



RFP FOR

**GROUNDWATER AND SURFACE WATER  
MONITORING SERVICES FOR THE BEAUMONT  
AND SAN TIMOTEO GROUNDWATER  
MANAGEMENT ZONES**

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**CITY OF BEAUMONT**

JANUARY 06, 2022

605 Third Street / Encinitas, CA 92024 / 760.942.5147

**DUDEK**



# Cover Letter

January 06, 2022

Thaxton Van Belle  
General Manager of Utilities  
City of Beaumont  
550 E. 6th Street  
Beaumont, California 92223

**Subject: RFP for Groundwater and Surface Water Monitoring Services for the Beaumont and San Timoteo Groundwater Management Zones**

Dear Mr. Van Belle,

The City of Beaumont (City) requires an experienced team ready and able to successfully provide the groundwater and surface water monitoring services required in the 2014 amendment (Order R8-2014-0005) to the Santa Ana River Basin's Water Quality Control Plan (Basin Plan). Since July 2016, Dudek has served as the City's representative in collecting the required groundwater and surface water data to demonstrate the City's compliance with the Maximum Benefit Commitments established in Order R8-2014-0005. To ensure that the City is compliant with the monitoring requirements, Dudek follows the monitoring protocols and schedules outlined in the 2015 Maximum Benefits Monitoring Program (MBMP) Work Plan. Dudek's experienced team has worked closely with City staff, and is familiar with the City's procedures, monitoring equipment, and with the many individual parties and stakeholders that are participants in the MBMP. Our team will offer value to the City by leveraging our:

- Local groundwater and surface water monitoring experience, including established relationships with City staff and participating stakeholders and individual well owners
- Long-standing local agency relationships and knowledge of the regulatory requirements, and
- Ability to seamlessly integrate the data collected in the field with the MBMP annual reports that Dudek prepares as the MBMP Data Manager under contract with Yucaipa Valley Water District .

**Local Experience and Proven History with the City.** The Dudek team brings extensive local experience and knowledge to the project. Dudek's experience includes conducting semi-annual groundwater monitoring services and biweekly surface water monitoring services in the Beaumont and San Timoteo Groundwater Management Zones, conducting biological and groundwater monitoring services along San Timoteo Creek as part of a Habitat Monitoring Program, and the development of a Groundwater Sustainability Plan for the Yucaipa Subbasin that included the participation of water purveyors operating in San Bernardino and Riverside Counties.

Dudek has served the City since 2016 and has successfully met the annual reporting requirements in Order R8-2014-0005. Dudek has, through lessons learned in the field and the development of trusted relationships with the individual well owners participating in the MBMP, improved our efficiency in collecting the data and reduced our annual costs. Our experience with providing the services required under the MBMP as outlined in the scope of services in this proposal, and the familiarity and knowledge of the region, will be a great benefit for the City in terms of project efficiency and cost.

**Distinctively Qualified Project Management Team.** Mr. Stuart has 24 years' experience as hydrogeologist, managing groundwater supply projects and hydrogeological investigations throughout California. Responsibilities include the oversight and project management of groundwater resource assessments and development, hazardous waste remediation projects, and regulatory compliance. Mr. Stuart's experience includes developing Sustainable Groundwater Management Act-compliant GSPs; managing groundwater and surface water monitoring programs; and designing, calibrating, and implementing 2D and 3D numerical models to simulate groundwater flow and contaminant fate and transport in the unsaturated and saturated zones.

Mr. Stuart and his team will continue building on the trusted relationships with City staff and other MBMP participants and are committed to being:

- **Informed.** Fully understanding the project and client goals;
- **Connected.** Effectively communicating with MBMP participants and Santa Ana Water Board;
- **Resourceful.** Identifying problems and finding practical, cost effective solutions;
- **Responsive.** Providing frequent communication and responding to phone calls and emails; and
- **Efficient.** Maintaining project budgets and momentum.

Joseph Monaco, President and CEO, is authorized by Dudek to contractually obligate Dudek. His signature certifies that Dudek will comply with the nondiscrimination requirements of the State and Federal Government. Additionally, Dudek has reviewed our past and current projects, clients, and contracts, and has reviewed our staffs' roles within the company, and does not find any conflicts of interest that would impede our ability to perform the scope of work requested by the City in the RFP.

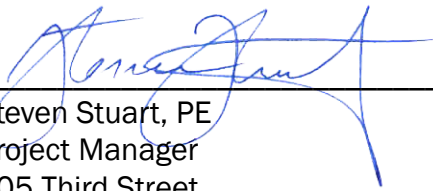
We appreciate the opportunity to propose on this project and welcome any questions regarding our capabilities. Please reach out to Mr. Stuart with any questions or requests for clarification.

Sincerely,



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Joseph Monaco  
President and CEO  
605 Third Street  
Encinitas, California 92024  
760.479.4296



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Steven Stuart, PE  
Project Manager  
605 Third Street  
Encinitas, California 92024  
760.479.4128

*This fee estimate is valid for 90 days from the date of this proposal; after 90 days, Dudek reserves the right to reassess the fee estimate, if necessary.*

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# Introduction/Information

## Statement of Understanding of Services Proposed

Dudek is very pleased to present this proposal to the City of Beaumont (City) for providing groundwater and surface water monitoring services to meet the data collection requirements for the Beaumont and San Timoteo Groundwater Management Zones (BMZ and STMZ, respectively) as established in the 2014 amendment (Resolution No. R8-2014-0005) to the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). The requirements for the groundwater and surface water monitoring services are detailed in the Maximum Benefits Monitoring Program (MBMP) Work Plan adopted in 2015.

Dudek has provided the groundwater and surface water monitoring services for the City since July 2016 and has successfully collected, compiled, and submitted all data required in the annual MBMP reports to the California Regional Water Quality Control Board Santa Ana Region (Water Board) by the annual deadline of April 15. Dudek is under contract with the Yucaipa Valley Water District (YVWD); the designated MBMP data manager for the BMZ, STMZ, and the Yucaipa Groundwater Management Zone (YMZ); and serves to obtain, compile, and analyze all groundwater and surface water data required under the program. Dudek is responsible for preparing and submitting the MBMP annual reports on behalf of YVWD and all participating parties, including the City.

## The Dudek Team

The Dudek team in this proposal has served the City over the last few years in conducting all field work and data collection activities detailed in the MBMP Work Plan for the BMZ and STMZ. Dudek has a close and trusted relationship with the City and with the other participating agencies and stakeholders in the MBMP, including the private well owners upon which a large amount of the groundwater data and basin characterization depends. The Dudek team will be led by Project Manager Steven Stuart, who has served as the Dudek project manager for the MBMP services provided for the City since July 2016. Mr. Stuart will be supported by Xiomara Rosenblatt and Desiree Otilio, and both have conducted the surface water and groundwater monitoring services in the field over the last few years. Ms. Rosenblatt and Ms. Otilio are experienced in coordinating the field monitoring services with City staff, Clinical Laboratory of San Bernardino (Clinical Laboratory), and other stakeholders and individual well owners who are a major part of the MBMP.

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### ***Dudek Mailing Address***

*605 Third Street  
Encinitas, California  
92024*

### ***Dudek Main Point of Contact***

*Steven Stuart, PE  
sstuart@dudek.com  
760.479.4128*

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The proposed team organization is presented in **Figure 1**, and brief biographical summaries of the qualifications and expertise of the team is presented in the *Organization, Key Personnel, and Resume* Section. Full resumes of the team are provided in **Appendix A**.

# Approach

Dudek has an effective and proven project approach. We manage projects to meet client and technical needs, using sound science and engineering principles, a focus on data quality, and careful management of budget and schedule milestones. Our approach to this and every project begins with solid project management and quality assurance/quality control (QA/QC) processes. Our focus on these central tenets to performing environmental work has guided the Dudek team since our groundwater and surface water monitoring services were retained by the City in July 2016.

## Project Management Approach

The primary aspects of the Dudek approach to project management include communication, managing adherence to the scope, keeping the progression of work on schedule, cost controls, and predicting and avoiding risk. Dudek prides itself on also integrating a fundamental focus on high-quality work, optimized resource allocation, as well as maintaining focus towards meeting both client and project goals and objectives.

The following sections describe the Dudek project management approach.

### Project Planning

Planning is a critical step in the successful management of every project. Dudek Project Manager Steven Stuart and supporting staff, Ms. Rosenblatt and Ms. Otilio will coordinate with City staff and Clinical Laboratory at least one week before each surface water monitoring event, and at least four weeks before each semi-annual groundwater monitoring event. The Dudek team will also coordinate with each individual private well owner at least four weeks before each groundwater monitoring event. Planning considerations include the following:

- Clarifying the project requirements and confirming the project goals and outcomes
- Communicating with the City and other project stakeholders, including private well owners
- Monitoring project budget and schedule, and ensuring project deadlines and milestones are met
- Integrating quality standards for all data collection and field support

### Communication

The most-effective project manager is one who facilitates the continual flow of information, data, instructions, and guidance among the City, Dudek team members, and other jurisdictional stakeholders. When maintaining this flow, we use resources efficiently and minimize wasteful rework. We will achieve constant communication through the following:

- Regularly calling or emailing the City's key contact staff person, Mr. Van Belle, to discuss project milestones, activities, and potential issues
- Regularly discussing the project with key project staff to coordinate work efforts, monitor task completion, and review budget conformance; Dudek's key staff have worked together on this same project and other similar monitoring programs for more than three years



- Communicating immediately with City staff regarding any questionable data, or request further information (e.g., data for recycled water discharged to San Timoteo Creek), necessary to meet the data requirements for the annual MBMP reports
- Meeting with or holding conference calls with City staff on any matter related to the MBMP
- Diligently documenting issues, action items, and decisions

## Project Execution

The structure and flexibility of the Dudek team provides the ability to adapt resources and the execution approach to meet the data collection requirements of the project. Dudek has identified two additional staff members, Hugh McManus and Stephanie Chao, who may substitute for Ms. Rosenblatt and Ms. Otilio should they not be available for a particular task. Mr. McManus and Ms. Chao are experienced with performing surface water and groundwater monitoring services, and their assistance, when needed, will ensure the project progresses on schedule and that all data collection requirements are met. The Dudek team will notify the City when Mr. McManus and/or Ms. Chao will substitute the services of Ms. Rosenblatt and Ms. Otilio. Each member of our team understands the data collection requirements in the field and that they represent the City. They will conduct themselves professionally when engaging with other stakeholders and will operate in the best interest of the City.

