



**DOUGLAS COUNTY COMMISSIONERS
WORK SESSION
Monday, December 17, 2024
(In Office and Remote)**

A G E N D A

Time*

9:00 a.m.

**Water Commission – Water Plan RFP Response
Recommendation & RFI Process Information**

**Natural Medicine Businesses - Proposed
Regulations**

Agenda Item

DATE: DECEMBER 17, 2024
TO: DOUGLAS COUNTY BOARD OF COUNTY COMMISSIONERS
THROUGH: DOUGLAS J. DEBORD, COUNTY MANAGER
FROM: TERENCE T. QUINN, AICP, DIRECTOR OF COMMUNITY DEVELOPMENT *TCQ/TA*
CC: DJ BECKWITH, PRINCIPAL PLANNER
LAUREN PULVER, PLANNING RESOURCES SUPERVISOR
KATI CARTER, AICP, ASSISTANT DIRECTOR OF PLANNING RESOURCES
CHRISTOPHER PRATT, MANAGING COUNTY ATTORNEY
SUBJECT: WATER COMMISSION – WATER PLAN RFP RESPONSE RECOMMENDATION & RFI PROCESS INFORMATION

SUMMARY

At its November meeting, the Water Commission (Commission) provided a recommendation on the Water Plan Request for Proposal (RFP) responses. The following three firms responded:

- Forsgren Associates, Inc
- INTERA Incorporated
- Natural Resources Consulting Engineers, Inc

RFP Review and Recommendation

The Commission discussed all three RFP responses and agreed that the responses from INTERA Incorporated (Intera) and Forsgren Associates, Inc (Forsgren) were more responsive to the RFP than Natural Resources Consulting Engineers, Inc. Commission members commented that Forsgren's experience working on surrounding County plans was valuable and their proposal balanced data collection and analysis with public engagement. Member Smethills expressed support for selecting Intera as they provided a more scientific approach, a fresh look at the aquifer, and Forsgren appeared to focus more on larger districts than small, rural districts. The Commission members discussed discrepancies in the cost breakdown provided by Forsgren.

The Commission voted in favor of recommending Forsgren for development of the Water Plan, contingent upon Forsgren providing clarification on the cost. Member Smethills was the only objection.

Forsgren provided the additional information as requested, and the Water Commission's recommendation has not changed.

The RFP responses are attached with certain proprietary salary information redacted.

Request for Information (RFI) Process

The Water Commission requested staff to issue a RFI in June to solicit input from consultants so that it may better understand if anything was missing from the approach to developing a Water Plan. The Commission used this process to refine the final scope of services included in the RFP process and made it a prerequisite to be considered during the RFP process. All initial responses to the RFI request are attached.

Additional RFI Response

The formal RFI and RFP processes closed earlier this year, but an additional RFI response was received in late November from Mekorot, the Israel National Water Company, and is provided for informational purposes only.

Since this was not timely received, it was not considered as part of the Water Commission's recommendation discussed above.

NEXT STEPS

Staff is prepared to discuss both items with the Board.

ATTACHMENTS

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RFP # CD002_2024
2050 COMPREHENSIVE DOUGLAS COUNTY WATER PLAN
BID RESULTS

BIDDERS	Natural Resources Consulting Engineers, Inc.	Forsgren Associates, Inc.	INTERA Incorporated
	Assad Safadi 131 Lincoln Avenue, Suite 300 Fort Collins Colorado 80524 United States asafadi@nrce.com 970-224-1851 Bid Document	Will Koger 56 Inverness Dr E, Ste 112 Englewood Colorado 80112 United States wkoger@forsgren.com 720-214-5884 Bid Document	Shaden Musleh 9600 Great Hills Trail Austin Texas 78759 United States Smusleh@intera.com 512-425-2000 Bid Document
BASE FEES LUMP SUM	\$451,980.00	\$472,600.00	\$669,778.00
ADDITIONAL OPTIONAL FEES	\$58,610.00	\$105,760.00	\$98,927.00
TOTALS	\$510,590.00	\$578,360.00	\$768,705.00
REFERENCES INCLUDED	YES	YES	YES
RFI RESPONSES SUBMITTED	YES	YES	YES



RFP NO. CD002-2024

2050 COMPREHENSIVE

DOUGLAS COUNTY

WATER PLAN

Presented to Douglas County by

FORSGREN
Associates Inc.

DOUGLAS COUNTY GOVERNMENT

Department of Community Development
100 Third Street
Castle Rock
303-660-7460
www.douglas.co.us

REQUEST FOR PROPOSAL (RFP)

NO. CD002-2024

2050 COMPREHENSIVE DOUGLAS COUNTY WATER PLAN

**YOUR PROPOSAL RESPONSE MUST BE RECEIVED NO LATER THAN
NOVEMBER 1, 2024 @ 5:00 PM**

REQUEST FOR PROPOSAL (RFP) CERTIFICATION

We offer to furnish to Douglas County the materials, supplies, products and/or services requested in accordance with the specifications and subject to the terms and conditions of the purchase(s) described herein:

NAME: Will Koger

ADDRESS: 56 Inverness Drive E, Ste 112

CITY: Englewood STATE: CO ZIP: 80112

TELEPHONE NUMBER: 720-214-5884 FAX NUMBER: n/a

E-MAIL: wkoger@forsgren.com

BY: Wilbur (Will) Koger

(Printed or Typed Name)



(Written Signature)

TAXPAYER I.D. NUMBER: 82-0255723

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Request for Proposal (RFP) shall be received ELECTRONICALLY ONLY through the Rocky Mountain E-Purchasing/BidNet System website at (<https://www.bidnetdirect.com/colorado>). All responses should consist of one (1) PDF document. The title of your document should reflect “**Company Name and RFP Number**”. It is the Contractors sole responsibility to ensure that their response is received on time.

Douglas County officially distributes solicitation documents through the Rocky Mountain E-Purchasing System only. Copies of solicitations obtained from other sources are not considered official copies and the County cannot attest to their accuracy. All BidNet website/system questions must be addressed with BidNet Vendor Support at 800-835-4603.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said RFP and furthermore, to award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful respondent.

November 1, 2024

Douglas County
Department of Community Development
100 Third Street
Castle Rock CO 80104

RE: RFP No. CD002-2024, 2050 Comprehensive Douglas County Water Plan

Dear Douglas County Water Commissioners and County Staff,

The Forsgren Team appreciates the opportunity to share our strategy for the Douglas County Comprehensive Water Plan (DCC Water Plan). After years of engaging with water issues across the region, largely centered on Douglas County, we responded to your Request for Information (RFI) in June 2024. We were then one of two teams invited to discuss the scope of the DCC Water Plan with you in August.

Since this RFP was released, our Team (Forsgren, LRE Water, and Michael Baker International) has come together to refine our project approach, schedule, and projected labor and expenses. Our submittal provides a detailed breakdown of our strategy to successfully develop the DCC Water Plan, based on these key themes:

- **Proven Regional Expertise:** Our team's successful water planning for neighboring Arapahoe, Elbert, and El Paso Counties has prepared us to strategically address Douglas County's unique challenges. Heavy reliance on Denver Basin groundwater is a common theme that does not change at the county lines.
- **Collaborative Project Management:** We will stay aligned with County goals through proactive communication, detailed progress tracking, and coordinated stakeholder involvement. We will strive throughout to make this a plan that reflects your direction and one that you can proudly "take ownership of."
- **Comprehensive Engagement:** Thanks to consistent and extensive community outreach, we will gather diverse stakeholder input for an adaptable, data-driven plan that aligns water supply and land use planning through 2050.

I am a Douglas County resident personally invested in its future and excited for this opportunity. As Project Manager, I am confident that the Forsgren Team has what it takes to provide the County with a sustainable, reliable water strategy for decades to come.

Thank you very much for your consideration.

Respectfully,



Wilbur L. Koger, P.E.
Project Manager
wkoger@forsgren.com | 720.232.6644

TEAM COMPOSITION

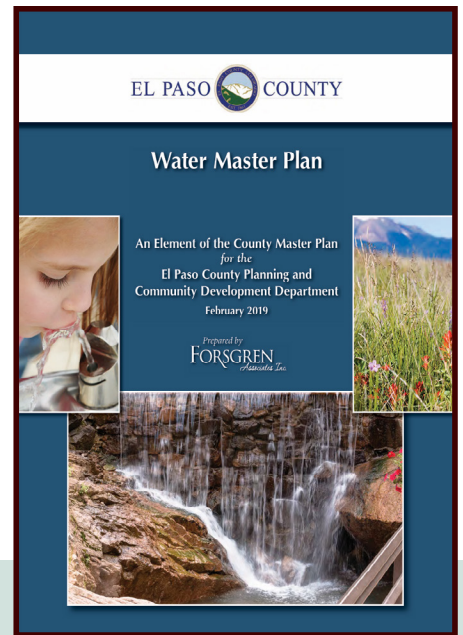


TEAM (RE)INTRODUCTION

Forsgren Associates, Inc. (Forsgren) has led four major water supply studies/master plans on the Front Range in the past six years, including the award-winning El Paso County Water Master Plan. Along with the Arapahoe County Water Supply Study now wrapping up, we have prepared plans for both Colorado’s first and third most populated counties. With unmatched experience in water supply planning and county-wide master plans throughout the region, our team is confident we are the best choice to develop Douglas County’s Comprehensive Water Plan (DCC Water Plan).

We have reassembled a team with extensive experience in Douglas County and across the Front Range, bringing a deep understanding of the unique challenges involved in coordinating land use and water supply planning in this region—particularly concerning Denver Basin groundwater management.

Much of our similar work has been supported by our teaming partners LRE Water (LRE) and Michael Baker International (MBI), as shown in the project table below. This successful collaboration on current or recent engagements makes us uniquely qualified to fulfill Douglas County’s long-term water planning goals through 2050.



[Check out the award-winning El Paso County Water Master Plan here](#)

Our Tie to Douglas County

Our engagement with the region’s water issues goes back several years. For example, our Team Lead, Will Koger, worked for two Douglas County water providers, both of which are members of the South Metro Water Supply Authority. Will was also the project manager for Douglas County’s Regional Water Conservation Planning Program, preparing 16 individual conservation plans for Douglas County water providers, which were consolidated into a single county plan. This early involvement, established rapport, and direct experience provides the Forsgren Team with a solid understanding of the County’s priorities and objectives.

The Forsgren Team responded to the County’s Request for Information (RFI) in June 2024 and was one of two teams invited to present to the Water Commission in August. Our focus for this proposal is to showcase our strategy for achieving success, not reintroduce who we are. For details on our firms, key personnel, and relevant projects, please refer to our RFI response included in Appendix A of this submittal.

Project Name	Forsgren	LRE Water	MBI
Arapahoe County Water Supply Study	◆	◆	◆
Arkansas River Basin Implementation Plan Update	◆	◆	
Eastern Arapahoe County Water Supply Plan Update		◆	
Elbert County Water Master Plan	◆	◆	
Elbert County Water Supply Study	◆		
Elbert County Water/Wastewater Planning for Agate	◆		
El Paso County Water Master Plan	◆	◆	◆
El Paso County Water Loop Study	◆		
Program Manager for El Paso County's ARPA Funding Program for Water/Wastewater Improvements	◆		
Pikes Peak Regional Office of Emergency Management Hazard Mitigation Plan	◆		◆
Pikes Peak Regional Water Authority (PPRWA) Regional Reuse Study	◆	◆	
PPRWA Regional Water Supply Infrastructure Study	◆		
Watkins/Bennett Supply and Demand Analysis		◆	

The Forsgren Team’s Recent and Relevant Water Planning and Study Experience

OUR TEAM AT A GLANCE

Forsgren will lead the DCC Water Plan as the primary point of contact, managing the project and driving all technical aspects, including water supply and demand analysis, groundwater evaluation, and mapping. LRE will focus more closely on groundwater analysis, water rights, and mapping, providing expertise in assessing the sustainability of Denver Basin groundwater and contributing to water demand projections. MBI will lead the project's public engagement and outreach efforts, facilitating stakeholder involvement and community workshops. They will also drive the land use policy analysis to align future development with long-term water resource planning.

Together, our three firms bring a comprehensive understanding of water supply and planning, and we are confident in our ability to deliver an innovative water plan that will adequately address the County's expectations and future water needs. We are also joined by Mr. Craig Dossey: a former planning director client who will serve as our technical advisor for the DCC Water Plan.

Collectively and as individual firms, our team strives to be the best at what we do and stay current with the latest methods and technologies for efficient operations. Our depth of in-team expertise and staffing allow us to provide Douglas County with personal, cost-effective service, promptly responding to your water planning needs. We are confident that we will not only meet, but exceed your expectations.



Will Koger discussing the Elbert County Water Master Plan with residents at an open house event

Our Team affirms that we understand the scope of services and all conditions and requirements contained in the RFP, and have reviewed the questions and answers issued by the County regarding the RFP. We do not have any known conflicts of interest in performing the required services.

FORSGREN
Associates, Inc.

56 Inverness Drive E, Ste
112, Englewood CO 80112
720-214-5884

Forsgren Associates, Inc. (Forsgren)

- Employee-owned, multi-discipline civil and environmental engineering firm
- 62 years of planning, design, and construction oversight for water and wastewater projects
- Denver office only 15 minutes from Douglas County's administration building
- Knowledgeable local team supported by 150+ staff across the West
- Developed water master plans throughout the region
- Selected as a "Local Expert" along with LRE Water for the Arkansas River Basin's Implementation Plan Update, part of the Colorado Water Plan

LRE WATER

CONNECTING WATER TO LIFE

1221 Auroria Parkway
Denver, CO 90204
303-455-9589

LRE Water (LRE)

- 50 years of planning, managing, and developing water resources throughout the Rocky Mountain West
- 60+ staff providing services in the areas of water rights, water supply planning, groundwater, environmental permitting, and water innovation and technology

Michael Baker
INTERNATIONAL

165 S Union Blvd, Ste 1000
Lakewood, CO 80228
720-270-9041

Michael Baker International (MBI)

- International planning and engineering powerhouse with a strong regional presence
- Will deliver a public engagement process that allows for broad participation and understanding of the Plan's importance

**PROJECT MANAGER: WILL KOGER, PE****Firm: Forsgren | Location: Englewood, CO | Years of Experience: 39 | PE-CO 31495**

Will has spent most of his career planning, designing, and managing water and wastewater projects in Colorado. He will lead our Team and serve as the Project's primary point of contact. In addition to his experience as the Assistant General Manager at Arapahoe County Water and Wastewater Authority (ACWWA) and Castle Rock's Town Engineer, Will has successfully managed numerous major water plans including the Elbert County Water Master Plan, Arapahoe County Water Supply Study, and the El Paso County Water Master Plan.

**DATA ANALYSIS & MAPPING LEAD: WILLIAM (BILL) FRONCZAK, PE, ESQ.****Firm: LRE Water | Location: Denver, CO | Years of Experience: 33 | PE-CO 0031277**

Bill's extensive water resources experience includes a major focus on groundwater. He will lead our Team's mapping, data analysis, and groundwater modeling tasks. He has experience as Assistant Project Manager for the Arapahoe County Water Supply Study and former Chief of Water Supply for the Colorado Division of Water Resources, and has led key analyses of Denver Basin groundwater for projects like the Elbert County Water Master Plan and the Eastern Arapahoe County Water Supply Plan Update.

**TECHNICAL ADVISOR: CRAIG DOSSEY, ESQ.****Firm: Vertex Consulting Group | Location: Colorado Springs, CO | Years of Experience: 18**

Craig will serve as the Technical Advisor for the DCC Water Plan, bringing nearly 20 years of experience in planning, land development, and project management. As the former Planning and Community Development Director for El Paso County, Craig led the development of the county's first Water Master Plan and has provided technical advisory support for projects such as the Arapahoe County Water Supply Study.

**ENGAGEMENT & LAND USE LEAD: ANNE KUECHENMEISTER, AICP****Firm: MBI | Location: Lakewood, CO | Years of Experience: 10**

Anne will lead the stakeholder and public participation efforts as well as the land use tasks for the DCC Water Plan. As an urban planner with expertise in public engagement, Anne has successfully led outreach initiatives for the Arapahoe County Water Supply Study and the El Paso County Water Master Plan, facilitating stakeholder input and integrating public feedback into water policy recommendations.

**ENGINEERING & TECHNICAL LEAD: MIKE WARESAK, PE****Firm: Forsgren | Location: Colorado Springs, CO | Years of Experience: 38 | PE-CO 53009**

With almost four decades of experience in water supply, distribution, and treatment studies and designs, Mike will lead this project's engineering and technical tasks. His notable projects include the Willows Water District Condition Assessment, El Paso County Water Loop Study, and the Elbert County Water Supply Study as well as multiple water treatment plant engineering reports and capital improvement plans throughout Colorado.

**PLANNING ADVISOR: TED HEYD****Firm: MBI | Location: Denver, CO | Years of Experience: 25**

Ted is a Senior Planner and will help our Team evaluate water conservation strategies related to land use planning. As a task leader for the Arapahoe County Water Supply Study, Ted led efforts to estimate potential water savings through 2050 by applying drought-tolerant landscaping, conducting a comprehensive review of county landscaping regulations, and preparing a quantitative analysis showing the significant water savings achievable over time.

