current ratings for each carrier as of July 15, 2025, rounded to the nearest whole number, for Terra its full peer group and its primary 11 competitors:

Terra Insurance Company:	**81%**
American International Group, Inc.:	59%
RLI Corp.:	54%
Chubb Limited:	45%
CNA Financial Corp.:	43%
W.R. Berkley Corporation:	40%
Houston Casualty Company:	39%
Peer Group Average:	39%
Markel Group Inc.:	36%
Zurich Insurance Group Ltd.:	31%
AXA S.A.:	28%
The Hanover Insurance Group, Inc.:	26%
Liberty Mutual Group Inc.:	24%

In addition, Terra leads professional liability insurers, and the entire industry composite, in most other A.M. Best rating analytics over the last ten years:

10-Year Averages	**Terra**	Composite	Industry
Combined Ratio	72.6	98.7	99.9
Loss and LAE Ratio	12.4	69.1	72.7
Pre-tax operating income ROR	31.8	12.1	8.6
Total ROR	26.9	10.8	13.3
Operating Ratio*	68.2	87.0	90.8
Pre-tax operating income ROE	12.4	10.4	6.4
Total ROE	10.5	9.3	10.0
Accident Year Combined Ratio	71.5	98.4	100.2

*A.M. Best's Operating Ratio measures a company's overall operating profitability from investment and underwriting activity, and excludes other income, capital gains and income tax liability. The smaller the result or lower the number, the more efficient the company is at generating revenue versus expenses.

Terra's Limited Exposure and Strong Reinsurance

The structure of Terra's reinsurance and the strength of our reinsurers are additional factors that should reassure your client. Our current reinsurance arrangement limits Terra's exposure to a maximum of $500,000 per claim for a $10 million per claim/$10 million aggregate limit of coverage.

As stated above, A.M. Best rates Terra's treaty reinsurer, Everest Reinsurance Company, "A+," Class "XV". Such ratings exceed the rating requested by your client. With this reinsurance arrangement, if a Terra policyholder reports a claim, our reinsurers are liable above Terra's maximum retained exposure of $500,000 of the first $10 million per claim/$10 million aggregate in coverage. In other words, Terra has significant assets, equity and reinsurance support to fund any given claim.

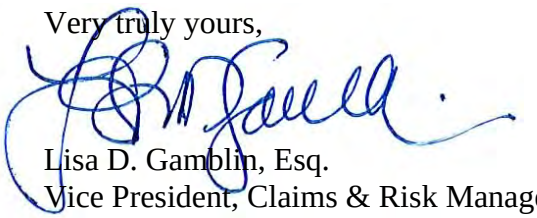
Terra Has Nation's Second Longest Continuous Record Covering Professional Engineers

Terra companies have a 57-year, uninterrupted history of insuring engineers in the United States. As mentioned above, we trace our roots to 1968, making Terra and its predecessor company the second oldest PL provider to design professionals in the United States.

We insure some of the nation's premier engineers, including companies that appear in the Engineering News Record's list of the country's 500 largest design firms. We insure firms as small as $300,000 in annual revenue and as large as $200,000,000 in annual revenue. And, perhaps most importantly, Terra has incurred hundreds of millions of dollars in claim payments, and has never failed to pay a claim.

Terra's stellar AM Best operating metrics, its reinsurance support, its reinsurance structure, and its unrivaled financial success (it has reported 149 calendar quarters of profitability), makes it a very secure and reliable professional liability insurer for design professionals. I hope that the information in this letter answers any questions your client has regarding Terra's A.M. Best rating. Please don't hesitate to contact me if you or your client has any questions.

Very truly yours,



Lisa D. Gamblin, Esq.
Vice President, Claims & Risk Management

Key RCS Staff Resumes

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

ANTHONY HICKE, PRESIDENT & PRINCIPAL GROUNDWATER GEOLOGIST

Professional Experience

Anthony Hicke is President and Principal Groundwater Geologist for Richard C. Slade & Associates LLC, Consulting Groundwater Geologist (RCS), Mr. Hicke joined the RCS company in 2001 and has worked as a Groundwater Geologist at the firm since that date. In June of 2025, Mr. Hicke assumed the role of President of the RCS Company. Mr. Hicke has a BS degree in Geology (Engineering Geology) from UCLA and has successfully completed many graduate-level hydrogeology courses at CalState LA, including classes in hydrogeology, environmental & forensic geochemistry, and environmental isotopes. Mr. Hicke maintains licenses as a Professional Geologist and a Certified Hydrogeologist in California.

Mr. Hicke has either participated in, conducted and/or managed/supervised more than 350 groundwater projects in a large number of groundwater basins throughout California. Major areas of groundwater work for Mr. Hicke, while an employee at Richard C. Slade & Associates, LLC, include project management for numerous groundwater development projects, including: groundwater basin evaluations; creation of hydrogeologic conceptual models well construction projects; and aquifer testing studies throughout California. In addition, Mr. Hicke serves as the lead geologist during Hydrogeologic Evaluations of California Groundwater basins, and calculation of estimates of underflow and groundwater in storage for those basins. Mr. Hicke is also a project manager overseeing preparation of groundwater availability studies for various agricultural clients, as well as the preparation of technical documents intended to support the creation of Environmental Impact Reports (EIRs). Mr. Hicke provides technical and administrative oversight during well construction and aquifer testing projects. Since December 2008, Mr. Hicke has performed the duties of the Assistant ULARA Watermaster.

Highlights

Education

- University of California, Los Angeles, B.S., Geology (Engineering Geology), 2000

Registrations/Certifications

- Professional Geologist, California (No. 7886)
- Certified Hydrogeologist Geologist, California (No. 858)

Representative Project Experience

Well Feasibility and Well Construction, City of Beverly Hills, Los Angeles County, CA, 2025

RCS is currently working with the City of Beverly Hills via multiple contracts and subcontracts with Engineering firms, to develop groundwater resources in the La Brea Subarea of the Central Basin. The City of Beverly Hills Historically pumped groundwater from properties outside of their City limits within the La Brea Subarea but abandoned those groundwater production facilities in the late 1970s. RCS teamed with an Engineering firm beginning in 2017 to develop a Preliminary Design Report for the City's desired reactivation of groundwater resource facilities in the La Brea Subarea. For that effort, RCS was tasked with evaluating the groundwater production potential (with respect to quantity and quality) of six candidate sites within the La Brea Subarea.

RCS designed and provided hydrogeologic services and field oversight for one of those candidate well locations. First, a new nested monitoring well was constructed as part of the evaluation work. Data from that monitoring well were used to present the project to the Division of Drinking Water (DDW). In 2021, RCS managed the construction of the first new municipal supply well in the La Brea Subarea since the 1970s (La Cienega Well No. 1). Testing showed that the well met water production and water quality goals, with a recommended operational pumping rate of 500 gpm. RCS also provided hydrogeologic well design and field services associated with the construction of triple-nested monitoring wells at the City's Sand Pit site property. RCS designed the well to monitor key aquifers beneath the property for the purposes of monitoring water quality changes (if any) over time. Data collected from the monitoring well will be used to determine the feasibility of construction of a new municipal -supply water well at the site.

RCS was recently part of a team working to construct two new municipal supply wells in the La Brea Subarea. For this project, RCS helped to site wells and prepared the technical specifications and testing protocols for the project. Well construction was completed in spring of 2025. Mr. Hicke is the project manager for the current City of Beverly Hills projects. RCS continues to evaluate other properties in the region for future well sites.

Hydrogeologic Conceptual model of the Santa Clara River Valley East Groundwater Basin, Santa Clarita Valley Water Agency (SCVWA), Los Angeles County, CA, 2020-2022, 2025

RCS recently completed documentation of the hydrogeologic conceptual model (HCM) of the Santa Clara River Valley East Groundwater Basin in support of the Groundwater Sustainability Plan for the groundwater basin. This work was in conjunction with a number of other consultants, as part of an overall team effort working toward Sustainable Groundwater Management Act (SGMA) compliance. RCS was responsible for the creation of the HCM chapter of the GSP, which included hydrogeologic interpretation, cross section creation, and interpretation of hydrogeologic processes. Mr. Hicke was the project manager for this effort and provided a public presentation to summarize the results of the work. Currently, Mr. Hicke is the project manager for an effort to update the HCM by addressing known data gaps and including recently collected data into the overall basin subsurface interpretations.

Antelope Valley-East Kern Water Agency (AVEK), High Desert Water Bank (HDWB) – Western Antelope Valley, CA: Project ***Manager for owner's advisor services.***

RCS is currently providing hydrogeologic services as subcontractor to an engineering firm, where RCS and the firm are acting as the owner's advisor. AVEK is implementing a $131M groundwater bank in partnership with Metropolitan Water District to store up to 280,000 AF of Metropolitan's State Water Project (SWP) water supply in AVEK's groundwater bank, with water recovery of up to 70,000 AFY over four consecutive years. RCS has provided technical oversight and support to the Project Engineer and AVEK, reviewing work product prepared by the design engineering/hydrology team contracted to design and build the project. RCS work on the project has included: reviewing technical reports and proposals created by the design engineer/hydrogeologist team; reviewing technical specifications for well drilling work; performing field observations during well drilling and construction; reviewing subsurface hydrogeologic data, including geophysical electric logs, geologic logs, isolated aquifer zone testing data, and other data; reviewing proposed well designs; commenting on pumping testing procedures; with additional wells estimated to begin construction in 2026. Ultimately, approximately 27 recovery wells will be constructed to extract water from the banking project property.

Indio Water Authority (IWA) Well Siting Study, City of Indio, Riverside County, CA, 2021

For this project, RCS evaluated more than ten properties owned or accessible to IWA throughout the IWA service area that could be used as a new well site. RCS reviewed and summarized the hydrogeologic conditions throughout the IWA service area to identify the "hydrogeologically desirable" areas of the basing with respect to water quality and quantity. Each potential site was then evaluated for a number of factors including: potential well production rate; water quality impairments; distance to distribution infrastructure, construction suitability, permitting feasibility, among others. Working closely with IWA staff, RCS developed a ranking matrix to score each property so that the properties could be compared and ranked. RCS also included key design parameters for a future well at the selected site, as well as an approximate estimate of construction costs for the well for budgetary planning purposes. Mr. Hicke was the project manager for this study.

United Water Conservation District (UWCD), Santa Paula Basin Hydrogeologic Characterization and Safe Yield Study Ventura County, California, 2017

RCS provided an independent and detailed definition of a hydrogeologic conceptual model of the Santa Paula Groundwater Basin to help better understand the hydrogeology of the basin, and to describe the movement of groundwater into and through the basin. To do so, RCS created detailed hydrogeologic cross sections of the basin by correlating key marker beds detected on available geophysical electric logs of oil wells, production water wells, and monitoring wells. Using those subsurface interpretations, and groundwater elevation data, RCS calculated the estimated amount of groundwater underflow that entered and exited this groundwater basin. Ultimately the work was used to help re-calculate the safe yield of the groundwater basin.

Conceptual Groundwater Basin Model and Assessment of Available Groundwater Supplies, Santa Monica Groundwater Basin, The City of Santa Monica, Los Angeles County, CA, 2011 to 2013

The initial RCS project involved providing a detailed hydrogeologic conceptual model of subsurface hydrogeologic conditions in each groundwater subbasin, including: locations of known water wells; definition of groundwater flow directions and current water quality; identifying the base of fresh water; calculating groundwater in storage; defining aquifer parameters; evaluating water levels vs trends in historic rainfall; and preparing several cross sections using detailed correlations of E-logs from several water wells and numerous oil wells. Preliminary locations and drilling depths for new City wells were also identified. A sustainable yield study was also performed to determine the future availability of groundwater supplies for the City. Additional work included preparation of Technical Specifications and Line Item Bid Sheets for a new City well. RCS geologists were present in the field to: log the drill cuttings; evaluate the new E-logs; conduct isolated aquifer zone testing; prepare the Final design of the well for the City; and monitor well construction development and testing of the new well. Mr. Hicke was a Senior Geologist for this project and provided services related to data interpretation and report writing for this effort.

Experience History

RICHARD C. SLADE & ASSOCIATES LLC, CONSULTING GROUNDWATER GEOLOGISTS, October 2001 to present. Duties include: project management and technical analysis for the creation of a hydrogeologic conceptual model for a southern California coastal groundwater basin; estimation and calculation of various hydrogeologic aspects of groundwater basins to support the creation of groundwater budgets, including groundwater in storage, and inflow/outflow of groundwater; management during multi-well design and construction projects in the Central Valley and High Desert areas of California; field monitoring of all elements of the drilling and construction of municipal-supply and irrigation-supply water wells; providing technical and administrative oversight of well drilling, construction, development, and testing activities on production well and monitoring well projects; geologic logging of numerous boreholes throughout southern California, field monitoring of water quality and water level data during construction and testing of new water wells; planning and administration of long term aquifer tests, including the utilization of pressure transducers in a variety of hydrogeologic settings; preparation of hydrogeologic feasibility reports for sites throughout California; computer analyses of data and map and data presentation using a Geographic Information System (GIS).

RALPH STONE AND COMPANY, INC., April 2000 to October 2001. Employment position was as a Staff Geologist with responsibilities that included organization of site investigations, geologic logging of boreholes, data collection, preparing maps and cross sections, and lab testing of soil. Prior work includes numerous seismic hazard (seismically induced landslide and liquefaction) analyses for homes in the Santa Monica Mountains, as well as the cities of Los Angeles, Beverly Hills, Culver City, Malibu, and Santa Monica.

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

SEAN FULCHER, SENIOR GROUNDWATER GEOLOGIST

Mr. Fulcher is a Professional Geologist (PG) and California Certified Hydrogeologist (CHG) with fifteen years of experience developing, executing, and managing water resource and environmental projects throughout North America and Africa for both private and public sectors. Water resource projects completed by Mr. Fulcher include municipal water-supply wells, industrial water-supply and treatment, agricultural water-supply, stormwater management and treatment, and mine dewatering and treatment. Mr. Fulcher has been a Groundwater Geologist with the firm since 2017 and has managed groundwater development projects including the design, permitting, and construction management of municipal, monitoring, and irrigation-supply wells. These efforts include well construction monitoring, testing, destruction, and rehabilitation of numerous municipal wells and irrigation-supply wells throughout California.

Representative Project Experience

Municipal Supply Well Rehabilitation for Multiple Wells for Irvine Ranch Water District, 2018 - Ongoing

For several years, the Irvine Ranch Water District (IRWD) has embarked on an extensive well rehabilitation program to maintain groundwater production and to extend and/or maintain the anticipated service life of their aging well field. According to IRWD, approximately 65% of their drinking water supply comes from local groundwater sources. The remaining 35% is obtained from the Metropolitan Water District of Southern California. As part of the program, RCS has assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities with regard to ongoing contractor rehabilitation operations of the wells. Such rehabilitation operations have consisted of mechanical redevelopment, chemical treatment to clean the casing and gravel pack, installation of casing liners in selected wells (to mitigate sand in pumped discharge) and pumping redevelopment and testing to determine the new pumping capacities of the wells. In addition, RCS has prepared technical memoranda, pumping recommendations memoranda, and final summary of well rehabilitation operations reports for each rehabilitated well.

Municipal Supply Well Rehabilitation for Multiple Wells for City of Newport Beach, 2018 - Ongoing

The City of Newport Beach has maintained a robust and periodic well rehabilitation program to maintain groundwater production and to extend and/or maintain the anticipated service life of their Tamura and Dolphin Wells. For their program, RCS has assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities with regard to ongoing contractor rehabilitation operations of the wells. Such rehabilitation operations have consisted of mechanical redevelopment, chemical treatment to clean the casing and gravel pack, installation of casing liners in selected wells (to mitigate sand in pumped discharge) and pumping redevelopment and testing to determine the new pumping capacities of the wells. In addition, RCS has prepared technical memoranda, pumping recommendations memoranda, and final summary of well rehabilitation operations reports for each rehabilitated well. RCS has also provided the City with well siting services for the construction of new municipal water supply wells to increase their service capabilities and decrease their reliance on imported drinking water.

Highlights

Education

- Cornell University
  PhD Geology (April 2026)
- University of Western Ontario
  MSc Geology
- University of Ottawa
  HBSc, Geology

Registrations/Certifications

- California Professional Geologist #9548
- California Certified Hydrogeologist #1101

Experience History

RICHARD C. SLADE & ASSOCIATES LLC, CONSULTING GROUNDWATER GEOLOGISTS

November 2017 Staff Hydrogeologist with major responsibilities as a project manager for groundwater evaluation, exploration, and development projects. Project management responsibilities encompass preparation of cost estimates, technical specifications, and construction management for municipal-and irrigation-supply well projects, source water assessments, aquifer storage and recovery, and groundwater modeling. Mr. Fulcher's technical responsibilities comprise of preparing well construction and well rehabilitation technical specifications; technical and administrative oversight of well construction testing; hydrogeologic interpretation of data; and spatial analyses and presentations of datasets. Geological and groundwater modeling efforts by Mr. Fulcher utilize a step-wise multifaceted approach incorporating surficial geologic mapping, geophysical logging, geochemistry, and statistical data interpolation. Geological models completed by Mr. Fulcher include basin analysis, fault/deformation modeling, soil erosion forecasts, and infiltration/porosity indexing. Groundwater flow modeling projects by Mr. Fulcher include well capture zone analysis, well/well-field interference, and basin yield analysis using analytical element and finite difference/element techniques. Mr. Fulcher is also adept with water quality modeling using

conservative and reactive-transport simulation for water quality forecasting, principal component analysis, and point source identification. Additional responsibilities include database management and data quality assurance and control with respect to all RCS projects.

TETRA TECH, INC, 2015 to 2017, Senior Staff Hydrogeologist with responsibilities of assisting and managing water resource, geotechnical, and environmental projects throughout California. Mr. Fulcher planned, managed, budgeted, and executed ground/surface water, soil, soil-gas, and air sampling projects for municipal, agricultural, RCRA, and CERCLA sites. Groundwater and environmental projects utilized hollow-stem, direct-push, and sonic drilling methods coupled with USEPA SW-846 sampling methods for site characterization and monitoring. For these projects, Mr. Fulcher supervised and aided well-design/construction, sample collection, and data analysis. Findings of these projects were prepared by Mr. Fulcher for private and regulatory entities in the form of remedial investigation/feasibility, site characterization, and monitoring reports. Mr. Fulcher also assisted with remediation feasibility, design, and monitoring for sites containing soil and groundwater impacted from VOCs, SVOCs, PAHs, metals, solvents, and nitrates. Internal safety and operating procedures and protocols (HASP, ERP, SOP and FA) for these projects were prepared by Mr. Fulcher. Remediation monitoring and sampling protocols were devised by Mr. Fulcher and included soil and wellhead gas sampling systems methods and procedures. Geotechnical studies and investigations included investigations and characterization for expansive soils, seismic liquefaction, and slope stability. Stormwater projects managed by Mr. Fulcher were stormwater assessment, monitoring, and protection plans for general/site NPDES licenses and watersheds. Components of these stormwater projects required regional watershed compliance monitoring, permitting, reporting, sampling, and statistical data analysis. Project database administration, data visualization, and conceptual site modeling for the aforementioned projects were the responsibilities of Mr. Fulcher.

BAFFINLAND IRON MINES CORP, 2012 to 2015, Project Geologist overseeing acid-rock drainage (ARD) delineation and modeling for the Mary River Iron Ore project and co-supervising regional mineral exploration and database administration. Mr. Fulcher assisted with the development of open-pit mine dewatering and treatment and mine tailings management. Groundwater infiltration, surface water runoff, and water quality characterization studies were completed by Mr. Fulcher through physical and statistical data analysis and water quality modeling. Monitoring and sampling plans for groundwater and surface water characterization/monitoring were devised and executed by Mr. Fulcher using multiparameter water quality meters, flowmeters, and turbidity instruments. Site environmental assessments, remediation, and spill prevention plans and procedures were also developed by Mr. Fulcher. A multi-year regional mineral exploration and sampling program was co-supervised by Mr. Fulcher for base and precious metals incorporating regional scale geologic mapping, geophysical surveying, drilling, and ore deposit modeling. Primary duties for this project were data collection, analysis, interpretation, and management. Mr. Fulcher's analysis and interpretation redefined regional and local lithologies as well as iron ore paragenesis and augmented the district ore tonnage estimate. Results of both the ARD and exploration programs were communicated through internal and regulatory reports.

Publications

Improving borehole fracture characterization using oriented sidewall cores for geothermal assessment – an example in central New York State USA, S. A. Fulcher, T. E. Jordan, Stephen E. Laubach, S. Elliott. J., and V.N. Herrera, 2025, Geothermics, v. in review, p. 40,

Diagenesis is key to unlocking outcrop fracture data suitable for quantitative extrapolation to geothermal targets, S.J. Elliott, S.R. Forstner, Q. Wang, R. Corrêa, M. Shakiba, S.A. Fulcher, N.J. Hebel, B.T. Lee, S.T. Tirmizi, J.N. Hooker, A. Fall, J.E. Olson, and S.E. Laubach, 2025, Frontiers in Earth Science, v. 13, p. 1-38, https://doi.org/10.3389/feart.2025.1545052

Subsurface insights from the Cornell University Borehole Observatory (CUBO): A 3km deep exploratory well for advancing Earth Source Heat deep direct-use geothermal for district heating, P. Fulton, R. Clairmont, R., S. Fulcher, D. Pinilla, I. Purwamaska, M. Fresonke, R. Puthur, J. Torres, T. Heaton, K. Beckers, S. Beyers, W. Bezner-Kerr, R. Bland, B. Erdinc, O. Gustafson, T. Jordan, and J. Tester, 2024, Proceedings, 49th Workshop on Geothermal Reservoir Engineering Volume SGP-TR-227: Stanford University, Stanford, California, Stanford University, p. 12.

Active Tracers for Hydraulic Control of Cooled Short Circuits, A.J. Hawkins, D. Tang, R. Sinha, S.A. Fulcher, S. Hormozi, P.M. Fulton, C.A. Alabi, U.B. Wiesner, and J.W. Tester, 2023, 48th Workshop on Geothermal Reservoir Engineering, Volume Proceedings: Stanford CA, Stanford University, p. 5.

Fracture network characterization and permeability for direct-use geothermal energy – Cornell University Borehole Observatory ESH No. 1, S.A. Fulcher, D. Pinilla, T.E. Jordan, P.M. Fulton, and P. Henrique Viera de Luca, 2023, Proceedings, 48th Workshop on Geothermal Reservoir Engineering, Volume SGP -TR-224: Stanford CA, Stanford University, p. 13.

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

GEZA DEMETER, PROJECT GROUNDWATER GEOLOGIST

Mr. Demeter joined RCS in 2018 as a Groundwater Geologist. Major areas of expertise include project management, technical report writing, and field monitoring during the drilling, construction, and testing of municipal- and irrigation-supply water wells. Mr. Demeter has also provided similar office and field services during rehabilitation and redevelopment of existing water-supply water wells. These efforts have included numerous wells within southern and central California. Areas of additional responsibility for Mr. Demeter include electronic data management and analysis, and manipulation of Geographic Information Systems (GIS) to evaluate hydrogeologic conditions.

In addition, Mr. Demeter reviews and assists with Low-Impact Development (LID) requests for new developments and redevelopment construction projects within the groundwater basins that comprise the adjudicated area known as the Upper Los Angeles River Area.

Prior work has included soil and groundwater assessment and remediation for various industrial and retail petroleum facilities, as well as the development and implementation of storm water pollution prevention plans for numerous industrial facilities and construction projects in both California and Arizona.

Highlights

Education

- San Francisco State University
  B.S., Geology, 2006
- CSU Los Angeles M.S., Geological Sciences, emphasis in Environmental Hydrogeology, 2016

Registrations/Certifications

- Professional Geologist, California (No. 8826)
- Certified Hydrogeologist, California (No. 1128)

Representative Project Experience

Municipal Supply Well Rehabilitation for Multiple Wells for Irvine Ranch Water District, 2018 - Ongoing

For several years, the Irvine Ranch Water District (IRWD) has embarked on an extensive well rehabilitation program to maintain groundwater production and to extend and/or maintain the anticipated service life of their aging well field. According to IRWD, approximately 65% of their drinking water supply comes from local groundwater sources. The remaining 35% is obtained from the Metropolitan Water District of Southern California. As part of the program, RCS has assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities with regard to ongoing contractor rehabilitation operations of the wells. Such rehabilitation operations have consisted of mechanical redevelopment, chemical treatment to clean the casing and gravel pack, installation of casing liners in selected wells (to mitigate sand in pumped discharge) and pumping redevelopment and testing to determine the new pumping capacities of the wells. In addition, RCS has prepared technical memoranda, pumping recommendations memoranda, and final summary of well rehabilitation operations reports for each rehabilitated well.

Municipal Supply Well Rehabilitation for Multiple Wells for the City of Chino (2021 – 2023)

Rehabilitation of City of Chino Well Nos. 12, 14, and 17 was a City-funded and grant-funded project. Well Nos. 12 and 14, had not been operational since 2018 and 2008, respectively, due to dissolved-phase volatile organic compounds (VOCs) exceeding Primary Maximum Contaminant Levels (MCLs) for drinking water standards. Well No. 17 had been idle and had not been put into service since it was constructed in 2006. Each well underwent rehabilitation prior to the completion of a treatment facility that was utilized to treat groundwater supplied from these wells. RCS assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities with regard to contractor rehabilitation operations for each well. Rehabilitation operations for these wells consisted of chemical and mechanical redevelopment to clean the casing and gravel pack, downwell surveys, including an Electro-Magnetic Defecto-Scope (EMDS) survey to document the current thickness of the casing walls in each well, and pumping redevelopment and testing to determine the current pumping capacity of each well.

Municipal Supply Well Rehabilitation Work for the City of Anaheim Well No. 43 (2019 – 2020)

Well No. 43 was a City-funded rehabilitation project to recapture production capacity of the well, which had been steadily declining since the well was constructed in 1984. Reportedly, Well No. 43 had not undergone rehabilitation procedures since it was constructed and had recently experienced a significant loss in production capacity. RCS assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities with regard to contractor rehabilitation operations of the well. Rehabilitation work for this well consisted of chemical and mechanical redevelopment to clean the casing and gravel pack, installation of a full casing liner due to sanding issues and pumping redevelopment and testing to determine the current pumping capacity of the newly-rehabilitated well.

Municipal Supply Well Rehabilitation for Multiple Wells for the Santa Clarita Valley Water Agency (2022 – Present)

Rehabilitation of the Santa Clarita Water Agency (SCVWA) Well Nos. 201 and 205 is an Agency-funded project to rehabilitate these two deep wells, which have not been subjected to rehabilitation activities since they were constructed in 1989 and 1999, respectively. The purpose of these rehabilitation activities was to prepare each well for service, and attempt to establish the current pumping capacity for each well prior to the completion of a treatment facility that will be utilized to treat groundwater supplied from these wells. RCS assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities with regard to contractor rehabilitation operations for each well. Rehabilitation operations for

these wells consisted of chemical and mechanical redevelopment to clean the casing and gravel pack, downwell surveys, including an Electro-Magnetic Defecto-Scope (EMDS) survey to document the current thickness of the casing walls in each well, and pumping redevelopment and testing to determine the current pumping capacity of each well.

Municipal Supply Well Rehabilitation for Multiple Wells for City of Newport Beach, 2018 - Ongoing

The City of Newport Beach has maintained a robust and periodic well rehabilitation program to maintain groundwater production and to extend and/or maintain the anticipated service life of their Tamura and Dolphin Wells. For their program, RCS has assisted in the preparation of Technical Specifications and provided field oversight and monitoring activities of rehabilitation operations performed by the contractor. Such rehabilitation operations have consisted of mechanical redevelopment, chemical treatment to clean the casing and gravel pack, installation of casing liners in selected wells (to mitigate sand in pumped discharge) and pumping redevelopment and testing to determine the new pumping capacities of the wells. In addition, RCS has prepared technical memoranda, pumping recommendations memoranda, and final summary of well rehabilitation operations reports for each rehabilitated well. RCS has also provided the City with well siting services for the construction of new municipal water supply wells to increase their service capabilities and decrease their reliance on imported drinking water.

Experience History

RICHARD C. SLADE & ASSOCIATES LLC, CONSULTING GROUNDWATER GEOLOGISTS

January 2018 to present. Duties include: detailed geologic logging of pilot boreholes; field monitoring of each element of the drilling and construction of municipal-supply, irrigation-supply, and groundwater monitoring wells; providing technical and administrative oversight of well drilling, zone testing in open pilot holes, well construction and development, pumping tests, and rehabilitation activities on production wells and monitoring well projects; field sampling of water quality parameters and water level data during construction and testing of new and rehabilitated water wells; hydrogeologic interpretation of data via computational and mathematical means; preparation of hydrogeologic feasibility studies and well completion reports; producing spatial analyses, raster maps, and presentations of datasets using GIS software to create various maps and graphics; database management of well information; and the preparation and completion of final project reports.

Antea USA, Inc. dba Antea Group. January 2010 to January 2018. Employment position was as a Project Manager, with responsibilities that included budget development and preparation, proposal development for work plans and for assessment and remediation activities for both soil and groundwater. Prepared cost proposals for bid requests and conducted some marketing and development for existing and potential new clients. Responsible for quarterly groundwater monitoring data analysis, bioremediation system monitoring, and contaminant plume delineation. Responsible for communication to clients, and state and local government agencies. Evaluated sites with complex geologic and hydrogeologic data to determine soil and groundwater properties and features that could influence the migration of contaminants. Performed various site audits for the development of SPCC Plans, construction and industrial SWPPPs, and Hazardous Materials Business Plans (HMBPs). Prepared and performed soil waste characterization projects for the development of soil management plans (SMPs). Responsible for the preparation of work plans, site assessment reports, site conceptual models, remedial action plans, regulatory closure requests, and soil management plans. Prepared, executed, and maintained various permitting requirements with Local and State regulatory agencies. Provided technical document review for finalization prior to submittal to clients and/or regulatory agencies. Managed direct reports and provided employee development and mentoring for career advancement.

Delta Environmental Consultants, Inc. October 2006 to December 2009. Employment position was as a Staff Geologist, then later as a Project Geologist. Responsibilities included oversight of various work activities at retail petroleum sites and industrial facilities, including soil boring and soil sample collection, groundwater monitoring well installation and development, remedial well installation, underground storage tank and system removal and soil sampling, and soil excavation and transport of nonhazardous and hazardous soil and groundwater. Performed air monitoring and sampling per the South Coast Air Quality Management District's 1166 guidelines, soil gas investigations, soil vapor extraction (SVE) and air sparge pilot testing, and aquifer testing. Obtained encroachment and well permits from various city, county, and state agencies. Trained new staff personnel for field activities. Wrote and prepared reports, including boring logs, groundwater potentiometric maps, contaminant isoconcentration maps, and geologic cross-sections.

RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

TONY G. LEBEAU, STAFF GROUNDWATER GEOLOGIST

Mr. LeBeau joined RCS in 2021 as a Hydrogeologist. Major areas of expertise include project management, technical report writing, and field monitoring during the drilling, construction, and testing of municipal and irrigation-supply water wells in southern and central California. Mr. LeBeau has provided similar office and field services during rehabilitation and redevelopment of existing water-supply wells. He has experience in geologic logging of pilot boreholes; evaluation and interpretation of field data; and conducting well siting and feasibility studies. This also includes office and field services for the destruction of abandoned water-supply wells. Areas of additional responsibility include writing technical reports for clients, electronic data management and analysis, and the use of Geographic Information Systems (GIS) to help evaluate hydrogeologic conditions.

Representative Project Experience

Municipal Supply Well Construction for New Water-supply Well for the City of Buena Park, 2023-Ongoing

Working as a subcontractor under Psomas Engineering, RCS is responsible for the design, construction monitoring, well development, and testing of a new municipal-supply water well for the City of Buena Park. This project also required documentation for the Drinking Water Source Assessment and Protection (DWSAP) program, which RCS prepared. Mr. LeBeau is the project manager.

Municipal Supply Well Rehabilitation for Saugus Well 1 and 2, Santa Clarita Valley Water Agency, 2022-2025

Mr. LeBeau was project manager in charge of the rehabilitation of two Saugus Formation wells in the Santa Clarita Valley. Both Saugus Well 1 and 2 had a casing liner installed in 2014 and 2012, respectively, but had not undergone rehabilitation since that time. Video surveys for both wells showed biofouling of the casing liner and the casing screen. RCS created the Technical Specifications and Line Item Bid Sheets for the project and provided both office and field support during rehabilitation.

Municipal Supply Well Construction and Testing for Saugus 3 & 4, Santa Clarity Valley Water Agency, 2021-2024

The construction of Saugus 3 and 4 municpal-supply water wells were part of an ongoing multi-year project by the Santa Clarita Valley Water Agency (SCVWA) to expand their water well resources in the Santa Clarita Valley area. RCS sited and provided a preliminary design for the two wells, and provided field services and monitoring during the construction and testing of the two wells. Deep aquifer zone testing was conducted to depths of approximately 2,600 feet within the Saugus Formation, which had not been explored by other deep wells in the region. This testing showed that there were groundwater sources at depth that were viable for drinking water supplies. One well was constructed such that it extracts groundwater almost exclusively from deep portions of the Saugus Formation, perforations begin at approximately 1,700 ft below ground surface. To date, both wells have been constructed and tested, and the project was completed in early 2025. Mr. LeBeau provided management services for this project.

Municipal Supply Well Rehabilitation for Well No. 10 & No. 11, City of Fountain Valley, 2022-2024

The City of Fountain Valley Well has undertaken a mulit-year preventative maintenance and rehabilitation program for five of its six existing water wells. As a part of this program, RCS evaluated Wells 10 and 11, provided assistance in the preparation of Technical Specifications and oversight and monitoring of field activities. These wells had conditions that were unique to each well and required creative solutions. Specifically, Well 10 began producing SiLibeads after a full casing liner had been installed by others in 2018, which included emplacing SiLibeads in the casing liner annulus. RCS was not involved with that prior rehabilitation of the well. SiLibeads were discovered in the City's water distribution lines and Well No. 10 was deemed the source because no other City wells had been provided with SiLibeads. Limited pumping tests and a dynamic video survey were performed at that time, but the mechanism of bead production was not determined. In 2022, RCS became involved, and the well underwent a well rehabilitation program. RCS worked closely with the City to determine options to keep the well operational: the efforts included various pumping tests and inline basket strainer configurations. Limitations from the original construction of this well prevented a conclusive determination of the mechanism for and complete cessation of SiLibead production. At the conclusion of the rehabilitation, it was shown that the well could be pumped at approximately 2,200 gpm with a specific capacity of approximately 15 gpm/ ft of drawdown.