## Project Controls

Dudek's project manager, Mr. Stuart, will monitor and control the project budget, schedule, and quality using a suite of tools from project inception to completion. Dudek project tools include real-time project budget management, schedule management software, and QA/QC checks. As the project advances, our project manager communicates with the team on a regular basis to evaluate project resource requirements, budget, and schedule.

## Quality Control

Steps will be taken in the field, office, and laboratory to ensure that data are transferred accurately from collection to analysis to reporting. Sample documentation, including labeling and chain-of-custody forms, will be completed to ensure that data are transferred accurately to the laboratory. Notes will be taken in the field to double check chain-of-custody forms for accuracy. Laboratory reports will be checked for completeness. Final laboratory reports will be reviewed by the laboratory quality assurance manager or laboratory project manager for errors before release.

Data collected or received by Dudek will be reviewed for completeness and evaluated for accuracy. Because Dudek serves as the MBMP Data Manager for the BMZ, STMZ, and YMZ under contract with YVWD, there is a seamless transfer of data collected under this contract to the YVWD MBMP database. This is an efficient and cost-savings approach for the City because Dudek provides the data collection and prepares the annual reports. Collected data are reviewed, quickly evaluated, and compiled in the MBMP database with no additional expense required to format and send data to the Data Manager.

# Firm Profile

## The Dudek Advantage

We are a California-based environmental and engineering consultant with nationwide offices and more than 700 planners, hydrogeologists, scientists, civil engineers, contractors, and support staff. We assist private and public clients on a range of projects that improve and evolve our communities, infrastructure, and natural environment. From planning, design, and permitting through construction, we move projects forward through the complexities of regulatory compliance, budgetary and schedule constraints, and conflicting stakeholder interests.

Dudek is committed to technical excellence and is mindful of client cost considerations, melding the two in our negotiations with regulatory agencies. Our professionals find practical, cost-effective approaches to help you achieve your desired project goals. We work to maintain your trust, which allows us to offer constructive solutions with your project's long-term success in mind.

Our team focuses on the following:

- **Water Resource Management.** Dudek's water and wastewater engineering team has decades of experience helping local water agencies evaluate alternatives and develop proven water treatment and management solutions for their districts.
- **Regulatory Compliance.** Our scientists and planners have established strong working relationships with the local staffs of state and federal regulatory agencies. Our knowledge of agency expectations, inter-agency agreements, and local regulations involving your project are vital for keeping projects moving forward and obtaining final approvals.
- **Natural Resource Management.** We provide science-based analysis for preserve design and species survey methodologies, coupled with habitat planning, permitting, design, and installation expertise.
- **Infrastructure Development.** We have in-depth experience managing projects where science, regulatory requirements, and community and stakeholder interests converge. We guide clients through analysis, permitting, and implementing private development and public infrastructure projects.

As a mid-sized firm, we provide the personal service of project managers who stay with your project from start to finish, combined with the breadth and depth of capabilities characteristic of larger firms in order to meet your project's requirements. Our project managers are empowered to be problem-solvers with the ability to make decisions in a timely fashion to keep project momentum moving forward. We are proud of our low employee turnover; our staff's long tenure means the project manager you see at the bidding stage will likely be with you at project completion.

### *Dudek at a Glance*

- *Multidisciplinary environmental and engineering services*
- *700+ employees*
- *17 nationwide offices*
- *Founded in 1980 (41 years in business); employee-owned*
- *Top 125 U.S. Environmental Firms (Engineering News-Record)*
- *92% rating for reliability, timeliness, and responsiveness (Dun & Bradstreet, 2016)*



# Location

## Principal Office

Project Manager Steven Stuart and supporting staff are located at Dudek’s main corporate office in Encinitas, California. Dudek has satellite offices in Palm Desert, Riverside, and Pasadena that may also provide support to the project and facilitate any meetings requested by the City.

# Organization, Key Personnel, and Resumes

## Key Personnel and Team Organization

Our team consists of highly educated and credentialed geologists, engineers, and scientists in the full breadth of services required under this contract. Dudek offers the City an experienced team of accessible, committed staff members who are ready to begin work immediately.

The proposed team organization for this project is presented in **Table 1**, followed by our team’s organization chart (**Figure 1**). Resumes of key personnel are included in **Appendix A**.

**Table 1. Project Team Members**

Name and Role	Education and Licenses	Brief Qualifications
<b>Steven Stuart</b> Project Manager, Planning and Modeling	San Diego State University MS, Geology, emphasis in Hydrogeology University of California, San Diego BS, Physics, specialization in Earth Sciences PE, CA Civil No. 79764	24 years’ experience in California managing groundwater supply projects and hydrogeological investigations. Responsibilities include the oversight of hazardous waste remediation projects, groundwater resource assessments and investigations, and regulatory compliance. Experience includes developing SGMA-compliant GSPs; managing groundwater and surface water monitoring programs; and designing, calibrating, and implementing numerical models to simulate groundwater flow and contaminant fate and transport in the unsaturated and saturated zones. <b>Relevant projects include:</b> <ul style="list-style-type: none"> <li>▪ Project Management for Maximum Benefits Monitoring for City of Beaumont</li> <li>▪ Project Management for Maximum Benefits Monitoring and Data Manager for YVWD</li> <li>▪ Project Manager for San Timoteo Creek Habitat Monitoring Program for YVWD</li> <li>▪ Project Manager for Development of Yucaipa Subbasin GSP</li> </ul>

**Table 1. Project Team Members**

Name and Role	Education and Licenses	Brief Qualifications
<p><b>Xiomara Rosenblatt</b> Field Monitoring Services, Data Compilation and Analysis</p>	<p>San Diego State University MS, Geology BS, General Geology GIT No. 1071</p>	<p>4 years' experience in California-based field work specializing in hydrogeology and geotechnical field activities. Responsibilities include assisting in multiple phases of site assessments, municipal water projects, remediation projects, and data interpretation. This work has involved site walks; well construction oversight; grading and earthwork evaluations; and soil, surface water, and groundwater sampling. Experience with direct push drilling, test pit sampling, hollow stem auger drilling, and hand auger sampling. Skilled in subcontractor oversight, soil logging, and soil and groundwater sampling and evaluation.</p> <p><b>Relevant projects include:</b></p> <ul style="list-style-type: none"> <li>▪ Field Technician/Data Analysis for Maximum Benefits Monitoring for City of Beaumont</li> <li>▪ Field Technician/Data Analysis for Maximum Benefits Monitoring and Data Manager for YVWD</li> <li>▪ Annual Monitoring for the 2011 Natural and Cultural Resources Management Plan, El Cajon, California</li> </ul>
<p><b>Desiree Otilio</b> Field Monitoring Services, Data Compilation and Analysis</p>	<p>Humboldt State University BS, Geology</p>	<p>3 years' experience as a staff scientist, specializing in geotechnical and hydrologic lab tests, data analysis, geophysical field work and modeling, and saltwater interface groundwater modeling.</p> <p><b>Relevant projects include:</b></p> <ul style="list-style-type: none"> <li>▪ Field Technician/Data Analysis for Maximum Benefits Monitoring for City of Beaumont</li> <li>▪ Field Technician/Data Analysis for Maximum Benefits Monitoring and Data Manager for YVWD</li> <li>▪ Watershed Steward, Redwood National Forest</li> </ul>
<p><b>Hugh McManus</b> Field Monitoring Services, Data Compilation and Analysis</p>	<p>San Diego State University BS, Geology PG No. 9935</p>	<p>7 years' experience in the hydrogeological and environmental sector. Experience in well design and construction oversight, groundwater resource investigations and management, and groundwater compliance reporting. Prepared well design and completion documentation, groundwater resources investigations, groundwater mitigation and monitoring plans, groundwater compliance reports, and environmental site assessments.</p> <p><b>Relevant projects include:</b></p> <ul style="list-style-type: none"> <li>▪ Field Technician/Data Analysis for Maximum Benefits Monitoring for City of Beaumont</li> <li>▪ Wells 65, 66, and 209 Municipal Groundwater Production, Eastern Municipal Water District, Riverside County, California</li> <li>▪ Annual Monitoring for the 2011 Natural and Cultural Resources Management Plan, El Cajon, California</li> </ul>

**Table 1. Project Team Members**

Name and Role	Education and Licenses	Brief Qualifications
<b>Stephanie Chao</b> Field Monitoring Services, Data Compilation and Analysis	San Diego State University BS, Environmental Engineering	1 year experience in environmental engineering, specializing in hydrogeology and hazardous waste assessment. Assisted in assessing potential air, soil, and groundwater contamination for public agencies and private landowners; in conducting Phase I and II Environmental Site Assessments; and sampling of soil, soil vapor, air, surface water, and groundwater; as well as data management and report writing. <b>Relevant projects include:</b> <ul style="list-style-type: none"> <li>▪ IPS Facility, Groundwater Monitoring Services, Gardena, California</li> <li>▪ Enhanced Evaluation of the Removal of Contaminants of Emerging Concern in Decentralized Water Reuse Systems by Non-Targeted Analysis, The Water Environment &amp; Reuse Foundation and National Science Foundation, San Diego State University, San Diego, California</li> </ul>

**Notes:** PE = Professional Engineer; SGMA = Sustainable Groundwater Management Act; GSP Groundwater Sustainability Plan; GIT = Geologist-in-Training; PG = Professional Geologist;

*Figure 1 Organization chart*



**PROJECT MANAGEMENT**

**Project Manager/Principal in Charge**  
 Steven Stuart, PE

**PROJECT TEAM**

**Field Monitoring Services, Data Compilation and Analysis**  
 Xiomara Rosenblatt  
 Desiree Otilio  
 Hugh McManus  
 Stephanie Chao



## Project Experience

### Surface and Groundwater Monitoring Services in the Beaumont and San Timoteo Groundwater Management Zones

**Client:** CITY OF BEAUMONT

**Project Duration:** 2016–Ongoing

**Dudek Personnel:** Steven Stuart, Xiomara Rosenblatt, Desiree Otilio

Dudek was retained by the City of Beaumont to provide groundwater and surface water monitoring services in the Beaumont and San Timoteo Groundwater Management Zones as part of the MBMP outlined in Resolution No. R8-2014-0005 issued by the California Regional Water Quality Control Board Santa Ana Region and the MBMP Work Plan adopted in 2015. Since 2016, Dudek personnel have coordinated the groundwater and surface water monitoring services with City staff to use and calibrate the City’s monitoring equipment, and have coordinated with Clinical Laboratory to obtain appropriate sample containers and arrange delivery of water quality samples after collection. Dudek personnel have coordinated groundwater monitoring services with the private well owners included in the MBMP monitoring program. Dudek personnel have provided the analytical laboratory results to each respective private well owner as a courtesy for allowing the City to access their well and obtain valuable information on groundwater conditions in the BMZ and STMZ.