PROJECT APPROACH



PROJECT APPROACH

The goal of the DCC Water Plan is to analyze the ability of water resources throughout the county to support a wide range of land uses, especially as the region continues to grow and face extended droughts. The Forsgren Team has worked together to strategize how we will efficiently tackle the four phases outlined in the County's RFP. The approach outlined in this proposal was developed based on our extensive experience developing similar water plans across the region, including for three neighboring counties. We look forward to collaborating with Douglas County to design and deliver an approach that meets your needs, addresses your concerns, and provides a resilient, reliable, and sustainable water plan for decades to come.

PROJECT MANAGEMENT

We take pride in our ability to foster collaboration with respect and efficiency. Forsgren will perform project management throughout the entire duration of the project, recognizing that effective communication is essential to our success. Our Project Manager, Will Koger, will maintain regular contact with the County's Project Manager to provide continuous alignment with County objectives and project goals. As we progress, our task leaders and specialists will also engage closely in each phase. We are committed to ongoing, responsive communication through phone calls, face-to-face and virtual meetings, and email. Our work must reflect the County's direction, and achieving this requires consistent dialogue and close collaboration every step of the way.

Performance, budget, and schedule are the measures of good project management. We have included a proposed schedule and base budget in this submittal, as well as a more comprehensive budget alternative for consideration. Once the schedule and budget are established, we will use them to track progress and performance on the DCC Water Plan. Each major task will be identified in our monthly invoices which will include hours by staff and expenses, with a summary of the work performed. Additional details on charges are always available upon request.

The detailed budget and schedule will be included in a Work Plan that will also show staffing assigned by task. All work will be completed under the direction of the County's Project Manager. At a minimum, our Project Manager will schedule monthly coordination meetings with the County's Project Manager and maintain consistent contact throughout the month. Additional team members will join these meetings as needed, based on the specific topics or areas of focus for each discussion.

Project Management Deliverables:

- **Holding a Kickoff Meeting** with the County staff and the Douglas County Water Commission (DCWC) to establish a clear understanding of the project goals, milestones, schedule, public engagement plan, and lines of communication. This meeting will also identify project leadership and stakeholders.
- **Preparing a Work Plan** with a schedule for milestones and deliverables, along with budget, assignments, project references, etc.
- **Preparing monthly progress reports** with task, budget, and schedule updates.
- **Providing draft technical results to the DCWC** for information and feedback at key work stages. Up to six submittal stages are included for our base fee and two more would be added for the expanded option.
- **Presenting updates to County staff, the DCWC, and other stakeholders at key stages of the work.** Up to six such presentations are included for our base fee and two more would be added for the expanded option.

Optional Services - Project Management:

The two additional draft technical submittals and two additional presentations may be selected as optional services. This allows more flexibility with regard to budget limitations

PHASE 0 – ENGAGEMENT AND OUTREACH

As all stakeholders and community members must have reliable, resilient water supplies and systems, obtaining a broad spectrum of input is important to this Plan’s success. Our other, recent countywide studies have shown that residents and stakeholders provide valuable information on constraints, priorities, opportunities, and commonly-held perceptions about long-term water supplies. To gather this vital input, our team will employ a combination engagement techniques that have proven effective in our past planning efforts. These include stakeholder meetings, focus groups, public workshops, and presentations to the Board of County Commissioners as detailed below. We have also identified some optional services for your consideration.

Stakeholder Meetings

We will coordinate with the DCWC to assemble a representative stakeholder group that includes water providers, planners, and developers. The group will meet quarterly throughout the project to provide input related to engagement, findings, and recommendations. Meetings will be held in-person with a virtual option. Our team will be responsible for coordinating and facilitating up to five meetings with this group. We will develop agendas, relevant content, and minutes – including any action items identified.

Focus Groups

As the project progresses, our team will collaborate with the DCWC to identify appropriate categories and members for focus groups. These may be developers, HOA representatives, or others who may be impacted by the DCC Water Plan’s recommendations. We will conduct up to two focus groups to gain a deeper level of understanding and garner additional input on a particular subset of issues or topics taken from the survey results and the first open house.

Public Workshops

The Forsgren team will conduct three public workshops. We propose an initial, virtual open house which provides a project overview, shares how people can receive updates, and provides input as the project progresses as well as a Q & A session with the project team.

We also propose two in-person workshops in an open house format near the beginning of Phase 2. Our team will share a summary of input received through the online survey including any notable trends or shared sentiments among the responses. We will also share initial findings on current and future supply and demand at these workshops and seek input on potential strategies for water use, conservation, and recycling that will help inform recommendations. The open houses should be located at each end of the County, north and south generally, to be convenient for as many residents as possible.

To boost local engagement and education, we propose inviting other community organizations that are focused on water use and conservation in the county or region to the open house as we did recently for the Arapahoe County Water Supply Study. This could include, for example, water providers, Denver Botanic Gardens, or Wild Ones. This also provides partners the ability to set up a table/display offering attendees information and resources related to conservation (e.g. water-wise, drought-tolerant landscaping) and efficient water use (e.g. rain-barrel collection systems).

Board of County Commissioner Presentations

The Forsgren team recommends that we present to the Board of County Commissioners twice. The first presentation will be at a project midpoint, prior to the end of Phase 3 to share key information, respond to questions and hear any feedback prior to a second, final presentation when the Plan is considered for Commissioner adoption.



MBI Leading a pop-up workshop with Aurora County residents

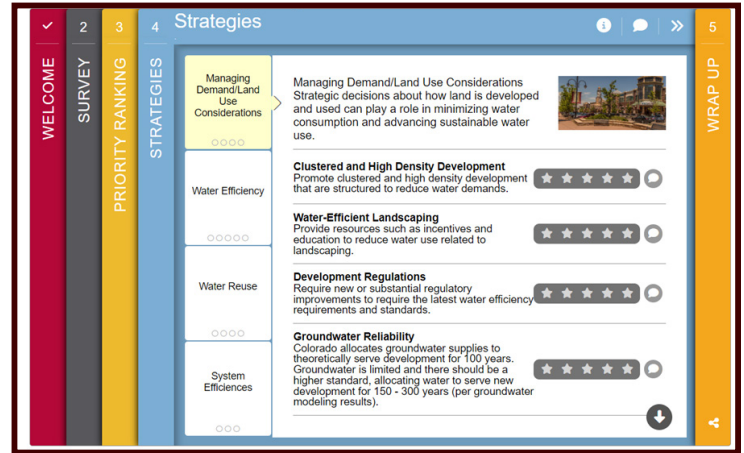
Phase 0 - Optional Services

We recommend the following tasks as well for more robust public engagement, but have identified them as optional to provide budget flexibility. If these optional services are not selected, we will need to rely more heavily on the the County and stakeholders to post basic information regarding the DCC Water Plan.

Optional Service - Digital Engagement Hub

The Forsgren team will use Social Pinpoint to create a digital engagement hub that houses project information and updates, as well as a notification sign-up form. We will refresh content on this hub up to five times through the course of the project, sharing updated data, opportunities for engagement (e.g. open houses), and draft documents for public review.

- Update 1: Setup.** Initially, the engagement hub will contain an overview that includes a project description, goals, schedule, and desired outcomes. We will create a project interest and questions form that allows interested community members to receive project updates and ask questions or pose comments throughout the process. The Forsgren team will maintain and monitor the form and any responses.
- Update 2: Water Priorities Survey.** This update will align with Phase 1 of the project. Our team will collaborate with DCWC to finalize questions for an online survey that will be broadly disseminated. This survey will be open for approximately 45 days and will allow our team to better understand stakeholders' water supply priorities and preferences related to conservation, recycling, reuse, and increased storage. We will also share details on the first public open house and encourage interested parties to invite colleagues, neighbors, and friends.
- Update 3: Survey and Study Summary.** Our team will release this update at the start of Phase 2. We will share an initial summary of findings from both the water supply and demand analyses, as well as a summary of responses from the on-line survey. If any clear trends emerge from the responses, such as a desire for increased in-home graywater reuse, we will highlight those as part of this update.
- Update 4: Open House Notification.** This will occur during Phase 2. We will share information on the second and third public open houses including dates, locations, and times.
- Update 5: Final Report.** This will occur near the end of Phase 3. We will share the final report, summary of findings and next steps.



Digital engagement platform used for both the El Paso Water Master Plan and the Arapahoe County Water Supply Study. The Arapahoe County Water Supply Study received over 300 responses



Our strategy includes providing content for Douglas County to post on

their Facebook, X, and Instagram accounts. We will develop a total of six posts; at the start of the project, prior to the first open house, prior to the second open house, and at two other strategic points during the course of the project.

Optional Service - Outreach Materials and Activities

To build awareness of the project throughout the County, we will create a one-page project information sheet that can be distributed digitally or as hard copy. It will mirror the content we include on the Social Pinpoint engagement hub, including the project overview, schedule, goals, how to be involved, and desired outcomes. We will encourage the project stakeholder group identified above to assist with distribution of this one-pager to their networks to increase awareness of and engagement in the project.

We will also provide brief content that County staff and key stakeholders can share in their e-newsletters. The first will announce the project, the second will announce the engagement hub on Social Pinpoint and first open house, the third will share a summary of survey responses, and the fourth will announce the second and third open houses.

PHASE 1: WATER SUPPLY AND DEMAND ANALYSIS

The water supply and demand analysis is a logical starting point, and we will accomplish that in four major tasks as described in the RFP and expanded upon below.

Task 1: Water Supply Information Collection

Task 1a – Data Tabulation

This process starts by collecting, reviewing, and evaluating water supply plans from all water providers (including municipalities, water districts, special districts, water companies, and community well systems) and regional entities that extend into the county such as the South Metro Water Supply Authority. We will reference the Colorado Water plan, the Basin Implementation Plans, and their provisions that apply to Douglas County and its water providers.

We will then prepare a comprehensive water supply and water use profile for Douglas County water providers starting with the template provided in the RFP and present the water information to the DCWC. Some of that data will be available from the State's database. We performed very similar tasks for the El Paso County Water Master Plan and for a handful of regional water infrastructure studies.

From here, we will tabulate water resource supplies and reliability and source of supply use data including tributary, non-tributary, non-tributary, alluvial water (well), surface water, water rights, water storage rights, contracts, or commitments of water providers and transfer of water from providers external to Douglas County.

From this data, we can determine and tabulate the average annual yield and safe yield of the surface and groundwater water rights identified above and extrapolated in 10-year increments through 2050.

We will assess raw water storage by tabulating available reservoir capacities and mapping storage locations available to water providers, noting other water information, as applicable, including current and projected water conservation efforts by County water providers to extend supplies and serve new growth through 2050. We can then analyze the results of the information gathered, including annual water production history, and current and projected water use for each municipality or water district.

Task 1b – Mapping & Development of Figures and Digital Data

Next, we will develop a comprehensive mapping and data system to support the discussion of opportunities and challenges associated with water supply planning throughout Douglas County. Colorado water is unique in that water providers account for all water used from the source of supply to the point of return, including system losses or even lawn irrigation return flows that occur between. Not only is the water tracked, but the specific types of use or specific places of use are limited by permits or court decrees.

Further, most municipal water supplies have varying degrees of reliability or annual firm yield based on climate, changes in river administration, declining water levels in aquifers, or contractual obligations or limitations. To understand the limits (also known as institutional barriers) is to understand the potential for future shortages as well as opportunities for cooperation, sharing, and interconnection between water providers.

In regard to the mapping, development of figures, and digital data, our team has performed this type of analysis for Arapahoe, Elbert, and El Paso Counties. We will first collect digital and other publicly available data and organize it into a geodatabase and interactive GIS map.

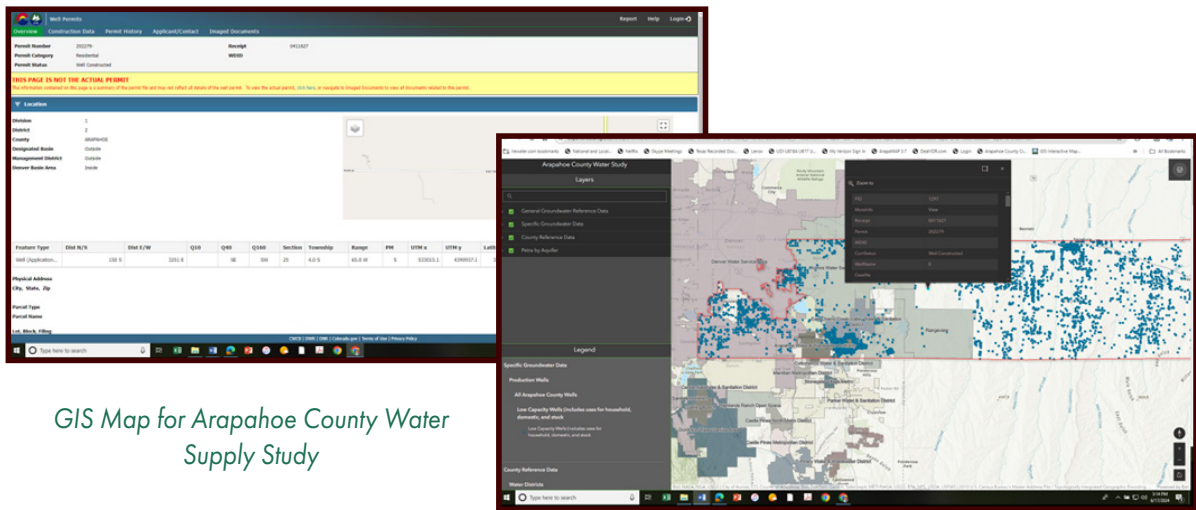
Once this is accomplished, the GIS map can serve two purposes. The first is to assist the County in its decision-making regarding the use of groundwater to support new development and growth. The second is as a tool for the public to understand the groundwater resources they rely on, and create the ability to rapidly find accurate, concise information regarding their groundwater. This mapping will also incorporate data developed during the groundwater analysis (Task 3) to provide further value.



CONNECTING WATER TO LIFE

Team member LRE Water developed the municipal water efficiency plan (HB04-1365) data portal for the Colorado Water Conservation Board (CWCB) and understands how to efficiently extract and use information within the required reports to support water supply and demand analyses on a regional level.

Our team envisions developing a GIS database with layers for water wells, water rights, water providers' boundaries and service areas, water providers' existing and projected facilities, and County data. The database will also have hyperlinks to the Colorado Division of Water Resources (DWR) and other publicly available data as demonstrated in the Arapahoe County figures that follow. Additionally, the database will house the groundwater analysis data.



GIS Map for Arapahoe County Water Supply Study

The data collected could include the following:

- County GIS/digital data
- County existing and future growth scenarios
- County administrative boundaries related to Section 18A designations regarding water supply zones
- Identified water provider boundaries, service areas, current and future zoning plans, and to the extent available, existing and projected water facilities that can be shared
- GIS data from DWR regarding:
 - ◇ Well permit and structure data (both Denver Basin and alluvial)
 - ◇ Pre-213 and other data regarding Denver Basin groundwater (i.e. not nontributary [NNT], nontributary [NT], and deemed consent boundaries)
 - ◇ Active surface water rights
 - ◇ Regional Denver Basin data sets available from the USGS and DWR (water levels, geophysical data, etc.)
 - ◇ Groundwater analysis data (PETRA analysis)

This GIS map and underlying data will be used in the DCC Water Plan to:

- Assist in the identification of data gaps and information needs.
- Assist in identifying overlap of service areas, areas of cooperation between service areas, areas of possible interconnections, and other water-sharing services (regional facilities).
- Assist in the identification of barriers to sharing water services.

Task 2: Water Demand Projection Analysis

Our team will analyze currently planned and projected development through 2050, as well as projected water demands by water providers compared to current water supply and demands. This will include analyzing land within existing water provider service areas and areas expected to develop with individual wells. We will then use this analysis to develop a countywide gap analysis between water supply and demand, much like we did for El Paso and Arapahoe Counties.



The 2023 Colorado Water Plan used a scenario planning process with five different forecasts using different assumptions about the state's growth. These included "business as usual, weak economy, cooperative growth, adaptive innovation, and hot growth." Arapahoe County considered the "weak economy" scenario to be too pessimistic, possibly leading to underestimating future water demands. They settled on the "business as usual" forecast at the low end and the "hot growth" scenario at the upper end, effectively bracketing potential water demand conditions. Our team then used those scenarios to identify a range of demands for analysis.

We will use the DWR well database to catalogue the location of Denver Basin wells as described under "mapping" and assign an estimated production level to approximate the total, current supply from these sources to support the gap analysis.

Our team will forecast future consumption by assuming wells currently in production will continue to produce at the current rate (with decline curves by aquifer) and by adding the anticipated consumption from future wells. We will use the County's growth analysis to project a new well count in rural areas. The intent is to account for the current and future production for this sector in the gap analysis through 2050.

Data from each water supplier will be aggregated, tabulated and presented graphically for the county or regions within the county as:

- Current, 2030, 2040 and 2050 water supply forecasts
- Current, 2030, 2040 and 2050 water demand forecasts
- 2030, 2040, and 2050 gap analyses

We will also analyze supply and demand for current conditions on individual rural wells and use the County's growth analysis to project demands for that sector through 2050. We will then run a gap analysis in coordination with the groundwater analysis of Task 3.

Besides evaluation of projected water demands by water providers, our team will largely focus on the nontributary Denver Basin aquifer demands east of the foothills. Not-nontributary Denver Basin groundwater, alluvial groundwater and fractured granite groundwater, while used, are subject to augmentation plans reducing the projected demands.