Fountain Valley Well No. 11 was originally constructed in 1987 to a total depth of 962 ft bgs. The pump for this well failed in 2019 and the well has been offline since; the pump was removed from the well. Investigations at the time the pump was pulled showed that there was an obstruction at approximately 280 ft below top of casing (ft btc) and also at 670 ft btc. A review of historic pumping water levels and pumping rates from 2016 to 2019

Highlights

Education

- California State Polytechnic University Pomona
  B.S., Geological Sciences
  2018

Registrations/Certifications

- Geologist In Training (2019)

showed a marked decrease in performance of the well in the summer of 2018, pumping water levels declined by approximately 60 ft, the specific capacity of the well decreased from approximately 60 ft/ddn to 26 gpm/ft ddn, and the pump rate was on the order of 2,000 gpm. A rehabilitation program was developed and monitored by RCS and executed by the contractor. A large, mineralized growth was discovered at 283 ft btc; this was minimized, but not entirely eliminated, through mechanical and chemical means. It was discovered that the bottom of the well had been filled with approximately 276 feet of gravel pack. An attempt was made to remove the gravel pack fill, but little progress could be made because at least one hole in the casing at approximately 686 ft btc allowed the gravel pack to quickly backfill the well. A cement plug had to be installed and the new bottom of the well was established at approximately 647 ft btc. Approximately 55% or 197 ft of perforated casing remains exposed in the well. Chemical and mechanical re-development was then performed on the well, followed by pumping re-development. Pumping tests demonstrated that the well could be pumped at 3,400 gpm with a specific capacity of 28 gpm/ft ddn, a significant increase in the performance of the well, compared to when it went offline in 2019. Mr. LeBeau was the project manager for this project.

Well No. 10 Construction and Destruction of Well No. 8, City of Signal Hill, Los Angeles County, 2022

The construction of new municipal-supply Well No. 10 destruction of Well No. 8, was a city funded municipal well construction project to secure and augment groundwater sources in the City of Signal Hill. The project well site location posed several well design and construction challenges. RCS proposed and executed a specific construction plan to mitigate equipment clearance and space issues. Well No. 8 was destroyed in accordance with all local and State regulations and its destruction was required prior to the construction of the new Well No. 10 because of its proximity to the new well. Through detailed hydrologic analysis and customized well development, a pumping capacity of approximately 2,500 to 3,000 gpm was achieved, exceeding the desired pumping capacity of 1,100 gpm.

Experience History

RICHARD C. SLADE & ASSOCIATES LLC, CONSULTING GROUNDWATER GEOLOGISTS

February 2021 to present. Hydrogeologist as a project manager for construction and rehabilitation of water-supply wells and groundwater evaluation projects throughout California. Responsibilities have included preparation of cost estimates, well siting and feasibility studies, technical specifications, source water assessments, project completion reports, and construction management for municipal- and irrigation-supply well projects. Mr. LeBeau provides technical and administrative oversight of well construction testing, interpretation of hydrogeologic data, spatial analysis, presentation of hydrogeologic and time-series data, and management of water well and groundwater data sets.

National Engineering & Consulting Group, Inc. July 2020-January 2021. As a Staff Geologist, Mr. LeBeau worked on the Exide Residential Clean-Up Project and supervised five worksites and a total of thirty field personnel. He was also in charge of ensuring compliance with local and State permit requirements and safety regulations and compiled and submitted documents to the State at the conclusion of work contracts.

Geolabs – Westake Village October 2018 - June 2020. As a Staff Geologist, Mr. LeBeau interpreted and prepared site plans, spreadsheets, figures, and reports; created cost estimates, and executed field investigations. He has analyzed slope stability of natural and engineered slopes using Slide 2018. He routinely engaged with clients and subcontractors. Mr. LeBeau investigated and analyzed a site for the feasibility of constructing water tanks for reclaimed water for the Santa Clarita Valley Water Authority. He also managed the documentation of a soils compaction testing for a large residential development in Camarillo, California.

Proforma Grading Consultants, Inc August – August 2018 - October 2018. As a Field Mapping Technician, Mr. LeBeau operated a Trimble SPS855 base station, and an SCS930 controller and rover. He digitized grading site plans for modeling and analysis.

Sean Pour, PhD, PE, IAM

Project Manager

Sean leads Hazen's West Region Asset Management practice, helping utilities transition to proactive asset management.

Education

PhD, Civil and Environmental Engineering, concentration in Const. Eng. and Mgmt., Oklahoma State University

MS, Civil and Environmental Engineering, concentration in Const. Eng. and Mgmt., Amirkabir University of Technology

BS, Civil and Environmental Engineering, concentration in Const. Eng. and Mgmt., Amirkabir University of Technology

Certification/License

Professional Engineer: CA, AZ

California Board For Professional Engineers, Land Surveyors, And Geologists

Areas of Expertise

- Enterprise Asset Management Strategy
- CMMS Selection & Implementation
- Asset Registry Development
- Organizational Change Management
- Digital Systems Integration

Enterprise Asset Management Program Support, Santa Clarita Valley Water Agency, CA

Project Manager. Hazen partnered with SCV Water to develop and implement a phased enterprise asset management program. The team led a needs assessment, RFP development, software selection, and strategic asset management planning, aligning business processes with industry best practices and national standards. Hazen supported cross-departmental coordination, defined technical and GIS requirements, and facilitated data readiness for future CMMS integration. Following procurement, Hazen assisted with the selection and implementation of Trimble Unity Maintain, managing asset data migration and integration with financial and SCADA systems.

Needs Assessment and CMMS Selection, El Toro Water District, Lake Forest, CA

Project Manager. Hazen's supported El Toro Water District in selecting a CMMS system for their growing system wide asset management program. Hazen worked with El Toro to engage CMMS vendors and develop and organize scripted demos by each CMMS vendor that were presented virtually by CMMS vendor. District staff used a Hazen developed scoring criteria during the presentations to rank each CMMS vendor in various areas to facilitate the selection process. Hazen provided additional consultation once the highest-ranking CMMS vendor was determined to help the district weigh the CMMS features against price and operational staff's preference for the existing CMMS system.

District-Wide Asset Management Plan, Goleta Sanitary District, Goleta, CA

Project Manager. Led the phased development of an Asset Management Plan (AMP) for Goleta Sanitary District, focusing on optimizing O&M strategies and prioritizing both short- and long-term R&R. Managed asset inventory, condition and risk assessments, and long-term investment projections for the wastewater treatment plant and sewer collection system. The project involved developing the asset register, integrating GIS data, and converting CCTV defect codes into condition scores for risk modeling of gravity mains, force mains, manholes, and ocean outfall. Supported the integration of the AMP with the District's new CMMS, ensuring seamless data flow and management. Additionally, assisted with the development of a 10-year Capital Improvement

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Plan (CIP) based on the asset management model, including business case evaluations to rank rehabilitation and replacement projects. Utilized Microsoft Power BI to streamline CIP project validation and provide real-time visualization for informed decision-making, ultimately enhancing the District's asset management practices.

Digital Asset Management Plan, Water Replenishment District, Torrance, CA
Project Manager. Led the development of a custom Asset Management Planning (AMP) BI application for WRD using Microsoft Power BI. Managed the project through a phased approach, conducting condition and risk assessments across WRD's treatment plants. The solution integrated data from multiple sources, automating updates from field activities and enhancing decision-making through real-time insights. This project optimized WRD's asset management, reducing manual processes, improving data accuracy, and enabling predictive asset lifecycle strategies.

Asset Management Plan for Pump Stations, Rancho California Water District, Temecula, CA
Project Manager. Led the development of an Asset Management Plan (AMP) for 38 pump stations at Rancho California Water District, focusing on increasing reliability and minimizing risk exposure. Managed asset inventory, visual condition assessments across civil, mechanical, structural, electrical, and I&C disciplines, and developed a structured, repeatable condition scoring system. Using condition assessment results, determined remaining useful life, probability of failure, and risk prioritization for rehabilitation and replacement projects. Developed a digital AMP using Microsoft Power BI, integrating real-time field data through Survey123 forms. The AMP BI application provided dynamic updates, automatically adjusting condition scores and accounting for asset deterioration, enabling proactive lifecycle planning and maintenance strategies.

Water Master Plan Development, Santa Clarita Valley Water Agency (SCVWA), City of Santa Clarita, CA
Asset Management Lead. Led the development of logics for a risk-based prioritization of rehabilitation of the Agency's water pipelines using InfoAsset Planner software. Led the condition assessment of critical pump stations, reservoirs and treatment facilities. Using the data from the Agency's GIS, CMMS and InfoWater, built and calibrated the risk model within InfoAsset Planner for the water pipelines and developed logics to recommended pipe segments for rehabilitation, replacement, or further condition assessment. Led the development of rehabilitation and replacement recommendations to develop CIPs. The project included training of the Agency staff on the implementation of the risk-based R&R prioritization logics in InfoAsset Planner.

Collection System Prioritization Program, San Francisco International Airport, San Francisco, CA
Project Manager. Led the risk-based prioritization of SFIA's sewer and industrial waste collection system pipelines, addressing challenges related to aging infrastructure and regulatory compliance. Managed the development of a prioritized program that considered asset condition, failure consequences, and automated risk assessments using ModelBuilder's workflow capabilities. This allowed integration with existing datasets and map layers, enabling real-time updates based on new CCTV inspection data. Results were visualized through an Esri dashboard and Story Map, providing SFIA with dynamic tools for stakeholder communication. The project also included identifying gaps in the existing SSMP and recommending strategies for compliance with the State Water Resources Control Board's General Order.

Water, Recycled Water, and Sewer Master Plan, Trabuco Canyon Water District, Lake Forest and Rancho Santa Margarita, CA
Condition Assessment Lead. The 2022 System-wide Master Plan Update and Condition Assessment has been prepared as an update to the 1999 Water, Wastewater and Reclaimed Water Master Plan. This report provides comprehensive documentation, analysis, and recommendations for the water system, non-domestic water system, and sewer system including a calibrated GIS-based hydraulic model for each system. The Master Plan develops a Capital Improvement Program (CIP) that identifies the recommended projects needed to ensure that the District continues to provide safe, reliable, and efficient water, non-domestic water, and sewer service to its customers.

Steve Conner, PE

Condition Assessment

Steve brings over 30 years of experience in the planning and design of water and wastewater infrastructure including production wells, storage tanks, treatment systems, pipelines, booster stations, lift stations, and sewer facilities.

Education

BS, Civil Engineering,
University of California, Irvine

Certification/License

Professional Engineer

Areas of Expertise

- Pump Stations
- Well Equipping
- Pipeline Design
- Trenchless Pipeline Rehabilitation and Installation
- Steel Tanks
- Concrete Tanks

Professional Activities

- Steel Tank Institute – AWWA D100 Water Storage Tank Seminar
- NASTT
- NASTT Trenchless Technology Short Course – New Installation
- Hydraulic Institute – Effective Pump Intake Design and Troubleshooting Problem Intakes

District Wide Lift Station Condition Assessment and Diaz Lift Station Feasibility Study, Eastern Municipal Water District, CA
Project Manager. Led a districtwide lift station condition assessment of 36 lift stations that Hazen inspected, and determine the remaining useful life and cost of replacement for every asset at all 47 lift stations. A Power BI dashboard was developed for the District so they can easily visualize, sort, and drill-down into the data as needed. In addition, the project included a feasibility study for converting the Diaz Lift Station from dry-pit to wet-pit operation by converting a portion of the existing dry-pit. Hazen developed a preliminary layout and detailed cost estimate as part of the report. The capacity of the Diaz Lift Station is 12 MGD.

Barrier Pump Station and Basin Rehabilitation and Replacement (R&R) Project, West Basin Municipal Water District, CA
Pump and Mechanical Task Lead. Hazen conducted detailed condition assessment of six pumps (two 150hp and four 300hp) including variable frequency drives (VFDs) and all associated mechanical, electrical and control systems. In addition, a detailed mechanical, structural and electrical condition assessment was conducted of the facilities. Hazen prepared a technical memorandum documenting the condition assessment work and subsequently, worked with West Basin staff to prepare a project construction phasing plan to align the estimated $8 million construction project with the District's Capital Improvement Plan (CIP) budget. Hazen has been retained to conduct the design of the R&R improvements and prepare bid documents.

Vasona Pump Station Upgrade Planning Services, Santa Clara Valley Water District, Santa Clara, CA
Pump Station Engineer. Led the improvements that will upgrade and modernize the Vasona Pump Station Plant. The project will increase the current pump station level of service to meet current and future treated water demands and provide recharge when needed. The project determined the current facility capabilities, current and anticipated future operational requirements and evaluated feasible solutions. Hazen's scope included

Hazen

development of hydraulic model, feasible alternatives report, planning study report, and preliminary design documents. The improved facilities will include four 600-hp horizontal split case pumps with over 155 cfs firm pumping capacity, VFDs, control valves, backup generator, switch gear/MCC, and upgraded controls system.

El Toro Sewer Lift Station Preliminary Study, Trabuco Canyon Water District, Lake Forest, CA
Field Assessment. Performed field assessment and provided recommended upgrades. El Toro Sewer Lift Station (ETLS) is a critical facility within Trabuco Canyon Water District's sewer system. ETLS includes a dual wet well/dry pit configuration with two wet wells and two sets of pumps in series for each wet well. The pumps are two 100-hp pumps in series with both electrical motors, and engine driven backups. A planning study was performed that recommended complete replacement of piping, valving, site improvements, security, and electrical and controls. Additionally, a building analysis was conducted to identify associated structural and architectural upgrades needed to accommodate the mechanical and electrical improvements.

Skyfarm 'A' and Hansford Court Lift Station Reconstructions, City of Santa Rosa, CA
Pump System Engineer. Hazen was selected to provide a condition assessment, alternative analysis, detailed design and design services during construction for reconstruction of two of the City of Santa Rosa's wastewater lift stations. The lift stations were destroyed in the 2017 Tubbs fire. The reconstruction included replacement of existing lift station structures, pumps, electrical service, and associated electrical, mechanical and control components along with provisions for temporary pumping and power to ensure uninterrupted wastewater service to the surrounding residents. Since these lift stations were destroyed as part of a natural disaster, the design also required collaboration and coordination with the City and FEMA to comply with federal funding requirements.

Climate Resiliency Study SP-152, Orange County Sanitation District, Fountain Valley, CA
Vulnerability and Adaptation. Performed field assessment of pump stations as part of a risk assessment of the district's infrastructure of two treatment plants and multiple pump stations based on climate variability and change and developed adaptation and mitigation recommendations to reduce vulnerabilities intensified by climate change. Sea level rise, flooding, wildfire and high heat were considered for impact to structures and systems. Adaptation strategies include emergency response procedures, setting new floor elevations for new CIP projects, retrofitting wall penetrations and pipe tunnel entrances. (2018-2019)

Glenoaks Pump No. 1 Replacement Project, City of Glendale, CA
Pump Selection QA/QC. Reviewed the plans, specifications and estimates the replacement of Pump No. 1, a 125 hp, 4160 volt 875 gpm centrifugal pump that has outlived it useful life. The pump was replaced in kind in the Glenoaks Pump Station (2018). The pump serves the 1290 pressure zone in the Glenoaks Canyon area. Pump No. 1 serves the daily flow condition for the 1290 pressure zone. Pump No. 2, a 250 hp, 4160 volt, 2,000 gpm centrifugal pump, which was recently replaced, will serve as the high demand pump. The work included a hydraulic analysis Technical Memorandum used for pump selection and a review of the hydraulic performance of the pumping station. The work also included the engineering services during construction by doing the RFI and Submittal reviews for the City

West Napa Pump Station Project, Napa Sanitation District, Napa, CA
Pump Station QA/QC. Project involves increasing the firm capacity of the pump station to 15.4 mgd and address the aging infrastructure such as the seismic condition of the 40-year old existing facility. The existing pump station was congested with little to no room for expansion of pumping capacity. Project elements include a new submersible pump station, new electrical building and infrastructure, chemical injection for corrosion control, odor control, solar panels, demo of the existing pump station and site civil improvements.

Steven Hutchings, CMRP, CRL

Senior Associate

Steve has more than 30 years of experience, specializing in the management of asset risk-based equipment condition assessments for wastewater and water treatment projects.

Education

MS, Master of Information Systems, University of Phoenix

BS, Management, University of Phoenix

BS, Electrical Engineering Technology, University of Cincinnati

AS, Electro-Mechanical Engineering Technology, Cincinnati State Technical & Community College

Certification/License

Certified Reliability Leader

Certified Maintenance & Reliability Professional

Areas of Expertise

- Asset Management
- Maintenance & Reliability
- Reliability Centered Maintenance & Design
- Condition & Risk Assessment
- Preventive Maintenance Optimization
- Maintenance Organization Analysis
- Asset Management Maturity Assessment

Professional Activities

- Association of Asset Management Professionals (AMP)
- Society of Maintenance and Reliability Professionals (SMRP)
- The Institute of Asset Management (IAM)
- American Water Works Association (AWWA)

Maintenance Management Program Optimization, Rancho California Water District, Rancho, CA

Asset Management Specialist. Hazen assisted Rancho California Water District in identifying pump station asset criticality, executed a comprehensive asset condition assessment, and developed detailed maintenance strategies for 65 classes of RCWD's pump station assets. Based on the asset classification maintenance tasks, an estimate of labor resource effort and associated costs were assigned to each asset for presentation of cost-benefit analysis and compared to asset criticality.

Structured Asset Maintenance Plan and Renewal Program, City of Santa Rosa Transportation and Public Works, Santa Rosa, CA

Asset Management Specialist. Hazen assisted The City of Santa Rosa in identifying asset criticality, performed a comprehensive asset condition assessment, and developed detailed maintenance strategies for 17 medium-voltage electrical asset classes for the Laguna Treatment Plant. Each detailed maintenance strategy was based on NETA (InterNational Electrical Testing Association) and/or NFPA 70B (National Fire Protection Association) standards.

Biosolids Treatment and Renewable Energy Master Plan, City of Durham, Durham, North Carolina

Asset Management Subject Matter Expert. This scope of services is for a Biosolids and Renewable Energy Master Plan for North and South Durham Water Reclamation Facilities (WRFs). Through various tasks, this project will address immediate needs for rehabilitation, replacement and safety as well as longer term plans for an optimized biosolids process that improves reliability as well as renewable energy utilization on both a near-term planning horizon (20-years) and a long-term planning horizon (50-years).As part of this task, Hazen will review the existing asset registry, conduct a condition assessment, assign individual asset risk, and develop a short and long-term prioritized asset Repair and Replacement lists.

Hazen

Reliability Centered Maintenance Pilot Program, North Texas Municipal Water District, Wylie, Texas
Reliability Centered Maintenance/ Design Specialist. The North Texas Municipal Water District (NTMWD) is seeking to execute a Reliability-Centered Maintenance Pilot Program (RCMPP) to enhance NTMWD's existing asset management program for water and wastewater operations. The objective is to provide hands-on facilitation of an RCM analysis on a select group of assets at both the water and wastewater treatment facilities. In addition to the facilitation and final report, development of a Standard Operating Procedure that can be used to develop a sustainable process for executing further RCM analyses with NTMWD internal staff.

Asset Maintenance Optimization, Miami-Dade Water and Sewer District, Miami, Florida
Maintenance & Reliability Specialist. The purpose of this project is to develop and implement a maintenance and reliability program framework at MDWASD's Hialeah and Preston water treatment facilities that provides MDWASD with the processes, data, and tools to enhance the asset management decision-making process across all facilities. The goal is to make decisions that will ensure the long-term functionality and reliability of all assets to continue to meet MDWASD's current and future needs. The project contains multiple tasks including asset validation, risk assessment, Failure Mode and Effects Analysis, Maintenance Task Analysis, Reliability Centered Maintenance, Maintenance Management Operating Process analysis, and Key Performance Indicator dashboard development.

Asset Management Services, City of Baltimore, Baltimore, Maryland
Maintenance & Reliability Specialist. The City of Baltimore requested support in improving several aspects of their Asset Management Program which included review of the current Computerized Maintenance Management Software, validation of the current asset register and hierarchal structure, assessment of current asset condition, and assignment of assert consequences of failure to determine overall asset risk. Hazen worked closely with City of Baltimore staff to develop framework for each of these elements as well and provide field validation of assets, and final results for both the Back River and Patapsco Water Reclamation Facilities.

Sanitary and Stormwater Pump Station Power Reliability Study, Great Lakes Water Authority, Detroit, Michigan
Reliability Centered Maintenance/ Design Specialist. GLWA is seeking to develop a baseline of the current reliability of each assigned pump station using a quantitative reliability framework. Once the baseline assessment has been completed, the consultant will make recommendations to improve power reliability and provide an initial assessment of the scope, feasibility,schedule, and costs associated with improving the reliability of each pump station relative to its dry weather and firm pumping capacity. The study shall perform a thorough review of each major electrical sub-system within each pump station to determine overall capacity, reliability, and redundancy relative to the ability of each station to provide sufficient pumping rates for dry weather and firm capacity flows. For each station, a dry weather and firm capacity reliability estimate needs to be developed in accordance with standard reliability prediction practices.

Maintenance Management Analysis, Veolia-New Orleans Operations, New Orleans, Louisiana
Maintenance and Reliability Specialist. Veolia North America requested Hazen to assist in reviewing and analyzing the overall maintenance management program for their City of New Orleans operations contract. Activities within this task included a review of current maintenance management processes, staff shadowing, and analysis of maintenance work order history. The result of this analysis provided recommendations for additional staffing, adjustments to workflow processes and increased use of the computerized maintenance management system and monitoring the maintenance program through the use of several recommended Key Performance Indicators (KPI's). In addition, Hazen assisted plant staff in documenting the current spare parts inventory and developing a foundational spare parts inventory program.

Alan Mlakar, PE

Electrical - Condition Assessment

Mr. Mlakar has over 8 years in the Water/ Wastewater industry. He specializes in electrical and instrumentation design, electrical system studies, and engineering services during construction. This encompasses knowledge of electrical distribution systems, motor control centers, programmable logic control (PLC), process control related to water, wastewater and power projects.

Education

B.S., Electrical Engineering, California Polytechnic State University, California

Certification/License

Professional Engineer

Areas of Expertise

- Electrical System Studies
- Electrical/Instrumentation and Control Systems
- Water and Waste Water Facility design
- Engineering services during construction

Professional Activities

IEEE

Rio Hondo Recycled Water Pump Station Condition Assessment and Risk Failure Analysis, Central Basin Municipal Water District Commerce, CA

Electrical Engineer for the project which entailed a condition assessment, risk of failure analysis, determination of remaining useful life and recommendations for rehabilitation or replacement of a critical recycled water pump station.

Glenoaks Pump No. 1 Replacement Project, City of Glendale, CA

Electrical Engineer for the replacement of Pump No. 1, a 125hp, 4160 volt, 875 gpm centrifugal pump that outlived its useful life. The pump was replaced in kind at the Glenoaks Pump Station. The pump serves the 1290 pressure zone in the Glenoaks Canyon area. Pump No. 1 serves the daily flow condition for the 1290 pressure zone. Pump No. , a 250 hp, 4160 volt, 2,000 gpm centrifugal pump, which was recently replaced, will serve as the high demand pump. The work included a hydraulic analysis Technical Memorandum used for pump selection and review of the hydraulic performance of the pumping station.

Moreno Valley RWRF Solids Handling MCC Replacement East Municipal Water District, Riverside County, CA

Lead Electrical for the Solids Handling MCC Replacement Project which includes the replacement for four motor control centers that have exceeded their rated useful life. The project also included a condition assessment of the existing motor control centers which required a shutdown of the plant equipment during non-peak hours and also a detailed maintenance of plant operations plan to minimize plant distributions during construction.

Hazen

Adele Pump Station Arc Flash Study for the Los Angeles Department of Water and Power, Los Angeles, CA
Lead Electrical for the Adele Pump Station Arc Flash project. Performed load flow, short-circuit, protective device coordination, and arc flash analyses using ETAP electrical modeling software. Additionally, updated record single line drawings based on field conditions.

Water Treatment Plants for Stations 7 and 11, Lemoore, CA
Lead Instrumentation and Control for the City of Lemoore Stations 7 and 11 Water Treatment Plants. Hazen, in partnership with Filanc Construction, was selected by the City of Lemoore to provide progressive design build services for two groundwater treatment plants. The groundwater has been impacted by iron, manganese, ammonia, sulfides, color, turbidity, arsenic and high TOC concentrations forming elevated DBPs in the presence of chlorination. Sixty percent design was completed in sixty days in order to assist Filanc with preparing the guaranteed maximum price (GMP). Final design proceeded in August 2019 with construction scheduled to commence at the end of 2020. Hazen is providing engineering design and services during construction and startup.

Well #26 and Raw Water Transmission Main Design, City of Goodyear, Goodyear, AZ
Lead Electrical and Instrumentation Engineer for the City of Goodyear Well #26 and Raw Water Transmission and Main design project. This $1.9M project is a design-build project for the installation and equipping of Well #26, raw water transmission main, and design modifications to the 3 MGD Bullard Water Campus to treat an additional 1.5 MGD of flow.

City of San Diego Stormwater DV-2 Project, MCTC, San Diego, CA
Lead Electrical and Instrumentation Engineer for the City of San Diego Stormwater DV-2 Project. Hazen provided electrical and instrumentation services associated with the design of a stormwater diversion valve for the City of San Diego. This included the design of a control panel exterior and interior layout, control panel schematic, and associated control strategy. Additionally, an electrical site plan and electrical and instrumentation details were provided.

Edward C Little Water Recycling Facility Reverse Osmosis CIP Waste Discharge Project, West Basin Municipal Water District, El Segundo, CA
Lead Electrical and Instrumentation design engineer responsible for developing electrical and instrumentation drawings and specifications throughout design as well as providing E&IC engineering services during construction.

Initial Disinfection Sodium Hypochlorite Storage and Feed System, Irvine Ranch Water District, Irvine, CA
Lead Electrical design engineer responsible for developing electrical drawings and specifications throughout design as well as providing electrical engineering services during construction.

Phase I Plant Upgrade Project, Laguna County Sanitation District, Santa Maria, CA
Lead Instrumentation design engineer responsible for developing instrumentation drawings and specifications throughout design.

Site 2 Improvements Project, Henderson, Henderson, NV
Lead electrical design engineer responsible for developing electrical drawings and specifications throughout design.

SCHEDULE OF CHARGES

January 2026

Professional Services	Hourly Rates
Principal Groundwater Geologist	$315.00
Senior Groundwater Geologist	$266.00
Project Groundwater Geologist	$245.00
Staff Groundwater Geologist	$230.00
Field Groundwater Geologist	$175.00
Administrative/Clerical	$120.00

Field Equipment Charges

Pressure Transducers (water level & barometric pressure monitoring during pumping tests)	$150.00/wk.
Electric Tape Water Level Probe	$ 50.00/day
Field Water Quality Probe (T, pH, EC)	$ 75.00/day

Litigation, Depositions and Testimony

Depositions and trial testimony are charged at twice the hourly rate (4-hour minimum/day).

Travel Time and Mileage

Travel time for meetings and/or to job sites will be charged at our standard hourly rates. Mileage is charged at the current IRS rate.

Outside Services

Any services and materials not ordinarily furnished by RCS, including subcontracted services (i.e., water quality laboratory testing), delivery services, reproduction and printing, etc., are billed at cost + 15%. Reproduction costs for large format printing, and/or high volume reproduction and binding of hard copy reports performed in-house by RCS staff, will be billed at rates similar to comparable outside services.

Conditions

RCS reserves the right to update this Schedule of Charges on January 1 of each year (the beginning of our Fiscal Year). Invoices are issued at our option on a monthly basis or when the work is completed. A service charge of 1½% will be payable on any amount not paid within 30 days. Any attorney fees or other costs incurred in collecting delinquent charges shall be paid by the client.

Client will furnish rights-of-way to land as required for field visits and field operations, such as sampling or testing of water wells.

Well Rehabilitation and Maintenance Program

Services provided under this Schedule of Charges in connection with the Sweetwater Authority's Well Rehabilitation and Maintenance Program (RFP issued February 6, 2026) shall be billed in accordance with the hourly rates and equipment charges set forth herein. Work will be performed

on a time-and-materials basis consistent with the approved scope of services, including: Task 1 – Data Collection, Review, and Project Coordination; Task 2 – Field Assessments and Condition Evaluation; Task 3 – Rehabilitation Planning, Maintenance Strategy, and Program Development; and Task 4 – Final Program Preparation and Deliverables. Direct expenses, including travel, equipment, laboratory testing, printing, and other outside services, shall be billed in accordance with the Outside Services provisions above. Invoices will be submitted monthly in conformance with the Sweetwater Authority's invoicing requirements, no later than the 15th calendar day of the following month.

Reallocation of Task Funds

RCS reserves the right to reallocate funds among tasks within the total authorized not-to-exceed contract amount, as necessary to efficiently complete the scope of services. Such reallocation shall not increase the total contract amount without prior written authorization from the client. RCS will provide prompt written notice to the client of any proposed reallocation that, individually or cumulatively, exceeds ten percent (10%) of the budget for any individual task.

TABLE 1 - RCS COST ESTIMATE DETAIL

Sweetwater Authority Well Rehabillitation and Maintenance Program
March 13, 2026

PHASE AND TASK LISTINGS		Principal Groundwater Geologist	Senior Groundwater Geologist	Project Groundwater Geologist	Staff Groundwater Geologist	Field Geologist	Admin Personnel	Direct Costs	Total Task and Subtask Costs
		$315	$266	$245	$230	$175	$120		
		HOURS	HOURS	HOURS	HOURS	HOURS	HOURS		
TASK 1: Data Collection, Review, and Project Coordination									
Subtask 1.1	Kick-off Meeting			2	2				$950
Subtask 1.2	Collection and review of existing data		12	24	36				$17,352
Subtask 1.3	Data and operation review meetings			6	6				$2,850
Subtask 1.4	Project management meeting			6	6				$2,850
Subtask 1.5	Progress meetings	4		2	2				$2,210
	SUBTOTAL TASK 1	4	12	40	52	0	0	0	$26,212
TASK 2: Field Assessments and Condition Evaluation									
Subtask 2.1	Visual inspection of onsite facilities and equipment				48			$609	$11,649
Subtask 2.2	Evaluation of site accessibility, safety conditions, and related infrastructure			8	8				$3,800
Subtask 2.3	Observation of operational characteristics, including available pump performance indicators			12	12			$609	$6,309
Subtask 2.4	Review of historical performance data		4	16	24				$10,504
Subtask 2.5	Identification of potential issues (e.g., specific capacity, drawdown trends)		4	16	24				$10,504
Subtask 2.6	Recommendations for additional testing	8	9	12	16				$11,534
	SUBTOTAL TASK 2	8	17	64	132	0	0	$ 1,218	$54,300
Subtask 2.7	OPTIONAL- Additional field testing and downwell/equipment surveys	2	4	16	16	24		$609	$14,103
Task 3: Rehabilitation Planning, Maintenance Strategy, and Program Development									
Subtask 3.1	Well-by-well rehabilitation recommendations and prioritization	2	8	24					$8,638
Subtask 3.2	Preventive maintenance schedules and inspection procedures		8	16					$6,048
Subtask 3.3	Identification of equipment upgrades or replacements		8	8					$4,088
Subtask 3.4	Development of standardized tools								$0
Subtask 3.5	Preparation of cost estimates for rehabilitation tasks	3	16	16					$9,121
Subtask 3.6	Development of short-term and long-term budget projections	3	16	16					$9,121
Subtask 3.7	Conducting draft review meeting to present preliminary findings and receive feedback	3	3	3					$2,478
	SUBTOTAL TASK 3	11	59	83	0	0	0	0	$39,494
Task 4: Final Program Preparation and Deliverables									
Subtask 4.1	Preparation of the Draft Program	16	30	40	50				$34,320
Subtask 4.2	Incorporation of comments and revisions	8	8	24					$10,528
Subtask 4.3	Conducting a final presentation to Authority staff	8	8	8					$6,608
Subtask 4.4	Delivery of the Final Program	4	6	12					$5,796
Subtask 4.5	Submission of deliverables		3	3					$1,533
	SUBTOTAL TASK 4	36	55	87	50	0	0	0	$58,785

TOTAL ESTIMATED COSTS FOR RCS SERVICES	$178,791
SUBCONTRACTOR COST	$206,690
OPTIONAL WORK	$14,103
TOTAL PROJECT COST (Excluding optional Subtask 2.7)	$385,481

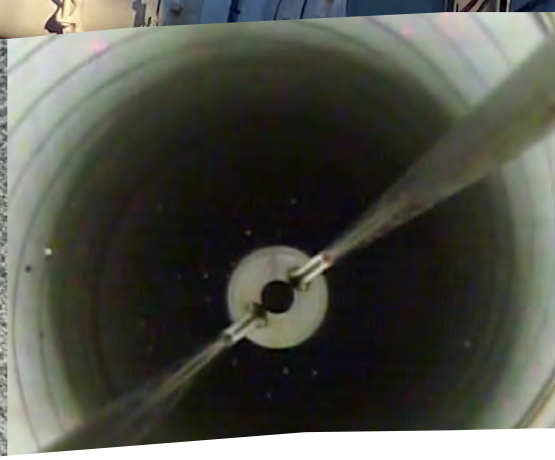
Hazen	Hazen and Sawyer*						Summary			Grand Total
	Principal In Charge $385	Project Manager $340	Technical Advisor QA/QC $385	Senior Associate $340	Principal Scientist $225	GIS Analyst $185	Labor Hours	Labor Cost	ODC's	
Task 1 – Data Collection, Review, and Project Coordination										
Preliminary Asset Register (Excel)		4			40	20	64	$14,060		$14,060
Data Gap Summary		2			8	16	26	$5,440		$5,440
TASK 1 - SUBTOTAL	**0**	**6**	**0**	**0**	**48**	**36**	**90**	**$ 19,500**	**$ -**	**$ 19,500**
Task 2 – Field Assessments and Condition Evaluation										
Discipline-Specific Survey123 Electronic Forms					4	16	20	$3,860		$3,860
Field Condition Assessment of Above-Ground Assets at 13 Wells		4	2	64	32	8	110	$32,570	$ 1,800	$34,370
Asset Register Updated with Condition Scores (Excel)		2	2	6	16	24	50	$11,530		$11,530
Field Condition Assessment Photographs						8	8	$1,480		$1,480
Condition Assessment Results Workshop (2-hour, in-person)		8		8	8		24	$7,240		$7,240
TASK 2 - SUBTOTAL	**0**	**14**	**4**	**78**	**60**	**56**	**212**	**$ 56,680**	**$ 1,800**	**$ 58,480**
Task 3 – Rehabilitation Planning, Maintenance Strategy, and Program Development										
Remaining Useful Life Analysis (by asset, site, and discipline)		1		4	16		21	$5,300		$5,300
Unit Cost Library (rehabilitation, replacement, and maintenance costs by asset class)		2	4	24	8		38	$12,180		$12,180
Inspection Checklists (per well, per discipline)		2	2	4	16		24	$6,410		$6,410
Maintenance Log Templates (editable, by asset class)		2	2	20			24	$8,250	$ 1,500	$9,750
Standard Operating Procedures (SOPs) for Routine Inspection and Preventive Maintenance		2	2	40			44	$15,050		$15,050
Power BI Dashboard Prototype		2	1		8	24	35	$7,305		$7,305
Participation in Draft Review Meeting (2-hour, in-person)		8		16	8		32	$9,960		$9,960
TASK 3 - SUBTOTAL	**0**	**19**	**11**	**108**	**56**	**24**	**218**	**$ 64,455**	**$ 1,500**	**$ 65,955**
Task 4 – Final Program Preparation and Deliverables										
Draft Rehabilitation Plan and Maintenance Program Report		8	6	24	40	24	102	$26,630		$26,630
Final Rehabilitation Plan and Maintenance Program Report		2	4	8	16	8	38	$10,020		$10,020
Final Power BI Asset Management Dashboard		2			4	4	10	$2,320		$2,320
Dashboard Training Session (4 hours, in-person)		4			8	8	20	$4,640		$4,640
Administrative Documentation for Long-Term Dashboard Maintenance			2			16	18	$3,730		$3,730
Participation in Final Presentation to Authority Staff (2 hours, in-person)		4		4	8		16	$4,520		$4,520
TASK 4 - SUBTOTAL	**0**	**20**	**12**	**36**	**76**	**60**	**204**	**$ 51,860**	**$ -**	**$ 51,860**
Task 5 – Project Management										
Kickoff Meeting	2	2			4		8	$2,350		$2,350
Monthly Invoice and Progress Meeting	1	24					25	$8,545		$8,545
TASK 5 - SUBTOTAL	**3**	**26**	**0**	**0**	**4**	**0**	**33**	**$ 10,895**	**$ -**	**$ 10,895**
TOTAL FEE (TASK 1-5)	**3**	**85**	**27**	**222**	**244**	**176**	**757**	**203,390**	**3,300**	**206,690**

*Rates are subject to 5% increase on July 2027

Prepared for
Sweetwater Authority

Professional Services for Development of the Well Rehabilitation and Maintenance Program

March 2026



Thomas Harder & Co.
Groundwater Consulting

SWEETWATER AUTHORITY

PROPOSAL TO PROVIDE PROFESSIONAL SERVICES FOR DEVELOPMENT OF THE WELL REHABILITATION AND MAINTENANCE PROGRAM

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Attachment A - Resumes

1. Introductory Letter (Cover Letter):

To Whom It May Concern:

Thomas Harder & Co. (TH&Co) is joined for this Project by MKN and Associates (MKN), and we are excited at the prospect of working with Sweetwater Authority (the Authority) to create a well Rehabilitation and Maintenance Program. TH&Co has prepared this proposal to provide Rehabilitation and Maintenance Program for the 13 wells governed by Sweetwater Authority, as outlined in the Request for Proposals . TH&Co will investigate each of the Authority's wells on an individual basis and provide a well condition assessment.