### Surface and Groundwater Monitoring, Data Management System Development

**Client:** YUCAIPA VALLEY WATER DISTRICT

**Project Duration:** 2014–Ongoing

**Dudek Personnel:** Steven Stuart, Xiomara Rosenblatt, Desiree Otilio

Dudek was retained by YVWD to provide groundwater and surface water monitoring services per the 2014 amendment (R8-2014-0005) to the Water Quality Control Plan for the Santa Ana River Basin and to act as data manager for information collected in the Yucaipa, Beaumont, and San Timoteo Groundwater Management Zones. The primary objective of the MBMP is to collect the data needed for the triennial re-computation of ambient water quality in the Santa Ana Basin. Dudek conducts field monitoring services, including measuring groundwater levels at wells in the MBMP monitoring network, collecting groundwater quality samples, and compiling water level and water quality data in a digital data management system. Dudek is currently developing the data management system to house information generated by the many services and operations managed by YVWD, and is configuring the data management system to assist YVWD in organizing and analyzing data used to generate reports required by the regulatory agencies.



## Habitat Monitoring Program in San Timoteo Creek

**Client:** YUCAIPA VALLEY WATER DISTRICT

**Project Duration:** 2011–Ongoing

**Dudek Personnel:** Steven Stuart, Xiomara Rosenblatt, Desiree Otilio

Dudek was retained by YVWD to provide biological and groundwater monitoring services per the Habitat Monitoring Program (HMP) developed as a component of the Non-Potable Water Distribution System Project approved by the District and the U.S. Environmental Protection Agency (EPA) in 2006. The purpose of the HMP is to establish adaptive management procedures to protect riparian habitat and the protected species dependent on the habitat against potential changes to the environment due to a reduction in discharge of advanced tertiary-treated wastewater to San Timoteo Creek by YVWD. Dudek provides riparian vegetation monitoring services at three stations adjacent to San Timoteo Creek. One station is located upstream of the discharge outfall, and two stations are located downstream of the outfall. Dudek also installed and continues to monitor groundwater levels at single-completion and dual-nested observation wells to characterize the interconnection of shallow groundwater and surface water. Dudek is responsible for preparing annual monitoring reports documenting the health of the habitat and groundwater conditions for EPA and the U.S. Fish and Wildlife Service.



Dudek provides riparian vegetation monitoring services at three stations adjacent to San Timoteo Creek. One station is located upstream of the discharge outfall, and two stations are located downstream of the outfall. Dudek also installed and continues to monitor groundwater levels at single-completion and dual-nested observation wells to characterize the interconnection of shallow groundwater and surface water. Dudek is responsible for preparing annual monitoring reports documenting the health of the habitat and groundwater conditions for EPA and the U.S. Fish and Wildlife Service.

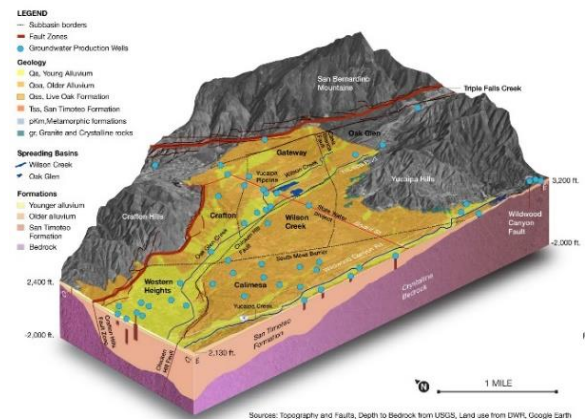
## Groundwater Sustainability Plan for the Yucaipa Subbasin

**Client:** SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

**Project Duration:** 2018–Ongoing

**Dudek Personnel:** Steven Stuart

The Yucaipa Groundwater Sustainability Agency, an eight-member GSAt that includes three local water purveyors, three municipalities, and two counties, contracted Dudek to prepare a Groundwater Sustainability Plan (GSP) for the high-priority Yucaipa Subbasin. Dudek’s responsibilities included coordinating and compiling hydrogeological, climatic, and surface water data to characterize historical and current conditions in the subbasin; developing a public outreach plan; designing and building a digital data management system; providing grant administration assistance; and leading public meetings over the course of developing the GSP.



Dudek used the existing U.S. Geological Survey (USGS) numerical model and a portion of the Upper Santa Ana River Valley numerical model developed by Geoscience to inform the historical, current, and future water budgets for the subbasin. Future model simulations were designed to simulate the effect of climate change on water supply, and to evaluate potential projects that may be implemented to achieve and/or maintain groundwater sustainability.



## Annual Monitoring Report for the Natural and Cultural Resources Management Plan of 2011

**Client:** UNDISCLOSED

**Project Duration:** 2016–Ongoing

**Dudek Personnel:** Xiomara Rosenblatt, Hugh McManus, Desiree Otilio

Dudek conducts semi-annual monitoring of surface water and lake floor water of Willow Lake in San Diego County. This project requires compliance monitoring of the lake to satisfy requirements for a Natural and Cultural Resource Management Plan (NRMP) for a local tribal community. Dudek’s role in maintaining groundwater quality compliance for the NRMP consists of developing a water quality sampling and analysis plan for the lake, conducting in-field monitoring of surface water using a multiparameter meter to measure pH, temperature, turbidity, and conductivity, sampling surface water from the lake surface and lake floor using a discrete interval sampler, compiling data sets and analyzing multiyear data sets for trends. Water quality results are compared to water quality objectives established by the San Diego Regional Water Quality Control Board’s Water Quality Control Plan. The data collected each year is included in an annual report that meets reporting requirements in the NRMP.



## References

<p><b>Joe Zoba</b>                  General Manager                  Yucaipa Valley Water District                  2770 Second Street                  Yucaipa, California 92399                  909.797.5119                  jzoba@yvwd.us</p>	<p><b>Length of services provided:</b> 10 years  <b>Description of services:</b> Monitoring services and report preparation for the HMP and MBMP monitoring programs, and development of the Groundwater Sustainability Plan for the Yucaipa Subbasin.</p>
<p><b>Jennifer Ares</b>                  Water Resource Manager                  Yucaipa Valley Water District                  2770 Second Street                  Yucaipa, California 92399                  909.790.3301                  jares@yvwd.us</p>	<p><b>Length of services provided:</b> 10 years  <b>Description of services:</b> Monitoring services and report preparation for the HMP and MBMP monitoring programs, and project manager for the development of a Data Management System for YVWD to act as a data repository and report generator for all services provided by YVWD.</p>



<p><b>Mark Iverson</b>          President          Yucaipa Groundwater Sustainability Agency          Western Heights Water Company          32352 Avenue D          Yucaipa, California 92399          909.908.6074          m.iverson@westernheightswater.org</p>	<p><b>Length of services provided:</b> 3 years  <b>Description of services:</b> Development of the Yucaipa Subbasin Groundwater Sustainability Plan, facilitate and present at public meetings, and provide project management for all aspects of developing the GSP.</p>
<p><b>Matt Howard</b>          Water Resources Senior Planner          San Bernardino Valley Municipal Water District          380 East Vanderbilt Way          San Bernardino, California 92408          909.387.9230          matth@sbumwd.com</p>	<p><b>Length of services provided:</b> 3 years  <b>Description of services:</b> Development of the Yucaipa Subbasin Groundwater Sustainability Plan, facilitate and present at public meetings, and provide project management for all aspects of developing the GSP. Participated in weekly project update meetings and/or conference calls with Mr. Howard and oversaw the development of monthly reports and in invoicing to the California Department of Water Resources during the development of the GSP.</p>
<p><b>Lance Eckhart</b>          General Manager/Chief Hydrogeologist          San Gorgonio Pass Water Agency          1210 Beaumont Avenue          Beaumont, California 92223          951.845.2577          leckhart@sgpwa.com</p>	<p><b>Length of services provided:</b> 1 year  <b>Description of services:</b> SGPWA is a member of the Yucaipa Groundwater Sustainability Agency, and worked with Mr Eckhart over the last year on the development of the Yucaipa GSP.</p>

## Scope of Services

Since July 2016, Dudek has successfully provided the City with the groundwater and surface water monitoring services necessary to meet the monitoring requirements established in the 2015 MBMP Work Plan for the BMZ and STMZ. Dudek is experienced in all aspects of the monitoring services, from coordinating with City staff on the use of City equipment in the field and with Clinical Laboratory to obtain the proper sampling containers and sample collection, to contacting individual well owners to gain access to their wells for the semi-annual groundwater monitoring events. Dudek has established close and trusted relationships with City staff and the individual well owners since 2016. Because of these relationships, and from what we have learned about this project since 2016, we have improved our efficiency in collecting all data in the field and reduced our costs by approximately 40%. We look forward to continuing our services for the City in the most efficient and cost-savings manner.