The pending "Slow Sip" case before the Colorado Supreme Court will determine whether using Denver Basin groundwater will be limited to a total withdrawal volume over a 100-year allocation. That ruling could have a substantial impact on using this vital resource in Douglas County. We will be prepared to estimate the impacts of the outcome and effects on the overall water supply picture.



Task 3: Groundwater Analysis

The groundwater analysis is an integral part of the DCC Water Plan and will be accomplished concurrently with the rest of the Plan, by the same team. While several Douglas County water providers have increased their use of renewable water for existing and future development (surface water and alluvial groundwater), development

in the unincorporated areas of the County continues to rely upon nonrenewable Denver Basin groundwater. Although this has been the primary supply for the region, the resource is not consistent across the county and is declining rapidly in some locations.

Allocation of Denver Basin groundwater is straightforward and governed by state law. Denver Basin groundwater is allocated based upon land ownership, saturated sand thickness and specific yield. However, the ability to

Our team has been directly involved in Denver Basin groundwater analyses and issues for water providers throughout Douglas County. Through these projects and other groundwater projects for private individuals throughout the county, we have compiled a significant amount of Denver Basin groundwater data. We will use this previously compiled public data as the foundation for the work to be completed under the groundwater analysis.

withdraw the legally computed allocation can be strained due to the fine-grained geology present in the aquifers and potential well-to-well impacts on a local and regional scale. This means significant water rights on paper can have a physical supply of wet water that is substantially less. For water providers, residents, and developers dependent upon this nonrenewable resource, this presents a significant challenge. The focus of this analysis will be to identify those areas where the physical supply of Denver Basin groundwater does not meet the expected allocation.

Water quality can also be a major concern for water providers, residents, and developers. Denver Basin supplies are susceptible to elevated levels of radium, uranium, selenium, arsenic and other naturally occurring constituents, in addition to the more typical iron and manganese exceedances. Total dissolved solids (TDS) can also be an issue, primarily in Laramie-Fox Hills wells.

A key component of that analysis will be the use of a PETRA model. This model uses geophysical and raster logs from numerous public resources (DWR, USGS, Colorado Geological Survey, Colorado Energy & Carbon Management Commission) to develop a picture of the Denver Basin aquifers. This model will help us analyze data to further characterize the amount of groundwater that is physically available using current technology. We will use collected data and geophysical and raster logs within the county to create cross-sections that define the extent of Denver Basin groundwater; depth, saturated sand, thickness, and productivity.

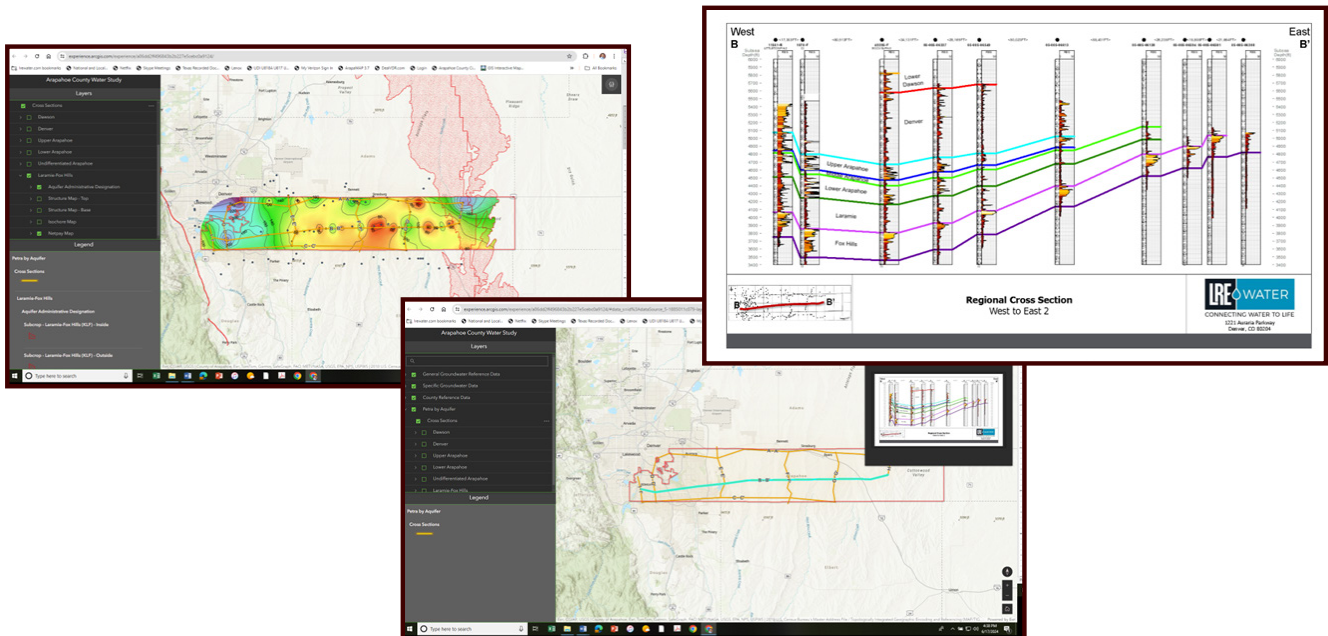
To accomplish this, our team will:

- Map unincorporated lands within the county and prepare a water inventory of these lands
- Compile alluvial water rights, exempt and non-exempt well permits (including pre-213 wells), and Denver Basin groundwater data from DWR
- Compile decrees/determinations regarding Denver Basin groundwater in unincorporated areas
- Collect a representative sample of geophysical logs, raster logs, and Colorado Energy & Carbon Management Commission logs to evaluate the Dawson and Denver aquifers across the county, with a primary focus on unincorporated areas
- Utilize the State groundwater allocation calculations to evaluate the Arapahoe and Laramie-Fox Hills aquifers across the county
- Use the PETRA model, with State groundwater allocation calculations, and other regional data sets to estimate physically available groundwater in the county. Using the water rights and well permit data, compare the PETRA estimated physical availability in the Dawson and Denver aquifers to the groundwater volume allocated by state regulations for these aquifers
- Total the amount of alluvial groundwater being withdrawn based on DWR well permit records
- Estimate current Denver Basin water level trends (collected from public resources) to evaluate changes that will influence future availability of Denver Basin supplies
- Review county regulations pertaining to groundwater development

- Review county data associated with subdivisions approved in unincorporated areas
- Analyze and extrapolate conditions expected through the year 2050 in 10-year increments
- Review and analyze current and potential future water statutes and regulations affecting groundwater use, such as the “Slow Sip” case before the Colorado Supreme Court
- Review areas of the county where County staff have identified complaints or evidence of significant groundwater declines and reductions in available supply. Assess construction of existing wells in these areas and whether the reductions result from well construction issues or localized zones of low well productivity and/or significant declines in aquifer water levels
- Evaluate aquifer declines regionally and locally upon review of publicly available data
- Collect data on water quality from USGS, EPA, CDPHE, or Douglas County Health, where available, and map areas with potential water quality issues
- Identify and recommend strategies to address data gaps, including a possible Denver Basin aquifer monitoring

Groundwater Analysis Deliverables:

- Inclusion in the geodatabase and interactive web-map water wells, water provider boundaries and service areas, subdivisions in unincorporated areas, decrees and pre-213 data, PETRA data, and other relevant Douglas County data layers. Examples of the geodatabase are provided in the figures that follow.
- A technical Task Memorandum documenting the PETRA analysis, data development, groundwater withdrawal computations and assumptions, water quality information and water level information. A PETRA analysis example is shown in the figures that follow.
- For all deliverables, the Forsgren team assumes that spatial and tabular data sets, related information, and reports relevant to this effort will readily be available from the County, State, water providers, or other public resources.



plan for consistent evaluation of water levels now and in the future

Optional Services - Phase I

The following tasks are offered as optional services for Tasks 2 and 3:

- Perform demand analysis for not-nontributary Denver Basin groundwater, alluvial groundwater, and fractured granite groundwater subject to augmentation plans.

- Obtain data and perform PETRA analysis on the Arapahoe and Laramie-Fox Hills aquifers which to date have not been extensively used due to depth.

PHASE 2: LAND USE POLICY ANALYSIS

The requested scope of services for the Land Use Policy Analysis aligns with the approach that the Forsgren team outlined in its RFI response earlier this year. The scope is founded on our understanding that the amount, form, and location of future land development will drive future water demands and challenge the County's water providers to sustain and deliver a long-term supply.

Through this analysis, we will assess how the relationship between forecasted demand and supply calculated in Task 2 correlate to forecasted changes in land use for 2030, 2040, and 2050. Generally, as more residential, commercial, and industrial land uses come online in Douglas County in the next 25 years, we expect the gap between demand and supply to tighten. Following methods used on other, recent countywide studies, we will rely on a combination of local, regional, and state-level data to estimate key indicators including population growth, number of residential dwelling units, amount of commercial/industrial square footage and the number of new jobs. We will tabulate each of these for year 2030, 2040, and 2050 and evaluate them in comparison to the demand/supply variation calculated in Task 2.

Depending on our findings, our team can then make informed land-use policy recommendations. For example, if demand is projected to exceed supply under the ultimate land use scenario (full buildout), we can identify strategies that would help the County recalibrate its forecasted land-use portfolio and reduce the level of projected demand. Ultimately, the goal of this task is to establish a framework that allows the County to accommodate continued development, but in a way that is consistent with maintaining reliable water supplies.

PHASE 3 – DEVELOPMENT OF THE DCC WATER PLAN

In Phase 3, our team will create the overall DCC Water Plan using the information from Phases 1 and 2, including the groundwater analysis. We will facilitate meetings with the DCWC to develop policy recommendations based on our study observations, analyses, and findings. We will also identify and discuss renewable water alternatives that could serve the county in the future. Our team will lead the public meetings referenced in Phase 0 during Plan development and after the final Plan is published.

Throughout performance of the work, the Forsgren team will prepare correspondence, meeting summaries, and technical memoranda documenting activities and recommendations. As those documents are prepared, they will be compiled by topical sections and then "knitted together" to create the DCC Water Plan. We will submit a draft report to the County staff and then meet to receive review comments. We will then prepare a draft of the report for public comment.

We could extend the schedule to first present the Plan to the DCWC and BOCC before releasing for public comment if requested. (For Arapahoe County, we presented draft findings to their planning commission and BOCC prior to public release.) Once public comments are received we will prepare a "pre-final" version of the report and join County staff in presenting to the DCWC, Planning Commission and BOCC for adoption. Following those meetings, we will incorporate final comments received and produce a final report.

The DCC Water Plan is expected to include the following sections:

1. Executive Summary presented in a user-friendly format, easily understood and accessible to the public, such as a summary or brochure condensing the findings
2. Maps and graphics to enhance readability and ease-of-use
3. Summary of Phase 1 – Water Supply and Demand Analysis - Full report to be included as an appendix, possibly with a stand-alone report for the groundwater analysis.
4. Summary of Phase 2 – Land Use Policy Analysis- Full report to be included as an appendix
5. Summary of Groundwater Analysis (with full report included as an appendix)
6. Public Engagement Summary

Optional Services - Phase 3

We can offer the following tasks as optional services:

- Provide presentations of the draft report to the DCWC and BOCC prior to releasing for public comment.
- Provide technical advisory support to the County as they carry forward policy recommendations for possible BOCC adoption as regulatory requirements. This would primarily include support by our technical advisor, Mr. Craig Dossey.

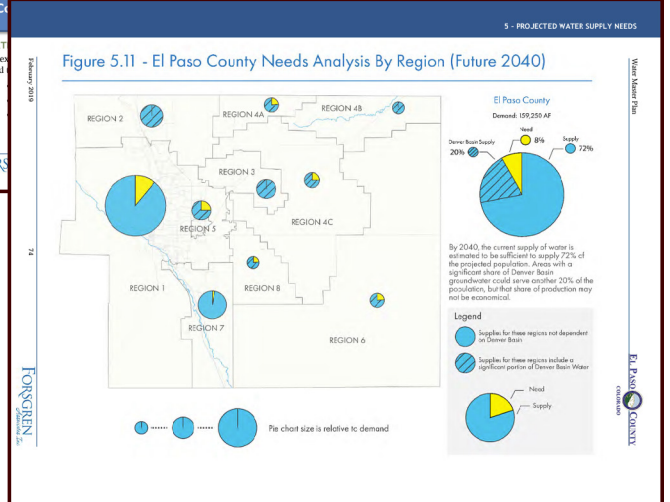
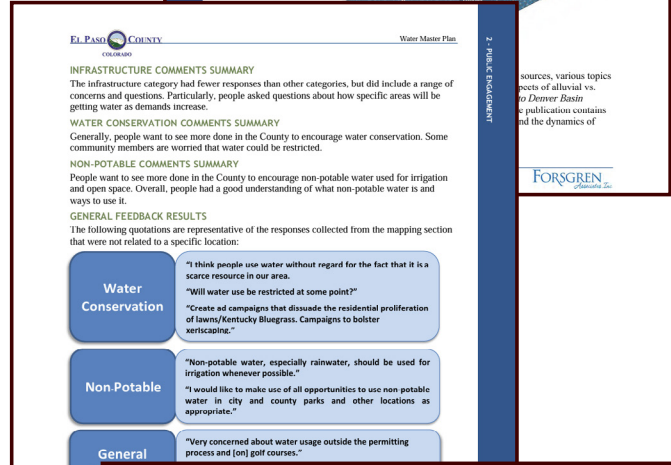
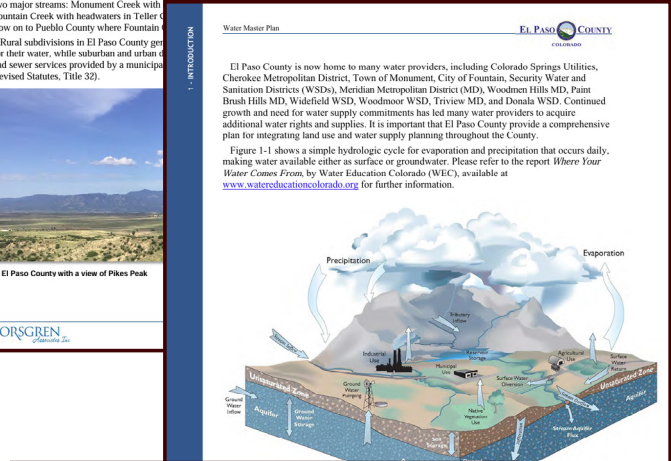
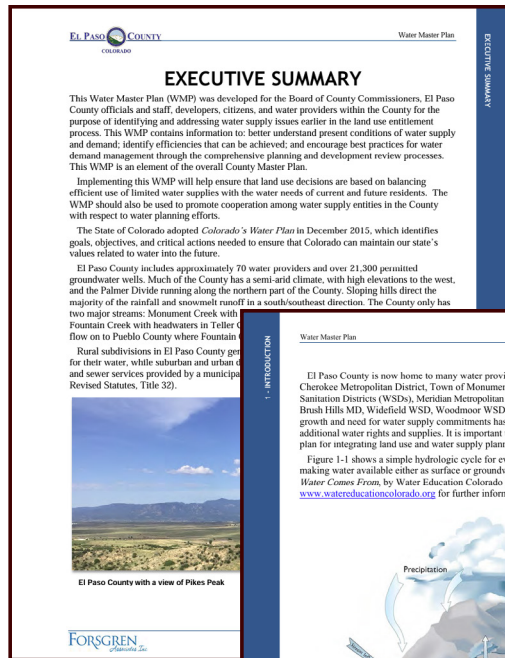
The pages at right are excerpts from the Forsgren Team's El Paso County Water Master Plan, which won the National Association of Counties 2020 Achievement Award in the Planning Category.

"The El Paso County Water Master Plan is innovative, informative, relevant, and dynamic. Few, if any Colorado counties, with such a significant population or diversity of water suppliers, have developed a Water Master Plan that addresses growth and community sustainability at this level."

~ Press Release from El Paso County

The Forsgren Team is prepared and eager to develop an equally comprehensive water plan for Douglas County's water resources through 2050. We have the expertise, strategy, and vested interest in this project to help you plan and protect your supply of this precious, vital resource for generations to come.

We look forward to doing so.



PROJECT TIMELINE

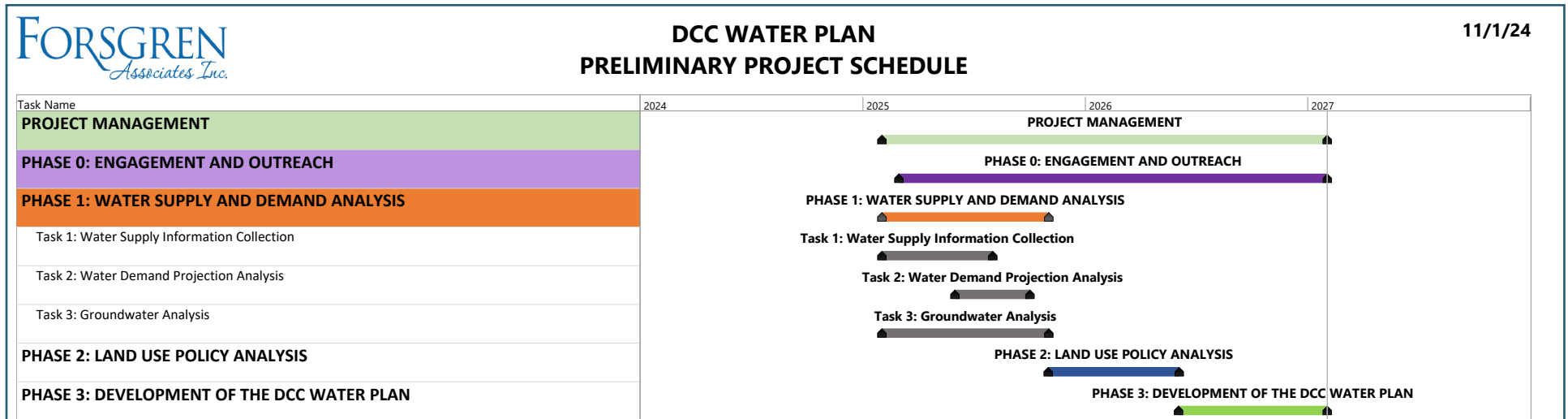


PROJECT TIMELINE

We estimate that the DCC Water Plan will take approximately 24 months after Notice to Proceed is issued. The general task and phase timelines and inter-relationships are shown in the chart below. Although the time shown is sufficient, it will require a well-organized approach and prompt performance. We welcome your feedback on the estimated schedule and will finalize once the scope of services is confirmed through the RFP process.