We bring to the Authority a wealth of expertise in all aspects of hydrogeology, including well condition assessments, well siting, municipal well design and construction management, managed recharge, groundwater flow models, basin management and groundwater quality. I have provided technical direction for the design of more than 100 successful production wells. With TH&Co and MKN's combined knowledge of the hydrogeology of the San Diego area, well design expertise, backed by more than 35 years of professional groundwater resource consulting experience, I believe we are uniquely qualified to assist the Authority in meeting your future groundwater resource goals.

TH&Co, as well as MKN, will conduct onsite inspections to each well to verify the current conditions of each well site. After completing through onsite inspections, we will determine the remaining life expectancy of each of the Authority's wells. A Well Rehabilitation and Maintenance Program that considers the well construction characteristics and groundwater quality for each individual well will be created. A life-cycle cost schedule for rehabilitation and/or replacement will also be prepared. This will be based on their age, materials used in construction, rehabilitation history, and groundwater chemistry. Each of the 13 wells will have an individual narrative summary report.

We are submitting this proposal, which shall remain valid for a period of 90 days from the date of submittal.

Sincerely,

Thomas Harder

Thomas Harder, P.G., C.HG.
Principal Hydrogeologist
1260 N. Hancock St., Suite 109

2. Identification Of Responder:

a) **Company Legal Name:**
   a. Thomas Harder & Co., Inc.
   b. Michael K. Nunley and Associates, LLP dba MKN & Associates, LLP

b) **Legal Form of Company:**
   a. Thomas Harder & Co., Inc. is an S corporation.
   b. Michael K. Nunley and Associates, LLP is a Limited Liability Partnership (LLP)

c) **Identify any Parent Companies:**
   a. Thomas Harder & Co., Inc. has no parent company.
   b. The parent company of Michael K. Nunley and Associates, LLP is Arudrra Company Inc.

d) **Number of Employees and Address:**
   a. Thomas Harder & Co., Inc.: The company currently has 15 employees. Address: 1260 N Hancock Street, Suite 109, Anaheim, California 92807.
   b. Michael K. Nunley and Associates, LLP, an Ardurra Company, Inc. The company has over 2,500 employees. Corporate headquarters is located at: 1000 NW 57th Ct., Suite 800, Miami, FL 33126. Local address: 16130 Bake Parkway, Irvine, CA 92618

e) **Contact Person Regarding Proposal:** Any questions regarding this proposal can be directed to Thomas Feistel. He can be reached at (949) 290-4429 and his email is Tfeistel@thomashardercompany.com

3. Financial Relationships Disclosure:

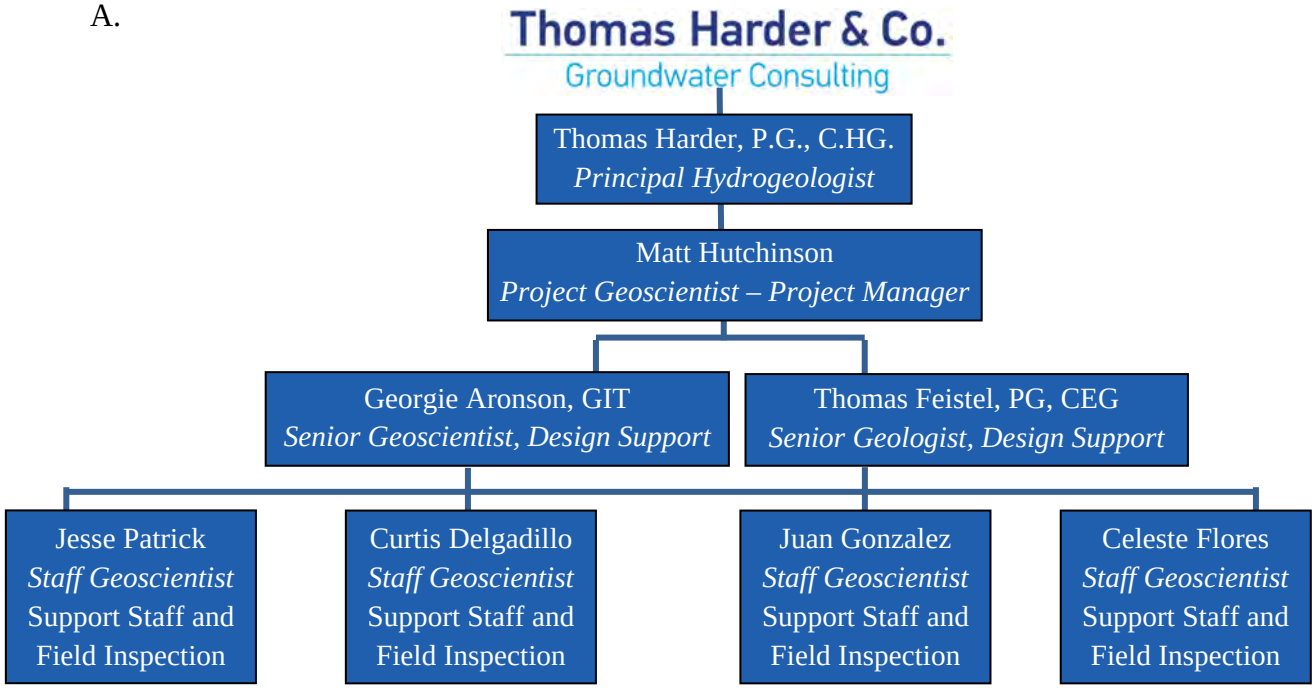
To the best of our knowledge, neither TH&Co nor MKN have existing or past financial relationships with the Authority's Governing Board, staff, or entities for which said members are employed of have an interest in.

4. Consultant's Organization and Key Personnel:

Mr. Thomas Harder, PG, CHG, is a principal hydrogeologist at TH&Co, and will be the Principal-in-Charge and technical lead for GSWC's Hill Street Replacement Well project. Mr. Harder is a California registered Professional Geologist and Certified Hydrogeologist with more than 36 years of professional groundwater consulting experience working on hydrogeological projects throughout California. He is a recognized expert in well design and construction, with experience on more than 100 large-diameter high-capacity well projects.

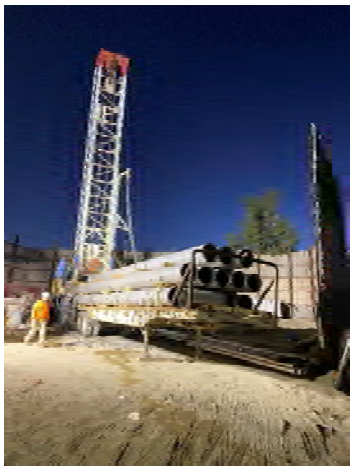
Assisting Mr. Harder will be ***Mr. Matt Hutchinson,*** who has more than 11 years of professional experience including oversight and field inspection on projects ranging from high production deep municipal well drilling to his extensive work in overseeing numerous well rehabilitations. In the past five years Mr. Hutchinson has worked on well rehabilitations. The wells ranged in ages from 17 years old to 82 years old and had widely varying needs for rehabilitation. Mr. Hutchinson evaluated each of these wells through an initial evaluation that typically included pulling the pump, conducting downhole video survey, and Casing Inspection Thickness Measurement (CITM) or Electromagnetic Defectoscope (EMT-24) surveys of each well. After creating custom rehabilitation plans for each well and completing those rehabilitations, each of these wells will likely have higher specific capacity than before the well rehabilitation work as done.

Resumes of all Project Team members, including MKN personnel, are provided in Attachment A.



5. Required Qualifications and Expertise:

Thomas Harder & Co. (TH&Co) is a full-service hydrogeological consulting company with extensive expertise in condition assessments and well rehabilitation, well siting, design, construction management, and testing of municipal water wells. Thomas Harder has more than 37 years of hydrogeological consulting experience and is a recognized expert in municipal well design and construction. He has developed and implemented effective designs and managed the construction for more than 100 successful large-diameter, high-capacity municipal water wells in California and rehabilitation for 34 wells. Mr. Harder will provide technical direction and management for the development of the well rehabilitation and maintenance program.



Municipal well design, construction management, and well rehabilitation are a day-to-day part of our work at TH&Co. Mr. Harder is supported by a staff of eleven professional geoscientists with extensive experience in field observation of municipal well drilling, construction, development and testing. Our services include:

- **Well Performance, Rehabilitation and Troubleshooting**
- **Well Modification**
- **Design of High Capacity Groundwater Wells**
- **Well Production Strategies**
- **Pumping Interference Evaluations**
- **Aquifer and Well Field Monitoring**
- **Groundwater Resource Management**
- **Groundwater Quality Analysis and Reporting**
- **Large-Scale Groundwater Basin Studies**
- **Artificial Recharge**
- **Groundwater Models**

Our mission is to provide clients with sound hydrogeologic analysis and technical expertise for developing effective and sustainable water resource solutions.

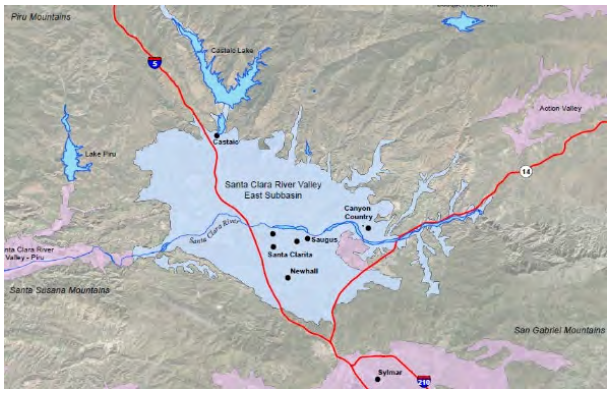
6. Demonstrated Experience on Previous Projects

The TH&Co team has developed a robust and successful process for well condition assessments of municipal production wells. As shown in the following table, we have extensive experience and a demonstrated record of success with well siting, and well condition assessments. As shown in the following table, we have extensive experience and a demonstrated record of success with well condition assessments and well rehabilitation.

Project / Location	Well Rehabilitation	Well Condition Assessment
Analysis of Existing and Future Wells Main Plant Master Plan Anaheim, CA *City of Fullerton*		✓
Well Condition Assessment for Water Master Plan Vernon, CA *City of Vernon*		✓
Well Condition Assessment for Master Plan and Saugus Formation Well Siting Study Santa Clarita, CA *Santa Clarita Valley Water Agency*		✓
Rehabilitation of Santa Clara and Honby Wells Santa Clarita, CA *Santa Clarita Valley Water Agency*	✓	✓
Rehabilitation of T7 & U6 Wells Santa Clarita, CA *Santa Clarita Valley Water Agency*	✓	✓
Evaluation for Rehabilitation of N11, N12, N13 Wells Santa Clarita, CA *Santa Clarita Valley Water Agency*		✓
Upper Valle De Los Caballos Regional Pump Station Well Evaluation and Well Siting Temecula, CA Rancho California Water District/MBI		✓
Well Condition Assessment and Well Rehabilitation of Well 21 Yorba Linda, CA *Yorba Linda Water District*	✓	✓
Well Condition Assessment for Water Master Plan Tehachapi, CA *Bear Valley Community Services District*		✓
Arlington Desalter Well Rehabilitations (Four Wells) Riverside, CA *Western Municipal Water District*	✓	

SCV Water Well Condition Assessment for SCV Water Master Plan, Santa Clarita, California

SCV Water/Hazen & Sawyer (2023 – 2024)



TH&Co conducted a well condition assessment for Santa Clarita Valley Water Agency's (SCV Water's) wellfield of 50 municipal wells. The results were incorporated into the SCV Water Master Plan. All of the wells are located in the Santa Clara River Valley East Groundwater Subbasin. The wells in this area are perforated in alluvial aquifer (shallow) and Saugus aquifer (deep). The purpose of this evaluation was to assess the current condition of each of SCV Water's existing wells and provide recommendations to on which wells should be rehabilitated or replaced.

Key tasks completed for this project included:

- Review existing data including, borehole lithologic logs, geophysical logs, downhole video surveys, historical static, pumping groundwater levels, well construction information, pumping test data, and groundwater quality data.
- Analyze groundwater quality, chemistry and determine Ryznar Stability Index (RSI) to determine corrosion potential in the groundwater production wells.
- Analyze data and recommend rehabilitation program for the mild steel production wells.
- Recommend a well operation schedule to increase well efficiency.
- Conduct life cycle analysis and compare construction costs for casing types, including HSLA, 304L Stainless Steel and 316L Stainless Steel for future production wells.
- Preparation of report summarizing the findings and recommendations to be incorporated into the Water Master Plan.

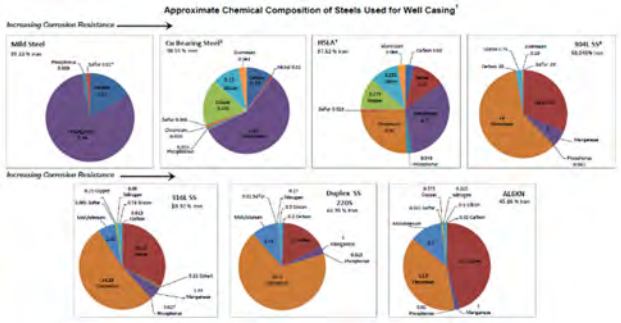
The wells with the most casing loss and oldest wells were recommended for replacement first. Overall, it was recommended to implement a well rehabilitation and replacement program for the older mild steel wells and transition into stainless steel casings. It is also recommended for SCV Water to cycle the wells daily to avoid casing damage and scale buildup.

Client Contact:
Mr. Michael Alvord (malvord@scvwa.org)
Santa Clarita Valley Water Agency
26515 Summit Circle
Santa Clarita, CA 91350
(661) 513 – 1277

Well Condition Assessment for City of Vernon's Water System Operations Analysis and Master Plan

City of Vernon / Infrastructure Engineering Corporation (2020 - 2021)

TH&Co conducted a hydrogeological condition assessment for nine City of Vernon wells. The wells are all located within the Central Basin of Los Angeles, California. The City supplies most of the municipal water supply within its boundaries and the surrounding area is predominantly industrial and commercial with minor residential land use. The nine wells include five active, three inactive and one on standby due to water quality concerns. All of their production wells have shown a decline in well efficiency over time due to clogging of well perforations. The purpose of this evaluation is to assess the condition of each of Vernon's existing wells and provide recommendations to the City in order to increase its groundwater production capacity.



Key tasks completed for this project included:

- Review existing data including, borehole lithologic logs, geophysical logs, downhole video logs, historical static, pumping groundwater levels, well construction information, pumping test data, and groundwater quality data.
- Analyze groundwater chemistry and determine Ryznar Stability Index (RSI) to determine corrosion potential in the groundwater production wells.
- Analyze data and recommend rehabilitation program for the mild steel City of Vernon production wells.
- Recommend a well operation schedule to increase well efficiency.
- Conduct life cycle analysis and compare construction costs for casing types, including HSLA, 304L Stainless Steel and 316L Stainless Steel for future production wells.
- Preparation of report summarizing the findings and recommendations to be incorporated into the City's Master Plan.

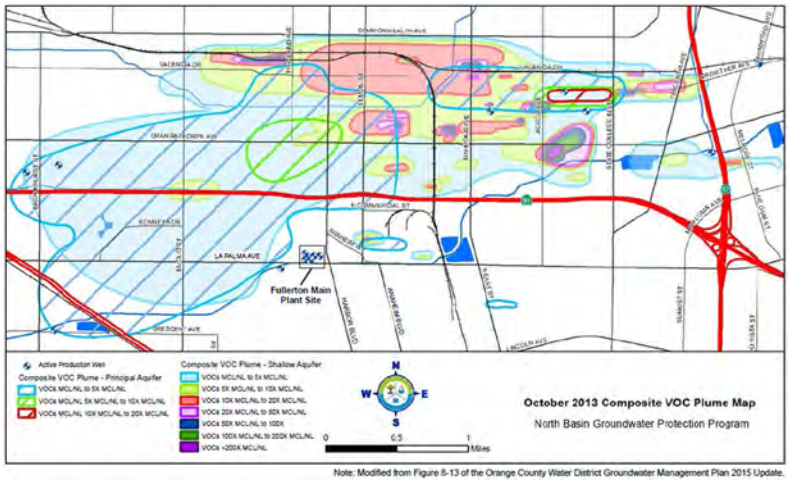
One conclusion of the analysis was that the current recharge capacity is sufficient, but production capacity is not enough for the future. Overall, it was recommended to implement a well replacement program for the older mild steel wells and transition into stainless steel casings. It is also recommended for the City to cycle the wells daily to avoid casing damage and scale buildup.

Client Contact:
Ms. Joanna Moreno (jmoreno@ci.vernon.ca.us)
City of Vernon: Public Utilities Department
4305 S. Santa Fe Ave.
Vernon, CA 90058
323-583-8811 ext. 888

Analysis of Existing and Future Wells for the Main Plant Master Plan

City of Fullerton/ Tetra Tech (2020-2021)

TH&Co conducted a hydrogeological investigation of City of Fullerton's existing wells located on the Main Plant property in Anaheim, California. The Main Plant property consists of approximately 5 acres of open land with three active water supply wells, three inactive water wells, and a discharge basin for blow-off water, a forebay, booster station, engine generator building, and multiple storage sheds. The production wells have shown a decline in well efficiency over time due to clogging of well perforations. The purpose of this project is to identify the operation and maintenance measures and analyze additional groundwater extraction well locations that will help the City maximize production at the Main Plant Site. Groundwater quality in the Study Area contains per- and polyfluoroalkyl substances (PFAS) detections as well as groundwater contaminant plumes with elevated volatile organic compound (VOC) concentrations in the shallow aquifer.



Note: Modified from Figure 8-13 of the Orange County Water District Groundwater Management Plan 2015 Update.

Key tasks completed for this project included:

- Review existing data including, borehole lithologic logs, geophysical logs, downhole video logs, historical static and pumping groundwater levels, well construction information, pumping test data, and groundwater quality data.
- Analyze groundwater chemistry and determine Ryznar Stability Index (RSI) to determine corrosion potential in the groundwater production wells.
- Analyze data and recommend rehabilitation program for the older mild steel production wells.
- Recommend a well operation and rehabilitation schedule to increase well efficiency.
- Conduct life cycle analysis of existing wells and well life expectancy based on well casing material type
- Preparation of report summarizing the findings and recommendations.

The City can meet an assumed maximum instantaneous production demand of 13,000 gallons per minute (gpm) through a combination of three existing Wells 8, 3A and newly constructed Well 7A, and with a strategic well replacement program.

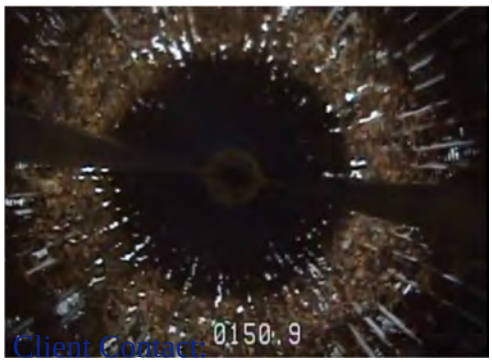
Client Contact:
Ms. Deborah De Bow (deborah.debow@cityoffullerton.com)
(714) 330-3683
City of Fullerton
303 W. Commonwealth Ave, Fullerton, CA

Hydrogeological Services for the Rehabilitation of Arlington Desalter Wells AD-1, AD-3, AD-4, and AD-5– Riverside, California

Western Municipal Water District (2019-2024)

TH&Co conducted a hydrogeological data collection services for the well rehabilitation and testing of four wells owned and operated by Western Municipal Water District (WMWD) in Riverside, California. The investigation was aimed at addressing a decline in the specific capacity of all four wells. The investigation started with the pump removal (for pump inspection) and a video log of each well. The pump was in good condition with little scale build up but the video showed significant scale build on the casing walls. The well rehabilitation plan was to perform a rehabilitation on the well, but leave the pump as is.

The well rehabilitation consisted of thoroughly brushing all of the stainless steel wire wrapped wells, and then conducting verification video surveys to see how effectively the brushing worked. On some of the wells the video log showed that brushing alone did not remove all the scale and build up. In those cases, an acid chemical treatment was also applied to the well and then the wells were brushed again. The pictures below show the before and after of that process. The left photo is before and the shows significant scale build up readily visible, while the after photo on the right is from after rehabilitation. The vast majority of the scale build up has clearly been removed and the well is significantly cleaner. At the end of the rehabilitation project all four wells were significantly cleared of scale and debris build up and debris, and pumped at higher specific capacities than prior to the rehabilitation work being completed.



Client Contact:

Client Contact:
Mr. Luis Cardenas, P.E. (lcardenas@wmwd.com)
Western Municipal Water District
14205 Meridian Parkway
Riverside, CA 92518
(951) 571-7290

Lift Station Condition Assessment (12 lift stations) Orange County, California

South Coast Water District (2021-2022)

MKN completed a comprehensive assessment of 12 of South Coast Water District's (SCWD) 13 wastewater lift stations to support proactive asset management, capital planning, and long-term system reliability. Since the District's lift stations varied in age, size, and configuration, and the previous systemwide evaluation was completed in 2005, the project provided SCWD with an updated, consistent understanding of the condition and performance of these critical facilities.

MKN's team reviewed available records, including as-built drawings, maps, GIS data, and historical reports, and used this information to guide field investigations and technical analyses. We also refined the District's lift station condition assessment form in Survey123 to better align with current industry practice and capture the components most relevant to SCWD's facilities. Field assessments were then completed for major civil, mechanical, structural, and electrical assets, including pumps, piping, valves, wet wells, dry wells, switchgear, generators, buildings, and related appurtenances.

In addition to documenting facility condition, the project evaluated wet well storage capacity and pump efficiency under current operating conditions. These analyses helped identify operational limitations, underperforming equipment, and improvement needs, and determined the additional capacity required to meet the District's response time criteria.

The project concluded with the preparation of a Draft and Final Lift Station Assessment Report that summarized findings for each station and provided recommended improvements, planning-level cost information, prioritization, and implementation timelines. As a result, SCWD received a practical and actionable planning tool that strengthened its ability to prioritize capital investments, improve system reliability, and support long-term wastewater infrastructure management.

Client Contact:
Ms. Taryn Kjolsing, Director of Engineering
31592 West Street,
Laguna Beach, Caliorfnia 92651
tkjolsing@scwd.org
(949) 541-1327

7. Project Understanding and Technical Approach to Complete Tasks

It is our understanding that the Authority was formed in 1977 as a Joint Powers Agency between National City and South Bay Water. Sweetwater Authority is a public water agency serving the areas of National City, western Chula Vista, and unincorporated Bonida and Lincoln Acres in San Diego County, California. The Authority's service area covers approximately 36 square miles and contains several water supply sources including surface water, fresh and brackish groundwater, raw and treated imported supplies purchased from San Diego County Water Authority (SDCWA). The Authority owns and operates three fresh groundwater wells and eleven brackish groundwater wells. The brackish wells are treated in the Richard A. Reynolds Groundwater Desalination Facility. The wells in their service area pump water from the San Diego Formation (SDF), the principal aquifer in the Coastal Plain of San Diego groundwater basin.

TH&Co will evaluate the current conditions and well performance of the Authority's thirteen groundwater wells and develop a Well Rehabilitation and Maintenance Program that identifies rehabilitation priorities. We will determine which wells require well rehabilitation, modification, or replacement, and the cost associated with each. The costs will be broken out into short term and long term costs. The goal will be to either increase specific capacities and lifespan of the 13 wells through rehabilitation and routine maintenance, or recommend adequate well replacement that suits the Authority's needs.

MKN will coordinate through TH&Co on scheduling, site access, data requests, and integrating MKN's work into the Prime team's deliverables. MKN will also implement QA/QC procedures for all technical content we provide, including internal reviews to ensure consistency, completeness, and compliance with the RFP requirements and TH&Co's formatting and terminology. Both teams will work together to supply the deliverables to the Authority in consistent and concise documents.

Planning Level Cost Estimate and Schedule:

A thorough planning level cost estimate and schedule of future well rehabilitation work will be incorporated into the final report. As part of this analysis, TH&Co will prepare a table summarizing the remaining life expectancy of the Authority's wells to prepare a well replacement schedule that considers the well construction characteristics and groundwater quality. From that information, we will prepare a life-cycle cost schedule for rehabilitation and/or replacement. The well replacement costs and schedule will be prepared considering

different types of steel construction materials to allow for the comparison of wells constructed with the relatively expensive materials that are corrosion resistant (high upfront costs) to wells constructed of less expensive materials that are more corrosive and don't last as long (low upfront cost).

Additionally, an operating and maintenance schedule and appropriate Standard Operating Procedures (SOP) for maintaining Sweetwater Authority's wells will be created. The maintenance schedule will be projected 10 to 20 years in the future.

8. Scope of Work

Task 1 – Data Collection, Review and Project Coordination

TH&Co, as well as MKN, will obtain necessary data to evaluate the hydrogeology of the area and existing well information each of the Authority's 13 groundwater production wells, including but not limited to:

- Existing well locations in relation to basin wide geology
    a. Geology and cross sections will be reviewed.
- Well construction information (driller's logs and as-built diagrams of each well)
    a. Casing material
    b. Filter pack material
    c. Annular seal material
    d. Reference point elevation
    e. Pump setting
- Well completion reports
- Groundwater quality data, including Title 22 analysis
- Historical and recent static and pumping groundwater levels
- Pump type and setting
- Historical pumping discharge rates and specific capacities of each well over time
- Recent Title 22 groundwater quality data from each well
- Downhole video surveys (pre- and post rehabilitation, if applicable)
- Electrical and mechanical information

Other potential sources of data may include the United States Geological Survey (USGS), California Statewide Groundwater Elevation Monitoring (CASGEM), California Department of Water Resources (CDWR) and Division of Drinking Water.

At a minimum, TH&Co will also provide project management and coordination during the project to conduct the following tasks:

- ***Kick off meeting***: TH&Co and MKN will attend a kick-off meeting (virtual video call) with Sweetwater Authority staff to discuss project scope, schedule, and data request needs and understanding of well history and potential operational issues.
- ***Progress Meetings***: It is assumed that additional meetings (or video calls) may be necessary during key milestones to present preliminary findings and discuss next steps.
- ***Project Management:*** Provide ongoing project management included schedule tracking, quality assurance/quality control (QA/QC) and regular progress updates.

Deliverables: Attend meetings and create meeting agenda, updated project schedule, biweekly project status report emails.

Task 2 – Field Assessments and Condition Evaluation

Using the data obtained in Task 1, TH&Co and MKN will conduct a well condition assessment for each of the Authority's wells. The condition assessment will include determining the construction and production information of each well and an assessment of the condition, or potential condition of each well based on review of the most recent downhole video logs, if available. This task will include in-person site visits to each of the wells and the associated facilities.

The site visits conducted by TH&Co and MKN will include inspection of:

- Wellhead and above grade mechanical and electrical assets, including observable condition of wellheads, and appurtenances, accessible pump/motor components, electrical equipment, and related infrastructure.
- Documentation of visible deterioration, corrosion, damage, or operational concerns observed.
- Observation of operational characteristics, including available pump performance indicators.
- Evaluation of site accessibility, safety conditions, and related onsite infrastructure.
- Identification of potential deterioration, fouling, corrosion, or structural deficiencies.
- Review of historical performance data (e.g., specific capacity, drawdown trends).
- Recommendations for additional testing where beneficial.

Video surveys and casing inspection thickness measurement (CITM) surveys are vital tools in determining the current condition of a well and whether rehabilitation is necessary or not. If no current video log is available then it may be suggested that video log is conducted in order to

move forward with the well condition assessment for that well (see Optional Task 1 in Table 1). Depending on the age and estimated condition of the well, an electromagnetic thickness tool (EMT-24) or CITM Survey, may be recommended to conduct as well. Casing thickness surveys provide data on the amount of metal loss and existing casing thickness which helps to determine the structural integrity during well rehabilitation, and potentially the remaining life of the well.

Video surveys will be used to confirm the well construction details of the wells (perforation intervals, total depth, etc.), determine the current static groundwater level, assess the condition of the wells, and assess the degree of plugging and types of scale (if any) observable on the perforations. Potential casing conditions will be evaluated for corrosion, scaling, fouling and other structural deficiencies. TH&Co will also evaluate well operation characteristics, well production and performance data, including specific capacity over time and drawdown trends.

Deliverables: Detailed well-by-well field inspection documentation, including completed mechanical and electrical visual inspection checklists, a photo log (where permitted) organized by well, and field observation narratives.

Task 3 – Rehabilitation Planning, Maintenance Strategy, and Program Development

Two main deliverables will come out of well assessment and condition evaluations:

1) **Well Rehabilitation and Maintenance Program** – A thorough well-by-well rehabilitation and maintenance program for each of the Authority's wells.

- 2) A **Life-Cycle Cost Schedule** for well rehabilitation and/or replacement for short term (1-3 years) and long term (5-10 years) time frame.

1) Well Rehabilitation and Maintenance Program:

Based on a review of the downhole video surveys and other available data, TH&Co and MKN will develop a recommended Well Rehabilitation and Maintenance Plan for each of the thirteen wells. At a minimum, the Rehabilitation and Maintenance Plan will include:

- Inspection checklists,
- Maintenance logs and templates,
- Suggested rehabilitation methods for specific wells,
- Standard operating procedures (SOPs),

The Well Rehabilitation and Maintenance Program will also discuss a thorough preventive maintenance schedule and inspection procedures, both aimed at increasing well longevity and

keeping costs low. The Program will consider both chemical and physical methods of rehabilitation based on the degree and types of encrusting material observed on the casing in the video logs and the amount of metal loss observed in each well. Wells with metal loss will require less aggressive rehabilitation methods. TH&Co will prepare a table that shows a comparison of all available well rehabilitation methods that will be considered when creating well rehabilitation specific plans for each of Sweetwater Authority's wells. Possible equipment upgrades and replacement will also be considered.

2) Life-Cycle Cost Schedule:

After gathering all of the relevant well construction information, the life expectancy of all 13 wells will be estimated and a life-cycle cost schedule for rehabilitation and/or replacement will be prepared. The life-cycle cost will be based on the Authority's wells based on well age, materials used in construction, rehabilitation history, and groundwater chemistry.

Both a thorough short term (1-3 years) and long term (5-10 years) life-cycle cost schedule will be developed. The well replacement costs will be detailed in a table comparing different types of steel construction, their relative costs, and advantages and disadvantages to using one material over another. Material advantages and disadvantages included relatively expensive materials that are corrosion resistant (high upfront costs) to materials of less expensive material that are more corrosive and don't last as long (low upfront cost).

Deliverables: Deliverables for this task will include:

- A well-by-well deficiency and recommendations table
- A rehabilitation table summarizing rehabilitation options
- Draft language describing recommended upgrades/replacements, and inputs for mechanical/electrical preventive maintenance and inspection schedules.
- Well Rehabilitation and Maintenance Plan
- Life-Cycle Cost Schedule

Task 4 - Final Program Preparation and Deliverables

TH&Co and MKN will prepare a comprehensive report summarizing the results of our investigation and recommendations including all of the Authority's wells. The report will provide recommendations for future well operation and maintenance to optimize and maintain the specific capacities in the wells.

The Well Rehabilitation and Maintenance Program created in Task 3 will be incorporated into the report. The draft report will be submitted to Sweetwater Authority for comments by July of this year, while the final report will be delivered by early August of this year.