*As a mid-sized firm, we provide the personal service of project managers who stay with your project from start to finish.*

The following scope of services addresses the requested scope presented in the City's Request for Proposal (RFP), and highlights lessons learned from our recent experiences with conducting the field work in the STMZ and BMZ.

### Task 1 – Project Management

Project Manager Steven Stuart, PE, has been the project manager for the groundwater and surface water monitoring services provided by Dudek for the City since July 2016. Mr. Stuart will continue to serve as the project manager for the duration of this contract. Having been involved with the MBMP as the Data Manager for YVWD since 2015, Mr. Stuart is well versed with the monitoring and reporting requirements in the 2014 Basin Plan Amendment and the MBMP. Mr. Stuart is committed to maintaining the working relationship with Mr. Thaxton Van Belle and other City staff and will always respond promptly to inquiries from City staff. Mr. Stuart has managed the groundwater and surface water monitoring services successfully and under budget since our contract with the City was initiated in 2016.

### Task 2 – Semi-Annual Groundwater Monitoring Services

Dudek personnel will be tasked with coordinating and conducting all fieldwork and data collection required for the two semi-annual groundwater monitoring events. Field work coordination includes contacting Clinical Laboratory at least four weeks prior to the groundwater sampling event to ensure that all appropriate sample containers and paperwork are prepared and available for Dudek personnel to collect at the City's offices for use in the field. This also includes Dudek personnel contacting each individual well owner at least four weeks prior to the sampling event to make

arrangements to meet with them and access their respective wells. We have found that this provides enough time for most owners to inform us of the conditions of their wells (e.g., should they be down for service) so that we can modify our schedule to accommodate theirs and collect a representative water quality sample per the MBMP sampling schedule. We have also learned that some owners are not always responsive, and we will make efforts during the monitoring event to contact them at their respective locations and introduce ourselves (if we haven't met before), announce who we represent and why we are there. Under these circumstances we've found that they are receptive to our purpose for monitoring and will permit access to their wells. We've never experienced a confrontational situation or have been physically escorted off a premise. Over the past five years, Dudek staff have created a friendly and professional relationship with many of the MBMP community members and stakeholders.

The protocols and list of tasks for collecting the required data from sampling wells in the BMZ and STMZ under responsibility by the City are summarized as follows:

- For every semi-annual groundwater monitoring event since 2016, Dudek has collected water-level and/or water-quality data at 35 wells designated under the MBMP as “Field – Beaumont” and at eight (8) wells designated as “Field – Multiple” in Tables 2-1 and 2-2 of the 2015 MBMP Work Plan. Of these 43 wells, 12 wells are either inaccessible because their properties are abandoned, were destroyed, were denied access by their owners, or weren't sampled for water quality because there is no power to the pumps. Dudek, acting as Data Manager for the MBMP for BMZ, STMZ and YMZ, identified 6 other wells in the MBMP to replace some of these wells, thereby reducing the number of wells for data collection from 43 to 37. Recent development in Beaumont, particularly west of Interstate-10, is the primary reason for the loss of some of these wells in the MBMP monitoring network. Dudek will rely on its familiarity of the area and relationships with stakeholders and private well owners to identify potential wells as replacement wells for those removed from the network to maintain the spatial data requirements for the MBMP.
- Of the 37 wells designated for field monitoring by the City, Dudek will manually measure depths-to-water (DTW) at 19 wells designated for water-level data collection in the MBMP Work Plan. Dudek will follow the data collection protocols included in the “Water-Level Measurement Field Form” in Appendix A of the MBMP Work Plan. The water levels will be measured using a Solinst electric water level sounder provided by Dudek, if the well is accessible. The DTW will be measured at 0.01-foot accuracy. The time and date of each DTW measurement, plus the conditions (e.g. static or dynamic) of the water level at each well, will be recorded in the field form. The MBMP Work Plan requires two consecutive paired water-level measurements under static conditions. A field form will be filled out separately for each well where the DTW was measured.
- Water-level data will be downloaded from dedicated pressure transducers, if any, at wells where they are deployed. The water-level data will be barometrically corrected and compiled with the manual water-level measurements if the pressure transducers measure absolute pressure.
- Of the 25 wells designated for water quality sampling in the MBMP Work Plan, only 16 wells still exist, are accessible, or have operable pumps to facilitate sample collection. Dudek will collect water quality samples from these wells following the protocols included in the “Water-Quality Measurement Field Form” in Appendix A of the MBMP. All 16 wells are equipped with dedicated pumps that will be operated by their respective owners. The first phase of water



quality sampling is purging the well to remove any stagnant water or other water not representative of the native formation from which the water quality samples are required. Water quality parameters will be measured in the field to evaluate whether the water is representative of formation groundwater and sample collection may proceed. Water quality samples will be collected while each well is operating.

- Field parameters pH, temperature, specific conductance, and dissolved oxygen will be measured during the purging process to characterize the water quality and identify when the water produced from the well is representative of native groundwater. Measuring these four field parameters are required per the MBMP Work Plan. Dudek will use a multi-parameter device provided by the City to measure the water quality parameters. Dudek staff will calibrate the device prior to use in the field using calibration standards provided by the City. The calibration of the multi-parameter device will be documented in calibration records prepared by Dudek staff.
- The field sampling forms will include the name of the sampler, the date/time of measurement and sample collection, the volume of water purged before representative water quality samples are collected. Representative samples will be determined when the field parameters monitored during purging are stable within 10% of previous measurements, or when three (3) casing volumes have been purged, if information of the well design is known.
- Water quality samples will be collected in sample containers provided by Clinical Laboratory, a California certified analytical laboratory (ELAP Certificate No. 1088). All sample containers will be labeled with the data/time of sample collection, the well ID, identification of the preservative (if any) in the container, and the name of the sampler. A chain-of-custody form will be completed as each sample is collected and submitted with the samples to Clinical Laboratory. The analytical laboratory will analyze each sample for the “Laboratory Parameters” listed in Table 2-4, “Analyte List for the Groundwater Quality Program” in the MBMP Work Plan. All water quality samples will be stored in an ice chest during the sampling event. The samples will be delivered on ice to Clinical Laboratory.

Dudek will make multiple attempts to contact respective well owners and accommodate scheduling needs for all participants of the MBMP.

### Task 3 – Bi-Weekly Surface Water Monitoring Services

Dudek personnel will conduct all field work required for surface water monitoring detailed in the MBMP Work Plan. This includes bi-weekly measurements of surface water flows and water quality sampling at designated monitoring points, and up to six water quality sampling events following major storm events that contributed significant runoff to Cooper’s Creek and San Timoteo Creek. Dudek has learned that precipitation events of at least 0.5-inches of rainfall will provide enough runoff to substantially affect stream flows. The MBMP Work Plan does state that the requirement of sampling stream flows after storm events may be discontinued after 3 to 5 years of implementation of the MBMP. Dudek, under contract with YVWD and serving as the Data Manager for the MBMP for the STMZ, BMZ and YMZ, will review all stormwater data for these three Management Zones and provide a recommendation to YVWD that sampling after storm events is no longer required.

Dudek anticipates conducting 29 individual surface water monitoring events in 2022. Bi-weekly surface water monitoring will include the following tasks:

- Measure surface water flow on a bi-weekly basis using a pygmy current meter at the following surface water monitoring stations: CC-01, CC-02, and CC-03 on Cooper's Creek; and STC-01 on San Timoteo Creek in the BMA and STMZ. CC-02 and STC-02 are weather dependent for flow; therefore, these locations will be monitored bi-weekly and will be measured only if sufficient flow is observed. The surface water monitoring stations, TMC-01 and TMC-02, which are located on a tributary to Marshall Creek, are only sampled if the City discharges tertiary treated water to discharge point DP-007. Surface water flow will be calculated using the Velocity-Area Method described in Discharge Measurements at Gaging Stations by USGS (Turnispeed, 2010).
- Dudek will use the City's multiparameter water quality field probe to measure temperature, pH, electrical conductivity, and dissolved oxygen of the surface water at each monitoring station. These parameters will be recorded in a field sampling form completed for each station.
- Water quality samples will be collected in sampling containers provided by Clinical Laboratory, labeled with the data/time of sample collection, the surface water monitoring site ID, identification of the preservative (if any) in the container, and the name of the sampler. A chain-of-custody form will be completed as each sample is collected and submitted with the samples to the analytical laboratory. Each surface water sample will be analyzed for constituents listed in Table 3-1 of the 2015 MBMP Work Plan, which includes the constituents required for groundwater plus ammonia as nitrogen. Silica will not be analyzed in the surface water samples.
- Water quality samples may also be collected at NC-02, STC-02, and CC-03 following up to six storm events. Dudek anticipates conducting four additional sampling events to capture stormwater flows outside the regularly scheduled bi-weekly sampling events. Dudek anticipates conducting two stormwater sampling events concurrently with regularly scheduled bi-weekly sampling events. The stormwater event samples will be analyzed for the same parameters required with the bi-weekly samples.
- All water quality samples will be stored in an ice-chest during the sampling event. The samples will be delivered on ice to Clinical Laboratory. This fee does not include costs for the analyses performed by Clinical Laboratory. Dudek anticipates that the City will receive invoices directly from Clinical Laboratory for payment on all surface water samples analyzed.
- Dudek will provide maintenance and troubleshooting of City's pygmy current meter and YSI pro plus as needed.

# Cost Proposal

Dudek's cost proposal can be found in the accompanying sealed envelope, as instructed in the RFP.

## Additional Information

### Project Familiarity

Dudek staff are very familiar with the monitoring requirements outlined in the MBMP Work Plan and the Maximum Benefits Commitments for the City. Having provided the groundwater and surface water monitoring services since 2016, Dudek is well aware of the many details and issues related to each monitoring station and groundwater well, such as accessing the surface water sites and handling water quality profiling while wells are purged for sample collection.