The response to one of the RFQ questions indicates that a potential 18-month schedule was identified as the DCWC was formed to develop the DCC Water Plan. If that shorter schedule is preferred, we can certainly coordinate some modifications to the scope with the County staff and the DCWC to complete the Plan sooner.

Our Team is well experienced in delivering studies of this type and we are ready to start immediately after Notice to Proceed. We recognize that scope changes, delayed feedback from reviewers, and difficulty scheduling meetings have the potential to delay the work but will work closely with you to overcome those potential delays to the extent possible.



PROJECTED LABOR & EXPENSES



PROJECTED LABOR & EXPENSES

The Forsgren Team is a collaboration of firms built to offer technical strength at cost-effective, competitive rates low on overhead. Fees will be determined by actual time and expenses within an agreed upon budget that best serves the County’s needs. Additional services would be performed based on time and expenses, and then only upon written direction by the County.

The fee is built upon estimating the number of hours by task and subtask for each staff person assigned, for completion within 24 months. The fee also includes project expenses. Please note that we have assumed reliance primarily on electronic copies of documents throughout to minimize expenses, but production of documents or bound reports could be included at additional cost.

Our proposed fee is summarized in the table below and detailed in the pages that follow. The proposed fee and options can be used to tailor the services to the available budget. *We are glad to review the details with you and refine the scope and fee as needed to provide the greatest value to the County.*

Base Fee: \$472,600

Possible Options: \$105,760

GRAND TOTAL: \$578,360

FEE PROPOSAL SUMMARY			
TASK	DESCRIPTION	BASE FEE	OPTIONAL FEES
PM	Project Coordination & Administration	\$79,194	\$9,778
			Optional Tasks
			Tech Submittals & Presentations (2)
0.0	Public Engagement & Outreach	\$95,761	\$33,097
			Optional Tasks
			Digital Engagement Hub
			Outreach Materials and Activities
1.0	Water Supply Demand & Analysis	\$153,273	\$26,510
			Optional Tasks
			Demand Analysis for Ground Water Under Augmentation Plans
			PETRA Analysis (Arapahoe & Laramie-Fox Hills Aquifers)
2.0	Land Use Policy Analysis	\$46,802	\$0
3.0	Development of Douglas County Water Plan	\$97,569	\$36,374
			Optional Tasks
			Present Draft to DCWC & BOCC Before Public Review
			Policy and Implementation
	TOTAL	\$472,600	\$105,760

COMPANY REFERENCES



COMPANY REFERENCES



Loretta Daniel | Arapahoe County Long-Range Planner
5334 S. Prince St., Littleton, CO 80120
720-874-6657 | ldaniel@arapahoegov.com



Larry Mugler | Arapahoe County Planner/ Project Specialist
5334 S. Prince St., Littleton, CO 80120
720-874-6657 | lmugler@arapahoegov.com



Eric Larson | Elbert County Government Economic Development Projects Manager
215 Comanche St., Kiowa, CO 80117
720-595-3617 | Eric.Larson@elbertcounty-co.gov



Jessie Shaffer | Woodmoor Water and Sanitation District Manager
1845 Woodmoor Drive, Monument, CO 80132
719-488-2525 | jessies@woodmoorwater.com



Tom Tharnish | Town of Monument Public Works Director
645 Beacon Lite Road, Monument, CO 80132
719-884-8039 | ttharnish@tomgov.org

"Forsgren Associates has completed several projects for the Town over the last several years and is well versed in our system needs and has always completed their assigned projects in a timely manner and on budget."

~ Tom Tharnish, Town of Monument Director of Public Works
Memo to the Board of Trustees

CERTIFICATE OF INSURANCE



PROPOSAL

Douglas County 2050 Comprehensive Water Plan



Prepared for



Prepared by



NOVEMBER 1, 2024

DOUGLAS COUNTY GOVERNMENT

Department of Community Development
100 Third Street
Castle Rock
303-660-7460
www.douglas.co.us

**REQUEST FOR PROPOSAL (RFP)
NO. CD002-2024
2050 COMPREHENSIVE DOUGLAS COUNTY WATER PLAN**

**YOUR PROPOSAL RESPONSE MUST BE RECEIVED NO LATER THAN
NOVEMBER 1, 2024 @ 5:00 PM**

REQUEST FOR PROPOSAL (RFP) CERTIFICATION

We offer to furnish to Douglas County the materials, supplies, products and/or services requested in accordance with the specifications and subject to the terms and conditions of the purchase(s) described herein:

NAME: INTERA Incorporated

ADDRESS: 9600 Great Hills Trail Suite 300 W

CITY: Austin STATE: TX ZIP: 78759

TELEPHONE NUMBER: 512-425-2000 FAX NUMBER: N/A

E-MAIL: SMusleh@intera.com

BY: Shaden Musleh

(Printed or Typed Name)



(Written Signature)

TAXPAYER I.D. NUMBER: 74-3010638

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Request for Proposal (RFP) shall be received ELECTRONICALLY ONLY through the Rocky Mountain E-Purchasing/BidNet System website at (<https://www.bidnetdirect.com/colorado>). All responses should consist of one (1) PDF document. The title of your document should reflect “**Company Name and RFP Number**”. It is the Contractors sole responsibility to ensure that their response is received on time.

Douglas County officially distributes solicitation documents through the Rocky Mountain E-Purchasing System only. Copies of solicitations obtained from other sources are not considered official copies and the County cannot attest to their accuracy. All BidNet website/system questions must be addressed with BidNet Vendor Support at 800-835-4603.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said RFP and furthermore, to award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful respondent.

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Attachments

Attachment A Resumes (Abridged)

A. Letter of Transmittal

November 1, 2024

Douglas County Government
Department of Community Development
100 Third Street
Castle Rock, Colorado 80104
Delivered electronically via Rocky Mountain E-Purchasing System

**RE: 2050 Comprehensive Douglas County Water Plan
RFP No. CD002-2024**

Dear Douglas County Water Commission,

INTERA Incorporated (INTERA) is pleased to submit the enclosed proposal to provide Douglas County (the County) and the Douglas County Water Commission (DCWC) with a Comprehensive Water Plan through the Year 2050. We believe INTERA, with specialty consultant Brendle Group (the INTERA-Brendle Team), is an ideal selection to provide these services because of the following key assets that we offer. We firmly believe that close collaboration with DCWC and the County is essential for developing a water plan that can effectively facilitate informed decisions.

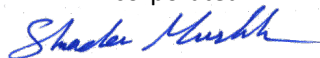
- **Proven Performance in the South Metro Area.** Our Team brings over two decades of water resources planning experience in the South Metro area, including current work on the South Metro Water Supply Authority (SMWSA) Aquifer Storage and Recovery (ASR) Regional Study. Overseeing this work is a technical committee comprised of representatives from Denver Water, Aurora Water, the Colorado Water Conservation Board (CWCB), State Engineer’s Office, South Metro members such as Parker Water and Sanitation District (Parker Water), Centennial Water and Sanitation District (Centennial), Castle Rock Water, East Cherry Creek Valley Water and Sanitation District (ECCV), Meridian Metropolitan District (Meridian), and Dominion Water and Sanitation District (Dominion) in addition to the U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE). Our experience in the South Metro region began with SMWSA’s first master plan in 2007. This legacy of work, together with our working relationships with relevant water providers and local agencies, highlights our local knowledge and ability to deliver these services efficiently. Recent work performed in Douglas County for the SMWSA ASR Regional study and for local water providers has provided up-to-date best practices and familiarity with relevant data that will facilitate our work in developing the County Water Plan.
- **Scientifically Sound - Tested Methodology.** Our approach leverages a scientifically sound, rigorously tested methodology for assessment of groundwater availability. Unlike the overly simplistic approach used in the Arapahoe County water plans (the El Paso County Water Plan did not address physical availability of groundwater) to estimate the “physically available” groundwater, our approach will address vital conditions like (1) aquifer heterogeneity, (2) changes in groundwater storage associated with conversion from confined to unconfined conditions, (3) and well to well interaction in “priority areas that matter” when it comes to existing and projected future water supply shortages as well as future levels of groundwater extraction occurring in the Denver Basin Aquifers. With Dr. Jeremy White of INTERA, a renowned expert specializing in the effective use of limited data and groundwater models, we excel in providing insightful assessments of groundwater resources to understand the extent of those resources and any risk associated with their use. This expertise allows us to use scientific-based relationships to identify trends and project groundwater availability under future scenarios.

- **Local Water Planning Expertise and Relationships.** Our proposed Team brings significant experience performing water planning services in Douglas County and neighboring areas, especially with projects focused on groundwater supply, having partnered with municipalities and government entities such as Dominion, Centennial, Castle Rock Water, SMWSA, Parker Water, Triview Metropolitan District, Donala Water and Sanitation District, Aurora Water, Denver Water, Castle Pines North, Cottonwood, Pinery, and more. These relationships with local entities in Douglas County and the South Metro region will be invaluable in our efforts to collect data and develop the Douglas County Water Plan.
- **Established Experience in Water Supply – Demand Planning and Land Use Studies.** Our Team has significant experience in conducting large-scale and county-wide water supply/demand and land use studies, both locally and nationwide. For example: a complex water supply needs analysis for Denver Water that involved demand forecasting and estimation of water supply gap under 2070 future scenarios; the Water 2120 100-year water plan (groundwater-focused) for the Albuquerque Bernalillo County Water Authority, NM; water plan for Hamilton County, IN; Yampa/White/Green Basin and South Platte River Basins Implementation Plans; numerous Groundwater Sustainability Plans developed under California’s Sustainable Groundwater Management Act (SGMA); and many Basin-Wide Groundwater Availability Models for Texas agencies for regional water planning, to name a few. Brendle Group has been at the forefront of integrating water and land use planning in Colorado, creating new approaches for calculating water and land use integration metrics by publishing the Sonoran Institute Growing Water Smart Metrics Guidebook, and then applying those methods in rapidly growing communities such as Evans and Fort Lupton, Colorado. Our Team combines local Douglas County knowledge with a broad and established understanding of water needs, land use, and subsurface environments to deliver innovative, best-value solutions to the County.
- **Previous Experience Working Together.** The INTERA-Brendle teaming relationship is not new. Our work together on projects like the Colorado WaterWise Best Practices Guidebook not only met but exceeded client expectations, showcasing our complementary strengths and shared commitment to excellence. These experiences have fostered a deep understanding of each other’s workflows and objectives, allowing us to streamline processes and enhance overall project efficiency. We are excited to leverage this proven partnership as we embark on the 2050 Douglas County Water Plan together, confident that our collaborative approach will continue to drive success.
- **An Outstanding Team of Management and Technical Personnel.** Our proposed Project Manager, Courtney Black, PE, will lead the Team’s efforts in providing professional services for the County. Using her decades of experience and proven qualifications in Colorado water resources, she will ensure successful delivery of the 2050 Water Plan. She will work closely with Shaden Musleh, PE, on this project; the two have successfully delivered water resources services together across Colorado. Their proven teamwork, local knowledge, and client-focus, currently highlighted by their work on the SMWSA ASR Regional Study, will provide the best outcome for the County.

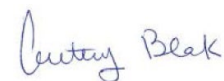
The scope and budget outlined in this proposal are based on the information provided in the request for proposals (RFP), along with several assumptions, such as the anticipated number of meetings. We can adjust the scope and costs to better align with the allocated budget and any preferences expressed by the DCWC. Notably, approximately 25% of the proposed budget is dedicated to engagement and outreach efforts, primarily consisting of meetings with the DCWC and other stakeholders. Should you have any questions regarding our proposal, please do not hesitate to contact us. Shaden Musleh may be contacted at 720.318.4725 or by email at smusleh@intera.com. We appreciate the opportunity to submit our proposal and look forward to supporting the County with this important project.

Sincerely,

INTERA Incorporated



Shaden Musleh, PE (authorized signer)
Project Principal



Courtney Black, PE
Project Manager

B. Response to Mandatory Requirements

The INTERA-Brendle Team brings decades of experience working in the South Metro area to provide water planning services. The subsections below describe our understanding of the project as well as proposed approaches to meeting Douglas County’s water planning needs.

B.1. Understanding of Scope of Services, Conditions, and Requirements

Douglas County is one of the fastest growing counties in Colorado. While there have been strides developing renewable water supplies and reuse throughout the county, there are still water providers and unincorporated areas of Douglas County reliant on nonrenewable groundwater. Over decades, groundwater level data have shown significant declines in local groundwater levels throughout the Denver Basin aquifer systems as groundwater users continue to pump groundwater to meet growing water demands.

One of the primary purposes of the Douglas County planning effort is to gain an understanding of the availability of groundwater near term and in the future (out to 2050) as Douglas County continues to grow. This planning effort is to address this while working with an array of governmental stakeholders (e.g. County staff, DCWC, the Douglas County Board of County Commissioners [BoCC]), water providers, and well owner representatives within Douglas County, cities and towns, other key stakeholders, as well as the public at large. In addition to the broad and diverse audience for this project, there are significant local differences throughout the county in the availability of renewable water supplies, water demands, subsurface geology and groundwater behavior, and stakeholder interests throughout Douglas County. Consequently, the “groundwater availability question” of

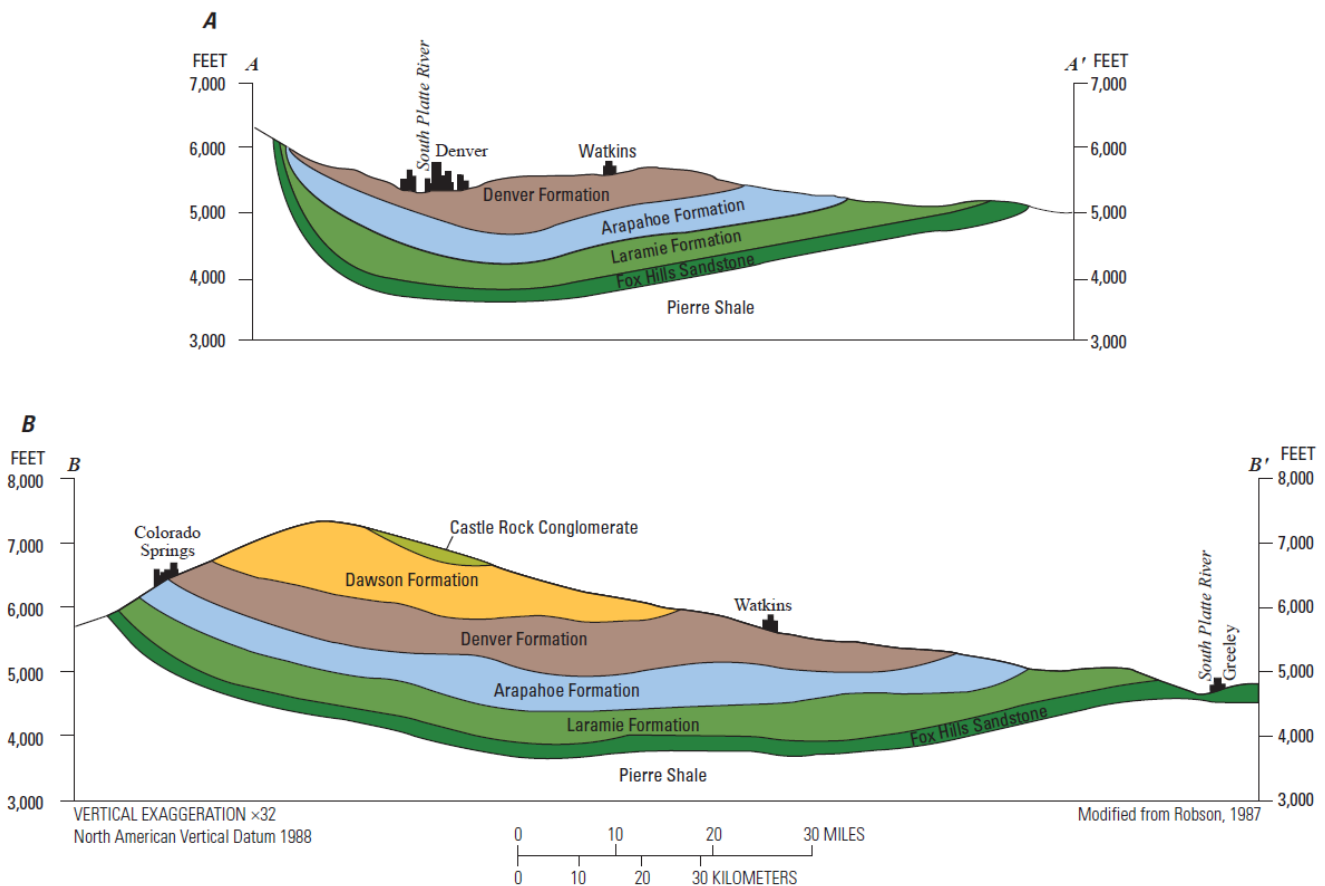


Figure B-1: Geologic formations of the Denver Basin. The INTERA-Brendle Team has decades of experience in the South Metro area.

existing and potential future groundwater availability is complex with many different spatial, temporal, and stakeholder engagement considerations. Some of these considerations include data availability and inherent data limitations, appropriate assumptions for future water use and land use development, heterogeneity of the Denver Basin in regard to subsurface properties and groundwater conditions, and working with a broad array of stakeholder interests throughout the County.