The report will include, but not be limited to, the following:

- Hydrogeological considerations including depth to groundwater, aquifer properties, and groundwater quality.
- An area map showing the locations of the thirteen wells with respect to area features, including any known contamination areas.
- A description of the Authority's well facilities and background for the analysis.
- Results of our review of the downhole video surveys, including an analysis of the current condition of the wells.
- Results of our review of the casing thickness surveys (CITM or EMT-24), if available, and an analysis of the current well conditions.
- A description of our evaluation for each of the thirteen wells will include:
    - Types and sources of data used in the evaluation
    - A description of the well including an as-built well design figure,
    - A discussion of historical specific capacity trends in the well,
    - Recommended pump setting, and
    - Recommended maximum discharge rate (or range of rates) based on groundwater level fluctuations and potential well efficiency improvements,
    - Recommendations for well improvements or rehabilitation work (includes the Well Rehabilitation Plan discussed in Task 3).
- Results of the well condition assessment and cost/benefit analysis to assess the relative advantages of rehabilitating existing wells versus replacing them with new wells.
- A recommended Rehabilitation and Maintenance Program (as needed) including a planning-level cost and schedule
- Life-Cycle Costs on a short term (1-3 years) and long term (5-10 years) time frame.

The budget for this task assumes that one draft of the report will be submitted to Sweetwater Authority in electronic format for review and comment prior to finalizing the document. Upon completion of the draft review and incorporation of comments, TH&Co will submit an electronic copy of the final version of the report to the Authority.

Deliverables:

- Draft and Final versions of the Final Rehabilitation Program Report
- Comment matrix with responses to Sweetwater Authority comments

9. Fee Schedule

In accordance with the RFP, the cost to perform the scope of work outlined in this proposal is provided separately. This cost estimate has been developed on a time-and-materials basis based on our experience successfully completing the scope of work for other similar projects. No additional work outside the scope or assumptions provided in Table 1 will be conducted without written approval from Sweetwater Authority. We are open to adjusting the level of effort to meet the needs of Sweetwater Authority.

10. Project Schedule

An estimated schedule to complete the project is provided on the following page. The schedule assumes a start date of March 27, 2026. The schedule shows that the entire project, can be completed in approximately 4 months (19 weeks). The project schedule meets the milestones as presented in the RFP. The schedule illustrates an expedited schedule with the draft Program Report being submitted in July 2026, and the final report submitted in August 2026.

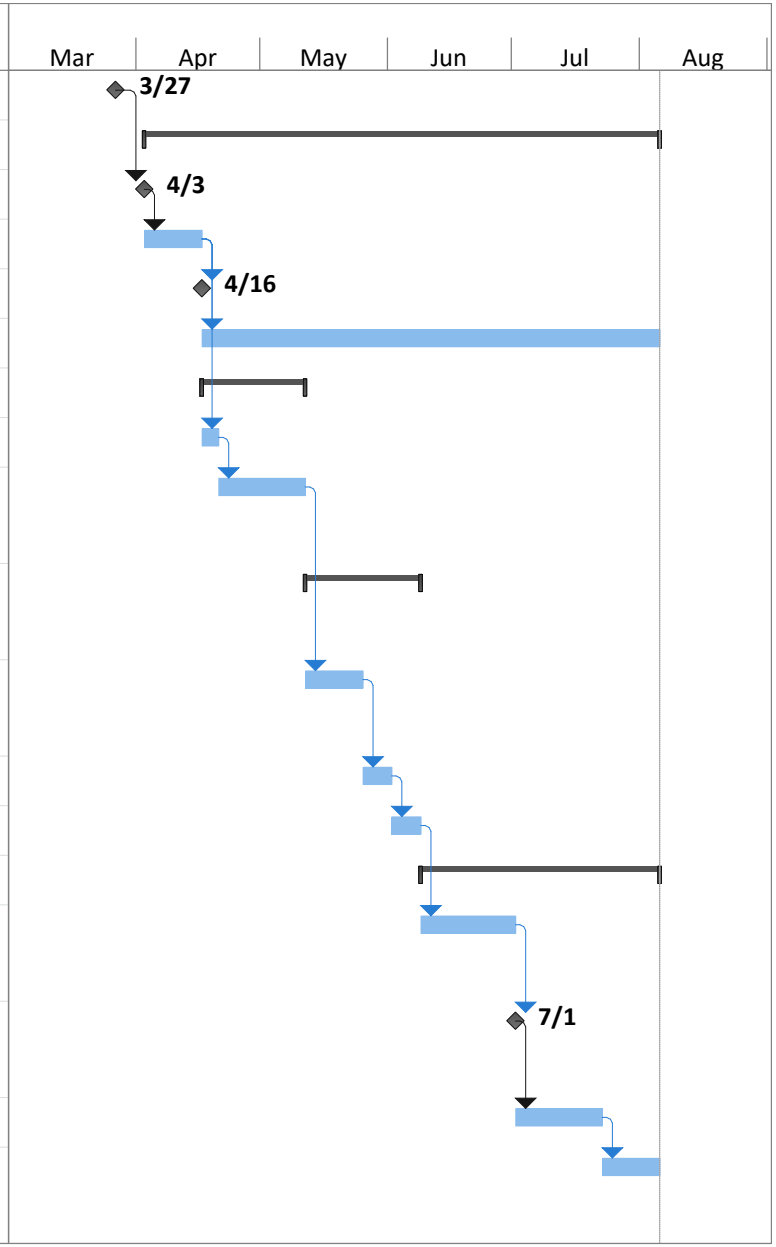
SWEETWATER AUTHORITY

Figure 1

Proposal for Development of the Well Rehabilitation and Maintenance Program

Proposed Project Schedule

ID	Task Name	Duration	Start	Finish
1	Notice to Proceed	0 days	Fri 3/27/26	Fri 3/27/26
2	**Task 1: Data Collection, Review and Project Coord**	**89 days**	**Fri 4/3/26**	**Wed 8/5/26**
3	Kick off Meeting (Data Request Letter)	0 days	Fri 4/3/26	Fri 4/3/26
4	Authority Provide Data to Consultant	10 days	Fri 4/3/26	Thu 4/16/26
5	Meeting with Authority Regarding Data	0 days	Thu 4/16/26	Thu 4/16/26
6	Project Coordination and Progress Meetings	79 days	Fri 4/17/26	Wed 8/5/26
7	**Task 2: Field Assessments and Condition Evaluation**	**17 days**	**Fri 4/17/26**	**Mon 5/11/26**
8	Site Visit in Field to Each Well (13 wells)	2 days	Fri 4/17/26	Mon 4/20/26
9	Evaluation of Well Data (Video Surveys, CITM, Wellhead, Pumps)	15 days	Tue 4/21/26	Mon 5/11/26
10	**Task 3: Rehabilitation Planning, Maintenance Strategy, and Program Development**	**20 days**	**Tue 5/12/26**	**Mon 6/8/26**
11	Prepare Short Term and Long Term Rehab Recommendations Per Well	10 days	Tue 5/12/26	Mon 5/25/26
12	Develop Well Maintenance Program	5 days	Tue 5/26/26	Mon 6/1/26
13	Well Life Cycle Cost Analysis - Short and Long Term	5 days	Tue 6/2/26	Mon 6/8/26
14	**Task 4: Final Program Preparation and Deliverables**	**42 days**	**Tue 6/9/26**	**Wed 8/5/26**
15	Prepare and Submit Draft Report and Prepare Presentation for Authority Staff	17 days	Tue 6/9/26	Wed 7/1/26
16	Draft Review Meeting to Present Findings & Receive Feedback	0 days	Wed 7/1/26	Wed 7/1/26
17	Authority Review and Comment Period	15 days	Thu 7/2/26	Wed 7/22/26
18	Address Comments from Authority and Submit Final Report	10 days	Thu 7/23/26	Wed 8/5/26



Attachment A

Resumes

Attachment A

Resumes

THOMAS E. HARDER

Principal Hydrogeologist

EDUCATION

B.S., Geology. California State Polytechnic University - Pomona, 1990

M.S., Geology with Honors. Emphasis in Hydrogeology, California State University – Los Angeles, 1995

PROFESSIONAL REGISTRATIONS

California Professional Geologist (No. 6512)

Certified California Hydrogeologist (No. 588)

PROFESSIONAL AFFILIATIONS

National Ground Water Association

Groundwater Resource Association of California

Watereuse Association

For more than three decades, Mr. Harder has been providing technical direction for municipalities and private interests to develop sustainable groundwater resources for the economy and well-being of the residents of California. From groundwater recharge projects in the Mojave Desert to basin management and adjudication in southern California to the modeling and management of banking operations in the Kern Water Bank, Mr. Harder has played a key role in providing the technical support needed to guide decisions for basin managers. His expertise spans a wide range of hydrogeological disciplines, including regional groundwater basin analysis, sustainable yield, artificial recharge, groundwater management, groundwater models, contaminant hydrogeology, and water wells.

PROFESSIONAL EXPERIENCE

2008 to Present: *Principal Hydrogeologist*, Thomas Harder & Co.; Anaheim, California

1998 to 2008: *Senior Geohydrologist*, Geoscience Support Services, Inc.; Claremont, California

1997 to 1998: *Principal Hydrogeologist, Geosciences Department Manager*, Parsons Engineering Science; Pasadena, California

1989 to 1997: *Senior Geologist*, Harding Lawson Associates; Irvine, California

TECHNICAL COMMITTEE PARTICIPATION

2016 - Present: Metropolitan Water District of Southern California Regional Recycled Water Recharge Scientific Advisory Panel

2011 to 2016: Kern Fan Monitoring Committee – Groundwater Model Technical Advisory Subcommittee

2010 to 2013: Chino Basin Recharge Master Plan Steering Committee

2009 to 2012: Chino Basin Watermaster Appropriative Pool and Advisory Committee

2003 to Present: Big Bear Lake Department of Water Groundwater Management Technical Review Team

2002: Chino Basin Subsidence Technical Committee

PROJECT EXPERIENCE

Construction and Testing of Municipal Production Wells – California, Arizona and Mexico

Mr. Harder is an established expert in the design and construction of high capacity water wells. During this career, he has provided technical direction and field oversight for the drilling, design and construction of more than 100 high capacity municipal water supply wells throughout Southern California. He has experience in the development of technical specifications, field inspection of the drilling process including borehole logging, inspection of geophysical logging, aquifer zone testing, well construction, well development, pumping tests, water quality sampling, and flowmeter surveys. He has provided technical direction for the design of wells including the evaluation of field borehole logs, cuttings samples, sieve analyses, geophysical logs and zone-specific water quality analyses.

Well Rehabilitation Projects

Mr. Harder provided technical direction and field oversight for the rehabilitation of multiple high capacity municipal water supply wells throughout Southern California. His work included development of technical specifications, bid support, initial testing including sidewall sampling and CITM, field inspection of the rehabilitation process, and follow-up pumping tests and water quality testing. Rehabilitation processes have included brushing, bailing, swabbing, air-jetting, combination airlift/swab, and chemical rehabilitation. Wells have included: *Chino Basin Desalter Authority* (13 Wells), *City of Big Bear Lake Department of Water* (Mooncamp Well), *City of Fullerton* (Well 5), *City of Murrieta* (Adams/Juniper Well), *City of Santa Barbara* (5 Wells), *Golden State Water Company* (Yeager Well No. 3), *Irvine Ranch Water District* (Wells 5, 21, 22, 110, and Stockdale West Agricultural Well), *Summit Partners, LLC* (Elliott Well), *Western Municipal Water District* (5 Arlington Desalter Wells).

Groundwater Modelling

Mr. Harder has developed successfully calibrated regional scale groundwater flow models for the Beaumont Basin, Chino Basin, Murrieta Basin, Kern Water Bank, Big Bear Valley, South Fork Kern River Valley, and Tule Subbasin. In addition, he has developed multiple small-scale groundwater flow models for aquifer dewatering, conjunctive use, and contaminant fate-and-transport evaluations. He has extensive experience with the USGS Code MODFLOW including MODFLOW 2000, MODFLOW 2005, MODFLOW NWT, MODFLOW-Surfact, and MODFLOW One-Water.

Permitting and Environmental Compliance

Mr. Harder has provided technical support for municipal clients developing and obtaining in California Environmental Quality Act (CEQA) documents, Drinking Water Source Assessment and Protection (DWSAP) Permits and reports, NPDES discharge permits, County well permits, encroachment permits. In the last 5 years, Mr. Harder has provided well permit assistance to Golden State Water Company, Three Valleys Municipal Water District, City of Fullerton, Moulton Niguel Water District, and Irvine Ranch Water District.

Contaminant Plume Evaluations

Mr. Harder has conducted multiple contaminant plume evaluations through Orange County, California, including evaluations of the Orange Volatile Organic Compound (VOC) plume (Orange County Water District), El Toro VOC Plume, and VOC evaluations in the Orange County Forebay. Most recently, he has provided technical direction for the design of municipal production wells to avoid shallow VOC concentrations and PFAS for the Cities of Colton, Riverside, Fullerton and the Santa Clarita Valley Water Agency.

Matthew Hutchinson

Senior Geoscientist

Mr. Hutchinson who has more than 11 years of professional experience including oversight and field inspection on projects ranging from high production deep municipal well drilling to his extensive work in overseeing numerous well rehabilitations. In the past five years Mr. Hutchinson has worked on over 8 well rehabilitation. The wells ranged in ages from 30 years old to 70 years old and were all in various states of decline. Each of these wells needed an initial evaluation that included pulling the pump and doing video and casing surveys of the casing. After creating custom rehabilitation plans for each well and completing those rehabilitations, each of these 8 wells are performing at a higher specific capacity that before the well rehabilitation work as done.

Mr. Hutchinson's other work has focused on project management, client/contractor coordination, borehole/well data analysis, well design, field inspection of pilot borehole drilling and logging, geophysical logging, isolated aquifer zone testing, well construction, well development, pumping tests, and collection of groundwater quality samples, including PFAS sampling. In his 11 years of experience with Thomas Harder and Company, Mr. Hutchinson has inspected the destruction of seven production wells, the drilling and installation of 20 small diameter monitoring wells, the drilling and installation of 30 large diameter municipal wells.

EDUCATION

B.S., Geology. California State University, Fullerton, 2014

PROFESSIONAL EXPERIENCE

September 2014 to Present: *Senior Geoscientist*, Thomas Harder & Co. Anaheim, California

PROFESSIONAL AFFILIATIONS

National Groundwater Association

PROJECT EXPERIENCE

Arlington Desalter Rehabilitation – Riverside, CA

Client: Western Municipal Water District. 2019 – 2024.

Provide project management and onsite field inspection during rehabilitation and testing of four desalter wells of 16-inch diameter. The wells were constructed to depths between 150 to 200 ft below ground surface. Project management tasks included provide daily updates to client and coordination with contractor. Review of submittals. Review and QC of contractor invoices. Scheduling and staffing coordination. Field tasks included observing rehabilitation including brushing, bailing, video surveys, chemical development, pumping tests, and well disinfection.

Well Assessment Master Plan – Santa Clarita, CA

Client: Hazen & Sawyer/Santa Clarita Valley Water Agency. 2022 – 2024.

Provide project management and condition assessment for 50 municipal wells. There are 40 wells offline due to contamination and inactive as a standby source. The standby wells were not in service due to mechanical reasons, casing damage, or need groundwater treatment. We provided a

condition assessment of each well and provided a life-cycle cost analysis as well as a comprehensive summary report with replacement and recommendation schedule.

Santa Clara and Honby Well Rehabilitation – Santa Clarita, CA

Client: Hazen & Sawyer/Santa Clarita Valley Water Agency. 2022 – 2024.

Provide condition assessment of Santa Clara and Honby wells. Provide project management for rehabilitation of 16-inch diameter municipal supply well. The wells were constructed to depths between 150 to 200 ft below ground surface. Project management tasks included provide daily updates to client and coordination with contractor. Review of submittals. Review and QC of contractor invoices. Scheduling and staffing coordination.

T-7 & U-6 Well Rehabilitation – Santa Clarita, CA

Client: SCV Water/Hazen & Sawyer. 2025 – Ongoing.

Provide project management and onsite field inspection during rehabilitation and testing of two 18-inch diameter municipal supply wells. The wells were constructed to depths between 140 to 175 ft below ground surface. Project management tasks included provide daily updates to client and coordination with contractor. Review of submittals. Review and QC of contractor invoices. Scheduling and staffing coordination. We provided a condition assessment of each well and provided a life-cycle cost analysis as well as a comprehensive summary report of all the rehabilitation work conducted on the wells, including brushing, bailing, development, and pumping tests.

Miramonte Well 1 and 4 – Los Angeles, CA

Client: Golden State Water Company. 2024

Provided project management and field inspection during the drilling, construction, and development of a 20-inch diameter municipal supply well. The well will be constructed this year to a total depth of 1,150 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included lithologic logging of pilot borehole, monitoring of drilling fluids, inspection of aquifer zone testing, well construction, well development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling. In office/managing responsibilities included attending pre-bid and project meetings, providing daily updates to the client, completing the well design letter, pumping test letter, and the well completion report.

Cucamonga Basin Well Siting – Rancho Cucamonga, CA

Client: Provost & Pritchard. 2024

Provide project management and onsite field inspection during rehabilitation and testing of three 16-inch diameter municipal supply well. The wells were constructed to depths between 150 to 200 ft below ground surface. Project management tasks included provide daily updates to client and

coordination with contractor. Review of submittals. Review and QC of contractor invoices. Scheduling and staffing coordination.

Well 8A – Big Bear, CA

Client: Big Bear City Community Services District. 2021 – 2022.

Provide project management during drilling, construction, and testing of a 12 ¼ inch diameter municipal supply well. The well was constructed to a depth of 390 ft below ground surface. Provide daily updates to client and coordination with contractor. Review of submittals. Review and QC of contractor invoices. Scheduling coordination and training with TH& Co field staff. In field inspection of casing and on-site materials, Title 22 groundwater sampling.

Well 7 and 7A – Anaheim, CA

Client: City of Fullerton/Hazen & Sawyer. 2021 – 2022.

Provide project management and on-site inspection during Well 7 destruction and the drilling, construction, testing of a 20-inch diameter municipal replacement supply Well 7A. The well was constructed to a depth of 1,390 ft below ground surface. Project management tasks included providing daily updates to client and coordination with contractor and TH&Co field staff scheduling, filter pack and well design, review and QC of contractor submittals and invoices. Review client "Payment Book" and sign off on completed work/tasks. In field tasks included inspection of conductor casing installation, lithologic logging of pilot borehole, isolated aquifer zone testing, well construction, well development, pumping tests, and Title 22 groundwater sampling.

Well Rehabilitation – San Clemente, CA

Client: City of San Clemente/Stantec. 2019 – Ongoing.

Provided project management and field inspection during well rehabilitation for three municipal wells (Well 5, Well 8, and Calafia Well). Project management including contact with contractor and client regarding field work phases and scheduling. Field tasks, to date, for Well 5 have included inspection of packer and pipe removal, downhole video surveys, construction and development of a dual completion monitoring well. For Well 8, field tasks have included video surveys, inspection of installation of a cement plug, video logs, re-development by mechanical development including brushing, bailing, swabbing and airlifting, re-development by pumping and surging. Conducted 72-hr hybrid step- and constant rate pumping test.

Georgie Aronson

Senior Geoscientist

Ms. Aronson has more than ten years of professional experience with project management oversight and field inspection on projects involving drilling, construction, development and testing of 27 high-capacity municipal water supply wells and one monitoring well as well as assisting with the development of detailed Technical Specifications. Her field experience includes lithologic logging during pilot borehole drilling, observation of geophysical logging, aquifer zone testing, well construction, well development, pumping tests, and collection of groundwater quality samples, including PFAS sampling.

EDUCATION

B.S., Geology. California State University, Long Beach, 2015

PROFESSIONAL EXPERIENCE

February 2016 to Present: *Senior Geoscientist*, Thomas Harder & Co., Anaheim, California

July 2015 to January 2016: *Student Assistant*, CA State Lands Commission, Long Beach, California

PROFESSIONAL AFFILIATIONS

South Coast Geological Society

Association for Women Geoscientists

PROFESSIONAL CERTIFICATION

Geologist-in-Training No. 708

PROJECT EXPERIENCE

Well Assessment Well 21 – Vernon, CA

Client: City of Vernon. 2025.

Provided condition assessment of Well 21 for the City of Vernon. In office responsibilities included review of the video survey, EMT survey, specific capacity data, groundwater levels and rehabilitation recommendations and preparation of rehabilitation technical specifications.

Well Assessment and Rehab of Well 21 – Yorba Linda, CA

Client: Yorba Linda Water Distrit. 2025.

Provided condition assessment of Well 21 for the Yorba Linda Water District. In office responsibilities included review of the video survey, specific capacity data, groundwater levels and rehabilitation recommendations. Field activities included brushing and bailing, video surveys, development, pumping tests, and sample collection. We also observed the water quality issues in this well and conducted packer testing. We designed the new pump depth with an engineered suction and mechanical packer.

Compton-Doty Well No. 2 Construction and Well No. 1 Destruction – Lawndale, CA

Client: Golden State Water Company. 2024 – 2025.

Provided project management and field inspection during the destruction of the existing well and drilling, construction, and development of an18-inch diameter municipal supply well. The new well was constructed to a total depth of 530 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling. In office responsibilities include preliminary design report, technical specifications, permitting, well design letter, pumping test letter and the well completion report.

Well 7– Riverside, CA

Client: Western Municipal Water District. 2021 – 2023.

Provided project management oversight and field inspection during the drilling, construction, development and testing of a 16-inch diameter municipal supply well. The well was constructed to a total depth of 330 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of conductor casing and pumping tests. In office responsibilities included technical specifications, well design letter, pump test letter, permitting assistance, and the well completion report.

Armstrong Well No. 2 – Lakewood, CA

Client: Golden State Water Company. 2022 – 2023.

Provided project management and field inspection during the drilling, construction, and development of an18-inch diameter municipal supply well. The well was constructed to a total depth of 1,080 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling. In office responsibilities include preliminary design report, and technical specifications.

Wells 32 and 33– San Bernardino and Colton, CA

Client: Michael Baker International/City of Colton. 2020 – 2023.

Provided project management oversight and field inspection during the drilling, construction, and development of two 18-inch diameter municipal supply wells. Well 33 was constructed to a total depth of 860 ft below ground surface and Well 32 was destroyed due to not meeting City production demand and water quality issues. The borehole for the wells were drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, well development, and collection of samples for Title 22 water quality analysis, including PFAS sampling. In office responsibilities include preliminary design report, technical specifications, well design letter and the well completion reports.

Main Plant Well 7 Destruction and Well 7A Construction – Anaheim, CA

Client: City of Fullerton. 2018 - 2021.

Provided project management oversight and field inspection during the drilling, construction, development and testing of a 20-inch diameter municipal supply well and destruction of existing Well 7. Well 7A was constructed to a total depth of 1,390 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of well Well 7 mushroom cap and Well 7A development. In office responsibilities included preparing the preliminary design report, technical specifications, permitting, and assisting with the well completion report.

La Jolla Well No. 3 – Placentia, CA

Client: Golden State Water Company. 2020 – 2022.

Provided project management and field inspection during the drilling, construction, and development of an18-inch diameter municipal supply well. The well was constructed to a total depth of 890 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling, and well disinfection. In office responsibilities include preliminary design report, technical specifications, permitting, well design letter, pumping test letter and the well completion report.

Gage 29-3R – San Bernardino, CA

Client: City of Riverside. 2019 – 2020.

Provided field inspection during the drilling, construction, and development of a 20-inch diameter municipal supply well. The well will be constructed this year to a total depth of 1,150 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, well development, and collection of samples for Title 22 water quality analysis, including PFAS sampling. In office responsibilities include assisting with well design letter, and assisting with the well completion report.

Well Siting and Feasibility Study in the Riverside North Basin – Riverside, CA

Client: Riverside Highland Water Company. 2021 - 2022.

Provided data analysis for an investigation of a potential groundwater extraction well site in the Riverside North Basin. Tasks included the analysis of driller's logs, analysis of bedrock depths, reviewing aerial imagery, estimating saturated groundwater thickness, analysis of groundwater quality data, and a field investigation at ten potential sites to determine the best feasible location for a potential new municipal well. In office responsibilities included ranking of well sites, and preparation of well evaluation summary report.

Thomas Feistel

Senior Project Geologist

During Mr. Feistel's more than 10 years of professional experience he has worked on a broad range of projects spanning from his early work in engineering geology to his current work in hydrogeology. Mr. Feistel's work in the field of engineering geology focused on earthwork and foundation design, including working on large hillside mass grading projects, conducting extensive geologic field investigations, mapping landslides, including determining their rupture surfaces as well as potential mitigation measures.

Mr. Feistel's work in hydrogeology has focused largely on municipal production well siting, construction, development, and testing. These projects have been constructed in both bedrock and soil formations and included: field logging and geophysical logging, isolated aquifer zone testing, well construction, well development, pumping tests data collection and analysis, and collection of groundwater quality samples (including PFAS sampling). Mr. Feistel has also been involved in data and aquifer analysis as well as report writing for these wells.

EDUCATION

B.S., Geology. California State University, Fullerton, 2012

PROFESSIONAL CERTIFICATIONS

California Professional Geologist (No. 9590)

California Engineering Geologist (No. 2799)

PROFESSIONAL EXPERIENCE

February 2024 to Present: *Project Hydrogeologist*, Thomas Harder & Co. Anaheim, California

January 2020 to February 2024: *Senior Staff Geologist*, Earth Mechanics Inc., Fountain Valley, California

February 2018 to January 2020 *Project Geologist*, GeoKinetics, Inc., Irvine, California

June 2013 to February 2018: Senior *Staff Geologist*, NMG Geotechnical Inc., Irvine, California

PROFESSIONAL AFFILIATIONS

National Groundwater Association
South Coast Geological Society – 2026 President

PROJECT EXPERIENCE

Beaumont-Cherry Valley Water District Well 1A - Beaumont, CA

Client: Beaumont-Cherry Valley Water District. 2024 – Ongoing

Provided project management and field inspection during the drilling, construction, and development of a 20-inch diameter municipal supply well. The well will be constructed this year to a total depth of 875 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Management of field tasks including lithologic logging of pilot borehole, monitoring of drilling fluids, inspection of aquifer zone testing, well construction, well development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling. Other management responsibilities include ensuring well construction meets approved standards, attending client meetings, analyzing water qaulity data and well testing data, writing the well design and pumping test, and the well completion reports.

Mile Square Park Irrigation Well – Fountain Valley, CA

Client: Orange County Parks/Orange County Public Works. 2024 - 2025

Provided project management and field inspection during the drilling, construction, and development of a 14-inch diameter supply well. The well was constructed to a depth of 275 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks overseen by Mr. Feistel included lithologic logging of pilot borehole, monitoring of drilling fluids, well construction, well development, and short and long-term pumping tests. Management responsibilities included project management meetings, daily updates to the client, invoice review, writing the well design, pumping test, and well completion reports.

Eastern Tule Groundwater Sustainability Agency Land Subsidence 2023 - 2024 Annual Report , Tulare County, CA

Client: Eastern Tule Groundwater Sustainability Agency. 2024-2025

Work on data collection and analysis throughout the year for the Eastern Tule Groundwater Sustainability Agency (ETGSA), focusing on groundwater levels and land subsidence elevations. Analyze year to year groundwater elevation and land subsidence data in order to determine the current, as well as projected rates of subsidence in the ETGSA. Work on determining possible ways to expand the groundwater data collection and land subsidence elevation networks including: designing and installing new groundwater monitoring wells and new survey benchmark locations.

Twin Dolphin Slant Wells – Cabo San Lucas, Mexico

Client: Vista Serena. 2024 – Ongoing

Provide onsite field inspection and field management during drilling and construction of two 16-inch diameter municipal supply wells. These wells were drilled at angles between 15 and 20

degrees and extend under the ocean. The wells were constructed to depths between 150 to 200 ft below ground surface.

Live Oak Springs Well 6, Live Oak Springs, CA

Client: San Diego County. 2024

Provided project management and field inspection during the drilling, construction, and development of a 8-inch diameter municipal supply well drilled in bedrock via the air-rotary method. The well was constructed to a total depth of 310 ft below ground surface. Management of field tasks including lithologic logging of pilot borehole, well construction, well development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling. Other management responsibilities include ensuring well construction meets approved standards, attending client meetings, analyzing water quality data and well testing data, writing the well design and pumping test, and the well completion reports.

Well Siting and Feasibility near Newman – Newman, CA

Client: MKN and Associates. 2024 - Ongoing.

Provided data analysis for an investigation of a potential groundwater extraction well site in the outside area near the City of Newman in Stanislaus County, CA. The analysis included evaluation of driller's logs, and groundwater quality data from surrounding wells, and existing aquifer conditions as they relate to the larger subbasin. An evaluation of the site was presented in a preliminary design report.

Well Siting for Yorba Linda Water District – Well 23 – Anaheim, CA

Client: Yorba Linda Water District. 2024 - Ongoing.

Provided data analysis for an investigation of a potential groundwater extraction well site. The site was evaluated for existing constituents of concern and the preliminary well was designed specifically to mitigate arsenic, manganese, and total dissolved solids in the future well. Major tasks included the analysis of driller's logs, water quality data for over 20 wells surrounding the area, and analysis of site/aquifer subsurface conditions. An evaluation of the site was presented in a preliminary design report.

Curtis Delgadillo

Staff Geoscientist

BACKGROUND

Mr. Delgadillo's professional experience with oversight and field inspection on projects involving drilling, construction, rehabilitation, and development of municipal water supply wells as well as office work which include assisting with the development of municipal well design, preliminary design report and detailed Technical Specifications. His field experience includes lithologic logging during pilot borehole drilling, observation of geophysical logging, observation of well drilling, isolated aquifer zone testing, construction, airlift and swab development, pumping development. Other field experience includes observation of pre-rehabilitation and post-rehabilitation including, observation of video surveys, pump removal and installation, bailing and brushing, observation of well chemical treatment, and collection of groundwater quality samples, including PFAS treatment.

EDUCATION

B.S., Geology. California State University, Long Beach, 2023

PROFESSIONAL EXPERIENCE

April 2024 to Present: *Staff Geoscientist*, Thomas Harder & Co., Anaheim, California

PROFESSIONAL AFFILIATIONS

Los Angeles Basin Geological Society

PROJECT EXPERIENCE

Beaumont-Cherry Valley Water District Well 1A - Beaumont, CA

Client: Beaumont-Cherry Valley Water District. 2024 – Ongoing

Provided field inspection during isolated aquifer zone testing of a 20-inch diameter municipal supply well. The well was constructed this year to a total depth of 865 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks include well development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling.

Twin Dolphin Slant Wells – Cabo San Lucas, Mexico

Client: Vista Serena. 2024 – Ongoing..

Provide onsite field inspection during pilot borehole drilling using directional drilling, lithologic logging, observation of geophysical logging, well construction, airlift and swab development, pumping development and testing of two 12-inch diameter municipal supply well. The wells were constructed to depths between 150 to 200 ft below ground surface. These wells were drilled at angles between 15 and 20 degrees and extend under the ocean.

Mile Square Park Irrigation Well – Fountain Valley, CA

Client: Orange County Parks/Orange County Public Works. 2024 – 2025

Provide onsite field inspection during pilot borehole drilling, lithologic logging, video survey, and chemical disinfection.

Miramonte Well 1 and 4 – Los Angeles, CA

Client: Golden State Water Company. 2024

Provide onsite field inspection during pilot airlift and swab development, pump development and video surveylithologic logging, observation of geophysical logging, construction, airlift and swab development, pumping development and testing of two 12-inch diameter municipal supply well. The wells were constructed to depths between 150 to 200 ft below ground surface. These wells were drilled at angles between 15 and 20 degrees and extend under the ocean.

Gage Well No. 3 Construction and Well No. 1 Destruction – Bell Gardens, CA

Client: Golden State Water Company. 2024.

Zone testing, well construction, video survey

Celeste Flores

Staff Geoscientist

BACKGROUND

Ms. Flores's professional experience with oversight and field inspection on projects involving drilling, construction, rehabilitation, and development of municipal water supply wells as well as office work which include assisting with the development of municipal well design, preliminary design report and detailed Technical Specifications. Her field experience includes lithologic logging during pilot borehole drilling, observation of geophysical logging, observation of well drilling, construction, airlift and swab development, pumping development. Other field experience includes observation of pre-rehabilitation and post-rehabilitation including, observation of video surveys, pump removal and installation, bailing and brushing, observation of well chemical treatment, and collection of groundwater quality samples.

EDUCATION

B.S., Geology. California State University, Fullerton, magna cum laude, 2019

PROFESSIONAL EXPERIENCE

January 2023 to Present: *Staff Geoscientist*, Thomas Harder & Co., Anaheim, California

PROFESSIONAL AFFILIATIONS

South Coast Geological Society- Digital Community Coordinator

Geological Society of America

PROJECT EXPERIENCE

City of Colton Well 32 and Well 33, Colton, CA

Client: Michael Baker Inc. 2023

Provided field inspection during the construction of 18-inch diameter well 32, constructed to a depth of approximately 910 ft bgs. Provided field inspection during the construction of 18-inch diameter well 33, constructed to a depth of approximately 860 ft bgs. Tasks included mechanical development, zone-testing, pump development, BAC-T Sampling, pump tests and disinfection.

Gage 29-2R, Colton, CA

Client: City of Riverside. 2023

Provided field inspection during the construction of one 20-inch diameter well, constructed to a depth of approximately 990 ft bgs. Tasks included drilling/pilot borehole, lithologic logging, reaming, construction, pump development, video log and Gyro.

Armstrong Well No. 02, Lakewood, CA

Client: Golden State Water Company. 2023

Provided field inspection during the construction of one 18-inch diameter well, constructed to a depth of approximately 1,080 ft bgs. Tasks included construction, mechanical development, pump development, pump tests and disinfection.

Riverside Basin Well 7, Riverside, CA

Client: Western Municipal Water District. 2023

Provided field inspection during the construction of one 16-inch diameter well, constructed to a depth of approximately 330 ft bgs. This well was rehabilitated as part of a preventative maintenance program. Tasks included disinfection and sampling.

Gage Well No. 3 Construction and Well No. 2 Destruction – Bell Gardens, CA

Client: Golden State Water Company. 2023- 2024.

Provided field inspection during the destruction of the existing well, and drilling, construction, and development of an 18-inch diameter municipal supply well. The new well was constructed to a total depth of 820 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of well destruction of Well No.2, Drilling, Construction, logging, mechanical development, pump development, pump tests, disinfection and BAC-T sampling. In office responsibilities include well design letter and well completion report.

Live Oak Springs Well, Live Oak Springs, CA

Client: Infrastructure Engineering Corporation. *2023- 2024.*

Provided field inspection during the construction of one 18-inch diameter well, constructed to a depth of approximately 1,080 ft bgs. Tasks included drilling, logging, reaming, brushing and bailing, construction, mechanical development, pump development, pump tests and disinfection.