- Familiarity and rapport with local community participants in the MBMP leads to an efficient collection of representative data that benefits not only the City but the individual well owner.
- Refined data collection practices that are efficient and cost-effective.
- No expensive learning curve because our staff is well versed and experienced with conducting the surface water quality parameter monitoring and flow measurements in the field.
- Staff with the skills to troubleshoot and repair equipment in the field; this means our staff can make repairs in the field to ensure that data is collected on schedule and under budget.
- Dudek serves as the Data Manager for YVWD in collecting, compiling and documenting all data collected for the MBMP in the BMZ, STMZ and YMZ. The benefit of this is a seamless and very cost-effective way for data collected for the City to be included in the annual MBMP reports submitted to the Santa Ana Water Board. No additional expense is required by the City to compile and submit the data to the Data Manager.



## Insurance/Certification

Dudek can affirm that all professional liability insurance requirements stipulated in the RFP will be in force at the time of contract execution.



# Appendix A

Resumes

# Steven Stuart, PE

## PRINCIPAL HYDROGEOLOGIST

Steven Stuart is a professional hydrogeologist with 24 years' experience managing California groundwater supply projects, subsurface remediation projects, and hydrogeological investigations. He has experience with collecting and analyzing hydrogeologic and geologic data, designing and constructing water production wells and observation wells, designing and implementing 2D and 3D finite difference numerical models to simulate groundwater flow in the unsaturated and saturated zones, and evaluating the feasibility of potential surface water infiltration projects to recharge local groundwater basins.

In addition, Mr. Stuart has managed and performed various onsite field activities such as aquifer testing to estimate aquifer properties and collecting groundwater samples to evaluate water quality. He has designed numerical groundwater models utilizing the windows based pre/post-processor Groundwater Vistas and conducted simulations with the finite-difference codes MODFLOW and MODFLOW-SURFACT. Mr. Stuart's numerical modeling experience includes the simulation of contaminant migration, well-field capture zones, and possible future effects on groundwater quality and availability due to changing well-field production rates and/or increased recharge of aquifers.

## Project Experience

### Water Resources and Supply

**Groundwater Sustainability Plan for the Yucaipa Basin, San Bernardino Valley Municipal Water District.** Serving as project manager for the development of a GSP for the high priority Yucaipa groundwater basin. Overseeing the coordination and collaboration of nine member agencies in the Yucaipa Groundwater Sustainability Agency with the hydrogeology, public outreach, grant administration, and data management systems personnel at Dudek.

### **Maximum Benefits Monitoring Program for Yucaipa Valley Water District and City of Beaumont.**

Serving as data project manager for the Yucaipa, Beaumont and San Timoteo Groundwater Management Zones pursuant to the maximum benefit commitments specified in the 2014 amendment to the Water Quality Control Plan for the Santa Ana River Basin. The primary objective of the maximum benefit groundwater monitoring program is to collect the data needed for the triennial re-computation of ambient water quality in the Santa Ana River Basin. Responsibilities include collecting, compiling and analyzing groundwater and surface water data to evaluate how each water agency and public entity is operating to maintain the "maximum benefit" of the natural water resource in the upper northeastern section of the Chino Basin that includes San Timoteo Creek.

### *Education*

*San Diego State University*

*MS, Geology (Hydrogeology emphasis)*

*University of California, San Diego*

*BS, Physics (Earth Sciences specialization)*

### *Certifications*

*Professional Engineer (PE), CA No. 79764*

### *Professional Affiliations*

*Member of National Ground Water Association*

**Water Budget Analysis for Rancho Pauma Mutual Water Company.** Served as project manager in conducting a water budget analysis for an alluvial sub-basin in Pauma Valley, California. The analysis included an estimate of groundwater in storage under existing conditions and an evaluation of potential impacts to storage by anticipated increases in groundwater production from the basin. The water budget analysis evaluated how water inputs from infiltrating rainfall, applied irrigation, discharge from the San Luis Rey River, and imported water measured against outflows by evapotranspiration and pumping. The analysis estimated a level of groundwater production that may lead to overdraft and declines in groundwater storage.

**Groundwater Availability Evaluation for Joshua Basin Water District.** Modified an existing 3-D MODFLOW numerical model developed by USGS to evaluate potential changes to groundwater storage resulting from increased pumping from the basin to meet the projected water demands of a growing population. The USGS numerical model did not account for recharge derived from septic system discharges. To estimate the contribution of septic system discharge to basin recharge, a variably saturated numerical flow model was developed using the USGS code, VS2DT. The variably saturated model results indicated a potentially marked contribution to recharge from septic systems if the systems incorporated seepage pits set 12 to 20 feet below land surface. Predictive simulations must include septic system discharges as a component of recharge to the basin to more accurately evaluate the impact of population growth on groundwater storage.

**Water Availability Analysis for Water Appropriation Application, Eastern Municipal Water District.** Served as project manager in preparing a supplemental WAA for EMWD's 2009 application to appropriate water from an unnamed subterranean stream tributary to the West San Jacinto Groundwater Basin. The supplemental WAA was requested by the Division of Water Rights at the State Water Resources Control Board (SWRCB) to include an evaluation of the water that is likely to be available in typical dry years as well as normal years, the water available after factoring in prior rights, and the potential impacts of diverting the subterranean stream flow on groundwater dependent ecosystems. The WAA also included a flow frequency analysis per the *Policy for Maintaining Instream Flows in Northern California Coastal Streams*. The supplemental WAA concluded that there was unappropriated water available, the flow frequency analysis indicated annual variation in locally derived water, but operations at Perris Reservoir maintained a constant flux of locally derived water to the subterranean stream, and no impacts to groundwater dependent ecosystems. The SWRCB issued a permit to appropriate water from the subterranean stream in October 2018.

**Third Party Review of Hydrogeological and Biological Resources for City of Poway.** Served as project manager in providing a third party review of previous hydrogeological and biological investigations related to groundwater production and riparian habitat at the Maderas Golf Club in Poway, California. Groundwater production at the Maderas Golf Club is regulated by a conditional use permit (CUP), which included an operational plan and monitoring program to minimize potential impacts to groundwater levels at adjacent residential wells and riparian habitat. Findings from reviewing the previous investigations indicated limited hydraulic connection between the golf course wells and wells in adjacent residential community; and no hydraulic connection with groundwater in shallow alluvium that supports the local riparian habitat. Modifications were made to the operational plan and monitoring program of the CUP to provide a more efficient pumping schedule, but retain the necessary monitoring protocols to protect the water resources of nearby residential well owners. Mr. Stuart presented the findings from the third-party review to the Poway City Council.



**Nitrate Study for Santa Maria Wastewater Treatment Plant, Ramona Municipal Water District.**

Served as project manager in preparing a nitrate study per the Master Recycling Permit for the RMWD Santa Maria Wastewater Treatment Plant (SMWTP) in Ramona, California. The intent of the study was to evaluate whether or not recycled water originating from SMWTP and used for irrigation purposes would cause nitrate concentrations in groundwater to exceed the Basin Plan water quality objective. The sole user of recycled water from SMWTP is a golf course. The study estimated an agronomic rate for irrigated turf grass and evaluated the fate and transport of nitrate from land surface to the underlying groundwater table. Concurrently, a nitrate loading study was prepared to evaluate whether the use of recycled water and nitrogen fertilizer exceeded the agronomic rate of the irrigated turf and posed a potential threat to groundwater quality.

**Nitrate Study for North City Water Reclamation Plant, City of San Diego.** Served as project manager in preparing a nitrate study per the Master Recycling Permit (Order R9-2015-0091 issued by RWQCB) for the City of San Diego North City Water Reclamation Plant in San Diego, California. The RWQCB required that the City conduct a nitrate study to demonstrate whether or not the discharge from the NCWRP will cause groundwater to exceed the groundwater quality objective of 45 mg/L for NO<sub>3</sub> in areas with applicable numerical groundwater quality objectives. The nitrate study included a review and assessment of the existing treatment processes in removing nitrogen; a review of proposed modifications to the existing treatment process to enhance the removal of nitrogen and improve water quality in the recycled water effluent; a review and assessment of the fate and transport of nitrogen in recycled water from application for irrigation purposes to groundwater; a review and assessment of the application of recycled water at agronomic rates; a review of groundwater monitoring; and a review of other best management practices. Also evaluated the assimilative capacity in groundwater for nitrate in areas served with recycled water from NCWRP for irrigation purposes. The report concluded that the use of recycled water from NCWRP for irrigation purposes would not increase the ambient concentration of nitrate in groundwater above 45 mg/L.

**Water Well Aquifer Study for City of San Clemente.** Served as project manager investigating two City of San Clemente water supply wells that experienced degrading water quality and performance. The investigation included continuous fluid temperature and resistivity surveys under static and dynamic conditions, flow meter surveys characterizing the flow profile during pumping, and depth-discrete water quality sampling to identify the sources of poor water quality to each well. Findings from the investigation indicated that one of the wells was influenced by the presence of incipient seawater or the initial intrusion of formational saline water. Dudek provided recommendations to the City to reduce pumping at the well influenced by higher TDS water and continue monitoring, and to seal off the lower screen interval where poorer water quality enters the well.

**Well Rehabilitation for Joshua Basin Water District.** Served as project manager in directing well rehabilitation efforts for a major water supply well operated by Joshua Basin Water District in Joshua Tree, California. The well experienced marked degradation in water quality following initial attempts of rehabilitation. Dudek prepared a more aggressive approach utilizing a focused intake submersible pump assembly tool to isolate extraction to a 10-foot zone. Rehabilitation included aggressive agitation during mechanical development with a multidisc swab tool and disinfection with a chlorine enhancer. Dudek oversaw and documented all phases of rehabilitation, including the collection and submittal of water quality samples to evaluate progress.

**Installation of a Municipal Water Supply Well for Joshua Basin Water District in Joshua Tree, California.** Served as project manager in overseeing the drilling, design, construction, development and testing of a production well and observation well for the Joshua Basin Water District. Installations of the wells were funded by a grant provided by FEMA, which required detailed invoicing, progress reports, and accounting for all aspects of the project.