To address these complexities, we have developed an approach based on our understanding of the scope of services that meets the requirements and conditions of the RFP while also addressing the important “groundwater availability question.” Our approach described below draws from our Team’s breadth of experience working in the South Metro area for decades along with our Colorado and national expertise in conducting groundwater modeling studies and developing regional water plans in highly complex areas heavily focused on groundwater supplies.

B.2. Project Approach

In summary, we have developed a thoughtful approach that initially characterizes the existing and future land use in the region, characterizes future water demands and groundwater use, and then efficiently identifies key geographic priority areas most vulnerable to future water supply shortages for further groundwater evaluation. **We believe this approach provides significant efficiencies in effort and cost by identifying areas of highest vulnerability to future water shortages and focusing on them for future groundwater technical analyses. Key outcomes of this Plan include the quantification of water supply gap and identification of potential strategies to further mitigate existing and potential future impacts based on technical results and informed stakeholder input.**

We appreciate your time in considering us for this important work and welcome the opportunity to provide further clarification on our scope below and/or adjust components of the scope to best meet the needs of DCWC and Douglas County prior to entering a contract. In addition to the three phases called out in the RFP, we have included a fourth phase, **Project Management**, to ease execution of the project in an organized, task-differentiated manner.

Phase 0: Engagement and Outreach

Public and stakeholder engagement is crucial to developing an actionable plan that meets County and community needs. The INTERA-Brendle Team has spearheaded innovative engagement approaches spanning from technical stakeholder involvement on complex issues to public outreach and engagement to reach diverse community members. In addition to the tasks outlined here, Phase 1 and Phase 2 include additional focus groups and interviews with water providers and land use authorities on technical topics related to each phase respectively. Please see these phases for additional information.

The approach outlined below provides the framework for the engagement and outreach plan; however, tasks and order can be refined per the County’s needs.

State of Colorado 2020 Resiliency Framework

Brendle Group was hired by the Colorado Resiliency Office to lead the 2020 update of the State of Colorado’s Resiliency Framework. More than 300 stakeholders participated in virtual summits, sector meetings, and scenario planning and hundreds more Coloradans were engaged through surveys and roundtable discussions. More information can be found at COresiliency.com/colorado-resiliency-framework.

Task 1: Water Commission Work Sessions

To inform the process, our Team will work closely with the Douglas County Water Commission using the steps described below. DCWC will provide advice throughout the process to ensure deliverables meet the needs of the County, as well as the community.

The INTERA- Brendle Team strongly believes that close coordination with DCWC and Douglas County staff is a must to ensure the success of this important project. Thus, we propose five work sessions as discussed in detail below. In addition, we propose six additional in-person meetings to provide status updates and preliminary results as well as receive feedback from the DCWC. Also, as discussed in Phase 4, monthly project status will be provided in writing.

The INTERA-Brendle Team will support DCWC work session preparation and facilitation with five, 90-minute work sessions proposed quarterly throughout the duration of the project. The INTERA-Brendle Team proposes in-person attendance for all Water Commission work sessions to support interactivity and relationship building. While meeting topics will be dynamic and based on feedback and outcomes from other tasks, tentatively, we propose the following topics for each of the five Water Commission work sessions (**Table B-1**). This includes the finalization of a public and stakeholder engagement plan informing all subsequent tasks in this Phase. Outcomes from the Water Commission work sessions will guide subsequent in Phase 1 and Phase 2.

Table B-1: DCWC Work Sessions Objectives and Related Phases

DCWC Work Session	Objective	Related Phases
1	<ul style="list-style-type: none"> Introduce Water Commission to project objectives and overview of approach and schedule for Phase 1, Phase 2, and Phase 3. Garner support for overarching project and engagement plan Provide a process update with a focus on initial data gathering efforts and analyses for both land use planning and water demands, as well as outcomes from engagement activities completed to date 	<ul style="list-style-type: none"> Phase 4 Project Management
2	<ul style="list-style-type: none"> Provide a process update with a focus on initial data gathering efforts and analyses for both land use planning and water demands, as well as outcomes from engagement activities completed to date 	<ul style="list-style-type: none"> Phase 0 Engagement and Outreach Phase 1 Water Supply and Demand Analysis Phase 2 Land Use Policy Analysis
3	<ul style="list-style-type: none"> Present final results from land use and water demand analysis and discuss vulnerable areas Review groundwater analysis approach 	<ul style="list-style-type: none"> Phase 0 Engagement and Outreach Phase 1 Water Supply and Demand Analysis Phase 2 Land Use Policy Analysis
4	<ul style="list-style-type: none"> Present groundwater analysis results 	<ul style="list-style-type: none"> Phase 0 Engagement and Outreach Phase 1 Water Supply and Demand Analysis Phase 2 Land Use Policy Analysis
5	<ul style="list-style-type: none"> Share draft plan with Water Commission for review 	<ul style="list-style-type: none"> Phase 3 Development of the Douglas County Water Plan

Task 2: Douglas County Board of County Commissioner Meetings

To ensure alignment with Douglas County’s vision and strategic priorities, the INTERA-Brendle Team will provide periodic updates to the BoCC. This group will provide feedback throughout the process to ensure deliverables are aligned with key County priorities.

The INTERA-Brendle Team will support BoCC meeting preparation and facilitation for three in-person one-hour BoCC meetings, with meetings at the beginning and middle of the process, plus one meeting at the end of the project for final plan adoption. While meeting topics will be dynamic and based on feedback and outcomes from other tasks, tentatively we propose the following topics for the three BoCC meetings (**Table B-2**).

Table B-2: BoCC Meetings Objectives and Related Phases

BoCC Meeting	Objective	Related Phases
1	<ul style="list-style-type: none"> Introduce BoCC to project objectives and overview Garner support for overarching project and engagement plan 	<ul style="list-style-type: none"> Phase 4 Project Management
2	<ul style="list-style-type: none"> Provide a planning process update and ensure process and deliverables are aligned with BoCC priorities 	<ul style="list-style-type: none"> Phase 0 Engagement and Outreach Phase 1 Water Supply and Demand Analysis Phase 2 Land Use Policy Analysis
3	<ul style="list-style-type: none"> Share final draft plan with BoCC for adoption 	<ul style="list-style-type: none"> Phase 3 Development of the Douglas County Water Plan

City of Fort Collins, CO Water Resource Matters in the Fort Collins Growth Management Area

Brendle Group supported the City of Fort Collins, through Fort Collins Utilities, in performing a robust evaluation of the challenges and opportunities that arise from having multiple water service providers in the Fort Collins Growth Management Area (GMA) as well as identifying potential solutions. These challenges include those stemming from differences in rates and development costs (which have been magnified in recent years due to significant increases in housing demand, overall housing costs, and the effect on affordability), differences in customer programming, and potential differences in levels of service. Challenges notwithstanding, over the years there have been successful efforts to coordinate where shared benefits were identified. Examples include developing shared infrastructure for raw water delivery to treatment facilities, establishing interconnects to create redundancy in treated water delivery systems, and partnering with neighboring water districts to expand the sprinkler audit program into those service areas.

Four stakeholder groups were formed to provide direction and gather the input needed to achieve the study objectives. In the discovery phase, Brendle Group gathered input from the City working group and the external stakeholder group through interviews, polling, and large group meetings. Information collected through the interview, polling, and presentation process was compiled into a Microsoft Excel-based evaluation framework to document the identified water-related matters, solutions, and case studies. In the evaluation phase, Brendle Group worked with the core team to develop a scoring rubric to help evaluate the identified solutions. The scoring rubric considers resource needs, benefits to the City and Utilities organizations, benefits to external organizations, and benefits to the community.

Task 3: Public Workshops and Online Outreach

Engaging with key stakeholders and the public is essential to developing a plan that reflects the values and priorities of the County as a whole. Task 3 will focus on sharing information about the planning process with and soliciting feedback on key water planning concerns and priorities from the public and key stakeholders. Key stakeholders include those engaged at other points throughout the planning process, including city and county staff, BoCC, Water Commissioners, water providers, developers, and industry representatives.

As a foundational step, the INTERA-Brendle Team will develop content for an informational project web page that can be updated throughout the project. The web page will inform the public and key stakeholders about the project and engagement events. This page will be hosted by the County (on the Douglas County website). In addition to the project webpage, our team will develop a project overview fact sheet that can be shared with anyone interested in learning more about the project.

To provide meaningful and accessible engagement opportunities, we propose three public workshops (**Table B-3**). The first two public workshops will be in-person, open-house style events designed to inform the public and key stakeholders about the project, share facts and data related to water and land use in Douglas County, and gather feedback to inform the planning process (e.g., water opportunities and concerns, areas of change, areas of stability, etc.). In addition, online feedback forms will be developed to supplement each public workshop to allow for additional comments, as well as an opportunity for those who could not attend to provide feedback.

State of New Mexico Water Security Planning Act Public Engagement

Brendle Group is collaborating with the State of New Mexico Interstate Stream Commission (NMISC) to 1) gather input on water planning processes, priorities, and needs and 2) support the development and promulgation of new rules and guidelines within the Water Security Planning Act that will define how the State completes regional water planning. The approach involves facilitating a series of 16 open houses and an online open house, complemented by GIS mapping. These initiatives are geared towards soliciting input from a diverse array of stakeholders on water planning processes, priorities, and needs to build a resilient water future. The team is actively involved in advancing the development of maps, graphics, and analysis. Collaborating closely with NMISC staff, we have summarized the multiple-choice dot-responses, as well as the open-ended responses, by theme. Brendle Group is now developing an engagement summary report that compiles feedback across themes and the 16 different regions which will be leveraged to draft a recommendations report for the development of rules and guidelines.

Table B-3: Public Workshop Engagement Objectives and Key Activities

Activity	Engagement Objectives	Key Activities
Public Workshop 1	<ul style="list-style-type: none"> Introduce the planning process and desired outcomes Collect feedback on key issues and opportunities Collect feedback on areas of stability and change throughout the county 	<ul style="list-style-type: none"> One three-hour in-person public meetings Online feedback form
Public Workshop 2	<ul style="list-style-type: none"> Gather feedback on the 75% draft plan Help the public and stakeholders understand the water master plan opportunities and tradeoffs 	<ul style="list-style-type: none"> One three-hour in-person public meetings Online feedback form
Public Workshop 3	<ul style="list-style-type: none"> Share a virtual presentation of the final draft plan to support public review 	<ul style="list-style-type: none"> One-hour virtual meeting Draft Plan recorded presentation Online plan comment form

The final public event will be a virtual public workshop to provide an overview of the draft plan and a summary of the process and analysis. Like the above workshops, key stakeholders will also be invited to this workshop to ensure all who participated in the process have an opportunity to understand how data and feedback collected through the process is being shared via the plan. Our team will also develop an online plan comment form to facilitate targeted feedback on the draft plan. A memorandum summarizing public comments and recommendations for any plan refinements will be provided with the draft plan considered for adoption.

The INTERA-Brendle Team will design the outreach questions and facilitation process, administer the public workshops and surveys, and summarize results. Feedback gathered at these events will be shared with DCWC and County staff and used to inform analysis completed in subsequent Tasks.

Task 4 (Optional): Technical Advisory Committee

Our current approach assumes that the Douglas County Water Commission will serve as the main technical group, providing leadership and guidance throughout the process; however, the INTERA-Brendle Team has found a technical advisory committee can also bring great value to the process. This optional task includes the recruitment and formation of a technical advisory committee (TAC), as well as facilitation of five TAC meetings throughout the course of the project.

Comprised of relevant subject matter experts, this group would provide advice and varied perspectives throughout the process to ensure deliverables meet the needs of the County, as well as the community, to compliment feedback gathered from the DCWC and BoCC. Potential participants on the TAC include representatives from water and sanitation providers or districts, county service providers and stakeholders, and regional or state partners.

In addition to the formation, the INTERA-Brendle Team will support TAC meeting preparation and facilitation with five, two-hour TAC meetings throughout the duration of the project. We propose that these meetings are in-person to allow for interactivity and relationship building. While meeting topics will be dynamic and based on feedback and outcomes from other tasks, tentatively we propose the following topics for each of the five TAC meetings (see **Table B-4** on the next page). Outcomes from the TAC meetings will guide subsequent tasks.



The Brendle Group is committed to the entire process of each project— the communications, the collaboration, the commitment to the big picture of sustainability.”

Paul Lander
Former Executive Director



Brendle Group prides itself on designing and facilitating collaborative stakeholder engagement processes that lead to plans with compelling stories, actionable roadmaps for implementation, and long-term success for communities.

Phase 0 Deliverables

The following list summarizes the deliverables associated with Phase 0. The total number of engagements are for cost-estimating purposes and can be adjusted to meet County needs.

- Draft public and stakeholder engagement plan
- Final public and stakeholder engagement plan
- Five Water Commission Work Sessions
- Three BoCC Meetings
- Public and stakeholder engagement
 - Two in-person public workshops
 - One virtual public workshop and recording
 - Two public feedback forms
 - Project overview summary and fact sheet
 - Website content that is updated throughout the project
 - One draft plan comment form for public comment
 - Memorandum summarizing public comments and recommendations

Table B-4: TAC Meetings Engagement Activities and Related Phases

TAC Meeting	Engagement Activities	Related Phases
1	<ul style="list-style-type: none"> • Introduce Water Commission to project objectives and overview of approach and schedule for Phase 1, Phase 2, and Phase 3. • Garner support for overarching project and engagement plan. 	<ul style="list-style-type: none"> • Phase 4 Project Management
2	<ul style="list-style-type: none"> • Provide a process update with a focus on initial data gathering efforts and analyses for both land use planning and water demands, as well as outcomes from engagement activities completed to date. 	<ul style="list-style-type: none"> • Phase 0 Engagement and Outreach • Phase 1 Water Supply and Demand Analysis • Phase 2 Land Use Policy Analysis
3	<ul style="list-style-type: none"> • Present final results from land use and water demand analysis and discuss vulnerable areas. • Review groundwater analysis approach. 	<ul style="list-style-type: none"> • Phase 0 Engagement and Outreach • Phase 1 Water Supply and Demand Analysis • Phase 2 Land Use Policy Analysis
4	<ul style="list-style-type: none"> • Present Groundwater analysis results. 	<ul style="list-style-type: none"> • Phase 0 Engagement and Outreach • Phase 1 Water Supply and Demand Analysis • Phase 2 Land Use Policy Analysis
5	<ul style="list-style-type: none"> • Share draft plan with Water Commission for review. 	<ul style="list-style-type: none"> • Phase 3 Development of the Douglas County Water Plan

Phase 1: Water Supply and Demand Analysis

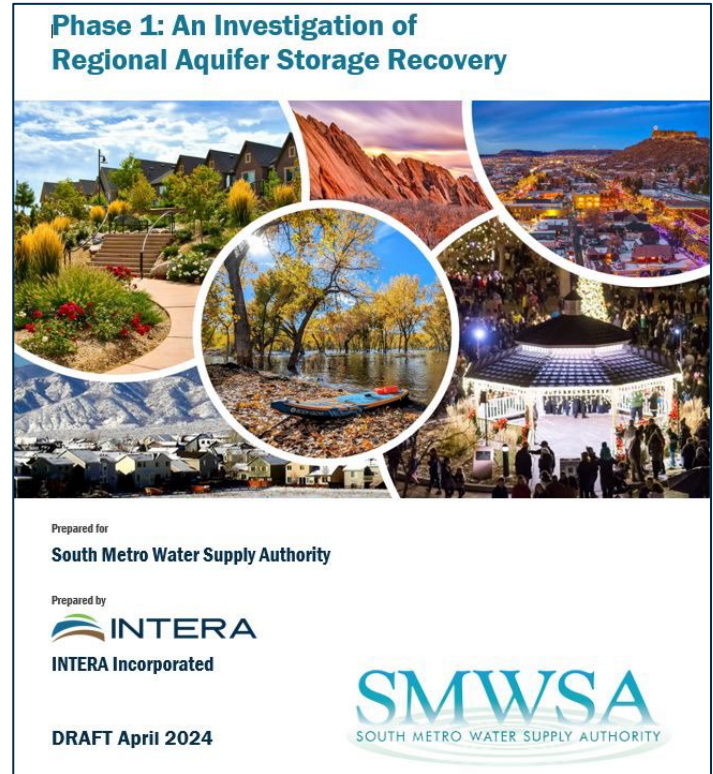
The scope for the water supply and demand analysis is presented under the same task structure provided in the RFP with one optional task for scenario planning.