Santa Clara and Honby Well Rehabilitation, Santa Clarita, CA

Client: Hazen and Sawyer. 2024.

Provided field inspection during the rehabilitation of two 18-inch diameter well, constructed to a depth of approximately 202 ft bgs and 160 ft bgs. This well was rehabilitated as part of a preventative maintenance program. Tasks included video log. In office responsibilities include assisting well rehabilitation report.

Well AD-5 Rehabilitation, Riverside, CA

Client: Western Municipal Water District. 2024.

Provided field inspection during the rehabilitation of one 16-inch diameter desalter well, constructed to a depth of approximately 150 ft bgs. This well was rehabilitated as part of a preventative maintenance program. Tasks included brushing and bailing, airlift and swab, and disinfection. In office responsibilities include assisting well rehabilitation report.

Miramonte Well 4 – Los Angeles, CA

Client: Golden State Water Company. 2024.

Provide onsite field inspection during pumping development and testing of a 18-inch diameter municipal supply well. The well was constructed to depths of 1,370 ft below ground surface. In office responsibilities include assisting pump test letters and well completion report.

Compton-Doty Well No. 2 Construction and Well No. 1 Destruction – Lawndale, CA

Client: Golden State Water Company. 2024 – 2025.

Provided onsite field inspection during the destruction of the existing well and drilling, construction, and development of an 18-inch diameter municipal supply well. The new well was constructed to a total depth of 530 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of video log, brush and bail for Well No. 1, excavation, well destruction, pilot borehole drilling, E-Log, reaming, mechanical development, and pump development. In office responsibilities include well design letter, pumping test letter and the well completion report.

Mile Square Park Irrigation Well – Fountain Valley, CA

Client: SYRUSA Engineering/ Orange County Parks/Orange County Public Works. 2024 – 2025.

Provide onsite field inspection of the drilling, construction, and development of an 18-inch diameter irrigation supply during pilot borehole drilling, lithologic logging, reaming, pump development, video survey, and chemical disinfection. In office responsibilities include sieving, well design letter, and well completion report.

Beaumont-Cherry Valley Water District Well 1A and 2A - Beaumont, CA

Client: Beaumont-Cherry Valley Water District. 2024 – Ongoing.

Provided field inspection during isolated aquifer zone testing of a 20-inch diameter municipal supply well. The well was constructed this year to a total depth of 865 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks include pilot borehole drilling, logging, zone testing, construction, mechanical development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling. In office responsibilities include sieving, and well design letter.

YLWD Well 21 Rehabilitation, Yorba Linda, CA

Client: Hazen and Sawyer. 2024.

Provided field inspection during the rehabilitation of two 18-inch diameter well, constructed to a depth of approximately 202 ft bgs and 160 ft bgs. This well was rehabilitated as part of a preventative maintenance program. Tasks included video log, brush and bail, and mechanical development- airlift and swab. In office responsibilities include assisting well rehabilitation report.

Jesse Patrick

Staff Geoscientist

BACKGROUND

Ms. Patrick's has more than a year of professional experience with oversight and field inspection on projects involving drilling, construction, rehabilitation, and development of 6 high-capacity municipal water supply wells as well as office work which include assisting with the development of municipal well design, preliminary design reports and detailed Technical Specifications. Her field experience includes lithologic logging during pilot borehole drilling, observation of geophysical logging, observation of well drilling, isolated aquifer zone testing, construction, airlift and swab development, pumping development and pumping tests. Ms. Patrick also has experience with various aspects of regional groundwater basin studies including compilation of large hydrogeological databases, and analyses for water budget components.

EDUCATION

M.S., Geology. Auburn University, 2023

B.S., Geology. Environmental Science Co-Major. Miami University, 2021

PROFESSIONAL EXPERIENCE

April 2024 to Present: *Staff Geoscientist*, Thomas Harder & Co., Anaheim, California

PROJECT EXPERIENCE

Beaumont-Cherry Valley Water District Well 1A and 2A - Beaumont, CA

Client: Beaumont-Cherry Valley Water District. 2024 – Ongoing.

Provided field inspection during isolated aquifer zone testing of two separate 20-inch diameter municipal supply wells. The wells were constructed a total depth of 865 and 845 ft below ground surface. The borehole for the wells was drilled using a fluid reverse circulation drilling rig. Field tasks for the two wells include zone testing, well development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling.

Compton-Doty Well No. 2 Construction and Well No. 1 Destruction – Lawndale, CA

Client: Golden State Water Company. 2024 – 2025.

Provided onsite field inspection during the destruction of the existing well and drilling, construction, and development of an18-inch diameter municipal supply well. The new well was constructed to a total depth of 530 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling. In office responsibilities include preliminary design report, technical specifications, permitting, well design letter, pumping test letter and the well completion report.

Twin Dolphin Slant Wells – Cabo San Lucas, Mexico

Client: Vista Serena. 2024 – 2025.

Provide onsite field inspection during pilot borehole drilling using directional drilling, lithologic logging, observation of geophysical logging, well construction, airlift and swab development, pumping development and testing of two 12-inch diameter municipal supply well. The wells were

constructed to depths between 150 to 200 ft below ground surface. These wells were drilled at angles between 15 and 20 degrees and extend under the ocean.

Mile Square Park Irrigation Well – Fountain Valley, CA

Client: Orange County Parks/Orange County Public Works. 2024 – 2025.

Provide onsite field inspection during pilot borehole drilling, lithologic logging, video survey, and chemical disinfection.

Miramonte Well 1 and 4 – Los Angeles, CA

Client: Golden State Water Company. 2024.

Provide onsite field inspection during pilot airlift and swab development, pump development and video surveylithologic logging, observation of geophysical logging, construction, airlift and swab development, pumping development and testing of two 12-inch diameter municipal supply well. The wells were constructed to depths between 150 to 200 ft below ground surface. These wells were drilled at angles between 15 and 20 degrees and extend under the ocean.

Gage Well No. 3 Construction and Well No. 1 Destruction – Bell Gardens, CA

Client: Golden State Water Company. 2024.

Provided field inspection during the destruction of the existing well, and drilling, construction, and development of an 18-inch diameter municipal supply well. The new well was constructed to a total depth of 830 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling. In office responsibilities include preliminary design report, technical specifications, permitting, well design letter, pumping test letter and the well completion report

Arlington Desalter 5 (AD-5) Rehabilitation – Riverside, CA

Client: Golden State Water Company. 2024.

Provided field inspection during the destruction of the existing well, and drilling, construction, and development of an 18-inch diameter municipal supply well. The new well was constructed to a total depth of 830 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling. In office responsibilities include preliminary design report, technical specifications, permitting, well design letter, pumping test letter and the well completion report

Juan Gonzalez

Staff Geoscientist

BACKGROUND

Mr. Gonzalez' professional experience with oversight and field inspection on projects involving drilling, construction, rehabilitation, and development of municipal water supply wells as well as office work which include assisting with the development of municipal well design, preliminary design report and detailed Technical Specifications. His field experience includes lithologic logging during pilot borehole drilling, isolated aquifer zone testing, observation of geophysical logging, observation of well drilling, construction, airlift and swab development, pumping development. Other field experience includes observation of pre-rehabilitation and post-rehabilitation including, observation of video surveys, pump removal and installation, bailing and brushing, observation of well chemical treatment, and collection of groundwater quality samples, including PFAS sampling.

EDUCATION

B.S., Geology. California State University, Long Beach, 2024

A.S., Geology. Cerritos Community College, 2022

PROFESSIONAL EXPERIENCE

April 2025 to Present: *Staff Geoscientist*, Thomas Harder & Co., Anaheim, California

January 2023 to May 2024: Student Research Assistant, Long Beach, California

PROFESSIONAL AFFILIATIONS

Los Angeles Basin Geological Society

PROJECT EXPERIENCE

Beaumont-Cherry Valley Water District Well 1A and 2A - Beaumont, CA

Client: Beaumont-Cherry Valley Water District. 2024 – Ongoing.

Provided field inspection during isolated aquifer zone testing of two separate 20-inch diameter municipal supply wells. The wells were constructed a total depth of 865 and 845 ft below ground surface. The borehole for the wells was drilled using a fluid reverse circulation drilling rig. Field tasks that Juan Gonzalez directly supervised for the two wells include: pilot borehole drilling, zone testing, reaming, well development, short and long-term pumping tests, and collection of samples for Title 22 water quality analysis, including PFAS sampling.

Arlington Desalter 5 (AD-5) Rehabilitation – Riverside, CA

Client: Golden State Water Company. 2024.

Provided field inspection during the destruction of the existing well, and drilling, construction, and development of an 18-inch diameter municipal supply well. The new well was constructed to a total depth of 830 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation

drilling rig. Field tasks included inspection of aquifer zone testing, well construction, and collection of samples for water quality analysis, including PFAS sampling. In office responsibilities

Compton-Doty Well No. 2

Client: Golden State Water Company. 2025.

Provided field inspection during the development of an18-inch diameter municipal supply well. The new well was constructed to a total depth of 530 ft below ground surface. The borehole for the well was drilled using a fluid reverse circulation drilling rig. Field tasks included inspection of pump development, disinfection, and collection of samples for water quality analysis, including PFAS sampling.

In office responsibilities included analysis of pump test data and creating figures for the final report.

Bear Valley Basin Well Siting TM

Client: Big Bear City Community Services District. 2025.

Provided the evaluation of seven potential well sites and presented data, criteria, methodologies and results for the ranking of the seven sites. Additionally, recommendations for future replacement production wells were also given.

SAFA KAMANGAR, PE, PMP, CCM, QSD/P

QA/QC

EDUCATION

- MS, Civil Engineering, University of Tehran, Iran
- BS, Civil Engineering, Azad University, Tehran, Iran

LICENSES & REGISTRATIONS

- Professional Civil Engineer, CA No. 70118
- Project Management Professional (PMP), No. 1863656
- Certified Construction Manager, No. 6341
- Qualified SWPPP Developer/Practitioner (QSD/QSP), CA No. 23059
- OSHA 30-Hour Construction Outreach Training
- OSHA 40-Hour HAZWOPER Certification
- OSHA Confined Space Training

PROFESSIONAL ASSOCIATIONS

- American Public Works Association (APWA)
- American Society of Civil Engineers (ASCE)
- American Water Works Association (AWWA)
- Iranian American Society of Engineers and Architects (iaSEA)
- Orange County Water Association (OCWA)

YEARS OF EXPERIENCE

- 2023 Start Year with MKN
- 1997 Start Year of Total Experience

Safa Kamangar is a highly experienced professional with expertise in water, wastewater, and water reuse since 1997. As a design engineer, Safa has provided hydraulic calculations, mechanical design, detailed design drawings, and development of specifications. He has a strong background in planning, design, and construction management, gained from working in both the private and public sectors. His expertise encompasses design, construction, and commissioning of water/wastewater infrastructure, including more than 50 pumping facilities, 15 wells, and more than 150 miles of pipeline ranging from 4 inches to 72 inches in diameter.

Well No. 7 Equipping and Discharge Pipe | Western Municipal Water District (WMWD), Riverside, CA

Project Manager. The project constructed a new groundwater well to augment the non-potable water supply in Riverside County. The scope of work included providing survey, environmental and California Environmental Quality Act (CEQA) review, final equipping design, and construction support services to equip the new well. The project included a deep well pump 150-foot-below the ground surface, a 200-hp electric motor and its control system, and approximately 2,600 feet of new transmission pipeline. The new pumping facility is housed in a new masonry block wall building.

Downey Wells | City of Downey, CA

Technical Manager. Provided project management services. Provided engineering services for the design, installation, and equipping of two new groundwater wells for the city's water system. With each well anticipated to supply 2,500 gallons of water per minute to the city's distribution potable system, the combined total well production could account for 25 percent of the city's future potable water needs. The project began with a comprehensive geohydrological, engineering, and hydraulic assessment of six

alternative well sites. This assessment addressed site-specific needs, evaluated site suitability for well construction and operation, and identified required off-site pipeline facilities. Two preferred sites were selected. Subsequent tasks included ensuring environmental and regulatory permitting compliance; preparing a preliminary design report; developing design plans and technical specifications for the equipping of both wells. (subconsultant to Geoscience Support Services Inc.)

Leahy Avenue Well Drilling and Equipping | Bellflower Somerset Mutual Water Company, Bellflower, CA

Project Manager. The project consisted of engineering and hydrogeological services for preliminary and final design (PS&E Preparation) as well as construction support and inspection services. The work included the abandonment of an existing well and the drilling and equipping of a new high-capacity groundwater well, located on their property at 14740 Leahy Avenue. The project resulted in a fully functional and reliable water well capable of producing sustained yields of high-quality water for domestic uses.

Drilling and Equipping of Wells 29 and 30 | City of Corona, CA

Project Manager/Resident Engineer. This project involved design and developing plans and specifications for equipping two new wells. The scope of work consisted of selecting pumps and designing mechanical and electrical components of the two new wells in the city. Well 29 was designed to be housed in a CMU block wall building whereas Well 30 was designed at the corner of the city yard and protected by a shade structure. Also provided on-site resident engineering services during drilling, casing, and soils inspection; E-Log interpretation; casing and screening design; mechanical and chemical development of the wells; and pump station design, review, and response to the shop drawings and RFIs.

Wells 27 and 28 | City of Downey, CA

Project Manager. Provided engineering services for the design, installation, and equipping of two new groundwater wells for the city's water system. With each well anticipated to supply 2,500 gallons of water per minute to the city's distribution potable system, the combined total well production could account for 25% of the city's future potable water needs. Project tasks included environmental and regulatory permitting compliance; preparing a preliminary design report; developing design plans and technical specifications for the equipping of both wells; and providing engineering support, construction coordination, and inspection services during construction. (subconsultant to Geoscience Support Services Inc.)

Portola Park Well | City of La Habra, CA

Project Manager. This design-build project consisted of a well for the City of La Habra. The 150-hp well pump and motor were designed to be 350 feet deep and capable of producing 1100-gpm of groundwater conveyed through a 12-inch PVC-C900 pipeline into the City's La Bonita Park blending reservoir. The station connects to the City's SCADA system for fully automatic operation.

OMID KHODADADI, PE, PMP

ELECTRICAL CONDITION ASSESSMENT

EDUCATION

- BS, Electrical Engineering, University of Waterloo, Ontario, Canada

LICENSES & REGISTRATIONS

- Professional Electrical Engineer,
  CA No. 24564
  AZ No. 84165
  CO No. 0066782
  ID No. 2871455
  IL No. 062.075755
  LA No. 49055
  MI No. 6201313388
  ND No. 41218
  NJ No. 24GE06117100
  NV No. 029417
  TX No. 153131
  WY No. 21120
  ON No. 100216677
- Project Management Professional (PMP), PMI No. 6113229

PROFESSIONAL ASSOCIATIONS

- Orange County Water Association (OCWA)

YEARS OF EXPERIENCE

- 2025 Start Year with MKN
- 2014 Start Year of Total Experience

Omid Khodadadi is a registered principal electrical engineer with experience since 2014 in power and control systems design and construction across diverse sectors including water and wastewater, mining, transportation, and oil and gas. He has led multidisciplinary teams and served as the engineer-of-record on various-sized projects throughout the United States and Canada. He is well versed on the latest codes and standards (e.g., IEEE, NFPA, and API), making him a valuable senior technical leader in both public- and private-sector infrastructure development.

Power System and Infrastructure Projects | AECOM (2019–2022), Multiple Locations, CA

Electrical Engineer. Omid managed and delivered power system studies for public- and private-sector clients, including short-circuit analysis, load flow, coordination studies, arc-flash risk assessments, and harmonic studies for new and existing power distribution systems. He developed and reviewed system protection and control schemes for buses, transformers, feeders, and motor loads (e.g., zone selective interlocking, differential protection), ensuring compliance with utility requirements. He modeled and analyzed complex electrical power distribution and generation systems using ETAP, EasyPower, and SKM and he contributed to the design and construction of water and wastewater facilities, transportation infrastructure, and buildings, adhering to applicable codes and standards. He conducted site assessments, participated in construction and commissioning meetings, and led progress reviews across all project phases. He also coordinated electrical designs with other disciplines to address requirements, resolve interferences, and ensure construction feasibility.

Wells 14 and 16 Hexavalent Chromium Treatment Facilities | City of Vacaville, CA

Principal Electrical Engineer. The project consists of planning, design, and construction of 2.4- and 2.8-MGD reduction-coagulation filtration facilities for Wells 14 and 16 (respectively) with reduction contactors, filtration treatment trains, a ferrous chloride storage and injection facility, and modifications to the existing fluoride- and sodium hypochlorite storage and injection systems for removal of hexavalent chromium from groundwater. The primary goal of the facility was to reduce the hexavalent chromium concentrations of each well below state the-mandated maximum contaminant level of 10 µg/L. Evaluated reverse osmosis, strong- and weak-base anion exchange and reduction-coagulation filtration with traditional pyrosulsite advantage- and Wateropolis Cerapure medias as feasible contaminant reduction strategies. Prepared Basis of Design Report, construction plans, specifications, and cost estimates for process/mechanical, civil, electrical, and instrumentation/controls design disciplines. (Ongoing) Design and preparation of electrical/I&C scope pertaining to the new filtration treatment trains, consisting of LV power distribution to process equipment and associated instrumentation/controls, as well as connecting to the existing power distribution system and the station's main PLC panel.

Solids Handling Facility Improvements | Central Contra Costa Sanitation District, Contra Costa County, CA

Senior Electrical Engineer. Omid managed construction support services as well as electrical and controls design drawings/specifications changes. He reviewed equipment submittals as part of construction support services for new wet scrubbers and incinerator burner controls for the existing incinerator system at the wastewater treatment plant. He also managed and coordinated the internal as well as external electrical design team that comprised several other consultants and subcontractors.

Tamiment Well No. 1R, Water Treatment Building, and Tank Modifications | Community Utilities of Pennsylvania, Pike County, PA

Senior Electrical Engineer. The project included a power distribution system design (240 V 3 Ph, High Leg Delta) and coordination of instrumentation and control. It also included an outdoor standby generator, an automatic transfer switch, associated duct banks, and a new treatment building.

Lemay Pump Station Medium Voltage Variable Frequency Drive (VFD) Improvements | Metropolitan St. Louis Sewer District, Lemay, MO

Senior Electrical Engineer. Omid prepared a comprehensive feasibility report and proposed a new VFD synchronous transfer gear to utilize the existing 5-kV 1,250-hp Rockwell Powerflex 7000 VFD to start the existing 1,250-hp synchronous pumps sequentially. The report included design alternatives to keep the plant operational with several different options and cost implications.

KEVIN SALEH, PE

MECHANICAL CONDITION ASSESSMENT

EDUCATION

- BS, Civil Engineering, University of Tabriz, Iran
- Computer Programming/System Analysis, Seneca Polytechnic, Toronto, Canada
- Project Management (PM) Certificate, Cornell University, Ithaca, NY

LICENSES & REGISTRATIONS

- Professional Civil Engineer, CA No. 90535
- Professional Civil Engineer, MD No. 36759
- Associate Design-Build Professional, DBIA

PROFESSIONAL ASSOCIATIONS

- American Membrane Technology Association (AMTA)
- Water Environment Federation (WEF)

YEARS OF EXPERIENCE

- 2023 Start Year with MKN
- 1994 Start Year of Total Experience

Kevin Saleh is an experienced civil engineer providing planning, design, construction management, and construction support services for public works projects, with specific areas of practice in water and wastewater. His experience includes water distribution and treatment facilities, pumping facilities, treatment plant projects/processes, reservoirs, pressure reducing, and surge facilities. Wastewater projects include conveyance systems, pumping stations, and treatment plant projects and processes.

Pierce Street Sewer Pump Station Condition Assessment | City of Riverside, CA

Project Manager. The Pierce Pump Station is the largest wastewater lift station in the City of Riverside and handles an average of 4.5 MGD. The condition assessment for the Pierce Street Sewer Pump Station to address the operational challenges the pump station is experiencing, including nonoperational valves, leakage from the wet well into the dry well, aging mechanical equipment, and outdated electrical components.

Wood Road Sewer Pump Station Assessment | City of Riverside, CA

Project Manager. The City of Riverside (City) is currently experiencing operational challenges at the Wood Road sewer pump station. Some of the issues are heavy ragging, extended ramp-up time of the VFDs, pumps not operating at the recommended efficiency level, and, most recently, failure of the ultrasonic sensors. As Project Manager, Kevin is leading a team to assess the current conditions of the Wood Road pump station and recommend modifications to the current operations and programming of the station. The desired outcome is to reduce the ragging problem, to have the pumps working at their recommended efficiency level, and to resolve any major flaws discovered during the assessment process.

Equipping of Wells No. 32 and 33 | County of Corona, CA

Project Engineer. As Design Engineer, prepared multi-disciplinary design documents for Corona Wells No. 32 and 33, including well equipping; discharge and pump-to-waste piping with valves/appurtenances; architectural/site planning and grading; and stormwater drainage design (hydrology, inlets/trench drains, pipe routing to tie-in, water-quality BMPs in accordance with City/MS4/WQMP requirements). I also completed standby generator sizing with pad/foundation details, and coordinated electrical/SCADA integration and construction phasing to maintain operations.

Pin Court Well Equipping and PFAS Treatment | Santa Clarita Valley Water Agency, Santa Clarita, CA

Principal Engineer. Led development of the Preliminary Design Report (PDR) for SCV Water's Pin Court Well PFAS Treatment Project, establishing the design basis and advancing the project toward detailed design, permitting, and construction. Defined project objectives and scope; developed the conceptual site layout and civil constraints (two-gate truck circulation, crane access, grading/drainage to adjacent channel, residential interface, security, and underground utility coordination); and prepared well equipping concepts including preliminary pump/TDH sizing, discharge piping, pump-to-waste strategy, and operational considerations. Evaluated PFAS treatment alternatives and selected a compact ion exchange (IX) approach with cartridge prefiltration and lead–lag vessels sized for 850 gpm, coordinated disinfection via on-site chloramination, and established materials/compliance requirements (NSF/ANSI standards) to support DDW approvals. Produced clear technical narratives, criteria tables, and design recommendations aligned with SCV Water standards and constructability needs.

Eastern Wells and Pipeline | City of San Juan Capistrano, CA

Project Engineer. Kevin was responsible for the pipeline design, construction inspection, and support of the project, which included two raw water wells and 9,000 feet of 16-inch AWWA C905 collection pipeline between the wells and the City's Groundwater Recovery Plant. This project also included the construction of the pipeline in the bike path under the I-5 Bridge crossing over San Juan Creek. Caltrans permit engineer required that the 16-inch carrier pipe be constructed inside a 24-inch steel casing pipe. He was responsible for the engineering, design, and construction support of two replacement groundwater wells. The wells were both drilled in a shallow aquifer (15 to 100-ft BGS) using an adapted auger method to reduce the need for drilling fluids and increase production. Both wells utilize 75-hp electric motors to produce up to 700 gpm of raw groundwater. The well facilities each include 22ft x 18ft slump stone well houses, Variable Frequency Drives, 8-inch Ductile Iron discharge lines, 4-inch PVC pump-to-waste lines, and concrete pump-to-waste cisterns.

Thomas Harder & Co.
Groundwater Consulting

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SWEETWATER AUTHORITY

Cost Estimate for Hydrogeological Services
Well Rehabilitation and Maintenance Program

Task	Sub Task	Description	Principal Hydro-Geologist $260/hr	Senior Hydro-Geologist $190/hr	Project Hydro-Geologist $165/hr	Staff Hydro-Geologist $145/hr	Graphics $130/hr	Clerical $100/hr	Total Labor	Reimbursable Expenses[1]	Total Cost
1	**Data Collection, Review and Project Coordination**										
		Gather and analyze data and background information on all wells including well construction, current groundwater levels, rehabilitation and testing history, and downhole video surveys. Attendance at one kick-off meeting, and progress meetings.	14	44		60	8	8	$22,540	$75	$22,615
		MKN & Associates Task 1							$14,832	$0	$14,832
								Subtotal Task 1	**$37,372**	**$75**	**$37,447**
2	**Field Assessments and Condition Evaluation**										
		Onsite well and pump, motor, electrical evaluations. Site accessibility and safety confirmation. Review of performance data and preliminary additional testing information.	10	40		132	40		$34,540	$325	$34,865
		MKN & Associates Task 2							$54,800	$2,000	$56,800
								Subtotal Task 2	**$89,340**	**$2,325**	**$91,665**
3	**Rehabilitation Planning, Maintenance Strategy, and Program Development**										
	3.1	Develop Well Rehabilitation and Maintenance Program	6	72		40			$21,040		$21,040
	3.2	Create Well Life Cycle Cost Analysis	2	20		24			$7,800		$7,800
		MKN & Associates Task 3							$31,688		$31,688
								Subtotal Task 3	**$60,528**	**$0**	**$60,528**

Cost Estimate for Hydrogeological Services
Well Rehabilitation and Maintenance Program

Task	Sub Task	Description	Principal Hydro-Geologist $260/hr	Senior Hydro-Geologist $190/hr	Project Hydro-Geologist $165/hr	Staff Hydro-Geologist $145/hr	Graphics $130/hr	Clerical $100/hr	Total Labor	Reimbursable Expenses[1]	Total Cost
4	**Final Program Preparation and Deliverables**										
	4.1	Prepare Draft Report	4	30		32	16	4	$13,860		$13,860
	4.2	Prepare presentation for Authority and present findings	2	8		12			$3,780		$3,780
	4.3	Address comments and Submit Final Report[2]	2	8		24			$5,520		$5,520
	MKN & Associates Task 4								$8,400		$8,400
								Subtotal Task 4	**$31,560**	**$0**	**$31,560**
								Total Tasks 1 through 4	**$218,800**	**$0**	**$221,200**
	Optional: Onsite Pump Removal and Video or Observation										
	Optional: Observation of pump removal and downhole video and CITM surveys (cost per well)			6		20			$4,040	$75	$4,115

[1] Reimbursable expenses include driving mileage, hotel stay, and per diem.

[2] Assumes preparation of one draft version (electronic submittal only) and one final version (electronic submittal only).

Sweetwater Authority | Proposal for

DEVELOPMENT OF THE WELL REHABILITATION & MAINTENANCE PROGRAM

March 13, 2026

WOOD RODGERS

BUILDING RELATIONSHIPS, *ONE COMMUNITY AT A TIME.*

At Wood Rodgers, we fulfill our mission by building value and relationships in not only the physical structures we create but also in our communities where we live and work!

Together, we shape the future of urban spaces.

We dedicated our charity spin to Urban Roots in support of STEM Education programs.

WR's awarded a $25K endowment scholarship to CSU Sacramento in honor of one of our own, supporting future engineers.

We became an event sponsor for Envirolution in support of a greener tomorrow.

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March 13, 2026

Kyehee (Kay) Kim, Engineering Manager of
Water Resources and Environmental
Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910

RE: PROPOSAL FOR DEVELOPMENT OF THE WELL REHABILITATION AND MAINTENANCE PROGRAM

Dear Ms. Kim,

Wood Rodgers is pleased to submit our proposal to Sweetwater Authority (Authority) for the development of a comprehensive Well Rehabilitation and Maintenance Program. We understand the importance of a structured, data driven program to support the Authority's mission of providing a safe and reliable water supply using best available technologies and sound management practices. With several groundwater production wells operating for decades, and thirteen wells supporting both desalination and potable supply operations, we recognize the critical need to evaluate current well conditions, streamline preventive maintenance, and ensure long term asset reliability.

Wood Rodgers brings the multidisciplinary hydrogeologic, engineering, and program management expertise needed to deliver the well by well assessments, rehabilitation recommendations, and long term planning tools described in the RFP's Scope of Services (Tasks 1–4). Our team has extensive experience completing well condition evaluations, performance diagnostics, rehabilitation design, and maintenance planning for municipal groundwater systems across California. We emphasize rigorous data collection and defensible analysis, including review of construction logs, historical performance, geochemistry, aquifer response, and mechanical/electrical conditions, to ensure that each recommendation is grounded in measurable results and aligned with operational priorities.

We understand that the Authority requires a partner who can clearly communicate findings, collaborate closely with staff, and maintain schedule discipline to deliver the final program by August 2026. Wood Rodgers has a proven record of successful project delivery supported by hands on involvement from senior technical staff and project managers. Our approach emphasizes transparency, responsiveness, and structured coordination through kickoff meetings, milestone check ins, and well documented deliverables, ensuring full alignment as we progress from field assessment to rehabilitation planning and final program development.

- **HYDROGEOLOGIC AND WELL REHABILITATION EXPERTISE |** Our engineers and hydrogeologists bring decades of experience evaluating, designing, and rehabilitating municipal wells, including brackish groundwater and complex treatment facility interfaces.
- **COMPREHENSIVE WATER SYSTEMS CAPABILITY |** We bring deep experience with groundwater wells, treatment, conveyance systems, hydraulic modeling, CIP planning, and regulatory compliance, ensuring a holistic, system aware approach to program development.
- **EVIDENCE BASED ASSESSMENT METHODS |** Our data driven methodology aligns directly with the Authority's objective to evaluate well conditions, identify operational deficiencies, and develop short and long term maintenance strategies.
- **PROVEN TRACK RECORD |** Wood Rodgers has provided condition assessments for nearly 200 municipal wells with a majority incorporating a rehabilitation prioritization plan and developing a data collection and maintenance program.

Wood Rodgers takes no exceptions to the RFP and presents this proposal as a firm offer valid for 90 days. We appreciate the opportunity to support the Authority in strengthening the long term performance and reliability of its groundwater production wells. Should you have any questions, please contact me at 657.549.3441 or jsobolew@woodrodgers.com.

Thank you for your consideration. We look forward to partnering with you on this important program.

Sincerely,

Josh Sobolew, PG, CHG
Senior Hydrogeologist

2. IDENTIFICATION OF RESPONDER

Established in 1997, Wood Rodgers, Inc. (Wood Rodgers) is dedicated to delivering exceptional service to our clients, fostering a positive work environment for our employees, and creating lasting societal value through our work. The company was founded by two engineers with a vision to establish a dynamic and innovative engineering firm focused on client needs and staff growth. Over the last 29 years, Wood Rodgers has evolved into a unique company that emphasizes innovation and quality in every project, while meeting deadlines, budgets, and environmental requirements.

Wood Rodgers operates as a California corporation with a diverse team of more than 390 professionals supporting projects across California and Nevada. Our team is composed of registered civil, transportation, traffic, structural, and geotechnical engineers; land planners; licensed surveyors; certified floodplain managers; hydrologists; certified hydrogeologists; landscape architects; LEED-accredited professionals; and GIS specialists. With extensive experience in both public and private projects, our adaptable team collaborates effectively with other professionals and clients to deliver high-quality engineering services that address economic challenges and aesthetic preferences.

Year Established | 1997

Wood Rodgers, Inc. was founded in 1997 by two engineers who set out to create an innovative engineering firm focused on the needs of their clients.

Number of Employees | 390+

Our staff includes engineers; planners; hydrogeologists; geologists; project management professionals; land surveyors; floodplain managers; landscape architects; stormwater developers; and LEED Accredited Professionals.

Areas of Expertise

- Civil Engineering
- Transportation Engineering & Planning
- Environmental
- Flood Control Engineering
- Hydrogeology
- Water Treatment
- Well Design
- Pump Station Design
- Structural Engineering
- Land Planning
- Landscape Architecture
- Mapping/Surveying
- GIS Applications

Corporate Office

3301 C Street, Building 100 B | Sacramento, CA 95816 |
Tel: 916.341.7760 | Fax: 916.341.7767 | www.woodrodgers.com

Branch Locations

Sacramento | Roseville | Pleasanton | Oakland | Orange | San Diego | Reno | Las Vegas

PRIMARY CONTACT
JOSH SOBOLEW, PG, CHG
(657) 549-3441 | jsobolew@woodrodgers.com
606 E Chapman Ave Ste 200 | Orange, CA 92866

Wood Rodgers has a proven track record of successfully managing and completing numerous award-winning projects, securing approvals from local, state, and federal agencies when necessary. We pride ourselves on the active involvement of our principals and management in project delivery, ensuring responsiveness to clients' needs. Our established relationships with government agencies further facilitate the smooth execution of our projects. At Wood Rodgers, we believe that our clients' success is our success.

Water is a critical urban resource, and if it is well planned, it can stimulate urban growth and ensure a constant supply of water to customers. Delivering it to customers with the highest quality and reliability is becoming a very complex task that Wood Rodgers, Inc. has successfully achieved in past projects. Wood Rodgers can help evaluate current systems or engineer new systems and prepare and implement a program that will satisfy customers beyond their expectations.

Wood Rodgers' engineering and program management services related to water management include domestic and recycled water system design, hydraulic network analysis, construction inspection, utility base mapping, source assessments, and improvement plan processing.