**Groundwater Monitoring Wells at San Sevaine Spreading Basins for Inland Empire Utilities Agency.** Served as project manager for locating and designing monitoring wells that satisfy the monitoring requirements established by the DPH for the use of recycled water discharged to spreading basins for the purpose of recharging groundwater. Also provide design specifications for the installation of nested lysimeters to provide pore water samples at discrete depths beneath the spreading basins to evaluate soil filtration and movement of recycled water through the upper unsaturated zone.

**Feasibility Study to Use Lower Tijuana River Basin for Aquifer Storage and Recover for City of San Diego.** Served as project manager in conducting a feasibility study evaluating the potential use of the lower Tijuana River valley alluvial aquifer and underlying San Diego Formation to seasonally store and recover recycled water originating from the South Bay Water Reclamation Plant in Imperial Beach, California. The study included an analysis of groundwater level data obtained from existing wells and results of previous aquifer tests conducted by Dudek. The study concluded that it was feasible to store 4 MGD recycled water in the eastern half of the lower Tijuana River basin, resulting in an approximate 5 feet rise in the water table.

## Ecohydrology

**Habitat Monitoring Program for Yucaipa Valley Water District.** Serving as project manager for a habitat monitoring program (HMP) in the San Timoteo Creek study area to evaluate the potential impact to riparian habitat resulting from the reduced discharge of recycled water to San Timoteo Creek. The HMP includes collecting surface water and groundwater data, coupled with vegetation surveys and aerial imaging, at monitoring stations both upstream and downstream of the existing recycled water discharge point. Data was collected two years prior to reductions in discharge to establish baseline conditions for groundwater and riparian habitat, followed by biweekly to semiannual monitoring to evaluate potential effects due to reduced discharge. Responsible for preparing annual reports for Yucaipa Valley Water District and the U.S. Environmental Protection Agency (EPA) that document the findings from the previous water year and assessing conditions relative to the baseline condition.

**San Diego River and San Vicente Creek Biological and Groundwater Resources Monitoring for City of San Diego.** Served as project manager for designing and implementing a monitoring program to establish baseline groundwater level conditions in shallow alluvium underlying riparian habitat downstream of El Capitan Reservoir and San Vicente Reservoir for the City of San Diego. Monitoring stations were installed downstream of San Diego River and San Vicente Creek, and downstream of their confluence, with two control points located in nearby drainages not influenced by modifications to stream flow originating in the upper reach of San Diego River. Soil moisture sensors and piezometers were installed at monitoring stations located just downstream of the El Capitan earthen dam to characterize the soil moisture profile from land surface to the shallow water table.

**Groundwater Site Investigation for Sweetwater Authority.** Served as project manager of an investigation of existing groundwater conditions at the Upper Sweetwater Reservoir Habitat Management Program area. The October 2007 Harris Fire caused extensive fire damage to the habitat in the area. Sweetwater Authority suspected that decaying baseline vegetation, the invasion of non-native species such as giant reed and salt cedar, and low moisture content of the shallow subsurface soil contributed to the extensive damage caused by the fire. Consequently, as part of the process to develop a conceptual design to recover the habitat, an investigation into existing groundwater and soil moisture conditions was implemented to estimate the potential response of the water table to proposed modifications of the HMP area floodplain. A network of six shallow groundwater observation wells, plus two soil moisture sensor arrays, were installed to characterize the soil moisture profile from land surface to the water table. A 2-D variably saturated flow numerical model was developed to simulate the potential effects to shallow groundwater levels and soil moisture when modifying a floodplain for a riparian habitat restoration project. The numerical model was used to estimate the depth to the water table and the height of the capillary fringe above the water table. Results from the numerical model were used to design a habitat mitigation plan to sustain new riparian habitat.

**Gobernadora Multipurpose Basin for Santa Margarita Water District.** Conducted an investigation to assess the potential impacts to groundwater dependent habitat downstream of a proposed diversion of stream flow to a new recharge basin. The investigation included the modification of an existing 3-D finite-difference numerical model to evaluate the potential impacts to groundwater levels at a downstream ecological reserve when diverting stream flow and pumping groundwater at a multipurpose basin upstream of the reserve. The modified numerical incorporated monthly stress periods to simulate monthly variations in rainfall, stream flow and evapotranspiration, which was defined using transpiration rates for riparian vegetation mapped in the reserve. The numerical model results were used to develop an operational plan for the basin to minimize the impacts to downstream habitat.

**Investigation of Potential Impacts on Grapevine Canyon Wetlands for Tejon Mountain Village, LLC.** Served as project manager in evaluating the potential impact of increased groundwater production on wetland habitat in Grapevine Canyon in Tejon Ranch. The investigation included identifying sources of water to Grapevine Creek, which were rainfall and storm water runoff, discharge from Tejon Lake, and springs. A network of shallow groundwater wells, plus soil moisture sensor arrays, were installed to complement existing, deeper wells in the area. Aquifer testing and water quality sampling provided data to evaluate hydraulic connections and sources of shallow groundwater supporting the local wetland habitat. A principal component analysis was conducted to identify source water contributions to the near surface groundwater.

**Groundwater and Soil Moisture Content Monitoring Report for Newhall Land.** Served as project manager in evaluating seasonal water quantity and quality requirements of cismontane alkali marsh on Newhall Ranch in Los Angeles County. Directed the installation and monitoring of shallow piezometers, soil moisture tensiometers, continuous groundwater level measurements and periodic water quality sampling during the project. Conducted short-term in situ hydraulic tests (i.e., slug tests) at piezometers to characterize the hydraulic conductivity of the shallow subsurface. Soil samples were analyzed to characterize the capillary pressure curves and groundwater flow in the shallow unsaturated subsurface.



## Soil and Groundwater Remediation

**Soil Vapor Extraction in Los Angeles for Lonza, Inc.** Served as project manager in overseeing the design, installation and operation of an aggressive soil vapor extraction and treatment program to remediate the shallow 15 feet of soil impacted by VOCs originating from former chemical manufacturing operations. The program included the installation of shallow soil vapor extraction wells at 10-foot centers with soil vapor sampling probes installed at midpoints between SVE wells. The SVE well field was designed to provide the ability to direct extraction at select areas of the treatment area. The aggressive SVE program reduced residual concentrations of chlorinated solvents to levels where the State of California issued a No Further Action letter.

**Hexavalent Chromium Remediation at former Marley Cooling Tower Company Site in Stockton, California.** Currently serving as project manager in overseeing data collection, monitoring and reporting requirements for remediation efforts targeting chromium-contaminated groundwater. Supervised the installation and testing of additional wells to the groundwater monitoring network. Provided oversight of a bench scale study characterizing the soil reductant demand to evaluate the effectiveness of an in situ chemical reduction program to reduce concentrations of hexavalent chromium in groundwater. Supervised the preparation of semiannual groundwater monitoring reports and 5-year Review reports for the Department of Toxic Substances Control and Regional Water Quality Control Board. Designed a 3-D MODFLOW groundwater numerical model to simulate the transport of dissolved chromium in aquifer units beneath the site. The numerical model is used to evaluate the hydraulic capture and containment of a hexavalent chromium plume by a remedial well field. Proposed modifications in the pumping scheme of the remedial well field are evaluated by using the numerical model to predict the effect of such changes.

**Soil Remediation for Huffy Corporation, Azusa California.** Served as project manager in overseeing the installation of nested soil vapor extraction wells to remediate 400 feet of unsaturated soil impacted by volatile organic compounds (VOCs). Supervised and logged the drilling, construction, and development of SVE wells using the STRATEX air rotary drilling method. SVE included the use of a resin to remove VOCs, followed later by the use of GAC to enhance treatment system uptime and efficiency.

**Rehabilitation of Groundwater Remediation Wells in Costa Mesa, California.** Supervised the rehabilitation of two remedial extraction wells using Welgicide to break down bacterial slime (mostly sulfate-reducing bacteria) and mineral scale, followed by acid solution treatment, pH neutralization, and re-development.

**Aquifer Testing and Simulated Well Field Capture in Orange County, California.** Served as project manager in coordinating and implementing a 5-day constant-rate aquifer test of an existing remedial extraction well to estimate aquifer properties and predict the long-term sustainable extraction rate. Results from the aquifer test were incorporated into a numerical model to simulate groundwater flow and the capture zone of the remedial extraction well.

**Deep Groundwater Monitoring Well Network Installation, Chico, California.** Provided oversight for the drilling, construction, and development of a network of groundwater monitoring wells using mud rotary. Responsibilities included coordinating underground utilities surveys with DigAlert and local entities, logistical planning of materials and drilling activities with drilling contractors, coordinating the sampling and disposal of cuttings and drilling fluids, and coordinating the development of the wells and temporary containment of purged groundwater.

**Groundwater Monitoring and Enhanced In Situ Bioremediation Remediation Project, Costa Mesa, California.** Served as project manager for the collection, compilation, and analysis of groundwater data to evaluate and report on the cleanup of a site impacted by chlorinated solvents. Cleanup included a pump-and-treat system with an extensive remediation well field and treatment using air stripping and GAC. Responsible for submitting quarterly groundwater monitoring reports to the RWQCB. Mr. Stuart also designed and implemented an in situ bioremediation pilot program to enhance cleanup efforts by introducing ethanol to increase the sequential biodegradation of chlorinated solvents.

## Numerical Modeling

**Numerical Modeling with MODFLOW-OWHM for Borrego Water District.** Modified an existing 3-D MODFLOW-OWHM numerical model developed by USGS to incorporate recent groundwater level and pumping data for the Borrego Groundwater Basin. The updated model was used to validate calibration of the numerical model and define uncertainty in estimates of aquifer storage. The numerical model will also be used to identify data gaps in the basin and to guide additional investigative work to improve characterization of the basin. The model is being used to help develop the Groundwater Sustainability Plan for the critically overdrafted Borrego Valley Groundwater Basin.