Task 1a: Data Tabulation

Based on our previous experience, compiling large volumes of water demand and supply data in areas with many water users and heterogeneity in data availability introduces complexities; however, we are well equipped to manage these data heterogeneities and plan to work with the water users in the area to develop a reasonable uniform approach to addressing data gaps and inconsistencies. During our recent experience acquiring data for the SMWSA regional ASR project, we worked with a technical committee (focus group) consisting of water providers, the State, and federal regulatory agencies.

We believe involving the stakeholders who will provide data is critical to the data collection process by initially conveying how the data will be used to establish trusting relationship and informative dialogue as the project progresses. The water demand and supply data collection group will consist of water providers, representatives rural water users, and others we are anticipating obtaining data from to inform the demand projections. The data collection process will consist of the following steps.

1. Data compilation/literature review of publicly available data (U.S. Geological Survey [USGS], CDPHE, Colorado Decision Support System [CDSS], etc.). This data collection process will consist of water demands data, water supply data and current planning efforts, groundwater data, etc. See the list on the next page for more details.
2. Introductory work session introducing the project and data request.
3. Distribution of a survey to the data collection group, as an initial first cut in acquiring their water supply and planning information.
4. Data review to identify questions and data gaps. The demand forecasting and water supply evaluation may also be refined to ensure results are at an appropriate resolution for regional county planning purposes while operating within the level of data disclosure water providers are comfortable providing.
5. Follow up with individual data collection group members, as needed, to answer questions and fill the data gaps.
6. Develop a final data inventory that feeds into Tasks 2 through 4 of this Scope of Work. This inventory will also document data limitations and reasonable assumptions necessary to facilitate continued analysis while compensating for data limitations.



INTERA engaged a diverse set of stakeholders to acquire the data needed for SMWSA's ASR project. Best practices and data from this effort will inform the 2050 Water Plan.

Data requested in the survey will include the following.

- Publicly available plans including the SMWSA Master Plan, if available at the time of analysis
- Projected population for 2030, 2040, 2050, and build out
- Current and future renewable water supply sources (e.g. surface water sources including origin of the renewable water)
- Current and projected water demands
- System per capita water use and how it is calculated (both system-wide and residential gallons per capita per day (GPCD))
- Percentage of residential and non-residential demands
- Water conservation targets by 2030, 2040, and 2050 as well as existing water conservation efforts
- Water master plans and existing water portfolio and future water supply portfolios
- Current and projected reuse and associated sources (e.g. renewable or non-renewable sources)
- Existing and future reservoirs and associated capacities
- Projected water supplies and infrastructure (e.g. new wells, expansion of existing reservoirs,)
- Data on existing wells (e.g. yield, aquifer source, depth, well type, etc.)
- Key water storage facilities including capacity, ownership, shareholders, etc.

Leveraging Local Knowledge to Anticipate Challenges

Efficiencies and processes that can be instilled at the front end can go a long way in preserving the budget as well as in developing an appropriate platform of data that provides meaningful results. These are challenges we have successfully navigated and learned from both locally in Douglas County and elsewhere.

A member of our proposed Team, Courtney Black, was deeply involved in SMWSA's 2007 master planning efforts which was very similar in scope to the proposed scope in the RFP, involving data collection on demands, supplies, infrastructure, etc. Additionally, our Team just recently completed a collection of groundwater information for SMWSA's Regional ASR project, working with South Metro water providers including Castle Rock Water and Centennial Water and Sanitation District.

Task 1a Deliverables

- Data inventory which includes a compilation of data collected and list of data gaps, inconsistencies, and other limitations. Assumptions necessary for latter tasks will also be addressed.

Regional ASR in the South Metro Region, South Metro Water Supply Authority

This multi-phase project entails developing an optimization model of ASR operations (infrastructure, pumping/extraction, surface water storage, water availability, WISE subscriptions and deliveries, water demand, aquifer behavior in response to injection and extraction, dominion and control of injected water, groundwater mound migration, interaction between ASR wells, physical deliveries of water between entities, paper exchanges, permitting constraints, etc.) in the South Metro region.

INTERA recently completed Phase I, which involved developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage "hubs" for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Town of Castle Rock, (2) Centennial Water and Sanitation District, and (3) ECCV. A conceptual groundwater model was developed (which included extensive data collection) to simulate aquifer behavior in response to various future injection and extraction scenarios and thus allow for optimization of the overall operations.

The project includes a large stakeholder group including Aurora Water, Denver Water, CDPHE, State Engineer, EPA Region 8, Parker Water, Dominion, and other South Metro entities. Other South Metro entities such as Dominion and Meridian have expressed their interest in being hubs as well. This regional project is built upon collaboration between entities that are either currently or potentially pursuing ASR to maximize use and storage of surplus water to meet demands during high water demand /low water supply periods.

Task 1b: Mapping and Development of Figures and Digital Data

Mapping is a critical component to the success of this project. The ability to demonstrate technical results in a manner that is meaningful to informed decision making and interpretation is crucial. By visually representing data (spatially and temporally, two-dimensional [2D] and three-dimensional [3D]), mapping allows stakeholders to easily identify patterns, trends, and relationships within the information collected. This clarity not only enhances understanding but also fosters more informed discussions among decision-makers. Furthermore, effective mapping can help identify and highlight vulnerable areas within the County, presenting opportunities to address these vulnerable areas.

In addition, mapping facilitates collaboration among diverse groups, encouraging input from community members and local organizations. Overall, the integration of mapping would enhance transparency, efficiency, and effectiveness, ultimately driving better outcomes for the community.

We plan to optimize efficiencies by obtaining available spatial data from existing studies, public sources, and from individual entities through the Task 1's data collection process as discussed above. We will work with Douglas County staff on the available spatial data they have already collected and developed.

Mapping will include:

- Municipal and district wells, and individual private wells consistent with the Colorado Division of Water Resources (DWR) well database
- Locations of existing or proposed interconnections between water suppliers
- Water suppliers, cities service areas and associated boundaries
- Existing and projected infrastructure and facilities
- Relevant hydrologic and hydrogeologic areas

INTERA-Developed Maps Can Support the Water Plan

As part of the SWMSA regional ASR study, INTERA has already developed maps of above ground infrastructure as well as multitude of groundwater data (e.g. water levels, well specifications, aquifer source, well locations, etc.) from Centennial, Castle Rock, and nearby areas that would support the development of Water Plan.

Collected spatial data will be stored and tabulated in a geographic information systems (GIS) database. This database will be made available to the County at the conclusion of the study. Data from this spatial database will be used to develop maps and visual resources to convey key results and information throughout the planning effort. Please note, for purposes of project execution, this task entails the data collection effort. Development of maps for individual tasks is included in each appropriate task.

Task 1b Deliverables

- Organized electronic spatial database for use by the County, including GIS files and accompanying meta-data.

Task 2: Water Demand Projection Analysis

This task identifies the areas in Douglas County that are highly reliant on Denver Basin and other nonrenewable groundwater based on existing and projected water demands coupled with individual water providers' current actions and future plans on reducing their dependency on the Denver Basin. This assessment is to identify areas where existing and/or future water demand projections exceed available renewable supplies (including reuse water) to estimate the level of reliance on non-renewable groundwater for four time periods: current conditions, 2030, 2040, and 2050. The following three steps convey this process. Please note that refinements to this three-step process will be made once data has been collected for Phase 1 and Phase 2 and there is greater understanding of "what is possible" based on available data. Such refinements will fit within the budget framework of this task and will be reviewed with DCWC.

Step 1: Identify current and future 2030, 2040, and 2050 water demands. Current and forecasted demands will be based on available water provider data and publicly available plans. In areas where data is not available, projected demands may be developed based on a combination of techniques, pending on whether the area is serviced by water providers. In areas serviced by a water provider, water demands will be estimated by multiplying projected population by an informed per capita water use based on an understanding of existing and projected water conservation efforts. Information from the Phase 2 Land Use Analysis coupled with available water conservation/efficiency plans and professional expertise in the area will help inform such data gaps and serve as a valuable “check point.” For example, areas with projected high rates of new development will likely be reflected with an appropriate level of increasing water demands. In addition to total water demands residential and non-residential water demands may also be delineated pending availability of data.

In areas of unincorporated Douglas County relying on domestic wells not serviced by a water provider, we will rely on the State well database and other public sources to estimate current water demands coupled with coordinating with the Rural Water Foundation of Douglas County and other identified unincorporated well-user representatives. This will entail assumptions on water use per individual domestic wells based on existing data and literature (e.g. 1 acre foot/year for a domestic well). Forecasts of future pumping by these wells will assume the wells will continue to produce at their current pumping rate. Additional wells may also be developed to meet future growing water demands, particularly in areas that are projected to increase in population.

The preliminary results of the water demand analysis will be compared to the results of the Phase 2 Land Use Analysis to discern key relationships between growth and projected water use as well as serve as a means of quality control. For example, areas with relatively high growing water demands intuitively should correspond to areas of high projected growth (the “areas of change” described in Phase 2). Data from the Phase 2 land use analysis will inform projections on future well development to meet growing water demands in 2030, 2040, and 2050.

Step 2: Develop understanding of renewable water supplies and reuse each water provider plans to bring online within the 2030, 2040, 2050 timelines. These data will be collected during the Phase 1 Task 1b data collection process for each applicable water provider in Douglas County. Distinctions will be made between supplies that providers are currently using to meet water demands relative to supplies that are planned to come online and when these supplies are anticipated to come online.

Step 3: Calculate reliance on non-renewable groundwater (a.k.a. gap). Reliance on nonrenewable groundwater is an important parameter for developing current and projected groundwater extractions in Task 3. This information not only feeds into estimating existing and future Denver Basin groundwater withdrawals (e.g. additional stress placed on the Denver Basin) but will also be an initial step to prioritizing which areas of the Denver Basin are exceptionally vulnerable to future water supply shortages and therefore may warrant more extensive study. Step 3 will consist of a spatial analysis based on water demands and renewable supplies developed and obtained in Steps 1 and 2. The current level of reliance on non-renewable groundwater and projected reliance in 2030, 2040, and 2050 will be estimated by subtracting renewable supplies and reuse from current and projected water demands.

Reliance on non-renewable groundwater (gap) = water demands – renewable supplies - reuse

Denver Water Supply Gap Analysis

INTERA has conducted a water supply gap analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios.

INTERA completed an investigation of groundwater availability for multiple locations that receive surface water from the High Line Canal that runs through Douglas County. We evaluated groundwater availability to fully supply the demand for each location. Our efforts included aquifer supply determination, water demand assessment, additional wells and associated water supply infrastructure needed to deliver water from each designated aquifer and a regional water quality, water levels, and well yield data collection and assessment.

Optional Task: Scenario Planning

The RFP proposes developing water demands for current conditions, 2030, 2040, and 2050. While this is standard practice, many entities, including the State through the Colorado Water Plan, are developing multiple water demand forecast scenarios to capture a variety of factors that play a critical role in future water demands. Some of these factors include rate of population growth, land use development patterns, the intensity of future water-using landscaping, a warming climate, water rates, and conservation measures. We propose developing a minimum of two demand forecast scenarios that capture a low water demand scenario and a high water demand scenario to show a representative band of possible future demands. This “book-end” approach is not only intended to show a representative band of possible future water demands, but also to inform county decision-making and policy by showing different outcomes if water demands can be lowered in the future. We also have been following the 100-year pumping rule that has been litigated at the supreme court level. The impact of such ruling on groundwater availability will be addressed under this task.

Experience Working with Front Range Water Providers

The INTERA-Brendle Team is or has recently worked with multiple water providers throughout the Front Range on water demand forecasting and water conservation planning efforts, as such Parker Water and Sanitation District, Dominion Water and Sanitation District, City of Fort Collins, Town of Berthoud, City of Lafayette, City of Longmont, City of Loveland, Town of Evans, City of Fort Lupton, Denver Water. Our first-hand local knowledge and expertise and will be valuable in forecasting water demand and establishing growth trends for the development of the Water Plan.

Task 2 Deliverables

- Maps depicting current, 2030, 2040, and 2050 demands and supplies.
- Maps depicting level of reliance on non-renewable groundwater (the gap) for current conditions and in 2030, 2040, and 2050.

Please note, documentation of the methodologies and results of this task will be provided in the Water Supply and Demand Analysis report detailed in Task 4. Mapping deliverables denoted in this task will be used for the Phase 0 engagement effort and for reporting purposes in Task 4.

Colorado WaterWise Best Practices Guidebook

Colorado WaterWise was formed in 2000 to promote and facilitate efficient water use in Colorado. Funded by a Colorado Water Plan Grant, the Best Practices Guidebook was inspired by an emerging need for water providers large and small to plan for and implement impactful water conservation programs, to comply with Colorado’s water conservation and management legislation, and to educate and inform water professionals and citizens.

INTERA and Brendle Group worked closely together to support updating the Best Practices Guidebook via a robust stakeholder process that collected input from local water providers, state agencies, the private sector, water conservancy districts, local non-profits, consultants, members of academia, and more. Over 300 different stakeholders were engaged throughout the process at six different workshops that were held in locations across the state and virtually.

The guidebook itself, includes seven best practices that cover topics ranging from Development and Codes to Measurement and Data to Rates and Fees, including opportunities for water provider and land use authorities to partner on strategies to improve water efficiency in new and existing development. Brendle Group specifically co-lead the development of the stakeholder engagement process and the outdoor best practice. Our team was the lead author of the Development Codes and Indoor Best Practice, in addition to leading plan creation and design.

Task 3: Groundwater Analysis

The Denver Basin aquifers within Douglas County have been experiencing significant declines in groundwater levels since the 1990s due to excessive groundwater withdrawal. It's crucial that the evaluation of groundwater availability due to future growth and other changes be quantitative and based on a scientifically sound approach to provide reliable results on which the County can depend to make informed decisions.

Our proposed quantitative modeling approach has been tested worldwide in various settings, is efficient, and has provided reliable results. We are proposing a hybrid modeling approach that combines a data-driven technique that has been published and peer reviewed with using the 3D USGS Denver Basin groundwater model to reliably estimate groundwater availability under current and future conditions. More details about this approach are provided below. We have successfully used these techniques in Colorado (e.g. ECCV), nationwide, and worldwide. In addition, our recent experience with developing a conceptual groundwater model for SMWSA (including Centennial, Castle Rock, and neighboring areas) coupled with 50 years of experience developing regional groundwater planning studies will prove valuable for the development of the County water plan. For budgetary and efficiency purposes, our proposed three-step process for the groundwater analysis entails a broad overview of the Denver Basin underlying both Douglas County and surrounding counties (**Step 1**) and then narrows in on priority vulnerable areas for more in-depth technical analysis (**Steps 2 and 3**).

Step 1: Regional Compilation of Data. This step involves collecting and compiling publicly available regional groundwater data and studies to provide an overview of the four Denver Basin aquifer systems. The data compilation process will include:

- General description of the four Denver Basin aquifer systems including areas of nontributary groundwater and not-nontributary groundwater
- Maps and cross sections of the aquifer systems underlying Douglas County
- Maps depicting wells in each of the aquifers
- Groundwater level contours and regional groundwater flow maps
- Groundwater quality conditions and considerations
- Historical groundwater levels
- Hydrogeological characteristics
- Historical pumping from the nontributary and not-nontributary groundwater basins in the Denver Basin Aquifer

We have a comprehensive understanding of the publicly available datasets available in Douglas County, having recently completed a comprehensive data search for the South Metro region and other water providers in the region. Data sources we may rely on include:

Leaders in Groundwater Management

INTERA has established itself as a leader in groundwater management by effectively integrating advanced groundwater modeling techniques with innovative data-driven analysis for groundwater availability projects worldwide. INTERA's Decision Support Science group led by Dr. Jeremy White leverages data-driven approaches to enhance model accuracy by incorporating machine learning algorithms and statistical analysis. Such techniques were used with a large success for many projects that involve groundwater availability quantification. Dr. White is a renowned expert and lead developer of several internationally recognized software platforms for uncertainty, data assimilation, and optimization under uncertainty, as well as groundwater modeling workflow automation. The modeling software he developed and/or contributed to (e.g. PEST++, MODFLOW 5 & 6) are used globally to solve groundwater problems

- CDSS Data
- USGS Maps, Aquifer Reports, and Well Test and Level Data
- State Reports such as the Groundwater Atlas, Regional Water Level Reports, and the Groundwater Circulars
- USGS Denver Basin Groundwater Model
- Colorado State University studies (e.g. Dr. Tom Sale’s work)
- Additional Reports and Studies such as nearby ASR Feasibility Studies
- Other relevant modeling studies Such as INTERA’s SMWSA ASR study
- Colorado Oil and Gas Information Database
- Rural Water Authority of Douglas County Data and Studies

As discussed in Task 1b of Phase 1, a GIS database of the collected data (e.g. water levels, historical pumping, well yield, well depths, aquifer characteristics, analysis results) will be developed and frequently updated throughout the project term. This database will allow us to extract specific data as needed and create maps for demonstration purposes, the final report, and County Plan. These maps will show regional boundaries such as municipal and district boundaries and other geographic features such as roads, city boundaries, and reservoirs.