Our approach to managing water projects is unique and flexible where we can work as part of an overall team, supplementing existing personnel where needed. Or, we can utilize all of our water supply expertise on the client's behalf by managing projects completely from start to finish. Whether the water system is aging and in need of rehabilitation, needs to expand to keep up with development, or needs to meet the latest state and federal regulations, the talented designers, engineers and project managers at Wood Rodgers have the experience, proven ability and desire to find innovative solutions to all water supply challenges. Our firm's Water Supply services include:

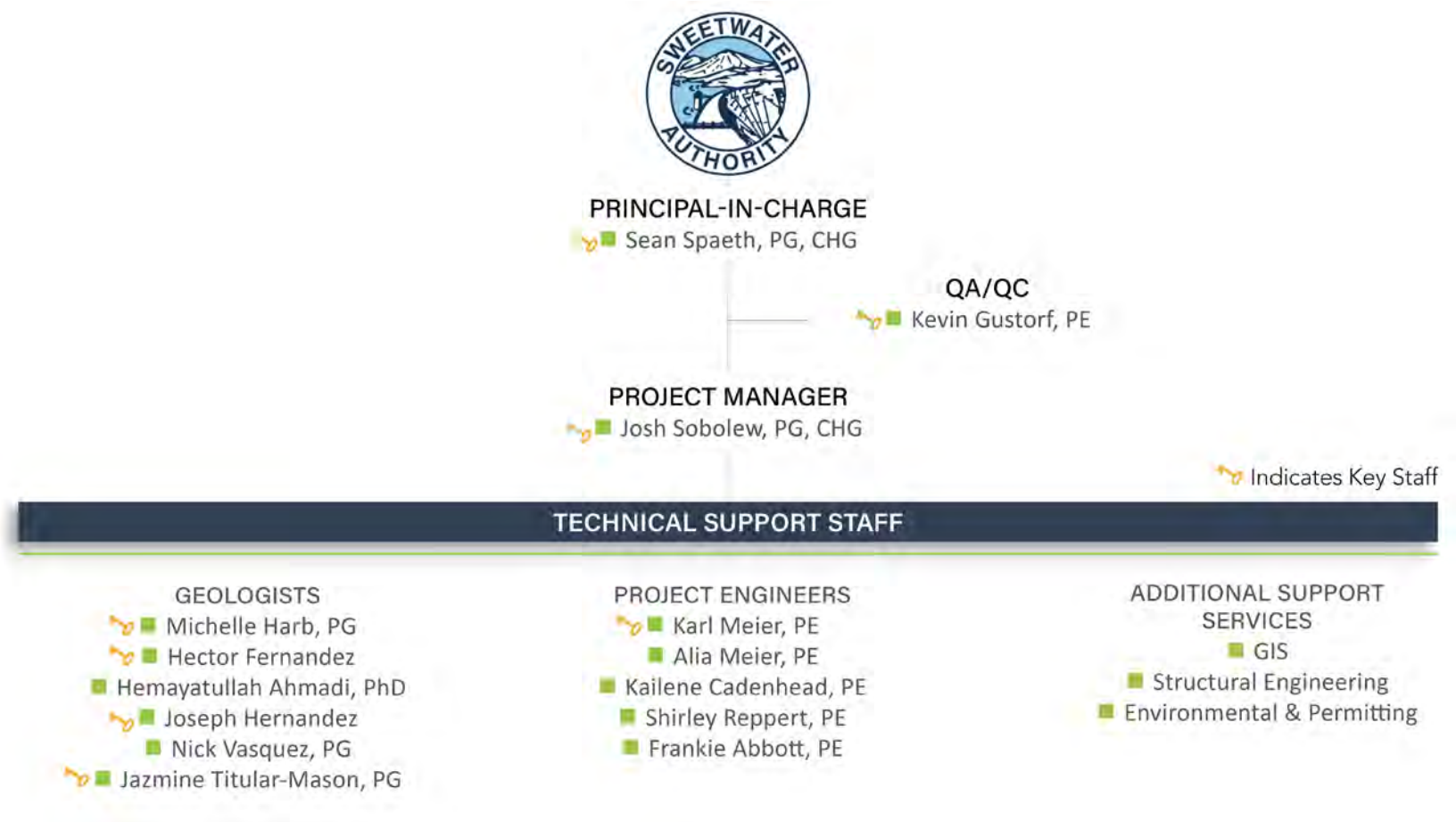
- Capital Improvement Programs
- Hydraulic Network Modeling and Calibration
- Urban Water Management Planning
- Drinking Water Source Assessments
- Master Plans
- Water Treatment Plant Design
- Groundwater Well Design
- Trenchless Pipeline Design
- Recycled Water Conveyance
- Water Transmission Main and Distribution Design
- Water Storage and Booster Station Design
- Well Profiling, Rehabilitation, and Modification Designs

3. FINANCIAL RELATIONSHIPS DISCLOSURE(S)

Wood Rodgers, Inc. confirms that there are no existing or past financial relationships between our firm and any current members of the Authority's Governing Board or staff, nor with any entities for which said members are employed or have a financial interest, either past or present.

4. CONSULTANT'S ORGANIZATION AND KEY PERSONNEL

We have carefully selected Team members based on their relevant project experience and availability to fully commit to this contract. Short biographies for each key Team member are provided, with full resumes available upon request. Our Team is dedicated to supporting this project and will remain available for its duration to ensure successful delivery.



SEAN SPAETH, PG, CHG | Principal-in-Charge

Office Location: 3741 Douglas Blvd Suite 150, Roseville, CA 95661

Sean, a California Professional Geologist and Certified Hydrogeologist, brings over 21 years of experience managing groundwater resource projects for public and private clients. He has led the design, budgeting, and execution of a wide range of projects, including municipal well design, construction management, and groundwater basin assessments. Sean has assessed over 150 production wells, developing effective rehabilitation programs to restore capacity and improve quality. He has extensive experience in groundwater management, including developing conceptual hydrogeologic models, supporting SGMA Groundwater Sustainability Plans, and implementing basin monitoring programs. Sean has overseen the drilling of over 140 exploratory test holes and the construction of over 120 production wells, including ASR wells. His leadership ensures technically sound and cost-effective solutions tailored to complex groundwater challenges.

JOSH SOBOLEW, PG, CHG | Project Manager

Office Location: 606 E Chapman Ave Ste 200, Orange, CA 92866

Joshua is a California-registered Professional Geologist and Certified Hydrogeologist with 14 years of experience in the water resource industry, providing well design, construction management and inspection services for many large-scale municipals well installation projects, as well as numerous monitoring wells, piezometers, exploratory boreholes, and well rehabilitation and redevelopment projects. His expertise is hydrogeologic data analysis and interpretation, pump design support, well permitting, well siting studies, developing drilling and rehabilitation plans and specifications, preliminary design reports, characterization of groundwater basins, and well field assessments. Josh experience also includes recharge investigations, water quality profiling of wells, and data collection and management for large scale groundwater recharge and desalination projects.

KEVIN GUSTORF, PE | QA/QC

Office Location: 3301 C Street, Building 100B, Sacramento, CA 95816

Kevin Gustorf is a professional civil engineer with 26 years of leadership and expertise in the water resources field. His water resource engineering experience includes the planning, design, construction, and management of a wide variety of projects for local municipal public works agencies, special districts, and private sector clients throughout California. His diverse project experience includes water and wastewater master planning, hydraulic modeling, and hydraulic analysis and studies. He is an expert on several different modeling platforms and has conducted presentations on modeling throughout the Western U.S. Kevin's design experience includes water and wastewater pipelines, pump stations, lift stations, flow/pressure control facilities, wells, tanks, and reservoirs for new facilities, as well as the repair and rehabilitation of existing facilities. His leadership experience includes managing projects ranging from small task orders to large, multi-discipline projects with multi-million-dollar design fees. As project manager, Kevin's focus is on achieving client goals in delivering quality projects, meeting the financial expectations of each project. He has managed hundreds of projects, all of which have met or come below budgets, regularly earning repeat business from clients due to his high-level of service and quality work. Kevin's leadership style is built on integrity, trust, and commitment. His excellent collaboration and communication skills allow him to remain dynamic and adaptable while maintaining project quality and timely delivery of services and work products.

KARL MEIER, PE | Project Engineer

Office Location: 2251 San Diego Ave Suite A-130, San Diego, CA 92110

Karl Meier has 22 years of experience as both a consultant and as a District Engineer for a public water agency. Karl's past public sector experience required active involvement and management of the engineering, operations and maintenance activities for a public water system. As a consultant, he has extensive experience in the planning and design of water, recycled water and wastewater infrastructure including pipelines, force mains, pump stations, wells, pressure reducing stations and reservoirs. Karl also has significant master planning and hydraulic modeling experience for public agencies and special districts. Karl's planning and design expertise is complimented by his past construction management and inspection experience, where he was directly responsible for construction management and inspection services for public works projects ranging from water infrastructure to municipal park and ADA improvement projects.

MICHELLE HARB, PG | Project Geologist

Office Location: 606 E Chapman Ave Ste 200, Orange, CA 92866

Michelle is a California Professional Geologist in Wood Rodger's Orange office with 9 years of experience. Her experience includes beginning to end inspection of water well construction, well destruction, and well rehabilitation activities for public and private agencies. Michelle's field activities include lithology classification (USCS method), water quality sampling, cement installation inspection, and casing inspections. Other field experience includes cross-hole sonic logging, levee cut-off wall installation, sonic drilling, and hard-rock drilling oversight. Office experience includes technical report writing, map creation using ArcMap, creating drawings and plan sets with AutoCAD, creating well design schematics and profiles using Strater, creating cross-sections using gINT, and data processing and analysis.

HECTOR FERNANDEZ | Project Geologist

Office Location: 606 E Chapman Ave Ste 200, Orange, CA 92866

Hector Fernandez has seven years of experience as a staff geologist and two and a half years as an environmental sampling technician. Hector is currently a staff geologist with extensive experience in Arc GIS Pro, his experience includes creating figures such as (Location maps, Detailed location maps, Sites of environmental concern, Regulatory offset maps, Drinking Water Source Assessment Map) for summary reports, technical specifications, proposals and many other type of reports. Hector also has experience in Strater 5 to design new well construction, monitoring wells, and well abandonment. Also, collection and input of database. Hector has experience in providing drilling and construction inspection for municipal water supply wells of large diameter and monitoring wells, borehole logging and analyzing geophysical logs, well rehabilitation and well destruction. His experience with various drilling methods includes direct mud drilling, reverse circulation drilling, Hollow-Stem Auger (HSA), mud rotary, direct push, and Cone Penetration Testing (CPT). Hector has experience in well installation oversight and is proficient in the installation and maintenance of the following instruments: strain gauges, multi- point borehole extensometers (MPBX), in-place Inclinometers (IPI) and vibrating piezometers. He is also experienced with 1166 soil monitoring and soil sampling, as well as dust and air monitoring. As a staff geologist he coordinates and schedules subcontractors and works with clients and operations staff.

JAZMINE TITULAR-MASON, PG | Project Geologist

Office Location: 606 E Chapman Ave Ste 200, Orange, CA 92866

Jazmine is a geologist with 7 years of experience in the water supply industry, with training in ArcGIS Pro and AutoCAD. She specializes in preparing maps and figures delineating groundwater conditions, compiling and analyzing large datasets, and the drafting and QA/QC of specifications and plan sets for new well construction. She has provided technical support and inspection services through the entirety of project life cycles, collaborating with cross-functional teams on complex, multi-phase projects. She is an experienced field geologist that has logged boreholes, provided geophysical logging interpretations, performed construction and destruction inspection services, conducted water quality sampling, and provided well development and testing oversight for production and monitoring wells throughout California. She is also experienced in well rehabilitation projects including mechanical and chemical cleaning, liner installation, and well redevelopment.

JOSEPH HERNANDEZ | Staff Geologist

Office Location: 606 E Chapman Ave Ste 200, Orange, CA 92866

Joseph Hernandez brings 4 years of experience dealing with a multitude of disciplines ranging from field work to office in various geologic disciplines including hydrogeology. Joseph is well versed with tools including MS Office, AutoCad, Photoshop, Gint, GIS, and strater. He has strong field inspection and observation skills documenting the contractor's adherence to the technical specifications of the project and communicating or identifying issues within the field before they arise.

5. REQUIRED QUALIFICATIONS AND EXPERIENCE

Wood Rodgers has assembled a team of hydrogeologists, geologists, and engineers to provide support for the Authority's well rehabilitation and maintenance program. Our hydrogeology group, part of Wood Rodgers' Water Supply Department, has worked closely with our civil and mechanical engineers since 2005 to streamline water infrastructure projects. Our clients benefit by having multiple in-house disciplines that are integrated to provide high quality and responsive service. Even when our engineering group is not directly working on a project, we are able to access and engage them on a project when project questions arise, such as identifying general timelines to design above grade infrastructure, determining if existing distribution pipelines are sized appropriately for an identified project, or providing general guidance and advice for next steps.

Pasadena Water & Power - Garfield Well Replacement

Our Hydrogeologic experience includes the assessment of over 180 production wells; designing well rehabilitation programs to restore capacity or improve water quality; evaluating potential new well locations for the feasibility of construction municipal supply wells; conducting exploratory drilling programs; designing and construction oversight of municipal wells. Our work for this project will be coordinated from our local office in Orange, California. This project will be supported by professionals located in our San Diego office as well as our corporate office in Sacramento and if the need for field observation services arise our team will utilize the San Diego office during execution of field tasks.

Wood Rodgers is regularly ranked nationally as a top design firm. We attribute this success to both our staff and Clients, working diligently to deliver impactful projects that serve our communities.

Our Project Team includes experienced hydrogeologists, geologists, and water infrastructure engineers to provide the Authority the highest level of quality services possible. Resumes of key personnel are located in the Appendix (page 23).

REFERENCES

Supply Well Condition Assessments | Golden State Water Company – San Dimas, CA

Golden State Water Company (GSWC) requested a condition assessment of 12 water supply wells in 2019 and 16 water supply wells in 2022. These wells were located across 18 water systems throughout Southern California. GSWC's objective was to better understand the groundwater system and to receive recommendations to maintain a high quality and reliable water supply to serve their customers. As part of the condition assessments, Wood Rodgers conducted a hydrogeologic study of the groundwater basin within each of GSWC's system.

Wood Rodgers' hydrogeologic study consisted of data collection and review of groundwater quality data, production records, well drilling logs, pump setting records, and downhole camera inspections. During the data review period, we coordinated with GSWC's operators to better understand specific operations of each well and to learn of any technical issues or challenges that they have observed at each well. Site visits were performed at each well site along with well performance testing.

A hydrogeologic study was completed for each water system using publicly available data, data provided by GSWC, and well-specific data collected by Wood Rodgers. This data was synthesized to evaluate the remaining useful service life for these wells, in order to understand current and future production opportunities with regard to groundwater quality.

Wood Rodgers' hydrogeologic study summarized the historical and current groundwater basin conditions (groundwater quality and elevations) and the ability of each well to maintain GSWC performance objectives. The study included a comprehensive analysis of the feasibility for each well to continue providing the necessary production and quality of groundwater to GSWC's system. Wood Rodgers designed and conducted well-specific pumping tests to confirm current operating conditions within each, and evaluated the current well condition, groundwater levels, water quality, and production rate. During this process, Wood Rodgers identified potential locations to construct replacement municipal wells where the ability to meet regulatory offset requirements for municipal supply wells was feasible, in addition to the likelihood of meeting GSWC production and water quality objectives. Proximity to GSWC's existing infrastructure was also considered when recommending new well sites to reduce overall capital costs for well replacement projects.

REFERENCES:	**Mark Insco**– Golden State Water Company **Address:** 630 East Foothill Blvd, San Dimas, CA **Phone:** (916) 853-3604 | **Email:** markinsco@gswater.com
PROJECT DATES:	2019 – 2023
CONTRACT AMOUNT	$237,000
PROJECT TEAM	Sean Spaeth (Project Manager) | Josh Sobolew (Project Geologist) | Hector Fernandez (Geologist)
PROJECT COMPONENTS:	▸ Performance Testin ▸ Condition Assessment ▸ Hydrogeologic Study ▸ Data Collection & Review ▸ Collaboration with Operators ▸ Site Visits ▸ Feasibility Analysis ▸ Well Performance Testing ▸ Well Site Evaluations

Well Rehabilitations + Redevelopment (On-Call Services) | City of Downey – Downey, CA

Wood Rodgers has served the City of Downey since 2015 in its on-call hydrogeological program. Services include assessment, review of well construction details, performance characteristics, hydrogeological conditions, historical groundwater quality, downhole video surveys, CITM surveys, and well and pump efficiency testing.

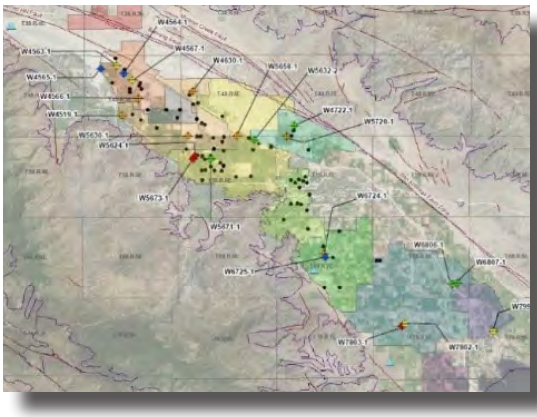
Wood Rodgers prepared a detailed well rehabilitation work plan suitable for retaining a contractor to perform rehabilitation and redevelopment of 11 wells (Nos. 5, 8, 10, 11, 14, 16, 17, 18, 23, 24, 29, and 30). Rehabilitation methods included structural evaluation, mechanical cleaning, chemical cleaning, redevelopment, and testing. The pump and motor for each well was evaluated and recommendations made regarding repair and/or modifications needed for the equipment to meet existing conditions in an efficient manner. Wood Rodgers was also retained as the on-call technical consultant and field inspector during rehabilitation of all nine wells.

All wells that were rehabilitated reported improved specific capacities and reduced sand production. For example, rehabilitation and redevelopment of Well 8 resulted in a 100 percent increase in pumping rate from approximately 600 gpm to 1,200 gpm. The specific capacity for Well 8 increased by 91 percent, from 23 gpm per foot of drawdown to 44 gpm per foot of drawdown at a pumping rate of 1,200 gpm.

Wood Rodgers is currently assessing two municipal wells (Well Nos. 2 and 9) following the same scope of work utilized in the previous 11 well rehabilitation and redevelopment work plans.

REFERENCES:	**Daniel Mueller** – City of Downey **Address:** 11111 Brookshire Avenue, Downey, CA **Phone:** (562) 904-7110 | **Email:** dmueller@downeyca.org
PROJECT DATES:	2022 - 2023
CONTRACT AMOUNT	$300,000
PROJECT TEAM	Sean Spaeth (Lead Hydrogeologist) | Josh Sobolew (Project Manager) | Hector Fernandez (Geologist)
PROJECT COMPONENTS:	▸ Well Condition Assessment ▸ Well and Pump Efficiency Testing ▸ Mechanical and Chemical Cleaning ▸ Well Redevelopment ▸ Focused Redevelopment ▸ Aquifer Pumping Tests ▸ Pump and Motor Evaluation ▸ Construction Management & Inspection

Well Rehabilitation Prioritization Plan | Coachella Valley Water District – Coachella Valley, CA



Coachella Valley Water District (CVWD) retained Wood Rodgers to develop a prioritization plan for well rehabilitation which would guide CVWD with proactive maintenance, rehabilitation, repair, or replacement of its 101 active potable water supply wells. The plan will be used to develop annual budgetary and facilities management planning in support of CVWD's Capital Improvement Plan.

Wood Rodgers compiled and evaluated data and information for 101 active production wells. The data were used to assess current condition and historical performance of each well. Twenty prioritization criteria were developed with input from multiple CVWD departments and used to prioritize the wells for potential rehabilitation programs. Including CVWD staff and providing an opportunity for the inclusion of individual institutional knowledge proved to be a key factor and provided the needed details to select and rank the wells for rehabilitation.

Baseline pumping tests were conducted by Wood Rodgers and CVWD staff at seven of the top-ranking wells to confirm current

well and pump conditions. Based on the testing results, three wells were selected for rehabilitation and one for servicing (removal of stuck pump) for CVWD's 2018-2019 fiscal year. Twenty-one additional wells were identified through the ranking process for well rehabilitation or pump/motor work as part of CVWD's 5-year Capital Improvement Plan. Wood Rodgers prepared a comprehensive report which summarized the current well conditions and methods, results, and recommendations from the study.

Wood Rodgers subsequently prepared plans and specifications for the three wells selected for rehabilitation and one for servicing. Wood Rodgers is currently providing CVWD with bidding and technical support services and onsite project inspection during critical phases of rehabilitation operations.

REFERENCES:	**Jesse Aguilar** – Coachella Valley Water District **Address:** 51501 Tyler St, Coachella, CA **Phone:** (760) 398-2661 | **Email:** jaguilar@cvwd.org
PROJECT DATES:	2018
CONTRACT AMOUNT	$369,216
PROJECT TEAM	Josh Sobolew (Lead Geologist)
PROJECT COMPONENTS:	▸ Hydrogeology ▸ Asset management ▸ Technical Plans and Specifications ▸ Well Rehabilitation

Well Assessments | City of Adelanto – Adelanto, CA

2023, the City of Adelanto engaged Wood Rodgers to enhance its potable water supply reliability by designing a new 3,000 gallon per minute (gpm) municipal supply well. Initially focused on well siting and hydrogeologic assessment, the project expanded to include a comprehensive system-wide hydrogeologic evaluation.

Wood Rodgers' initial task involved assessing the City's preferred site for well construction feasibility. Upon identifying data gaps and feasibility concerns, the scope broadened to include a city-wide well siting study. This assessment leveraged historical data from the City's existing well field, alongside supplementary research and well testing.

The study involved compiling groundwater quality data, production records, well drilling logs, pump settings, and downhole camera inspections. Given the limited data available, Wood Rodgers collaborated with local water agencies and drilling contractors to establish a comprehensive data set for the City. Concurrently, discussions with City operators provided insight into system operations and identified technical challenges at individual wells. On-site evaluations and performance testing were conducted for each well, where practical.

Wood Rodgers synthesized this data to assess each's operating condition, estimate remaining service life, and evaluate spatial variations in groundwater quality and production capacity. The resulting technical report detailed:

- Hydrogeologic conceptual model
- Historical and current groundwater basin conditions
- Each well's capacity to meet operational objectives
- Recommended near-term and long-term actions to enhance system reliability
- Potential well replacement sites that align with production capacity and water quality goals

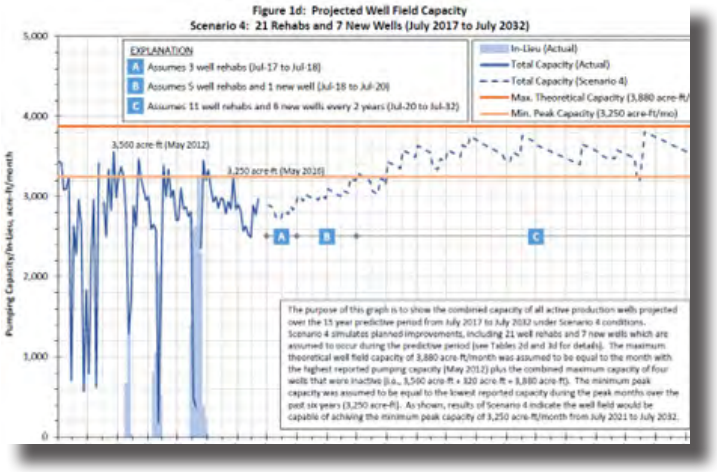
This comprehensive approach provided the City of Adelanto with actionable insights to improve its potable water system reliability both now and into the future.

REFERENCES:	**Richard Burgess** – City of Adelanto **Address:** 11600 Air Expressway, Adelanto CA **Phone:** (760) 246-2300 ext. 11146 | **Email:** rburgess@adelantoca.gov
PROJECT DATES:	2023 - 2025
CONTRACT AMOUNT	$126,060
PROJECT TEAM	Josh Sobolew (Project Manager) | Michelle Harb | Hector Fernandez | Joseph Hernandez
PROJECT COMPONENTS:	▸ Hydrogeology ▸ Well Design ▸ Well Siting ▸ Performance Testing ▸ Well Condition Assessments

Rehabilitation Priortization Plan |

Long Beach Water Department – Long Beach, CA

Long Beach Water Department (LBWD) supplies its customers with potable water using a combination of local groundwater and purchased imported surface water. Groundwater is produced by thrity-one wells located within the city of Long Beach from three pressure zones. During water years 2012 through 2016, the overall production capacity of LBWD's well field ranged from approximately 21,648 to 32,505 acre-feet per year. The wells range in age from approximatley 20 to 100 years and are exhibiting substantially decreased capacity, limiting LBWD's ability to reach its goal of utilizing its full groundwater extraction rights of 32,692 acre-feet per year. To restore lost capacity and maximize groundwater production, LBWD plans to implement a program of well rehabilitation and well replacement and to add new production wells to the system.



LBWD retained Wood Rodgers to prepare a Well Rehabiliation Master Plan which involved the evaluatation of the condition and estimate the reaming useful life of the existing production wells and creation of a priority list for well rehabiliation and replacement. The study required a comprehensive analysis of available historical well data and downhole video surveys to evaluate current well conditions and develop a phased prioritized plan for rehabilitation and/or replacement. A comprehensive summary report was prepared, and includes a priority ranking of the wells, a recommended well rehabilitation and/or replacement schedule, well monitoring protocols, well rehabilitation techniques, and recommended well design and operational changes to maximize operational efficiency.

REFERENCES:	**Abelardo Rendon** – Long Beach Water Department **Address:** 1800 E. Wardlow Road, Long Beach, CA **Phone:** (562) 570-2341 | **Email:** Abelardo.rendon@lbwater.org
PROJECT DATES:	2018
CONTRACT AMOUNT	$95,981
PROJECT TEAM	Joshua Sobolew (Geologist) | Sean Spaeth (Project Hydrogeologist) |
PROJECT COMPONENTS:	▸ Hydrogeology ▸ Well Rehabilitation Techniques ▸ Protocols and Procedures ▸ Well Performance Review ▸ Pump/Motor Performance Review ▸ Well Siting & Preliminary Design

6. APPROACH TO COMPLETE TASKS IDENTIFIED IN THE SCOPE OF SERVICES

SCOPE OF WORK

Task 1 Project Management, Coordination, and Meetings

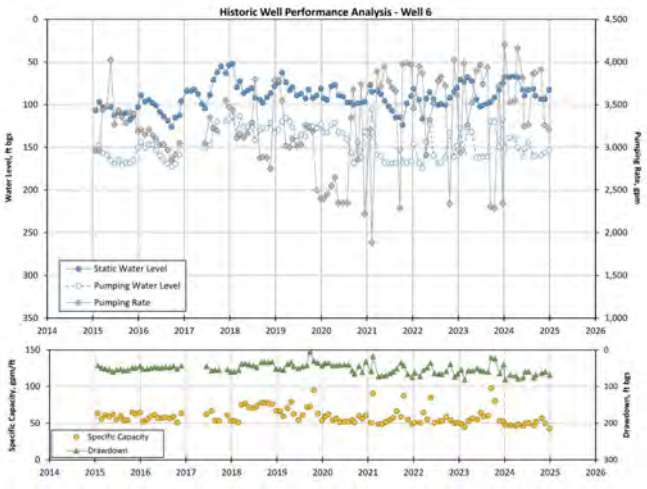
The management of an effective project scope, schedule, and budget are key components to a successful project. Keeping track of critical paths within each task, planning, and communication with all team members (Sweetwater Authority and Wood Rodgers), will keep the project within budget and allow for a final Program to be presented to the Authority by August of 2026. At the beginning of the project, Wood Rodgers will prepare a project schedule with objectives, deliverables, milestones, and task completion dates. The project schedule will be updated as needed to keep all participants involved in the project updated as it progresses.

Key Wood Rodgers team members will lead an in-person kick-off meeting with the Authority to review the project objectives and approach; establish lines of communication; review the baseline schedule; and to discuss the project execution strategy. Critical path tasks and the approach to meeting project milestones will be identified and discussed at the meeting. Once the project is underway, progress meetings will be held virtually at key milestones to discuss and review findings at decision-making junctures and provide an updated project schedule including dates of deliverables, and any other item that needs to be discussed. Wood Rodgers acknowledges that there will be a draft review meeting to discuss Program findings as well as receive feedback, and in addition, a meeting to present the Final Program to Authority staff. Wood Rodgers will be responsible for preparing meeting agendas and minutes.

Task 2 Information Gathering and Review

Wood Rodgers will prepare a request for information (RFI) to be reviewed during the project kickoff meeting. Wood Rodgers will review data provided by the Authority including well water quality data, production records, well drilling and construction logs, maintenance records, current and historical hydrogeologic conditions, pump settings records, video logs (if available), record drawings, and any other hydrogeologic data that may be available for the immediate area. The RFI will also request that the Authority identify pump contractors and subcontractors that have performed work within their well field allowing Wood Rodgers to request documents (with approval from the Authority) for any additional records that the Authority may not possess.

The information gathered will be organized by well and used for the evaluation and assessment process. All data received will be compiled and reviewed (in some cases graphically) to identify any data gaps or data that appear to be erroneous. Well performance charts utilizing historical groundwater elevations, pumping water levels, historical production rates, and energy consumption will be plotted. Groundwater quality will be assessed to determine if groundwater quality issues at specific wells. Well diagrams will be prepared to help visualize each individual well structure and will include any recent well modifications, obstructions, and sediment fill material within the well. Well completion reports, contractor maintenance records, rehabilitation events, and downhole video surveys will be utilized to prepare the well diagrams. All of the data will be organized in appendices by well and is anticipated to include well performance graphs with well, pump, and motor details followed with groundwater quality graphs and well records (e.g., downhole video surveys, well completion reports, maintenance records, etc.). Wood Rodgers will coordinate with Authority personnel, as necessary, to resolve discrepancies with the data. If critical data is missing or anomalous, we will develop assumptions using conventional interpretation methods in consultation with the Authority.



Once each data is organized for each well, Wood Rodgers will attend a meeting with the Authority staff to confirm the accuracy of collected information, system operational history, and discuss known issues with the existing wells. It is strongly encouraged that the Authority includes various decision makers from involved departments considering institutional knowledge that is not recorded is considered in each well assessment. In our experience, every well is different, even if constructed similarly and within a short

distance of another well. Through the analysis of all collected data, Wood Rodgers will be able to identify any structural or operational deficiencies for each well, which will allow for thorough prioritization and tailored individual rehabilitation plans. Wood Rodgers will organize and present all well data to Authority staff in a manner that will allow for ease of accessibility for future reference.

Task 2 Deliverables – Kick Off Meeting Agenda and Minutes

- Request for Information (PDF)
- Draft Well Performance Charts and Combined Data
- Well Diagrams (PDF)

Task 3 – Field and Condition Assessments

Concurrently with our review of the data received, Wood Rodgers will coordinate with the appropriate Authority personnel to schedule a site visit for each respective well site and assess the feasibility of performing pumping tests to further assess each well for rehabilitation. Each pumping test will require the well to be under static conditions prior to pumping and operating by personnel from the Authority. Wood Rodgers will request the Authority to provide downhole camera surveys and will review each video in Task 2 above. If there are any recent downhole camera surveys, Wood Rodgers will recommend that a camera inspection is performed. Each camera survey will be performed prior to the pumping test and if deployable through an existing access pipe that terminates below the current pumping setting to assess the current condition of the well structure. If the Authority reports elevated sand production, a dynamic survey will be performed under pumping conditions to observe sand entering the well structure. Wood Rodgers has not included subcontractor pricing for performing downhole camera inspections, which the necessity and number of videos will be determined during the progression of the project. It assumed that the Authority will contract directly with the subcontractor and Wood Rodgers will provide observation during 4 additional downhole video surveys.

During each site visit, we will document the visual condition of above-grade pumping station components, collect name plate motor details, well site condition, all existing infrastructure (treatment, piping, electrical, etc.), accessibility of wellhead, and conduct a baseline pumping test on operable wells to collect current performance data. The baseline well testing will include a one-hour constant rate test with systematic data collection. Prior to testing, Wood Rodgers will measure the static groundwater level. During the test, we will record the pumping rate, pumping water levels, electrical consumption (overall plant efficiency), and if permissible, sand production. Additionally, we will measure and document field water quality parameters, including pH, electrical conductivity, turbidity, total dissolved solids, ORP, and temperature while documenting any physical characteristics of the discharge water (e.g. color, aeration, and odor).

The data from these tests will be used to assess the current operating conditions of the well. Wood Rodgers will compile the data obtained from the baseline well tests to document and assess the current conditions. If any significant issues are identified, Wood Rodgers will notify the Authority in writing as soon as possible and the data will be used in the evaluation process.

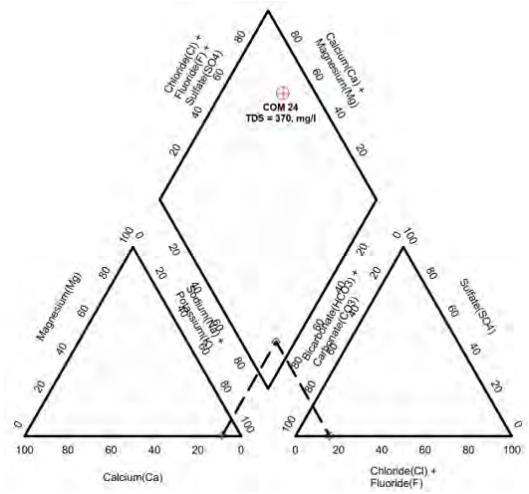
Task 3 Deliverables – Baseline Well Testing Graphs (PDF)

- Overall Plant Efficiency (PDF)
- Daily Inspection Reports (PDF)

Task 4 - Well Evaluation, Assessment, and Rehabilitation Selection

Wood Rodgers will incorporate well maintenance records, historical data, data collected from site visits and baseline test, and information gathered in previously completed tasks to complete a comprehensive understanding of each well owned and operated by the Authority. The data collected in the tasks above will be evaluated and used to prepare a condition assessment for each of the thirteen existing wells, including the estimated remaining well life. Wood Rodgers will develop a ranking system that prioritizes wells for rehabilitation while evaluating current condition and likelihood of returned performances. The assessments and well

ranking will be based on the primary factors that are associated with overall well performance, such as well construction details, drilling and construction methods, screen type, operational conditions, history of rehabilitation, water quality, structural condition, risk, importance to the Authority's hydraulic system/operations, cost considerations, etc.



Upon ranking each well by condition, the potential for successful rehabilitation will be assessed for each well based on the degree of clogging, length of time condition has remained unchecked, well design, the structural integrity of the well, and the complexity of well rehabilitation efforts. The cost/benefit of well rehabilitation efforts will also be considered (i.e., those wells with the greatest chance of successful rehabilitation with the lowest estimated cost will be ranked higher than expensive methodologies with a low chance of success). Those wells at high risk of structural failure will be removed from consideration and will be flagged for replacement. Wells that are near the end of their estimated service life will be discussed with the Authority on plans for decommission and replacement. Plans could include pumping until failure while developing costs and planning documents for a new well(s). Wood Rodgers has not included costs into this proposal for planning of new wells.

A final overlay to the priority ranking will be how critical the well is to the system and/or specific pressure zones and/or treatment plants, and whether or not there is available redundancy. Wood Rodgers will review the Authority's current well construction design standards and specifications and will provide design recommendations intended to improve and extend well efficiency, service life, and the ability to perform effective well rehabilitations. The work performed to assess well conditions and develop the ranking of priority for well rehabilitation, repair, or replacement will be provided to the Authority in the form of a comprehensive summary report. At a minimum, the report will include the following:

- Bios prepared for each well
  - Including performance graphs, groundwater quality graphs, well diagrams, and current pumping equipment including horsepower
  - All data and information collected for the project;
- Well condition assessments for each well;
- Estimated feasibility of successful rehabilitation or repair and estimated cost projections;
- List of wells ranked by priority of rehabilitation, repair and/or replacement, and by importance;
  - Recommended rehabilitation programs specific to top four ranked wells
  - Estimated costs for top four ranked wells
- Recommended well rehabilitation and repair techniques;
  - Driven by data and Authority shall routinely collect data to update prepared performance graphs to drive/support maintenance decisions
- A schedule for preventative maintenance activities;
- Standardized tools including inspection checklists, maintenance and data logs and templates, and SOPs; and
- Recommendation for future water well design standards

Criteria used for prioritizing wells for rehabilitation, repair, and/or replacement will be set up in a manner which is intuitive and allows for future planning. The goal of the deliverable is to prepare graphs and documents that will allow the Authority to easily amend with new data to support future capital improvement projects specifically supporting rehabilitations, pump upgrades, and/or replacement. A routine schedule of data collection is recommended and will be developed through a SOP for the Authority to utilize; however, maintenance schedules of wells will be driven by data (i.e., actual well performance) and will require continue upkeep of the developed performance graphs and will require interpretation by a certified hydrogeologist. Findings from this task will be presented to the Authority in draft stage for additional comment, discussion, and tailoring to the Authorities needs. The meeting will also be utilized to further understand and estimate realistic short term and long term projections that fit Authority's capabilities. The capability will consider the number of rehabilitations from an overall workload and budget perspective to establish short term and long term projections. For wells that were identified for replacement costs will be considered.