**Numerical Modeling for Paradise Valley Hydrogeological and Well Construction Services for Glorious Land Company.** Modified an existing 2-D MODFLOW numerical model by expanding the model domain with additional layers to better represent the geology of the groundwater basin and incorporating site-specific aquifer characteristics derived from local aquifer testing. The numerical model was used to simulate a number of scenarios to evaluate potential changes in water table elevation resulting from additional recharge from the discharge of imported water to a proposed spreading basin.

**Numerical Modeling of Potential Impacts to Groundwater Quality, Ramona Municipal Water District.** Prepared a 3-D groundwater flow and transport model using the MODFLOW-SURFACT code to evaluate the potential impact of population growth on the quality of groundwater in the Kimball and Gower Hydrologic Sub-Areas near Ramona, California. The numerical model was calibrated to steady-state and transient water level conditions, and to concentrations of total dissolved solids (TDS) in groundwater. A series of simulations were conducted to evaluate the potential impact on groundwater quality with an increased use of imported water in the basins for various climatic conditions.

**Numerical Modeling of the Fate and Transport of Pure Phase Chlorinated Solvents in the Subsurface.** Designed, constructed and implemented a 3-D numerical model using the T2VOC code to simulate the multiphase transport of chlorinated solvents from land surface through the unsaturated zone and into groundwater. The numerical model incorporated the influence of a nearby leaking canal and septic discharges on groundwater flow in the unsaturated zone.

**Investigation of Treated Wastewater Discharge to Percolation Beds in Rancho Santa Fe, California.** Served as project manager in designing and implementing an investigation of the infiltration capacity of existing percolation beds at the Rancho Santa Fe Water Pollution Control Facility. The goal of the investigation was to evaluate whether the existing percolation beds could accommodate an increase in treated wastewater discharge to 750,000 GPD. The investigation included the construction of a percolation test bed, the installation of shallow groundwater observation wells

around the test bed and nested piezometers in the test bed, and the development of a 3-D numerical model to simulate the infiltration of water through the percolation beds to the water table. The numerical model was calibrated to observations collected during the infiltration test, and used to simulate the potential effects to the water table with an increase in discharge to the percolation beds. Managed the design, construction, and implementation of a surface water infiltration experiment.



# Xiomara Rosenblatt, GIT

## GEOLOGIST

Xiomara Rosenblatt is a California Registered Geologist in Training with 4 years' experience, specializing in hydrogeology and geotechnical consulting. Ms. Rosenblatt has assisted in multiple phases of site assessments, municipal water projects and remediation projects. This work involving site walks, well construction oversight, grading and earthwork evaluations, and soil, soil vapor, and groundwater sampling. She has experience with direct push drilling, test pit sampling, hollow stem auger drilling, and hand auger sampling. Ms. Rosenblatt is skilled in subcontractor oversight, soil logging, and soil and groundwater sampling and evaluation.

## Relevant Project Experience

**Otay Percolation Study, San Diego County, California.** Served as a staff geologist. Logged 5 percolation boreholes and observed percolation tests to assess how surface water moved through the top 5 feet of sediment on the subject property.

**Phase I Environmental Site Assessments, San Diego County, Palm Springs, Oahu within California, and Hawai'i.** Served as a geologist on several Phase I ESA. Conducted site reconnaissance and report preparation for Phase I Environmental Site Evaluations. (2020–2021)

**Well 65, 66 and 209 Municipal Groundwater Production Well, Eastern Municipal Water District, Riverside County, California.** Served as staff geologist. Part of a team that provided construction oversight of 3 municipal groundwater production wells. Tasks included geologic logging and oversight during well reaming, mechanical well development chemical development, well construction and aquifer testing. (2021)

**Municipal Water Well Installation, Borrego Water District, Borrego Springs, California.** Served as staff geologist for installation of new municipal water supply well ID5-15. Part of a team that provided lithologic logging for the pilot borehole, supervision of well construction, well development, and aquifer testing. (2021)

**Maximum Benefits Monitoring Program, City of Beaumont and Yucaipa Valley Water District, Riverside County, California.** Served as field geologist and conducted surface water sampling and stream flow measurements in the Beaumont and San Timoteo Groundwater Management Zones for bimonthly and semi-annual. Data was used to evaluate how each water agency and public entity is operating to maintain the "maximum benefit" of the natural water resource in the upper northeastern section of the Chino Basin that includes San Timoteo Creek. Collected ground water samples for Yucaipa Valley Water District for PFAS testing.

## Education

San Diego State University  
Bachelor of Science,  
Geological Sciences,  
2018

San Diego State University,  
Master of Science,  
Geological Sciences,  
2021

## Certifications

Geologist in Training,  
Certification # 1071

OSHA 40-hour  
HAZWOPER

APGNA Nuclear Gauge  
Safety Training

Red Cross First Aid

## Professional Affiliations

San Diego Association  
of Geologists

**Mountain Avenue West Replenishment Basin Project, Eastern Municipal Water District, San Jacinto, California.** Served as staff geologist. Provided construction management services including surface completions for nested monitoring wells and transducer installation. (2020–2021)

**Annual Monitoring Report for the Natural and Cultural Resources Management Plan of 2011, Sycuan Band of the Kumeyaay Nation, El Cajon, California.** Served as staff geologist. Collected and reported water quality samples from Willow Lake. Water quality samples were collected by kayak at various depths and locations. Sampling results were compared to water quality objectives established in the San Diego Regional Water Quality Control Board’s Water Quality Control Plan for that section of Sweetwater River. The annual reports provided information for the management and protection of the Sycuan Band’s natural and cultural resources. (2021)

**Groundwater Monitoring and Remediation Project, Former Kearney-KFP Facility, Stockton, California.** Served as field geologist. Performed groundwater well redevelopment using a bailer and pump to flush water through the filter pack on two wells which had previously been producing fine sediments. (2021)

## Relevant Previous Experience

**Jefferson’s Makers Quarter, JPI, San Diego California.** Served as staff geologist. Conducted field sampling for the remedial grading plan. Scheduled subcontractors, sampled 16 test pits, used a PID and test to classify soil, and coordinated the laboratory testing. (2019)

**Horton Plaza Geotechnical and Fault Investigation, Horton SPC, San Diego, California.** Served as a geologist for the geotechnical and fault hazard investigation for the redevelopment of Horton Plaza. Prepared City of San Diego right-of-way and traffic control permits and County of San Diego DEH permit. Scheduled subcontractors for traffic control, steel plates, asphalt coring, utility clearance, drilling, and backhoe services. Managed and logged a 206-foot fault trench within the City of San Diego right-of-way and logged one 130-foot boring, including suspension logging. Prepared cross sections, geotechnical maps, fault trench logs, and the final report. (2019)

**729 Emerald Drive, Lennar, Vista, California.** Served as a geologist for a seepage evaluation. Hand augured 10 borings to determine direction of flow and depth of groundwater migration caused by excess irrigation. Prepared cross sections based on lithology and grading plans and retaining wall and subdrain design recommendations and prepared final report. (2020)

**G Street Pump Station Geotechnical Investigation, City of Chula Vista, Chula Vista, California.** Served as a geologist for the Geotechnical Investigation for the G Street Pump Station for the City of National City. Organized utility location services; prepared the County of San Diego permits; scheduled subcontractors; conducted field work; scheduled geotechnical testing; prepared cross sections, boring logs, and vicinity maps for project report; and prepared final report. (2020)

**Wells Park Geotechnical Investigation and Infiltration Feasibility Evaluation, City of El Cajon, El Cajon, California.** Served as a geologist for the City of El Cajon Wells Park geotechnical investigation and implementation of stormwater best management practices. Scheduled subcontractors, drilled one geotechnical boring and two infiltration test pits, and conducted the infiltration testing. Produced a geotechnical map, evaluated infiltration test results, prepared stormwater best management practices document, made recommendations for surface water infiltrations and bioswales, and prepared final report. (2020)

# Desiree Otilio

## GEOLOGIST

Desiree Otilio is a geologist with 3 years' experience in environmental assessment, groundwater and soil remediation, groundwater sampling and surface water studies, and well construction and development. She has experience with direct push drilling, shallow stem auger drilling, soil logging, as well as soil and groundwater sampling. Ms. Otilio is a skilled field scientist who provides efficient and impactful products to meet client needs through effective communication and technical writing.

## Relevant Project Experience

**Annual Groundwater Monitoring, Stockton, California, and Las Vegas, Nevada.** Served as staff geologist. Provided project support for soil and groundwater remediation projects, including organizing field operations and logistics, completing groundwater monitoring and sampling in the field. Prepare quarterly reports for state regulators and clients.

**Soil Sampling Plan and Health and Safety Report Drafting, Various Client/Locations.** Assisted and wrote several health and safety work plans and soil sampling work plans for soil remediation projects. Worked within relevant and applicable standards to produce cost effective and realistic solutions to meet regulatory and client needs.

**Phase I Environmental Site Assessment, Los Angeles, San Diego, Riverside, and Santa Barbara Counties, California and Yuma County, Arizona.** Served as staff geologist on projects with varied commercial outcomes and provided analysis of multiple types of properties ranging in use from industrial to residential. Provided research and preparation of Phase I Environmental Site Assessments. Completed reports to ASTM standards and within project budgets.

**Phase II Environmental Site Assessment, Riverside and San Diego Counties, California.** Served as staff geologist. Conducted relevant sampling events to determine subsurface conditions of project sites with varied commercial outcomes. Analyzed data and compared results to the applicable regulatory contaminate action limits, to determine further actions for site development. Prepare report and figures within project budgets.