Step 2: Identify Priority Areas for Additional Study. Water supply vulnerability of individual well owners and water providers depends on a variety of metrics, including natural conditions of the aquifer, well to well interaction, amount of extractions in the local area, change in aquifer storage conditions (e.g. change from confined to unconfined system), depth of wells in relation to groundwater levels, groundwater quality and presence of contaminants, and providers activities to address any issues, etc. The objective of this step is to identify key geographic areas of concern that are exceptionally vulnerable to groundwater quality and/or quantity concerns. Initial proposed metrics for assessing vulnerable areas are shown below in **Table B-5**.

Table B-5: Proposed Metrics for Assessing Groundwater Vulnerability and Data Sources (can be updated after discussions with DCWC)

Item	Proposed Metric	Data Sources
1	Nonrenewable groundwater reliance	Data generated through the data collection process, water demand and supply analysis, and land use analysis considering climate (Task 1, 2, and Phase 2 of this scope)
2	Areas of known significant pumping reductions and/or dry-up	Survey and follow-up discussions
3	Areas of relatively high pumping	Available local pumping data
4	Long-term groundwater level declines	Available local groundwater level data; regional reports and studies
5	Areas of water quality concern	Survey, state data, USGS, etc.

Step 2 entails a comprehensive spatial evaluation to identify areas within Douglas County that are currently or are projected to encounter one and/or more of the metrics in the Table above. Data collected and processed during data collection (Phase 1 Task 1) and the reliance on non-renewable groundwater (Phase 1 Task 2) will inform this spatial evaluation. Visual aids and mapping efforts will focus on identifying the level of vulnerability (e.g. contamination, significantly declining groundwater levels and/or well dry-up, projected pumping, etc.) for current and 2020, 2030, and 2040 forecasts relative to other geographic areas in the County. INTERA will show the vulnerability results at stakeholder meeting(s) described in Phase 0 and facilitate dialogue on how these vulnerabilities should be further investigated. A set of identified priority areas will be carried into **Step 3** for further analysis.

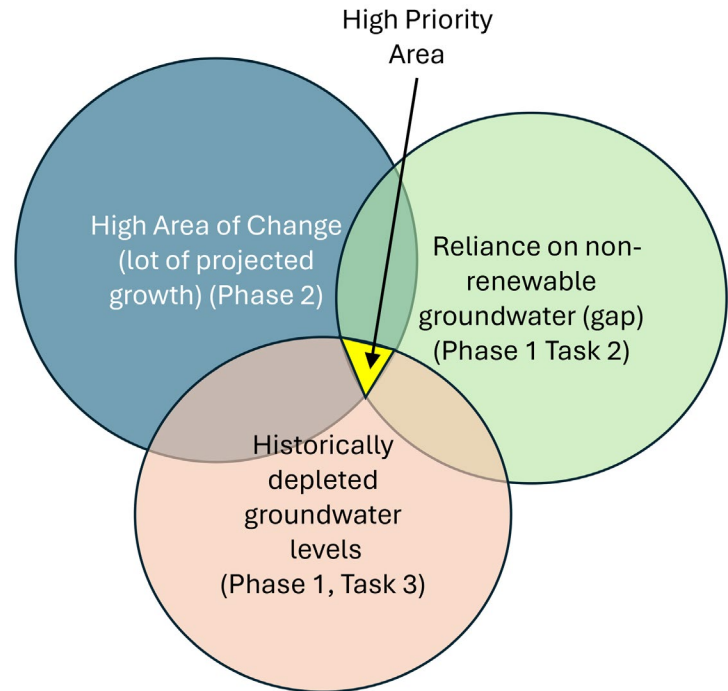


Figure B-2: The INTERA-Brendle Team’s focus on “priority areas that matter” will result in significant efficiencies in effort and cost as we develop a strategically minded Water Plan.

Step 3: Further Investigation of Priority Areas. This step entails local technical groundwater analyses to better understand the underlying issues associated with each of the selected priority areas along with an assessment of available local resources to address potential issues. Examples of questions that may be addressed include:

- What is/are the cause(s) of the current observed impacts (e.g. groundwater quality concerns, reduction in well water supply)?
- Groundwater levels are declining, when would individual wells start to be impacted (e.g. reduction in pumping yield) as a result of pumping and declining groundwater levels in the area? assuming no growth or 10% growth by 2050? When could wells start to dry?
- What changes would be necessary to mitigate impacts? (e.g. land use policy changes)
- Is mitigation feasible and affordable with available local resources?

A large corpus of groundwater system information has been developed for the Denver Basin, including detailed historical groundwater use patterns and groundwater levels at numerous locations. However, some areas within the County, specifically in rural areas and outside major water provider service areas may lack sufficient groundwater data to allow for accurate

Understanding of Aquifer Heterogeneity

A key finding of the SMWSA Regional ASR study directly applicable to the Douglas County planning effort is that groundwater conditions significantly vary not only among each of the four main aquifer systems (Dawson, Denver, Arapahoe, and Laramie-Fox Hills) in the Denver Basin, but also within each aquifer system throughout the South Metro area. This is a function of spatial differences in aquifer properties as well as in the level of groundwater extractions geographically occurring throughout each aquifer system. For example, the amount of groundwater available, and timing of well dry-up in Centennial’s wellfield in the western portion of the Arapahoe Aquifer is different than the timing and amount of groundwater available to Castle Rock Water or ECCV. The INTERA team has developed an efficient innovative approach to addressing these heterogeneities in “priority areas that matter” when it comes to existing and projected future water supply shortages.

assessment of groundwater availability. To address these limitations, we propose using a combination of groundwater modeling techniques and data-driven analysis techniques.

The INTERA team plans to use highly efficient data-driven (i.e. machine learning or artificial intelligence) techniques to learn the primary relations between groundwater use and the result groundwater levels (thus groundwater availability) at identified priority areas within the Denver Basin using available data. We anticipate using these data-driven techniques in priority areas where there is sufficient data. However, at locations without an abundance of historic groundwater system information, process-based numerical modeling (i.e. MODFLOW) provides the only viable approach to estimate the relation between anticipated future groundwater use and the resulting aquifer response (i.e. groundwater levels and groundwater availability). At a conceptual level, these two approaches represent different lines of evidence regarding the relation between expected future groundwater use and resulting groundwater system response (i.e. groundwater levels and groundwater availability). One is based purely on empirical relations learned from historical data, the other relying on physics and processes encoded into a numerical groundwater model. Both approaches have unique and non-commensurate positive and negative characteristics in their abilities to forecast unseen future aquifer conditions. Because of this, we plan to perform both analyses for the defined priority areas with data limitations. If the results of the two analyses generally agree, this provides some confidence in the results. However, if the results diverge, this is an indication of an area where additional monitoring and data collection may be warranted. In the situation where the results of these two analyses diverge, we will choose the more conservative (e.g. higher drawdown) result for reporting purposes. Where applicable, results (i.e. groundwater levels and groundwater availability) developed through our proposed modeling and data-driven techniques for the priority areas will be adjusted to account for the presence of non-tributary water and any associated augmentation obligations.

Data-Driven Groundwater Modeling Solutions

INTERA has successfully applied data-driven timeseries modeling techniques for many projects. In 2022, we competed in the international groundwater timeseries modeling challenge, where we applied these techniques to several different hydrologic settings. Most recently, we have applied data-driven techniques to very efficiently model the relation between groundwater use and drawdown for over 600 sites across the Great Artesian Basin in Australia.

The El Paso County Plan did not provide any quantitative assessment of groundwater availability. Geologic models alone cannot be used to provide a scientifically sound assessment of future groundwater levels and groundwater availability. The Arapahoe County Plan used a relatively simplistic approach to characterize groundwater conditions based on the saturated thickness and areal extent of one or more parcels of land to estimate the “physically available” groundwater. In the INTERA-Brendle Team’s opinion, this approach does not sufficiently address the local heterogeneity of the Denver Basin aquifer systems at the local resolution that would provide meaningful results to the county. The process **neglects the following critical factors related to the processes that govern the movement of water in the subsurface.**

- It is not economically feasible or possible to extract the water stored within all the pore spaces of a given volume of saturated aquifer material. Depending on the subsurface properties, one would need to install a high-capacity production well in grid pattern of variable spacing across the entire surface area under consideration. As groundwater levels fall, the yield of each of these wells would decrease rapidly, while energy (i.e. costs) required to lift water greatly increase.
- Considering only the volume of saturated materials neglects the spatial variability of aquifer properties, which govern the movement of groundwater.
- The “physically available” approach does not consider the cumulative effects of other groundwater users. If the drawdown from nearby users propagates beneath the area of interest, the yield of existing production wells will be impacted and the energy/cost required to lift the groundwater to the surface will also increase.
- The “physically available” approach does not capture the change in aquifer storage as water levels decline due to future pumping and consequently the aquifers change from confined to unconfined conditions. This is evident in many places in Douglas County such as Centennial’s service area.

Given the exceptional efficiency of available machine learning (i.e. artificial intelligence) tools, the INTERA-Brendle Team anticipates using a range of data-driven techniques, such as those summarized in the Collentuer and others (2024), including long-short-term memory neural networks (e.g. REFS to using NNs in groundwater model level prediction) and transfer-function-noise modeling (e.g. [Peterson and Western, 2018](#); [Collentuer, 2019](#)). These approaches are predicated on the availability of relatively long historic time-series data of both groundwater use and groundwater levels.

The existing Denver Basin MODFLOW regional groundwater model (DBM) provides a numerical modeling platform to evaluate the expected changes in aquifer conditions resulting from new/future groundwater use. The DBM was last updated through the 2012 water year. Our team proposes using the existing numerical groundwater flow model “as-is” by employing it as a tool to evaluate expected aquifer conditions changes from a baseline condition, rather a forecasting tool for absolute groundwater levels under expected future water use stresses; groundwater models are known to better at forecasting changes compared to forecasting absolute outcomes (e.g. [Sepulveda and Doherty, 2014](#)). In this way, the INTERA team can take advantage of the hydrogeologic structure and geometry, hydraulic properties, and other aquifer-system-specific characteristics encoded in the DBM without needing to revise and update the model recent/current aquifer conditions. This will provide significant cost efficiencies.

Task 3 Deliverables

- Input and output GW modeling files
- Pre- and post-processing files
- Executable files to rerun the models
- Modeled groundwater levels and availability in the priority areas under current, 2030, 2040, and 2050.

Task 4: Water Supply and Demand Analysis Report

A Water Supply and Demand Analysis Report will serve as the complementary technical resource to the Douglas County Water Plan. The report will be an appendix to the County Water Plan primarily geared for the audience member that is interested in understanding details of the technical work underlying the Douglas County Water Plan. The report will provide detailed documentation of the INTERA-Brendle Team’s approach to Tasks 1, 2, and 3, results, and key findings. This includes a risk and vulnerability assessment as described in Phase 1 Task 3. Metrics specific to vulnerability are outlined in the metrics table in Phase 1 Task 3. Key findings will include:

1. Areas of change (Phase 2)
2. Areas of high reliance on nonrenewable groundwater (Phase 1 Task 2)
3. Areas with key aquifer characteristics that yield a relatively higher level of vulnerability (Phase 1 Task 3)
4. High priority areas that warranted additional technical evaluation (Phase 1, Task 3)
5. Future change in water levels and groundwater availability in the priority areas (Phase 1, Task 3)



Shaden, you and your team (Courtney Black, Reid Polmanteer, Travis Zielke) have done a great job.”

Rick McLoud
Water Resources Manager



CENTENNIAL
WATER AND SANITATION DISTRICT

Results from the groundwater numerical techniques/modeling efforts conducted in the high priority areas will be provided in an understandable format to further decipher the level of groundwater vulnerability and the factors contributing to potential groundwater shortages to water users in the region. The results can be used to quantify groundwater availability within the area of interest. The report will also highlight potential mitigation strategies and recommendations such as additional studies, new policy recommendations, partnerships, etc. Such mitigation strategies will be further developed working with DCWC and other key stakeholders identified during the Douglas County Water Plan development.

Task 4 Deliverables

- Draft Water Supply and Demand Analysis Report
- Final Water Supply and Demand Analysis Report

Phase 2: Land Use Policy Analysis

Since the early 2000s Douglas County’s population has more than doubled from a population of roughly 180,000 in 2000 to just over 373,000 in 2024 ([Colorado State Demographers Office](#)). Coupled with this growth, the County is home to some of the most water efficient communities in the State, including Sterling Ranch which is Colorado’s leading example of a smart water community. Understanding the impact of both where growth is occurring, as well as the type of growth, is critical for understanding the County’s current and future water supply and availability. The approach outlined below provides the framework for how we will approach the land use policy analysis to successfully integrate land use into the water demand components of this project. Proposed tasks can be refined per the County’s needs and data availability.

Importance of Water and Land Use Planning in Colorado

The 2015 Colorado Water Plan called for at least 75% of Coloradans to live in communities that incorporate water conservation into their land use planning by 2025. More recently, the state legislature recently adopted a requirement that all county mast plans must include a water element by December 31, 2026 (SB24-174), as well as requiring all counties to include non-functional turf limitations by January 1, 2026 (SB24-005). As active member of the Colorado Water and Land Use Planning Alliance, the INTERA-Brendle Team will bring their regional experience and expertise to not only inform the project, but also ensure deliverables support State objectives and legislation.

Task 1: Focus Groups and Interviews

Building on outreach and engagement tasks in Phase 0, we recommend direct, targeted engagement with water providers, municipalities, regional and state water experts, and other key stakeholders to inform and support Phase 2: Land Use Policy Analysis. Because the County is not a water provider, and because land use authority varies across the county, feedback and buy-in from these entities and stakeholders is critical to inform the assumptions and estimates used for this analysis. Examples of potential stakeholders include, but are not limited to:

- Municipalities and land use authorities
- Developers and large land holders
- Economic development organizations
- Agricultural and other large water users
- Water providers
- State and/or regional entities (e.g., Colorado Water Conservation Board, Department of Water Resources/well-permitting representative)

Specifically, we recommend **two rounds of virtual focus groups and interviews with key stakeholders**. Each round of focus groups will include up to four 90-minute focus groups, and up to four supplemental 45-minute interviews. We will aim to group similar stakeholders together (e.g., water providers, municipalities, developers, regional and state water stakeholders). The four supplemental interviews will allow for input from additional stakeholders who were unable to attend focus group meetings, or for a deeper dive with targeted stakeholders. This will result in a total of up to eight focus groups and eight interviews.

In addition, we recommend creating **up to two feedback forms to support the collection of technical information from stakeholder groups**. Information collected in the feedback forms can be used to inform focus group and interview discussions or as a supplemental mechanism for providing feedback for those who cannot attend scheduled meetings. **This engagement approach is intended to be flexible to accommodate emerging project needs and** will be coordinated closely with Phase 0 and Phase 1 efforts. **Table B-6** summarizes example engagement objectives for each series.

For both the focus groups and feedback forms, the INTERA-Brendle Team will design the outreach questions and facilitation process, administer the focus groups and feedback forms, and summarize results. Feedback gathered at these events and through the feedback forms will be shared with the Water Commission and used to inform analysis completed in Phase 1 and Phase 2.

Table B-6: Key Stakeholder Engagement Series Engagement Objectives and Key Activities

Activity	Engagement Objectives	Key Activities
Key Stakeholder Engagement Series 1	<ul style="list-style-type: none"> • Inform stakeholders about the planning process • Gather input on land use areas of change and forecasts • Gather input on water supply and demand opportunities and challenges 	<ul style="list-style-type: none"> • Two feedback forms • Four 90-minute focus groups • Supplemental interviews
Key Stakeholder Engagement Series 2	<ul style="list-style-type: none"> • Follow ups on data collected in Series 1 • Share data results and conclusions 	<ul style="list-style-type: none"> • Four 90-minute focus groups • Supplemental interviews

Task 2: Existing Land Use

The technical analysis for this phase begins with review and analysis of Douglas County parcel/property records using GIS software. The INTERA-Brendle Team will use the data to create a county-wide map of generalized existing land use categories (e.g., residential, commercial, open space, etc.). At this stage we will also identify which properties are in incorporated places, and which are in unincorporated Douglas County – the primary area of focus for this effort.

Next, using the generalized existing land use information and in coordination with County and municipal staff, the team will classify properties as “stable” (e.g., developed, undevelopable) and “changing” (e.g., those with vested rights to develop, undeveloped but likely to develop within the Water Master Plan’s planning horizon).

Our Team will coordinate the existing land use summary with the water baseline to help paint a picture of **existing water and land use conditions**.

South Platte Basin and Yampa/White/Green Basin Implementation Plans, Colorado Water Conservation Board

These plans sought to investigate and analyze each basin’s water supply and demand through the year 2050, identify the amount and location of water supply shortage, and show how future municipal, industrial, agricultural, recreational, and environmental needs can be met by both existing and proposed water projects.

INTERA’s Shaden Musleh led the technical team that developed the Yampa/White/Green Basin Implementation Plan along with Courtney Black of INTERA. Shaden Musleh and Courtney Black also participated in the development of the South Platte Basin Implementation Plan. These projects involved numerous parties such as local and state government agencies, water management districts, local agencies, non-profit organizations, environmentalists and concerned citizens. The work encompassed researching previous studies, survey, education and outreach efforts, workshops, data collection, analysis of water supply and demand, modeling of water supply and demand under various hydrologic conditions and projected growth and operational scenarios using the State’s modeling tools and data. Shaden Musleh, vice chair of the Metro Basin Roundtable, also served on the committee that oversaw the most recent update to the South Platte Basin Implementation Plan in 2022/2023.