Task 4 Deliverables – Well Bios (Draft and PDF)

- Ranking System (Draft and PDF)

- SOP for Data Collection (Draft and PDF)
- SOP for Updated Graphs and Assessment Tools (Draft and PDF)
- PowerPoint Presentation (Microsoft PowerPoint)

Task 5 Prepare Final Deliverables

Wood Rodgers will provide a comprehensive Well Rehabilitation and Maintenance Program (Program) for the Authority's water system with individual well assessments, bios, performance graphs, groundwater quality graphs, well diagrams, combined data for each well, downhole video surveys, pumping test graphs, overall plant efficiency values, SOP's for data collection and further use of graphs, ranking system, rehabilitation programs for the top four ranked wells, and short and long term projections. The Program will include an executive summary on the findings and execution of the short term and long term projections. Wood Rodgers will develop budget planning tools for upcoming planned rehabilitations and how they may affect the short and long term projections. Wood Rodgers will include a regional wide hydrogeology discussion on the basin and identify if trends presented in the groundwater elevation are related to regional wide trends or well specific. The final deliverable will be provided to the Authority in PDF format in addition to fully editable formats including all collected and processed supporting data. The final Program will be presented to the Authority staff to discuss findings and recommendations.

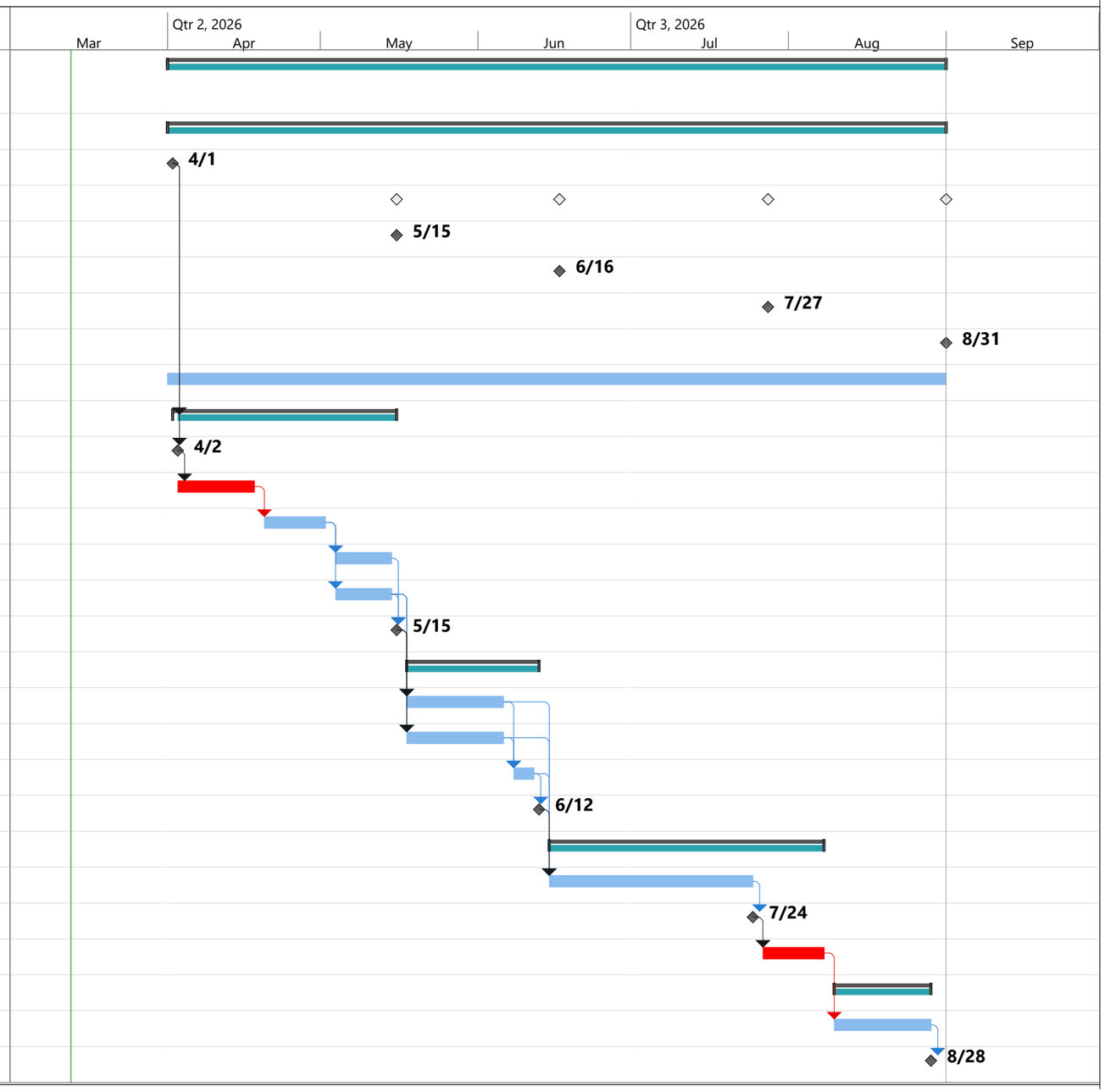
Task 5 Deliverables – Draft and Final Program (PDF)

- Ranking System (Final and PDF)
- SOP for Data Collection (Final and PDF)
- SOP for Updated Graphs and Assessment Tools (Final and PDF)
- PowerPoint Presentation (Microsoft PowerPoint)

SCHEDULE

Sweetwater Authority
Development of the Well Rehablilitation and Maintenance Program
Proposed Project Schedule

ID	Task Name	Duration	Start	Finish
1	**Sweetwater Authority Well Rehabilitation and Maintenance Program**	**109 days**	**Wed 4/1/26**	**Mon 8/31/26**
2	**1.0 PROJECT MANAGEMENT**	**109 days**	**Wed 4/1/26**	**Mon 8/31/26**
3	Project Kick-off Meeting	1 day	Wed 4/1/26	Wed 4/1/26
4	**PROGRESS MEETINGS**	**109 days**	**Wed 4/1/26**	**Mon 8/31/26**
5	Progress Meeting 1	1 day	Fri 5/15/26	Fri 5/15/26
6	Progress Meeting 2	1 day	Tue 6/16/26	Tue 6/16/26
7	Draft Program Review Meeting	1 day	Mon 7/27/26	Mon 7/27/26
8	Final Program Presentation	1 day	Mon 8/31/26	Mon 8/31/26
9	Project Coordination & Management	109 days	Wed 4/1/26	Mon 8/31/26
10	**2.0 INFORMATION GATHERING**	**32 days**	**Thu 4/2/26**	**Fri 5/15/26**
11	Prepare and Submit Request for Information	0 days	Thu 4/2/26	Thu 4/2/26
12	Sweetwater Authority Provides Data	11 days	Fri 4/3/26	Fri 4/17/26
13	Data Collection	10 days	Mon 4/20/26	Fri 5/1/26
14	Prepare Well Diagrams	9 days	Mon 5/4/26	Thu 5/14/26
15	Prepare Performance Charts	9 days	Mon 5/4/26	Thu 5/14/26
16	Submit Draft Performance Charts and Well Diagrams	0 days	Fri 5/15/26	Fri 5/15/26
17	**3.0 WELL SITE VISITS AND BAELINE TESTING**	**20 days**	**Mon 5/18/26**	**Fri 6/12/26**
18	Well Testing	15 days	Mon 5/18/26	Fri 6/5/26
19	Downhole Camera Inspection Surveys	15 days	Mon 5/18/26	Fri 6/5/26
20	Prepare Baseline Well Testing Graphs and OPE	4 days	Mon 6/8/26	Thu 6/11/26
21	Submit Baseline Well Testing Graphs and OPE	0 days	Fri 6/12/26	Fri 6/12/26
22	**4.0 WELL EVALUATIONS AND ASSESSMENTS**	**40 days**	**Mon 6/15/26**	**Fri 8/7/26**
23	Prepare Draft Program	30 days	Mon 6/15/26	Fri 7/24/26
24	Submit Draft Program	0 days	Fri 7/24/26	Fri 7/24/26
25	Sweetwater Authority Reviews Draft Program	10 days	Mon 7/27/26	Fri 8/7/26
26	**5.0 PREPARE FINAL DELIVERABLE**	**15 days**	**Mon 8/10/26**	**Fri 8/28/26**
27	Prepare Final Submittal	15 days	Mon 8/10/26	Fri 8/28/26
28	Submit Final Program	0 days	Fri 8/28/26	Fri 8/28/26



UNDERSTANDING OF THE PROJECT

The Authority's service area is located within the Coastal Plain of San Diego Groundwater Basin (San Diego Basin) and serves a population of approximately 191,282 residents with approximately 33,614 connections for commercial industrial, and residential customers. In 2016, Sweetwater Authority requested that California Department of Water Resources (DWR) recognize the San Diego Formation (SDF) aquifer system as a groundwater basin and to consolidate three basin boundaries of three DWR-recognized alluvial groundwater basins: Lower Sweetwater River, Otay River, and Tijuana River Valleys. DWR approved their request and designated the new consolidated basin as the Coastal Plain of San Diego Groundwater Basin (09-033). Through DWR Sustainable Groundwater Management Act (SGMA) requirements, the Authority is identified as the local agency.

The Authority's water supply relies on local groundwater, comprising approximately 70% of its supply, with the remaining supply of imported water (30%) from the Colorado River or the California State Water Project. Sweetwater Authority currently operates 14 groundwater production wells that pump groundwater from the SDF. 11 of those groundwater production wells pump brackish water in the City of Chula Vista, which is treated at their Richard A. Reynolds Groundwater Desalination Facility before being served to its customers. The remaining three groundwater production wells are located within National City, which requires chlorination before being served to its customers.

The Authority's service area is located within the southernly and western portions of the San Diego Basin and encompasses San Diego Bay. The groundwater conditions are affected by sea water intrusion, which causes brackish conditions to occur near the San Diego Bay. Sea water/brackish groundwater is identified with the level of chloride concentrations measured within the aquifers used for drinking water and can lead to detrimental effects to water infrastructure if found at high concentrations. Consideration to designing new wells and pumping equipment should be considered, if groundwater conditions are found to be in brackish or saltwater conditions. It is recommended to use higher grade steels to increase the life span of wells and pumping equipment, and well rehabilitations should be done regularly and directed by performance data.

These 13 groundwater production wells include SDF Well Nos. 1 through 11 and National City Well Nos. 2 through 4, and range in age from **15 to 50 years**. The total completed well depths range from **606 to 1,020 feet** and **690 to 810 feet** with production rates ranging from **470 to 2,500** gallons per minute (gpm) and **450 to 1,100 gpm** in SDF wells and National City wells, respectively. The Authority is seeking to contract a hydrogeology consultant to provide well design, well rehabilitation, well condition assessments, and hydrogeological studies to restore and/or increase their groundwater supply and/or manage their groundwater basin.

Wood Rodgers has an extensive history providing hydrogeological and engineering services for municipal clients throughout Southern California through previous and existing well rehabilitation and prioritization contracts. Wood Rodgers is one of the few firms that has both hydrogeological and engineering services. Others typically require teaming agreements, which can result in delayed responses and increased costs. Although not requested in our contract, conditions of existing above-grade infrastructure may need some level of input from engineers before making final decisions or proceeding with above-grade recommendations. Wood Rodgers will request input from our engineering team to identify any potential issues with the operation of wells with use of existing infrastructure within the Authority's service area. Our approach for these requested hydrogeological services is discussed below.

WELL CONDITION ASSESSMENT

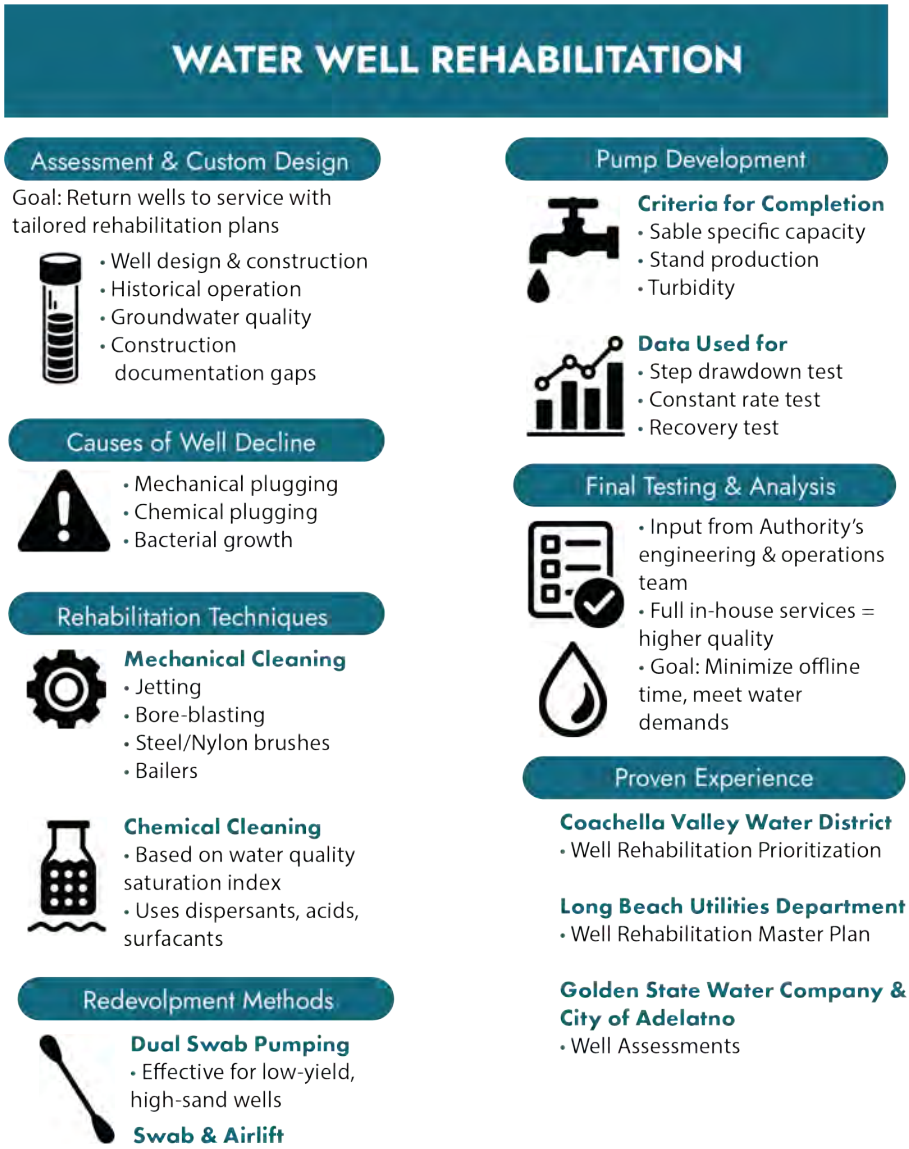
Wood Rodgers will prepare a request for information (RFI) and submit to the Authority requesting historical well records and data including groundwater elevations, pumping water levels, discharge rates, energy consumption, sand production, and records of past rehabilitation and/or modifications that were performed on their existing wells. Wood Rodgers will prepare historical well performances graphs to further evaluate each of the wells and determine if the well should be selected for well rehabilitation. There are many factors that contribute to well losses, such as mechanical, bacterial, and/or chemical plugging; well design, including well screen type, gravel envelope gradation, steel type; and lastly, historical operation and maintenance of the well.

Wood Rodgers will review and prepare a comprehensive background history for the well, including data from a well construction report, as-built diagrams, shop drawing information, maintenance reports, nameplate motor information, specifications, reports,

historical well performance data, groundwater quality data, any previous surveys.

Based on the information collected, Wood Rodgers will estimate the remaining useful service life of the well to determine the risks associated with a well rehabilitation. A service life is evaluated by the age, decline in performance, potential recovery of performance, and its relation to groundwater elevation, sand and turbidity production, water quality, and well design (such as gravel gradation, slot size, casing steel type, casing type). This will determine if the well is in need of replacement or rehabilitation. If a rehabilitation is recommended, collection of current operating conditions will be valuable prior to the rehabilitation activities, which may require a step drawdown or a baseline well testing event.For loss of capacity assessments, the testing will determine if the decline is a result of well structure plugging, pumping equipment problems, or regional changes in hydrogeologic conditions (such as declining groundwater levels). The current operating parameters are compared to historical records to evaluate any changes over time that could indicate a particular problem.

Based on the data collected, it may be necessary to conduct additional surveys and/or well profiling to further investigate the reported problem. These surveys or testing may include collecting time-series water quality samples to evaluate changing water quality over time; conducting a downhole video survey; conducting EMT survey; and/or collecting depth-specific water quality samples under dynamic or non-pumping conditions. This will allow Wood Rodgers to collect current operational data of the well and evaluate various rehabilitation techniques necessary to restore capacity and/or reduce other well performance issues.



CONSTRUCTION SUPPORT SERVICES

Our hydrogeologic staff are highly trained and experienced with all aspects of drilling, construction, development, and rehabilitation of municipal supply wells. Well construction and rehabilitation projects are very dynamic, requiring fast responses to contractor questions and conditions that may develop during borehole drilling, well construction, and well rehabilitation. Our staff is committed to being available onsite during all critical phases of the project, including 24/7 support during construction of all work path items that need immediate attention and response during the well drilling, construction, development, and testing portions of the project.

The work path items are detailed below:

- Providing input and answering questions related to the well construction
- Conducting a pre-construction meeting with the selected contractor at the site
- Conducting construction coordination and planning meetings
- Providing a lithologic descriptive log and photos of the formation samples
- Inspecting equipment, site configuration, and materials
- Checking drilling fluids properties, formation samples, and borehole geophysical logs
- Revising the well design as necessary for changed lithology in the production borehole
- Inspecting installation of well casing and screen, gravel envelope, and seals
- Inspecting brushes, chemicals, tools, etc., to be used during the rehabilitation process
- Checking well development progress to achieve optimal well efficiency
- Inspecting well pumping tests for the final pump design
- Collection of Title 22 water quality samples
- Witnessing well acceptance testing and preparation of punch list for acceptance
- Holding the contractor in compliance with contract documents

Following completion of the well construction or rehabilitation project, Wood Rodgers will assemble all pertinent records and provide this information to the Authority in a written Well Construction/Rehabilitation Summary Report. This report will include well pumping test plots, recommended well capacities, project construction timeline, surveys, record drawings, field data, water quality analysis, and our assessment of the well acceptance testing. After all work has been satisfactorily completed, Wood Rodgers will prepare a letter recommending acceptance, if warranted.

TREATMENT PLANT INTEGRATION

While this Request for Proposals is solely for Development of the Well Rehabilitation and Maintenance Program, drilling and construction (or rehabilitation of municipal wells) go hand-in-hand with the above grade treatment and distribution. Wood Rodgers has seamlessly integrated our above grade civil and mechanical engineers with our hydrogeologic staff to meet project needs. Wood Rodgers has included in this proposal engineering support services, including treatment plant integration. Wood Rodgers is one of the few firms that offers these services under one roof. Our water infrastructure engineers will evaluate pump selections, pump station modifications, pipelines, and site-specific treatment.

7. EXCEPTIONS TO THE RFQ

Wood Rodgers hereby certifies that it has no exceptions to the Request for Proposal (RFP), including but not limited to the Authority's Professional Services Agreement as outlined in Exhibit C. We acknowledge and accept all terms and conditions as stated, and no alternative language or modifications are proposed.

8. ADMENDMENTS TO THE RFQ

Wood Rodgers acknowledges receipt of all amendments as posted on PlanetBids and the Authority's Bid Opportunities and Results webpage. We confirm that our proposal reflects the requirements and updates outlined in those amendments.

9. PROPOSAL AUTHORIZATION

This proposal is submitted by Wood Rodgers, Inc. and shall remain in effect for ninety (90) days from the submission date. The undersigned, Sean Spaeth, is authorized to bind Wood Rodgers, Inc. in all matters related to this proposal and any resulting agreement.

Sean Spaeth, PG, CHG
Principal Hydrogeologist
(Authorized to Bind the Firm)

SEAN SPEATH, PG, CHG

Principcal-in-Charge

EDUCATION:

BS, Geology, California State University, Chico

MS, (coursework) Geology Program, California State University, Chico

REGISTRATIONS/ CERTIFICATIONS:

Professional Geologist, CA No. 94570

Certified Hydrogeologist, CA No. 1004

YEARS OF EXPERIENCE:

21 years total

18 years with Wood Rodgers

OFFICE LOCATION:

Roseville Office | 3741 Douglas Blvd Suite 150, Roseville, CA 95661

PROFESSIONAL BIO

Sean, a California Professional Geologist and Certified Hydrogeologist, brings over 21 years of experience managing groundwater resource projects for public and private clients. He has led the design, budgeting, and execution of a wide range of projects, including municipal well design, construction management, and groundwater basin assessments. Sean has assessed over 150 production wells, developing effective rehabilitation programs to restore capacity and improve quality. He has extensive experience in groundwater management, including developing conceptual hydrogeologic models, supporting SGMA Groundwater Sustainability Plans, and implementing basin monitoring programs. Sean has overseen the drilling of over 140 exploratory test holes and the construction of over 120 production wells, including ASR wells. His leadership ensures technically sound and cost-effective solutions tailored to complex groundwater challenges.

RELEVANT PROJECT EXPERIENCE

Pasadena Water and Power, Garfield Replacement Well – Pasadena, CA | Provided project management and lead technical oversight for the replacement of a 100-year-old municipal supply well. The replacement well, located adjacent to the original well, was constructed to a depth of 800 feet. Historical hydrogeologic and depth-specific temporary aquifer zone testing data was used to design the replacement well. The project included full-time construction observation/inspection from start to finish, including site preparation, borehole drilling, construction, testing and site cleanup. The project, located within a residential community also required mitigation measures to minimize noise impacts to the surrounding community. The well was tested over 4,000 gpm and met all of the performance requirements of the contract.

Long Beach Water Department, Wells North Long Beach 13 & 14 – Long Beach, CA | Lead Hydrogeologist for the replacement of two wells, North Long Beach 13 and 14. Sean supported the permitting by meeting well siting requirements with consideration of regulatory offset and control zone requirements. He also supported the preliminary design report by evaluating the project site within the Pressure Area of the Central Subbasin. Evaluation of the basin included the aquifer systems, aquifer yields, regional groundwater levels, water quality, potential contaminant activities, and the nearby anthropogenic sources. The preliminary design report implemented a preliminary well design, construction logistics, and anticipated conditions – including drilling, production capacity, and groundwater quality. Sean also compiled the necessary data and submitted the preliminary Drinking Water Source Assessment Programs to DDW. The completed project satisfied all project objectives, including a capacity of 2,500 gpm for each well.

Golden State Water Company (GSWC), Baseline Well No. 6 – San Dimas, CA | Provided overall project management and technical oversight as lead Hydrogeologist for the preparation of the plans and specifications, drilling, construction, and testing of Baseline Well No. 6. GSWC desired the construction and development of a municipal supply in proximity to its recently constructed Baseline Well No. 5. Execution of Baseline Well No. 5 (located approximately 400 feet away) provided an opportunity to utilize data obtained from that project to further the design anticipation of Baseline Well No. 6. Groundwater quality obtained from both isolated aquifer zone testing and the of the completed well provided sufficient water quality data for Baseline Well No. 6. A geologic exploration drilling program (test hole) was implemented to characterize the site-specific geology and prepare a final well design prior to mobilization of the reverse rotary drilling rig. The test hole was drilled to the full depth of alluvial groundwater basin and geophysically logged.

Golden State Water Company (GSWC), James Well No. 3 – Robbins, CA | Sean provided overall project management and technical oversight as lead Hydrogeologist and Principal-in-Charge for site

characterization and preparation of plans and specifications for the construction and testing James Well No. 3. The project addressed long-standing groundwater quality challenges that had required the community to rely on bottled water for more than a decade while a sustainable municipal supply solution was pursued. Located in a complex hydrogeologic setting, the project required the municipal supply well to target a specific water-bearing zone to avoid elevated salinity present in both shallower and deeper aquifers. Site characterization included installation of five single-completion monitoring wells to evaluate the vertical distribution of groundwater chemistry along with a survey and evaluation of surrounding wells to support a design that avoided salinity. Sean led the development of technical specifications and oversaw the drilling, construction, and testing James Well No. 3, which was successfully constructed in accordance with the design and met all project objectives for capacity and water quality.

Long Beach Water Department, Wells North Long Beach 13 & 14 – Long Beach, CA | Lead Hydrogeologist for the replacement of two wells, North Long Beach 13 and 14. Sean supported the permitting by meeting well siting requirements with consideration of regulatory offset and control zone requirements. He also supported the preliminary design report by evaluating the project site within the Pressure Area of the Central Subbasin. Evaluation of the basin included the aquifer systems, aquifer yields, regional groundwater levels, water quality, potential contaminant activities, and the nearby anthropogenic sources. The preliminary design report implemented a preliminary well design, construction logistics, and anticipated conditions – including drilling, production capacity, and groundwater quality. Sean also compiled the necessary data and submitted the preliminary Drinking Water Source Assessment Programs to DDW. The completed project satisfied all project objectives, including a capacity of 2,500 gpm for each well.

Kelso Valley Renewable Resources, Water Supply Assessment and Well Field Development – Kern County, CA | Conducted a basin-wide hydrogeologic assessment of the Kelso Lander Valley Groundwater Basin to determine the suitability of developing a local groundwater source for a large wind energy project in a remote location in the southern Sierra Nevada Mountains. The groundwater basin had never been developed for groundwater supply, and no data was available. An exploratory drilling program was designed to characterize the geologic formations in the groundwater basin as well as to characterize groundwater quality and quantity. The first phase of the assessment consisted of the drilling and construction of one test well and two monitoring wells to obtain data to determine aquifer characteristics during a long-term pumping test, followed by the preparation of a Water Supply Assessment to support the construction project environmental impact report (EIR). Following acceptance of the project EIR, Sean prepared and implemented a well field development program, consisting of drilling 13 test holes and constructing 5 single-completion, one multiple-completion monitoring well, and 7 production wells. A multiple-year groundwater elevation-monitoring program was developed and implemented to track long-term groundwater elevations and for compliance with project EIR. The hydrogeologic characterization and well field development successfully provided the project with a reliable source (over 110,000,000 gallons) for construction and project environmental needs (dust abatement and native re-seeding), with no significant impacts to the groundwater basin (as was predicted in the EIR).

City of Manteca, Well 30 Niles-Garden Well – Manteca, CA | Well 30 Niles-Garden Well was constructed on a 6,500 square foot parcel adjacent to a community park and residential development. Sean led the planning, design, permitting support, and construction oversight of a 530-foot-deep municipal supply well. Key project challenges included designing the well to mitigate elevated nitrate concentrations in shallower water-bearing zones, securing DDW approval despite the presence of regulated features nearby, and minimizing traffic and noise impacts to residents located within 100 feet – allowing for continuous 24-hour operations. The project was successfully completed, meeting all objectives for sand production, capacity, and water quality.

JOSH SOBOLEW, PG, CHG

Project Manager

EDUCATION:

BS, Geology, California State University, Fullerton

REGISTRATIONS/ CERTIFICATIONS:

Professional Geologist, CA No. 9771

Certified Hydrogeologist, CA No. 1116

YEARS OF EXPERIENCE:

14 years total

10 years with Wood Rodgers

OFFICE LOCATION:

Orange Office | 606 E Chapman Ave Ste 200, Orange, CA 92866

PROFESSIONAL BIO

Joshua is a California-registered Professional Geologist and Certified Hydrogeologist with 14 years of experience in the water resource industry, providing well design, construction management and inspection services for many large-scale municipals well installation projects, as well as numerous monitoring wells, piezometers, exploratory boreholes, and well rehabilitation and redevelopment projects. His expertise is hydrogeologic data analysis and interpretation, pump design support, well permitting, well siting studies, developing drilling and rehabilitation plans and specifications, preliminary design reports, characterization of groundwater basins, and well field assessments. Josh experience also includes recharge investigations, water quality profiling of wells, and data collection and management for large scale groundwater recharge and desalination projects.

RELEVANT PROJECT EXPERIENCE

Golden State Water Company, Montana Well No. 1 – Claremont, CA | Project Manager for replacement of the Miramar Well No. 3 with a production objective of 750 gpm for the new well, Montana Well No. 1. Joshua supported project permitting by identifying permits for discharging, DDW, noise ordinances, and encroachment permits. He also coordinated with an acoustic consultant to estimate noise generated during construction activities. Joshua also evaluated two discharge scenarios that allowed discharging to land and the City storm drain system. He analyzed aquifers systems within the Six Basins during the preliminary design report. The preliminary design report included characterizing aquifer systems, aquifer yields, regional groundwater levels, water quality, potential contaminant activities, and the nearby anthropogenic sources. Joshua also planned for the construction logistics, and anticipated conditions – drilling, production capacity, and groundwater quality. He developed the technical specifications for drilling of the municipal well drilling using the reverse circulation method and supported the bidding phase by preparing addenda, attendance at the pre-bid meeting, and reviewing contractor bids.

Long Beach Water Department, Wells Commission 14 and Citizens 10 Rehabilitations – Long Beach, CA | Project Manager for a series of well rehabilitation projects for Long Beach Water. Joshua reviewed historical groundwater level data, historical water quality data, well construction details, video surveys, geophysical logs, and well performances were reviewed. His analysis identified current operating conditions of each well. Baseline well tests and downhole video surveys were performed to further evaluate current pumping conditions. The wells were evaluated for restoring lost capacity through a developed well rehabilitation program specific to each well's current operating conditions, which including recommended upgrades to pumping equipment with related infrastructure in a preliminary design report. The project is currently in the final plans and specifications phase including the permitting.

City of Adelanto, Hydrogeologic Characterization and Well Field Memorandum and Prioritization Plan – Adelanto, CA | Josh is currently the project manager for the City of Adelanto, and is currently memorializing and evaluating all of their wells within their water system and provided a hydrogeologic characterization of one of their well fields adjacent to the Mojave River. A hydrogeologic characterization included a geologic cross section, geologic map, and DEM data and were used to evaluate discrepancies in flow across the well field. Josh determined that discrepancies in flow were related to alluvial and fluvial deposits. He also is currently providing assessments for 22 active and inactive wells within the City of Adelanto Water System. Historical groundwater level data, historical water quality data, well construction details, video surveys, geophysical logs, well performances, well rehabilitations, and pump inspection reports were reviewed and analyzed to document the City's well field and to determine current conditions of each well. The data was further analyzed to determine if a well rehabilitation was feasible, if a well replacement was

warranted, or if a well should be destroyed. A rehabilitation prioritization plan was generated based of the well construction details, drilling method, historic groundwater quality, current well structure, historic capacity, rehabilitation history, and the City's capability of providing treatment. The highest ranked wells selected will be further assessed through camera inspection and EMT-24 surveys and a baseline well test before selected wells for rehabilitation. Wells that were ranked lowest on the list were listed to be destroyed and/or pumped until failure. Wood Rodgers performed baseline well tests on two active wells and collected interference data to support the hydrogeologic characterization and the prioritization plan.

Golden State Water Company, 2022 Well Assessments – Various Locations, CA | Provided assessments for eight GSWC wells within the Orcutt, Southwest, Florence-Graham, San Dimas, and Claremont Water Systems. Historical groundwater level data, historical water quality data, well construction details, video surveys, geophysical logs, and well performances were reviewed and analyzed to determine current operating conditions of each well. The data was further analyzed to determine if a well rehabilitation was feasible, or if a well replacement was warranted. Wells that were selected for replacement where then further analyzed for constructability of the site and DDW regulatory offset requirements. Sites that were heavily urbanized around and had limited space for drilling and construction were selected to be moved to a new well site.

California Water Service Company, Leona Valley Groundwater Supply Study – Leona Valley, CA | Responsible for investigating the expansion of California Water Service Company's local groundwater supply to reduce their dependency on purchased treated surface water. The project reviewed and evaluated existing infrastructure including pipelines, water tanks, and wells within the service area.

Long Beach Water Department, Wells North Long Beach 13 and 14 – Long Beach, CA | Joshua provided hydrogeologic services for two replacement wells, Wells North Long Beach 13 and 14, and destruction of Wells North Long Beach 4 and 9. He supported the permitting process by gaining a conceptual site approval from DDW. The site did not meet the 50-foot control zone requirement nor one of the wells were within 500-feet of a nearby petroleum pipeline.. He also supported the preliminary design report by evaluating the project site within the Pressure Area of the Central Subbasin. Evaluation of the basin included: the aquifer systems, aquifer yields, regional groundwater levels, water quality, potential contaminant activities, and the nearby anthropogenic sources. The preliminary design report implemented: a preliminary well design, construction logistics, and anticipated conditions – drilling, production capacity, and groundwater quality. He also compiled the necessary data and submitted the preliminary DWSAPs to DDW. He further supported the construction management and design phases of the project. The final wells were both constructed and designed to pump at 2,500 gpm each with 24-hour specific capacities over 150 gpm/foot of drawdown.

Indio Water Authority, Wells AA & T Rehabilitation and Profiling Services – Indio, CA | Supported the assessments of Wells AA and T to evaluate pumping conditions, historical well performance, groundwater elevations, and water quality specifically hexavalent chromium. Joshua prepared the design of the well rehabilitation and profiling services program to restore capacity and evaluated sources of elevated concentrations of hexavalent chromium over the recently promulgated MCL of 10 µg/L. Well T is currently bidding for pump contractors, and Joshua will provide construction management services.

Orange County Water District, Monitoring Well SC-7 – Villa Park, CA | Provided project management and design services for drilling, construction, and development of the OCWD SC-7 Monitoring Well Cluster. Two of the deeper boreholes were drilled using the direct mud rotary method with the deepest borehole including a geophysical suite. The geophysical suite coupled with the classification of the lithology using the United Soils Classification System (USCS) for each borehole was utilized for each final monitoring well design. The two shallower boreholes were completed with the air rotary casing hammer method. All monitoring wells were developed with swabbing and airlifting, and a submersible pump. Following the development, water quality samples were taken under the chain-of-custody protocol and relinquished to OCWD's Water Quality Laboratory for analysis. Each monitoring well also included a video survey, disinfection, and installation of a traffic. Josh was a primary author for the monitoring well summary report which included a construction chronology, daily reports, contractor logs, detailed lithologic log, geophysical logs, and water quality results.