**Well 65, 66 and 209 Municipal Groundwater Production Well, Eastern Municipal Water District, Riverside County, California.** Served as staff geologist. Part of a team that provided construction oversight of three municipal groundwater wells. Performed geologic logging during initial reaming, oversight during mechanical well development, chemical development, pump development, well construction and aquifer testing. (2021)

### *Education*

Humboldt State University  
BS, Geology, 2018

### *Programs*

Watershed Stewards Program member, 2019

### *Certifications*

40-Hour OSHA HAZWOPER

### *Professional Affiliations*

Geological Society of America

San Diego Association of Geologists



**Well 205 Municipal Groundwater Production Well, Eastern Municipal Water District, Riverside County, California.** Served as staff geologist. Part of a team that provided construction oversight of a 1,140-foot municipal groundwater production well. Performed geologic logging during initial reaming, oversight during mechanical well development, chemical development, pump development, well construction and aquifer testing. (2020)

**Municipal Well Development for the Mountain Avenue Recharge Project, Eastern Municipal Water District, San Jacinto, California.** Served as staff geologist. Performed oversight of pump development of eight 200-foot monitoring wells. Oversight of development for two deep municipal groundwater production wells as part of a larger team. (2020)

**Figure Drafting and Creation in ArcGIS, Various Clients/Locations.** Produced a wide variety of figures and graphics for various reports including groundwater sustainability plans, Phase I Environmental Site Assessments, hazardous materials business plans, soil remediation plans, and annual groundwater remediation reports.

## Relevant Previous Experience

**Watershed Steward, Redwood National Park.** Completed one year of service as part of the California Conservation Core and AmeriCorps, Watershed Stewards Program. Worked directly with Redwood National Park geologist and hydrologist to monitor the Prairie Creek, and Redwood Creek watershed. Performed hydrologic monitoring on a daily basis, to assess hydrologic conditions of sediment loading in the watershed. Performed weekly maintenance and repairs of monitoring equipment in a remote setting. Developed a stream health assessment survey, and installed channel markers for future surveyors. Managed large data sets and drafted figures in ArcGIS for various environmental reports.

# Hugh McManus, PG

## GEOLOGIST

Hugh McManus is a geologist with 7 years' experience in the hydrogeological and environmental fields. Mr. McManus has experience in well design and construction oversight, groundwater resource investigations and management, and groundwater compliance reporting.

Mr. McManus has prepared well design and completion documentation, groundwater resources investigations, groundwater mitigation and monitoring plans, groundwater compliance reports, and environmental site assessments.

Mr. McManus's field experience includes conducting lithologic logging and geophysical interpretation, aquifer testing and analysis, and surface water and groundwater monitoring. Mr. McManus has conducted environmental sampling for groundwater, surface water, and soil.

## Relevant Project Experience

**Groundwater Monitoring Well Installation, Glenville Property LLC, Los Angeles, California.** Served as field geologist during the drilling, design, and construction of three groundwater monitoring wells. Wrote a well installation work plan and performed on-site lithologic logging to design monitoring wells in a shallow contaminated aquifer. The wells were used to perform ongoing sampling for compliance with the Los Angeles Regional Water Quality Control Board.

**National Pollution Elimination Discharge System Permit, City of Solana Beach, Solana Beach, California.** Served as field geologist and conducted groundwater and surface water sampling to obtain a National Pollution Elimination Discharge System permit issued by the San Diego Regional Water Quality Control Board for dewatering during the construction of a pump station owned by the City of Solana Beach.

**Well Completion Report for Monitoring Wells MW-403 and MW-452, and Replacement Lysimeters L-242R and L-244R, Former Marley Cooling Technologies Facilities, Stockton, California.** Served as staff geologist and performed lithologic logging, well and lysimeter construction oversight, and well completion reporting for two groundwater monitoring wells drilled with direct mud rotary. The purpose for the monitoring wells was to improve the definition of the distribution of chromium concentrations in the shallow and intermediate zones at the former Marley Cooling Technologies Facility in Stockton, California. Lysimeters were installed to measure chromium concentrations in soil moisture adjacent to the source of chromium contamination. A completion report was submitted and approved by the Regional Water Quality Control Board.

### *Education*

*San Diego State University  
BS, Geology*

### *Certifications*

*Professional Geologist (PG), CA No. 9935*

*Occupational Safety and Health*

*Administration (OSHA) 40-Hour HAZWOPER*

*Resource*

*Conservation and Recovery Act (RCRA)*

*and U.S. Department of Transportation*

*(DOT) Hazardous Waste Handler*

*Training*

### *Professional Affiliations*

*California*

*Groundwater*

*Resources Association*

**Installation of Groundwater Monitoring Wells KI-20 and KS-10, Former Kearney-KPF Facility, Stockton, California.** Served as staff geologist and performed lithologic logging, well construction oversight, and well completion reporting for two groundwater monitoring wells drilled with direct mud rotary. The purpose of the monitoring wells was to improve the definition of constituents of concern in the shallow and upper-intermediate zones of a site contaminated with chlorinated solvents and 1,4 Dioxane. The completion report was submitted and approved by the Department of Toxic Substances Control.

**Delineation and Destruction of Well B-1, Former Kearney-KPF Facility, Stockton California.** Served as staff geologist. Performed lithologic logging, groundwater sampling, soil sampling, well destruction oversight, and reporting for three temporary exploratory borings using a hollow stem auger to delineate the impact of soil and groundwater contamination from a release of oil in a groundwater monitoring well (B-1). Served as field geologist and collected groundwater samples from temporary wells, collected soil samples from a split spoon sampler, and recorded lithology. Additionally, ensured proper shallow zone monitoring well destruction to mitigate potential threats to the groundwater, in accordance with the San Jaquan County Well Standards, the Department of Toxic Substances Control Well Design and Construction for Monitoring Groundwater at Contaminated Sites, and California Department of Water Resources Bulletins 74-81 and 74-90. Findings of the investigation were submitted and approved by the Department of Toxic Substance Control.

**Installation of Groundwater Monitoring Wells KI-20 and KS-10, Former Kearney-KPF Facility, Stockton, California.** Served as staff geologist and performed lithologic logging, well construction oversight, and well completion reporting for two groundwater monitoring wells. The purpose of the monitoring wells was to improve the definition of constituents of concern in the shallow and upper-intermediate zones of a site contaminated with chlorinated solvents and 1,4 Dioxane. The completion report was submitted and approved by the Department of Toxic Substances Control.

**Groundwater Monitoring and Remediation Project, Former Kearney-KFP Facility, Stockton, California.** Served as field geologist and performed groundwater monitoring and sampling for a site contaminated with chlorinated solvents and 1,4-dioxane. Presented sample results in semi-annual reports to the Department of Toxic Substances Control.

**Perris North Basin Groundwater Contamination Prevention and Remediation Program, Eastern Municipal Water District, Moreno Valley, California.** Served as project geologist for the design and construction of three municipal groundwater production wells. Assisted Eastern Municipal Water District with production well drilling and construction oversight, well design, water quality sampling, and aquifer testing. Provided Eastern Municipal Water District with final well design recommendation to meet the program objectives of non-point source contaminant remediation and municipal groundwater supply.

**Preliminary Environmental Site Assessment for Viking Ranch, Borrego Water District, Borrego Springs, California.** Served as staff geologist and conducted a Preliminary Environmental Site Assessment (ESA) for a 160-acre property previously used for agriculture. The Preliminary ESA included a review of historical source information, a search of regulatory agency databases, a review of available local agency records, interviews, a site reconnaissance, and soil sampling. Soil was sampled from 10 locations for herbicides, pesticides, and arsenic. The preliminary ESA was used to decide future land use for the property, which included consideration for annexing into the Anza-Borrego Desert State Park.

# Stephanie Chao

## ENVIRONMENTAL ENGINEER

Stephanie Chao is a young professional in environmental engineering, specializing in hydrogeology and hazardous waste assessment.

As an environmental engineer, she has assisted in assessing potential air, soil, and groundwater contamination for public agencies and private landowners. While in this role, she has also assisted in conducting Phase I and II Environmental Site Assessments, sampling of soil, soil vapor, air, surface water, and groundwater, as well as data management and report writing.

## Relevant Project Experience

**IPS Facility Groundwater Monitoring, IPS Corporation, Gardena, California.** Assisted in groundwater monitoring at an industrial manufacturing facility and report writing to assess potential groundwater contamination from historical and present-day operations at the site.

**Los Angeles Facility Soil Sampling, Confidential Energy Client, Los Angeles, California.** Assisted in report writing and data management of soil sampling from a storage facility in Los Angeles, California.

**La Cañada Phase I Initial Site Assessment, City of La Cañada Flintridge Public Works, La Cañada Flintridge, California.** Assisted in report writing of the Phase I ISA site history to assess potential historical sources of contamination.

**Moss Landing, Moss Landing and Oakland Power Plants, Moss Landing, California.** Assisted in data management of wastewater analysis to gauge regulatory compliance for potential discharge.

## Relevant Previous Experience

**Enhanced Evaluation of the Removal of Contaminants of Emerging Concern in Decentralized Water Reuse Systems by Non-Targeted Analysis, The Water Environment and Reuse Foundation and National Science Foundation, San Diego State University, San Diego, California.** Pilot scale study on chemicals of emerging concern in wastewater treatment and membrane bioreactors and the roles of aerobic and anaerobic processes. Optimized pre-treatment systems for parallel MBR and AnMBR systems.

## Presentations

“Optimization of Pretreatment Preceding Parallel Aerobic and Anaerobic Membrane Bioreactors for Use in Decentralized Wastewater Treatment”, 2018. Presented at Southern California Conferences for Undergraduate Research. Pasadena, California.

### *Education*

San Diego State University  
B.S., Environmental Engineering, 2020

### *Professional Affiliations*

APWA, Education Committee member  
AWWA  
ASCE  
WEF



## Awards

Certificate of Achievement on the presentation of “San Diego State University Mission Valley West Wastewater Learning Lab” at CWEA’s Student Design Competition, California Water Environment Association, 2020.

3rd Place at the ASCE Pacific Southwest Conference for San Diego State University’s student ASCE chapter’s Environmental Competition Report, American Society of Civil Engineers, 2020.

Certificate of Merit for Co-Authorship of Poster “Concentrations and Loadings of Anthropogenic Contaminants During Storm Events in the San Diego River and its Tributary”, American Chemical Society Conference, 2019.

Certificate of Achievement on the presentation of “A Dairy Farm Wastewater Treatment System for Reducing Methane Emissions” at CWEA’s Student Design Competition, California Water Environment Association, 2019.



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