City of Downey, Well Nos. 2, 5, 9, 10, 14, 16, 24, & 30 Rehabilitation, Redevelopment, and Testing Programs – Downey, CA | Project Manager for the City of Downey under an On-Call Services contract for well rehabilitation projects. Joshua has supported the implementation and design of rehabilitation programs that include mechanical and chemical cleaning, initial and final development, well modification by backfilling and sealing and patching, well testing, and well disinfection. He develops rehabilitation programs by evaluating historical groundwater elevations and capacity and evaluates the conditions by viewing the most recent well video and casing inspection thickness measurement (CITM) surveys. Joshua also supports the design of permanent pumping equipment and provides oversight inspection when requested. Josh assessed two wells for potential modification to reduce per- and polyfluoroalkyl substances concentrations by utilizing a spinner survey and depth specific sampling to perform mass balance calculations. Both wells indicated elevated PFAS concentrations throughout the well structure, which it was determined to wellhead treatment.

KEVIN GUSTORF, PE
QA/QC

EDUCATION:

BS, Civil Engineering, Loyola Marymount University, Los Angeles, California 1999

REGISTRATIONS/ CERTIFICATIONS:

Professional Civil Engineer, CA #64755; NV #018880

YEARS OF EXPERIENCE:

27 years total

8 years with Wood Rodgers

OFFICE LOCATION:

Sacramento Office | 3301 C Street, Building 100B Sacramento, CA 95816

PROFESSIONAL BIO

Kevin Gustorf is a professional civil engineer with 26 years of leadership and expertise in the water resources field. His water resource engineering experience includes the planning, design, construction, and management of a wide variety of projects for local municipal public works agencies, special districts, and private sector clients throughout California. His diverse project experience includes water and wastewater master planning, hydraulic modeling, and hydraulic analysis and studies. He is an expert on several different modeling platforms and has conducted presentations on modeling throughout the Western U.S. Kevin's design experience includes water and wastewater pipelines, pump stations, lift stations, flow/pressure control facilities, wells, tanks, and reservoirs for new facilities, as well as the repair and rehabilitation of existing facilities. His leadership experience includes managing projects ranging from small task orders to large, multi-discipline projects with multi-million-dollar design fees. As project manager, Kevin's focus is on achieving client goals in delivering quality projects, meeting the financial expectations of each project. He has managed hundreds of projects, all of which have met or come below budgets, regularly earning repeat business from clients due to his high-level of service and quality work. Kevin's leadership style is built on integrity, trust, and commitment. His excellent collaboration and communication skills allow him to remain dynamic and adaptable while maintaining project quality and timely delivery of services and work products.

RELEVANT PROJECT EXPERIENCE

City of Anaheim, Linda Vista Facility Master Plan – Anaheim, CA | Project Manager for permitting, environmental, civil, structural, and electrical engineering services for a facility master plan at the Linda Vista Complex, a strategic water supply source in the City's water system. The Linda Vista Complex was an aging facility supplied from local groundwater wells and an imported water connection. The facility contained an aging 4 MG reservoir and a dual-zone pump station. This critical facility needed to be upgraded and expanded, without being removing from service. Responsibilities included analyzing historical well production and water quality data; reviewing existing planning studies, inspection reports, and system operating criteria; conducting hydraulic analyses using the City's existing hydraulic model; sizing the new reservoir and pump station facilities; developing preliminary plans for a water treatment facility; preparing alternative site layouts; preparing lifecycle cost analyses; evaluating construction phasing schedules; and preparing a preliminary design report. This project needed to be completed within a very short window in order for the City to take advantage of funding sources. Kevin developed a project approach that involved preparing a series of technical memorandums (TM) to analyze and discuss the major project components, which allowed for quick TM submissions and City reviews for the reservoir and pump station capacity and layout, electrical and SCADA systems, permitting, environmental compliance, and hydraulic evaluation. Based on City comments and stakeholder workshops, the TMs were completed and approved within two months, then compiled into a preliminary site layout and preliminary design report. The project also required a preliminary environmental feasibility analysis that investigated potential environmental constraints at the site under the California Environmental Quality Act (CEQA). The analysis focused on aesthetic impacts due to the height of the reservoir improvements, air quality impacts during construction, biological resources impact due to known nesting birds in the site vicinity, and noise impacts due to the operation of booster pumps.

Scotts Valley Water District, Water System Condition Assessment and Master Plan – Scotts Valley, CA | Project Manager for a water system condition assessment to evaluate the current external physical condition and the general operational condition of SVWD's major potable water and recycled water system facilities. Developed an Asset Master Plan to be used by SVWD to plan and

budget future infrastructure improvement projects. The three-phase project included: information gathering, data analysis, and Asset Master Plan preparation. Information gathering included ArcGIS geodatabase, record drawings, and operations and maintenance (O&M) logs. Data analysis consisted of identification of opportunities for improved operational efficiency, including a risk/failure analysis of the system piping to identify risk pipelines and needs. Asset Master Plan preparation included development of an implementation model that identifies specific projects, estimated capital costs, and improvements prioritization. The implementation model also includes the planned replacement of all major elements of the water supply and distribution facilities based on age, condition, and expected remaining useful life. Specific project tasks included asset data compilation, verification, and review; a condition assessment workshop; determination of system operating characteristics; asset condition assessment; replacement cost estimates; pipeline risk/failures analysis; and asset replacement/improvement recommendations. The assessment included 62 miles of distribution pipelines, 6 wells, 4 treatment plants, 11 pumping stations, and 9 reservoirs. Performed site visits to identify and evaluate the conditions of piping configurations and mechanical equipment, external coatings and corrosion, SCADA/telemetry equipment, structural features, and electrical equipment. Safety conditions were also evaluated.

Irvine Ranch Water District, Wells 21 and 22 Wellhead Facilities and Pipelines – Tustin, CA | Design Engineer. Supported the final design, bidding, and construction of wellhead facilities, untreated water, product water, and brine disposal pipelines. Deliverables included plans, specifications, and engineering estimates of probable construction costs for each the wellhead facilities and all pipelines. Well 21 and Well 22, with capacities of 3,300-gpm and 1,600-gpm respectively, are submersible turbine pump / motor assemblies, installed within vaults, and one well is equipped with a bladder-type surge tank. Project included 7,000 ft. of 24-inch steel untreated water pipeline, 13,000 feet of 36-inch steel product water pipeline, and 1,700 LF of 10-inch HDPE brine concentrate pipeline. The pipelines required jack-and-bores to cross the OCTA Metrolink train tracks, an Orange County Flood Control District channel, BNSF train tracks, a box culvert, and Peter's Canyon Channel. Responsible for processing Orange County Flood Control encroachment and discharge permits, encroachment permits for the cities of Tustin and Irvine, OCSD class 1 wastewater discharge and trunk sewer connection permits, SCRRA/OCTA Metrolink right of entry/crossing agreements, an OSHA tunneling permit, a Caltrans encroachment permit, and a BNSF - right of entry/crossing agreement.

Coachella Valley Water District, Well 7803-1 Pump Analysis – Coachella Valley, CA | QA/QC Manager responsible for reviewing hydraulic analysis and sizing of replacement pumps and motors for the District's well rehabilitation program. As part of a larger project, Wood Rodgers completed a Rehabilitation Prioritization Plan to guide the District in proactive maintenance of its 101 active potable water supply wells to optimize their performance. Following rehabilitation and well redevelopment activities, Wood Rodgers performed system hydraulic calculations to size and select a new 2,000 gpm vertical turbine pump and motor for this rehabilitated well to optimize performance. Wood Rodgers provided the District with a technical memorandum summarizing the hydraulic analysis and selected and specified acceptable pumps for procurement.

Coachella Valley Water District, Well 5624-1 Pump Analysis – Coachella Valley, CA | QA/QC Manager responsible for reviewing the hydraulic analysis and sizing of replacement pumps and motors for the District's well rehabilitation program. As part of a larger project, Wood Rodgers completed a Rehabilitation Prioritization Plan to guide the District in proactive maintenance of its 101 active potable water supply wells to optimize their performance. Following rehabilitation and well redevelopment activities, Wood Rodgers performed system hydraulic calculations to size and select a new 1,500 gpm vertical turbine pump and motor for this rehabilitated well to optimize performance. Wood Rodgers provided the District with a technical memorandum summarizing the hydraulic analysis and selected and specified acceptable pumps for procurement.

KARL MEIER, PE
Project Engineer

EDUCATION:

BS, Civil Engineering, New Mexico State University

REGISTRATIONS/ CERTIFICATIONS:

Professional Civil Engineer, CA No. 71713

Professional Civil Engineer, WA No. 52372

United States Army Corps of Engineers, Construction Quality Management (CQM) for Contracts Certification, SPK-USACE-02-18-00060

Occupational Safety & Health Administration, OSHA 30-Hour Construction Certification, No. 4163274

YEARS OF EXPERIENCE:

22 years total

6 years with Wood Rodgers

OFFICE LOCATION:

San Diego Office | 2251 San Diego Ave Suite A-130, San Diego, CA 92110

PROFESSIONAL BIO

Karl Meier has over 22 years of experience as both a consultant and as a District Engineer for a public water agency. Karl's past public sector experience required active involvement and management of the engineering, operations and maintenance activities for a public water system. As a consultant, he has extensive experience in the planning and design of water, recycled water and wastewater infrastructure including pipelines, force mains, pump stations, wells, pressure reducing stations and reservoirs. Karl also has significant master planning and hydraulic modeling experience for public agencies and special districts. Karl's planning and design expertise is complimented by his past construction management and inspection experience, where he was directly responsible for construction management and inspection services for public works projects ranging from water infrastructure to municipal park and ADA improvement projects.

RELEVANT PROJECT EXPERIENCE

North Long Beach Construction for Wells 13 & 14, Long Beach Water – Long Beach, CA | Design Manager for engineering design and construction services for the hydrogeological evaluation, engineering design, and construction management services for constructing Wells North Long Beach 13 (NLB 13) and North Long Beach 14 (NLB14) in the City of Long Beach. The Project includes the drilling and equipping of new wells with a capacity of 2,500 gpm each, enclosures, site improvements, supervisory controls (SCADA), and pressurized conveyance pipelines for two new wells. NLB 13 will be located south of Jackson Street between Orange Avenue and Walnut Avenue inside Jackson Park West. NLB 14 is located on the southeast corner of Walnut Avenue and Jackson Street inside Jackson Park East. Work will also include the design of new conveyance lines connecting the two new wells to LBWD's well main collection lines. Scope of work includes reviewing existing plans; evaluating existing facility modifications; making recommendations on layouts, materials and equipment; submitting construction packages including drawings, cost estimates, and specifications for both sites; acquiring permits; providing pre-bid and bid evaluation services; providing; construction management; resident engineering; and inspection services.

Well 7803-1 Pump Analysis, Coachella Valley Water District - Coachella, CA | Lead Project Engineer responsible for providing hydraulic analysis and sizing of replacement pumps and motors as part of a well rehabilitation program. As part of a larger project, Wood Rodgers completed a Rehabilitation Prioritization Plan to guide the District in proactive maintenance of its 101 active potable water supply wells to optimize their performance. Following rehabilitation and well redevelopment activities, Wood Rodgers performed system hydraulic calculations to size and select a new 2,000 gpm vertical turbine pump and motor for this rehabilitated well to optimize performance. Wood Rodgers provided the District with a technical memorandum summarizing the hydraulic analysis and selected and specified acceptable pumps for procurement.

870-2 Reservoir Improvement Project, Otay Water District – Spring Valley, CA | Serving as Principal in Charge/Project Manager. Wood Rodgers recently completed the design of a new 3.4 MG prestressed concrete reservoir. The new 870-2 Reservoir will allow the District to take the existing 11 million gallon (MG) earthen embankment 870-1 reservoir offline for maintenance to allow for the replacement of the floating cover/liner on this reservoir. The 870-1 reservoir is the sole reservoir serving the 870 PZ; therefore, a redundant reservoir is needed at the same site to provide storage while the existing reservoir is offline for the cover/liner replacement. In addition to the design of the new 870-2 Reservoir, Wood Rodgers is providing additional site and mechanical improvements which include the relocation of the 870-1 inlet, which must relocated in such a manner to avoid a complex network of proposed and existing yard piping which includes a 30-inch CML&TWC steel inlet, 30-inch

CML&TWC steel outlet, and a 30-inch RCP storm drain and overflow pipe. Wood Rodgers used Navisworks and AutoCAD Civil 3D to perform conflict detection and aid in the design of this aspect of the project.

Lake Murray Pump Station Evaluation, City of San Diego – San Diego, CA | Served as Principal in Charge/Project Manager. The Lake Murray Pump Station (LMPS) conveys raw water from Lake Murray to the Alvarado Water Treatment Plant. The City needs to have the ability to rely on the LMPS to produce drinking water in the event that other raw water sources are unavailable on peak summer days extending ten days. Wood Rodgers is conceptualizing alternative improvements to the LMPS to increase its capacity up to 120 MGD. As a part of this task, Wood Rodgers is performing a detailed hydraulic evaluation of the pump station and conveyance system to analyze hydraulic performance in accordance with City and Hydraulic Institute Standards to identify constraining factors within the limits of work (intake structure at the lake to rapid mix structure at the treatment plant). To validate the hydraulic calculations and system head curves, Wood Rodgers developed a field testing plan to allow for the comparison of the theoretical results to field results. Using the results from the hydraulic evaluation, Wood Rodgers is developing conceptual alternatives for the LMPS upgrades. The evaluation also includes a life cycle cost analysis and the development of opinions of probable construction cost for each alternative with cost data itemized by major assets (pumping units, valves, vaults, VFDs, etc.), to allow the City to selectively evaluate items for inclusion or exclusion from the project alternatives.

Escondido 4 Flow Control Facility and Pump Station, San Diego County Water Authority – San Diego, CA | Serving as Principal in Charge/Project Manager. The Water Authority has contract with Wood Rodgers to analyze the hydraulic performance of the Escondido 4 FCF and Pump Station. The pump station has a rated capacity of up to 10 cfs, however system constraints have limited production to 2 cfs. Wood Rodgers is performing field investigations, review of data, and performing hydraulic calculations and analyses to determine what is limiting production and how to resolve.

Oak Knolls Pump Station Replacement, City of Simi Valley/VCWWD No. 8 - Simi Valley, CA | Serving as Principal in Charge. Wood Rodgers is providing preliminary and final design services for the replacement of the Oak Knolls Pump Station (OKPS). The OKPS is being replaced to increase the capacity and total dynamic head of this facility to convey water to a new 1.0 MG reservoir. Due to the complex controls and facility operations, a detailed hydraulic analysis using InfoWater Pro was performed. The hydraulic analysis was conducted under an extended period simulation and examined both the suction and discharge pressure zones to evaluate required off-site upgrades, performance of the suction and discharge reservoirs as well as the desired control regime for the OKPS. The new 700 gpm pump station will be housed within a new CMU building, will be equipped with VFDs and a new diesel powered emergency generator.

Cottonwood Sewer Pump Station Replacement, Otay Water District – Spring Valley, CA | Serving as Principal in Charge and Project Manager. The Cottonwood Sewer Pump Station, a suction-lift pump station, was originally constructed as a temporary pumping facility and as a result has many access and operational shortcomings. The District examined the potential to rehabilitate this facility, however the shortcomings cannot be remedied. As such, the District is replacing the existing pump station with a new pump station.

Charter Oak Pump Stations No. 1 & 2, City of Camarillo – Camarillo, CA | Serving as Principal in Charge and Project Manager. The City of Camarillo's (City) water supply consists of locally-treated groundwater from the North Pleasant Valley Desalter (NPVD) as well as treated imported water from the Calleguas Municipal Water District (CMWD). With the North Pleasant Valley Desalter capable of providing a substantial portion of the City's water supply, the City has identified the opportunity to reduce treated imported water purchases. One such opportunity would be through the implementation of the Charter Oak Pump Stations Nos. 1 and 2 Project, which would meet customer demands in the City's higher elevation pressure zones 420 and 445A using two new pump stations (Charter Oak Pump Stations 1 & 2). Wood Rodgers is providing planning and design services for these two new pump stations. Services include hydraulic modeling, assistance with property acquisition, and pump station design.

Well 5624-1 Pump Analysis, Coachella Valley Water District – Coachella, CA | Lead Project Engineer responsible for providing hydraulic analysis and sizing of replacement pumps and motors for the District's well rehabilitation program. As part of a larger project, Wood Rodgers completed a Rehabilitation Prioritization Plan to guide the District in proactive maintenance of its 101 active potable water supply wells to optimize their performance. Following rehabilitation and well redevelopment activities, Wood Rodgers performed system hydraulic calculations to size and select a new 1,500 gpm vertical turbine pump and motor for this rehabilitated well to optimize performance. Wood Rodgers provided the District with a technical memorandum summarizing the hydraulic analysis and selected and specified acceptable pumps for procurement.

MICHELLE HARB, PG

Project Geologist

EDUCATION:

BS, Geological Sciences, California State University, Fullerton

REGISTRATIONS/ CERTIFICATIONS:

Professional Geologist, CA No. 10251

40-Hour HAZWOPER

YEARS OF EXPERIENCE:

9 years total

5 years with Wood Rodgers

OFFICE LOCATION:

Orange Office | 606 E Chapman Ave Ste 200, Orange, CA 92866

PROFESSIONAL BIO

Michelle is a Geologist in Wood Rodger's Orange office with 9 years of experience. Her experience includes beginning to end inspection of water well construction, well destruction, and well rehabilitation activities for public and private agencies. Michelle's field activities include lithology classification (USCS method), water quality sampling, cement installation inspection, and casing inspections. Other field experience includes cross-hole sonic logging, levee cut-off wall installation, sonic drilling, and hard-rock drilling oversight. Office experience includes technical report writing, map creation using ArcMap, creating drawings and plan sets with AutoCAD, creating well design schematics and profiles using Strater, creating cross-sections using gINT, and data processing and analysis.

RELEVANT PROJECT EXPERIENCE

Commission 24 and Commission 25 Well Rehabilitations, Long Beach Utility Department – Long Beach, CA | Assisted in planning and bid package preparation for the rehabilitation of two water wells owned and operated by the City of Long Beach's Utility Department. Provided technical support in drafting the Plans and Technical Specifications for the rehabilitations of two wells in Long Beach, California. The plan sheets were drafted using AutoCAD software and the specifications were drafted in the Construction Specifications Institute (CSI) format.

Citizens 10 and Commission 14 Well Rehabilitations, Long Beach Utility Department – Long Beach, CA | Assisted in planning and bid package preparation for the rehabilitation of two water wells owned and operated by the City of Long Beach's Utility Department. Provided technical support in drafting the Plans and Technical Specifications for the rehabilitations of two wells in Long Beach, California. The plan sheets were drafted using AutoCAD software and the specifications were drafted in the Construction Specifications Institute (CSI) format.

2022 Well Assessments, Golden State Water Company – Southern CA | Field inspection services and performed baseline testing, site evaluations, and well assessments for four wells in Golden State Water Company's Southwest, Orcutt, and Florence-Graham systems. Baseline testing included monitoring water levels, sand content, flow rate, and water quality during a one-hour constant rate test. Overall Plant Efficiency was calculated during the onsite visit. Wells were assessed based on performance, age, structural integrity, and potential for recoverable specific capacity. Replacement recommendations included site feasibility assessments for constructing a new well on the same property.

Monitoring Well SC-7, Orange County Water District – Villa Park, CA | Provided full-time inspection during the construction of monitoring well SC-7w as a part of a quad-completion clustered monitoring well project. The well was constructed with 4-inch PVC to a depth of 345 feet. Inspected materials and oversaw the installation of the bentonite seals, filter pack placement, and annular seal placement. Provided inspection during flush-mount vault installation.

Well NLB 13, Long Beach Water – Long Beach, CA | Provided full-time beginning to end inspection services during the drilling, construction, and testing of the new well, North Long Beach 13, which was constructed to a depth of 1,150 feet in Long Beach, California. Assisted in the lithologic classifications of borehole samples which were collected every 10 feet. Oversaw construction activities which included inspecting casing joints, welds, assembly of accessory tubing. Recorded a running tally of all construction activities including gravel install and annular seal placement. Provided oversight and recorded extensive data during well development and aquifer testing phases.

HECTOR FERNANDEZ

Project Geologist

EDUCATION:

BS, Geology, California State University, Fullerton

REGISTRATIONS/ CERTIFICATIONS:

40-Hour HAZWOPER

HAZMAT Certification

LEAD Certification

YEARS OF EXPERIENCE:

10 years total

5 years with Wood Rodgers

OFFICE LOCATION:

Orange Office | 606 E Chapman Ave Ste 200, Orange, CA 92866

PROFESSIONAL BIO

Hector Fernandez has seven years of experience as a staff geologist and two and a half years as an environmental sampling technician. Hector is currently a staff geologist with extensive experience in GIS Pro, his experience includes creating figures such as (Location maps, Detailed location maps, Sites of environmental concern, Regulatory offset maps, Drinking Water Source Assessment Map) for summary reports, technical specifications, proposals and many other type of reports. Hector also has experience in Strater 5 to design new well construction, Monitoring wells, and well abandonment. Also, collection and input of database. Hector has experience in providing drilling and construction inspection for municipal water supply wells of large diameter and monitoring wells, borehole logging and analyzing geophysical logs, well rehabilitation and well destruction. His experience with various drilling methods includes direct mud drilling, reverse circulation drilling, Hollow-Stem Auger (HSA), mud rotary, direct push, and Cone Penetration Testing (CPT). Hector has experience in well installation oversight and is proficient in the installation and maintenance of the following instruments: strain gauges, Multi- point borehole extensometers (MPBX), In-place Inclinometers (IPI) and vibrating piezometers. He is also experienced with 1166 soil monitoring and soil sampling, as well as dust and air monitoring.

RELEVANT PROJECT EXPERIENCE

Pasadena Water and Power, Garfield Replacement Well – Pasadena, CA | Provided Full-time inspection services for a reverse circulation drilling of an 820-foot Potable water supply well for the city of Pasadena with a design capacity of 1,700 gallons per minute. Inspection services included site preparation, lithologic classifications, overseeing pilot borehole drilling and reaming, isolated aquifer zone testing, geophysical survey, casing installation, gravel envelope placement, annular seal placement, initial development by swab and airlift, final well development by pumping and surging, constant rate test, water quality sampling, disinfection, and site restoration. Hector also supported the summary report.

2022 Well Assessments, Golden State Water Company – Southern California | Performed baseline testing, site evaluations for Miramar well 3 in Golden State Water Company's Claremont system. Baseline testing included monitoring water levels, sand content, flow rate, and water quality for the duration of a one-hour constant rate test. The overall Plant Efficiency was calculated during the onsite visit.

Long Beach Water, North Long Beach 13 - Long Beach, CA | Provided well oversight on a downhole video survey for NLB 9 conducted by pacific survey. He also, provided oversight during the borehole reaming, swab and airlift, pump development, title 22 sampling, and geophysical survey.

City of Downey, Well 30 – Downey, CA | Provided an as-needed service support for the well rehab of a 662-foot Production well for the city of Downey. Hector aided city of Downey on Pump Well Development to establish data collection, flow rates and sand production.

Golden State Water Company, Baseline Well No. 6 & Test Hole – San Dimas, CA | Provided part-time inspection services for a direct mud drilling of a 780-foot test hole to determine the feasibility of construction of Baseline Well No. 6 as proposed by GSWC. Hector Provided lithologic classification using the UCSC Classification, witnessed the geophysical survey and destruction of the bore hole. Inspection services included the installation of a conductor casing and installation of sanitary seal for Baseline Well No. 6.

JAZMINE TITULAR-MASON, PG

Staff Geologist

EDUCATION:

BS, Geological Sciences, California State University, Fullerton, 2016

YEARS OF EXPERIENCE:

7 years total

5 year with Wood Rodgers

OFFICE LOCATION:

Orange Office | 606 E Chapman Ave Ste 200, Orange, CA 92866

PROFESSIONAL BIO

Jazmine is a geologist with 7 years of experience in the water supply industry, with training in ArcGIS Pro and AutoCAD. She specializes in preparing maps and figures delineating groundwater conditions, compiling and analyzing large datasets, and the drafting and QA/QC of specifications and plan sets for new well construction. She has provided technical support and inspection services through the entirety of project life cycles, collaborating with cross-functional teams on complex, multi-phase projects. She is an experienced field geologist that has logged boreholes, provided geophysical logging interpretations, performed construction and destruction inspection services, conducted water quality sampling, and provided well development and testing oversight for production and monitoring wells throughout California. She is also experienced in well rehabilitation projects including mechanical and chemical cleaning, liner installation, and well redevelopment.

RELEVANT PROJECT EXPERIENCE

Long Beach Water Department – Wells North Long Beach 13 & 14 – Long Beach, CA | Mrs. Titular-Mason provided technical support for the drilling of two new municipal wells and the destruction of two existing municipal wells. She assisted with the design of the new wells and the destruction of the existing wells. Mrs. Titular-Mason also assisted with the writing of technical specifications, as well as created AutoCAD and GIS supporting exhibits. She provided full time inspection for the borehole reaming, annular seal installation, and initial development by swab and airlift for NLB 14. She also oversaw the abandonment of NLB4, including the bailing, perforating, mushroom cap, and backfilling phases. Mrs. Titular-Mason inspected the staking and installation of the conductor casing of NLB13, and will provide full-time inspection for the pilot borehole, borehole reaming, and construction of NLB 13.

Pasadena Water & Power – Garfield Replacement Well – Pasadena, CA | Ms. Titular-Mason provided technical support and full-time inspection services for the drilling and construction of an 800-foot municipal water supply replacement well. She assisted in the preparation of the technical specifications and AutoCAD drawings, as well as the final well design by analyzing the geophysical logs and lithologic classifications. Inspection services included pilot borehole reaming, lithologic classifications, isolated-aquifer zone testing of four zones, well construction, and initial development by swab and airlift.

Golden State Water Company – Baseline Well No. 4 and 5 – San Dimas, CA | Mrs. Titular-Mason provided inspection services in preparation of a municipal water supply replacement (Baseline Well No. 5) for Golden State Water Company (GSWC). She inspected a downhole video survey of Baseline Well No. 4 to confirm construction details prior to destruction of the well. She provided full-time inspection for the construction and part-time inspection for the development and aquifer testing for the replacement well.

Golden State Water Company – Mountain View Test Hole & Well No. 5 – Claremont, CA | Mrs. Titular-Mason provided technical services in preparation of a municipal water supply replacement for Golden State Water Company (GSWC). She created draft well profiles and GIS figures depicting pump efficiency and water quality data for the Preliminary Design Report and assisted in the writing of the technical specifications and AutoCAD drawings. She provided part-time inspection for the drilling of a direct mud rotary test hole, along with lithologic classification and test hole destruction. Mrs. Titular-Mason also provided full-time inspection for the drilling, construction, and development, and aquifer testing for the municipal well.

JOSEPH HERNANDEZ

Project Geologist

EDUCATION:

BS, Geology, California State University, Fullerton

YEARS OF EXPERIENCE:

4 years total

1 year with Wood Rodgers

OFFICE LOCATION:

Orange Office | 606 E Chapman Ave Ste 200, Orange, CA 92866

PROFESSIONAL BIO

Joseph Hernandez brings 4 years of experience dealing with a multitude of disciplines ranging from field work to office in various geologic disciplines including hydrogeology. Joseph is well versed with tools including MS Office, AutoCad, Photoshop, Gint, GIS, and strater. He is a quick learner, adaptable, pliable, and creative, allowing for excellent problem-solving skills. He has strong field inspection and observation skills documenting the contractor's adherence to the technical specifications of the project and communicating or identifying issues within the field before they arise.

RELEVANT PROJECT EXPERIENCE

Long Beach Utilities Department, Commission 14 Rehabilitation Project -- Long Beach, CA | Joe provided field inspection services for the rehabilitation of Well Commission 14. Field inspection services included injection and extractions of acid, well redevelopment using the focus intake pumping method, pump development, well testing, downhole video survey, bailing of sediment and removal of obstructions, and well disinfection. He also supported the preparation of the rehabilitation summary report and preparation of figures and attachments.

City of Lakewood, Well 22B -- City of Lakewood, CA | Prepared Preliminary Drinking Water Source Assessment Program documents for a new well with the City's service area. Preparation included identifying nearby contaminant and potential contaminant activities, creating modified fixed radii based off of total well screen length, design flow rate, groundwater direction, and gradient. Joe also determined the physical barrier effectiveness with respect to the confining layers above the proposed well screen interval and assessing the aquifer parameters.

City of Downey, Well 9 – Downey, CA | Provided an as-needed service support for the well rehab of a production well for the city of Downey. Joe aided city of Downey on Pump Well Development to establish data collection, flow rates and sand production. Reviewed video survey and provided summary report.

Golden State Water Company, Montana Well Site 1 -- Claremont, CA | Performed analysis of the proposed Montana Well No. 1 site within the Six Basins Subbasin. Joe supported the technical specifications, creating site maps and regulatory maps. Assisted in data collection, data analysis, and drafting the preliminary design report. Assisted in creating conceptual layouts of drilling equipment, sound walls, water source and discharge conveyance maps. Assisted in the permitting for a permanent discharge pipe installation into an existing storm drainage system.

City of Camarillo, Desalter Standby Well – Camarillo, CA | Assisted in the compilation of water quality data from nearby active wells in the Camarillo area. Identified wells with high concentrations of contaminants within a 2.5-mile radius from proposed well. Assessed the regional geology and structural setting. Created regulatory and offset maps for the proposed desalter well.

City of Adelanto, New Production Well – Adelanto, CA | Assisted in the compilation of well information for eight wells in the Adelanto area. Joe reviewed historical groundwater level data, historical water quality data, well construction details, video surveys, geophysical logs, and well performances. His analysis identified current operating conditions of each well. Then prepared well profiles for each of these wells based off the data collected.

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Sweetwater Authority
Fee Proposal to Provide Professional Services
for Development of the Well Rehabilitation and Maintenance Program

		Principal Hydrogeologist I / Engineer I		Project Manager / Project Engineer II		Geologist II		Geologist I / Engineering I		Field Inspector II		Labor	Direct Costs	Total Cost	
		Hrly Rate:	$320	Hrly Rate:	$270	Hrly Rate:	$240	Hrly Rate:	$225	Hrly Rate:	$170				
		Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Wk-Hrs	Amount	Amount	Amount	Wk-Hrs	Amount
1.0	**PROJECT MANAGEMENT AND COORDINATION**														
1.1	Project Coordination & Management	6	$ 1,920	24	$ 6,480	12	$ 2,880		$ -		$ -	$ 11,280	$ -	42	$ 11,280
1.2	Project Meetings (includes Kick Off and Progress Meetings [assumes 3 meetings])	6	$ 1,920	14	$ 3,780	16	$ 3,840	4	$ 900		$ -	$ 10,440	$ 140	40	$ 10,580
	Subtask 1 Total	***12***	***$ 3,840***	***38***	***$ 10,260***	***28***	***$ 6,720***	***4***	***$ 900***		***$ -***	***$ 21,720***	***$ 140***	***82***	***$ 21,860***
2.0	**INFORMATION GATHERING AND REVIEW**														
2.1	Data Review (includes RFI and Preparation of Well Diagrams)	2	$ 640	14	$ 3,780	24	$ 5,760	60	$ 13,500		$ -	$ 23,680	$ -	100	$ 23,680
2.2	Prepare and Submit Draft Performance Charts	2	$ 640	8	$ 2,160	12	$ 2,880	34	$ 7,650		$ -	$ 13,330	$ -	56	$ 13,330
	Subtask 2 Total	***4***	***$ 1,280***	***22***	***$ 5,940***	***36***	***$ 8,640***	***94***	***$ 21,150***		***$ -***	***$ 37,010***	***$ -***	***156***	***$ 37,010***
3.0	**SITE VISITS AND BASELINE WELL TESTING**														
3.1	Site Visits and Baseline Well Testing (assumes 13 wells)	1	$ 320	4	$ 1,080	8	$ 1,920	18	$ 4,050	60	$ 10,200	$ 17,570	$ 1,355	91	$ 18,925
3.2	Downhole Camera Inspection Surveys (assumes 4 static and 1 dynamic surveys)	1	$ 320	12	$ 3,240	16	$ 3,840	4	$ 900	36	$ 6,120	$ 14,420	$ 975	69	$ 15,395
	Subtask 3 Total	***2***	***$ 640***	***16***	***$ 4,320***	***24***	***$ 5,760***	***22***	***$ 4,950***	***96***	***$ 16,320***	***$ 31,990***	***$ 2,330***	***160***	***$ 34,320***
4.0	**WELL FIELD EVALUATION AND ASSESSMENT**														
4.1	Prepare Draft Program (includes Bios, Appendices, Ranking System, Assessments, Rehabilitation Programs, OPC, SOP's, and Executive Summary)	16	$ 5,120	42	$ 11,340	44	$ 10,560	66	$ 14,850		$ -	$ 41,870	$ -	168	$ 41,870
4.2	Draft Program Review Meeting	2	$ 640	12	$ 3,240	14	$ 3,360	6	$ 1,350		$ -	$ 8,590	$ 430	34	$ 9,020
	Subtask 4 Total	***18***	***$ 5,760***	***54***	***$ 14,580***	***58***	***$ 13,920***	***72***	***$ 16,200***		***$ -***	***$ 50,460***	***$ 430***	***202***	***$ 50,890***
5.0	**PREPARE FINAL DELIVERABLES**														
5.1	Prepare Final Program	6	$ 1,920	16	$ 4,320	24	$ 5,760	28	$ 6,300		$ -	$ 18,300	$ -	74	$ 18,300
5.2	Final Program Presentation	2	$ 640	8	$ 2,160	10	$ 2,400	4	$ 900		$ -	$ 6,100	$ 140	24	$ 6,240
	Subtask 5 Total	***8***	***$ 2,560***	***24***	***$ 6,480***	***34***	***$ 8,160***	***32***	***$ 7,200***		***$ -***	***$ 24,400***	***$ 140***	***98***	***$ 24,540***
	GRAND TOTAL (TASKS 1 THROUGH 5):	**44**	**$ 14,080**	**154**	**$ 41,580**	**180**	**$ 43,200**	**224**	**$ 50,400**	**96**	**$ 16,320**	**$ 165,580**	**$ 3,040**	**698**	**$ 168,620**