Task 3: Areas of Change Forecasts

Building on the existing land use analysis and the focus groups and interviews, our team will coordinate with Douglas County to group and delineate significant “areas of change” for deeper future land use exploration and analysis. These areas of change could include master planned communities, subareas, corridors, etc. that will bring significant new development or redevelopment to the area, with a focus on unincorporated areas.

For the areas of change, we will leverage zoning, future land use, and/or development approval data to inform estimates of future development conditions. These built conditions estimates would include housing units, building square footage, population, and/or employment levels for each “area of change.” Each area will include coordination with relevant stakeholders to estimate the timing/phasing of development. We will also identify the water provider(s) (if applicable) and existing development regulations/conditions that will likely influence water demand as these areas develop (e.g., turf and lot size limitations).



We have worked with Brendle Group on several projects involving the complex interrelationship between water resource management and land use planning. Brendle Group’s impeccable project management skills and ability to think strategically have yielded high-quality resources to assist Colorado communities in measuring and tracking their progress toward water resilience.”

Waverly Klaw
Former Director, Resilient Communities
and Watersheds for Sonoran Institute



Task 4: Buildout Scenarios

The results of the existing and future land use analyses will be combined into a “buildout” scenario (i.e., future built environment conditions if all areas of change develop as forecasted). For the areas of change not categorized as “significant” in Task 2, we will leverage the assumptions and forecasts developed in Task 2 to extrapolate buildout estimates for these smaller areas.

The INTERA-Brendle Team will leverage information and assumptions about the timing and rate of development for each area of change to inform estimates of 2030, 2040, and 2050 built conditions (e.g., housing units, non-residential building square footage).

The ultimate buildout and 2030/2040/2050 scenarios will be compared against previous modeling and related forecasting efforts (e.g., SMWSA Master Plan, Water District Plans, Denver Regional Council of Governments Travel Demand Model, State Demographer’s Office estimates/forecasts, etc.) to inform adjustments/refinements of the existing and future land use analyses if appropriate.

The technical assumptions for the land use analysis and the buildout estimates will be documented in a Draft Land Use Policy Report. This report will also identify potential land use policy options that could be considered in the Water Master Plan. Following one round of review of this draft report, we will finalize the report to include as an appendix to the Water Master Plan.

Task 5: Land Use and Water Demand Integration

The final step of this phase is to marry land use and water demand analyses. For each area of change, we will develop a water demand estimate informed by household and employment forecasts and provider-specific GPCD water use estimates. The water demand estimates will be compared against water provider plans and groundwater modeling to help identify which areas may face water-related constraints to development and/or areas that present water-related opportunities

Phase 2 Deliverables

- Countywide, generalized existing land use map
- Areas of change map (up to eight areas) supporting analysis of future built conditions
- Built conditions estimates for 2030, 2040, 2050 and ultimate buildout
- Draft Land Use Policy Analysis Report which identifies Technical (analysis methodology, outcomes, potential land use policy options)
- Final Land Use Policy Analysis Report

Sonoran Institute Growing Water Smart Metrics Pilot Program

Water availability is becoming a top concern in many parts of Colorado due to supply shortages, population growth, and water quality degradation. In collaboration with water utility and land use planning staff from across Colorado, Brendle Group and the Sonoran Institute published the Growing Water Smart Metrics Guidebook in 2020. The guidebook provides recommended metrics to track the progress of water-land use integration as well as the impacts of those integration efforts. Visit <https://bit.ly/GWSMguidebook> to review it.

Following the development of the guidebook, the Sonoran Institute and Brendle Group developed a program to support communities in testing the real-world application of the metrics identified. This work is funded by a Colorado Water Plan Grant and as part of Brendle Group's scope, Brendle supports Sonoran in meeting grant reporting requirements.

The program has now grown to assist four communities across Colorado, including the City of Fort Collins, the City of Evans, the City of Fort Lupton, and the Town of Bayfield. These communities received specialized training and assistance, including guidance in forming a stakeholder group, goal-setting, selecting metrics, gathering and analyzing water and land use data, and applying the findings.

Case Study: City of Fort Lupton. To better understand the impacts of projected growth, Fort Lupton's technical assistance focused on forecasting water demands based on the City's future land use map from their comprehensive plan. Leveraging existing water use and zoning GIS data, Brendle Group created a tool to estimate future water use under different land use scenarios. This information is being leveraged by the City's Planning and Utility department to support/inform development review, comprehensive plan updates, and the need to acquire additional water supplies.

Phase 3: Development of the Douglas County Water Plan

Plan Drafting and Review

Throughout the planning process, the INTERA-Brendle Team will facilitate discussions to inform potential policy options, solutions, and plan recommendations. In addition, prior to finalizing the draft Douglas County Water Plan, we will facilitate discussions with the DCWC and County staff to further develop the recommendations and mitigation strategies introduced in the Water Supply and Demand Analysis Study that ultimately will be in the County Plan. Such strategies may include county sponsored programs and/or actions, additional studies to further understand key vulnerabilities, potential future key partnerships and collaborative opportunities, policy recommendations and/or considerations, and leveraging other local projects in the area such as the South Metro Regional ASR project to enhance storage.

The Douglas County Water Plan will draw heavily from the Water Supply and Demand Analysis Study, highlighting key findings, methodologies, and potential strategies moving forward. Prior to drafting the Plan, an outline of the Plan will be presented to the DCWC and County Staff for input and to ensure we are aligned with the general content of the County Plan.

It will include the following key sections.

- Executive summary written for a broad audience (including the general public) presenting key findings in a condensed and well understood format.
- Well organized documentation of results, findings, and mitigation strategies. Maps and other visual aids will be used throughout the County Plan to convey key messages and findings and enhance usability of the Plan.
- Summary of public engagement.
- Water Supply and Demand Analysis Report as an appendix.
- Land Use Policy Analysis Report as an appendix

Water 2120 Plan Development for Albuquerque Bernalillo County Water Utility Authority

INTERA led the development of this comprehensive county water plan to articulate the Albuquerque Bernalillo County Water Utility Authority's (ABCWUA) water planning for the next 100 years, including surface- and groundwater management as well as potential new supplies. Water 2120 looked at the current water situation in Albuquerque and projects the community's needs based on various scenarios of climate variability and population growth.

The Plan builds on the Water Authority's past planning successes with conservation and the addition of surface water to the supply portfolio, both of which have allowed significant recovery of the aquifer that was previously the sole source of supply. The Plan was based on prudent future investments in conservation, ASR, stormwater capture, watershed restoration, and wastewater reuse.

INTERA staff served as the public face of Water 2120 via involvement through presentations to ABCWUA's Technical Advisory Committee and Board of Directors, as well as public meetings and outreach. INTERA developed a dynamic system simulation model for short-term surface and groundwater accounting, as well as long-term supply and demand planning and evaluation. The model serves as a management tool, with functionality to evaluate uncertainty in supply and demand due to impacts such as warming climate and population dynamics. The tool also enables evaluation of ABCWUA's existing water supply portfolio and determine at what period(s) in the future it may be necessary to expand the portfolio to meet growing demands. The model was used to evaluate and rank various water supply alternatives, aggregate the alternatives into water supply portfolios, and evaluate potential supply gaps in the future. Our team also developed a full groundwater reserve management plan to allow for prudent management of existing groundwater reserves. Other services included development of a conceptual reuse plan to evaluate potential supply and demand for non-potable reuse water for turf irrigation.

The County Plan will require multiple drafts and reviews before being finalized and considered for adoption. For purposes of this proposal, it is assumed four drafts of the Plan will be developed for three independent reviews by the DCWC, BoCC, and key stakeholders who were engaged in earlier phases of the process (e.g., water providers). We will also work with Douglas County staff in addressing comments.

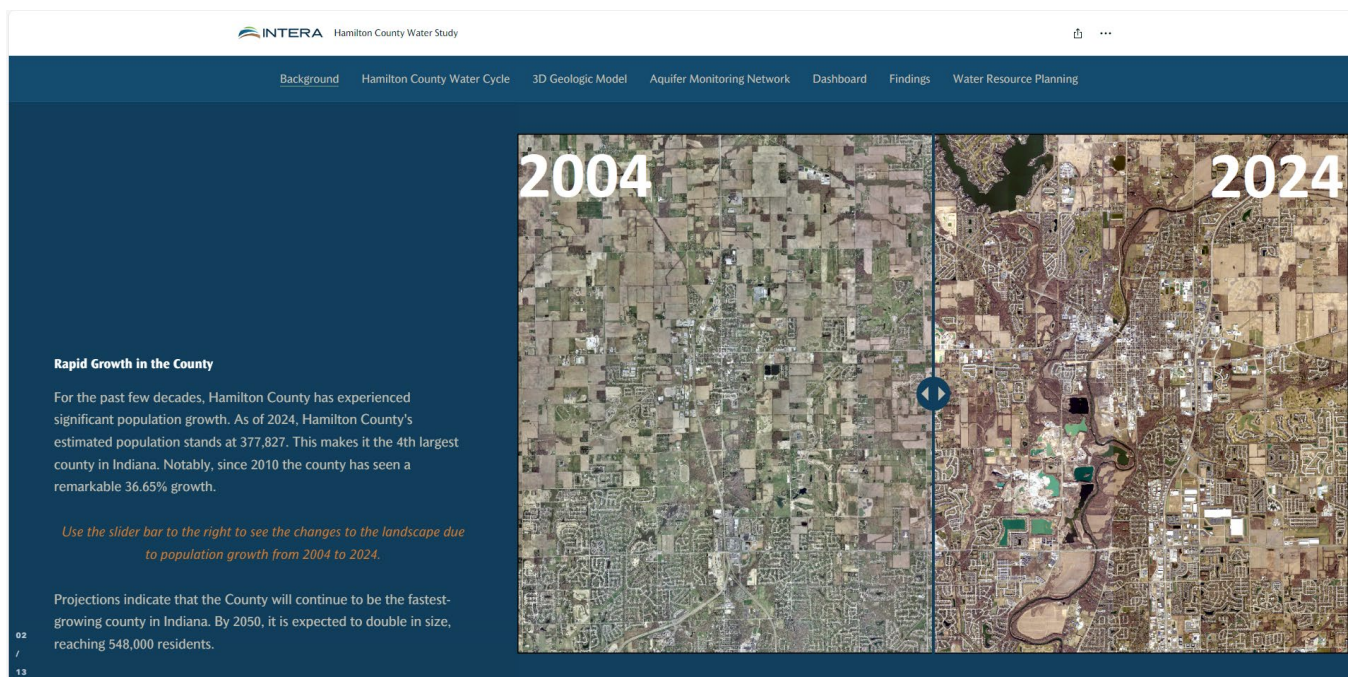
Additionally, as described in Phase 0, the draft Plan will be released for public review and comment, prior to consideration for adoption. A final presentation of the report’s findings and recommendations to DCWC and BoCC will be provided. The final presentation will be a succinct narrative of the information and recommendations developed during the duration of the project. As discussed in Phase 0 and Phase 4, our Team will be working with both the DCWC and BoCC and therefore the final presentation should not include any “surprises” near conclusion of the project.

Optional Task: Virtual Storyboard Development

If desired by DCWC, INTERA can develop a virtual storyboard that involves creating a visual narrative that effectively communicates key information to the public. The storyboard will outline the critical components of the plan, highlighting current and future water demand and supply and estimated gap in easily digestible graphical and map formats. Engaging visuals, such as charts and maps, will help convey the results of analyses, making complex information more accessible. This structured approach will not only inform residents about the water plan but also encourage community involvement in addressing water sustainability challenges. An example for a virtual storyboard that we recently developed for Hamilton County, Indiana can be viewed at this link: [Hamilton County Water Study](#).

Phase 3 Deliverables

- Four drafts of the Douglas County Water Plan for three independent reviews
- One final presentation of the Plan’s findings to the DCWC, County staff, and BoCC



INTERA created a virtual storyboard for the Hamilton County Water study. This is an optional task available to Douglas County.

Phase 4: Project Management

Our ability to successfully deliver this project for the county will be the direct result of our commitment, our technical expertise and ability to complete work efficiently, and our depth of personnel resources, by those being proposed and many other qualified staff within our two companies that can assist, if required.

Our proposed Project Manager, Courtney Black, will manage the project using INTERA's web-based project management system, Deltek Ajera, which integrates time keeping, accounting, and accounts receivable. Ajera is accessible by any internet connected device and provides detailed tracking of resources and schedules to ensure work order objectives and deliverables are met within budget constraints. The system facilitates early identification of problems so that corrective measures can be applied in a timely manner.

In supporting this project, one of the keys to success will be constant and open communication between our project team through our Project Manager and DCWC and County staff. As part of the startup for our work on the project, we will solicit input from DCWC and County staff regarding preferred methods of communication (e.g., phone calls, emails, Microsoft Teams meetings, in-person meetings) and the level of involvement that the County desires to have in the day-to-day execution and management of project task activities. We will document meetings and communications, and provide minutes or records of key communications, as warranted. In addition, our Project Manager will document any changes in scope or technical direction, should they occur. Additionally, INTERA will provide monthly reports to DCWC and County staff on the project's status with respect to the scope of services and budget. These reports will be prepared at the time each invoice is submitted.

The INTERA-Brendle Team will facilitate a Kick-off Meeting shortly after the Notice to Proceed to accomplish the following: understanding of the project goals; address key components of the public engagement plan; identify project leadership and stakeholders that include the DCWC, BoCC, and other County staff; review the scope of work; and key milestones. Following the Kick-Off Meeting, we will provide a Work Plan documenting key information from the Kick-off Meeting with timelines for the completion of key tasks, deliverables, and other identified milestones.

In addition to the monthly progress reports accompanying invoices, the INTERA-Brendle Team will facilitate work sessions with the DCWC, BoCC, and with the stakeholder during the duration of



The whole process ran so smooth...thanks Courtney for your professionalism! We love working with you and appreciate the top-quality product that you delivered!"

KELLY ROMERO-HEANEY
Water Resources Manager



Water Planning Services for Dominion Water and Sanitation District

INTERA is working with wholesale water provider, Dominion, in developing a water conservation plan. We recently completed a set of drought Rules and Regulations to define the foundational roles and responsibilities of Dominion and its retail water providers both during and prior to a drought. In addition, INTERA led development of a Drought and Water Shortage Plan with the following foundational components: drought mitigation, monitoring and triggers, stages, response, declaration protocol, implementation, and enforcement. This planning effort addressed the following questions which many municipal and industrial water providers face in the future as they become more water efficient.

- What is the appropriate balance between regulatory measures to enforce water demand reductions and incentives?
- How can a drought response framework be developed to incentivize water efficiency with both existing development and planned new development?
- How can drought response be implemented in a fair and equitable manner among Dominion's retail providers that range from using less efficient traditional practices to providers with sophisticated cutting-edge conservation practices?
- What is an appropriate level of drought response in communities that are highly water efficient, where relatively little additional water savings can be achieved without extreme measures?

the project. These interactive meetings and work sessions are critical to conveying project updates and preliminary key results and findings as well as in receiving feedback on key results, findings, and future direction. In addition, we will also facilitate a well-organized and executed public engagement program. The detailed scope of work for the public engagement program and interactive meetings and work sessions with the DCWC, BoCC, and stakeholders is provided in Phase 0 above.

We are committed to working with DCWC and County staff in scheduling a project timeline that sufficiently meets the County’s needs. For purposes of this proposal and cost estimate, we anticipate that a Douglas County Water Plan would be completed within one and half years upon execution of the contract, assuming data is readily available, and that all public meeting and stakeholder meetings can be scheduled within the appropriate timeframe to complete the work. This does not include additional local groundwater studies to further characterize current and future groundwater depletions beyond Task 3.

We propose establishing a single point of contact within the DCWC to streamline communication and ensure efficiency. This designated liaison will be responsible for relaying information between the scheduled meetings with DCWC, addressing any queries, and coordinating efforts between our Project Manager and the DCWC. By centralizing communication through one individual, we can minimize misunderstandings and enhance collaboration, ultimately facilitating a smoother workflow and more effective progress on the project.



Shaden Musleh has recently completed work for Denver Water’s Water Resource Strategy group as a consultant on South Platte River issues. His extensive knowledge of Colorado water resources and rights were a great asset to Denver Water. It should be noted that these projects were completed exhibiting excellence in communication, management, and attention to detail...”

RUSSELL SLADE
Lead Planner



Phase 4 Deliverables

- Work Plan documenting key decisions from the Kick-off meeting as well tasks, deliverables, and other identified milestones
- Monthly invoices with cover letters documenting the monthly budget, project status, and schedule changes.

B.3.1 Cost Estimate Assumptions

The following subsections describe the assumptions used by the INTERA-Brendle Team to create the cost estimate for this project.

Phase 0: Engagement and Outreach

- In addition to the five work sessions, the cost estimate includes an additional six in-person meetings held with the DCWC to provide status updates and preliminary results as well as receive feedback from the DCWC. This includes two sessions to address comments following the Phase 1 Water Supply and Demand Analysis report and the Phase 2 Land Use report as well as the County Water Plan. Additional DCWC work sessions or meetings can be accommodated with additional budget.
- Three meetings with Douglas County Board of County Commissioners are included in the cost estimate.
- Two in-person workshops and one virtual public workshop are included in the cost estimate.
- County staff will support the scheduling of all DCWC, BoCC, stakeholder, and public work sessions and meetings, and drafting any necessary packet materials.
- The County will host a webpage to inform the public and stakeholders on the process.
- County staff will support advertising the open house events through their platforms
- County staff will help identify meeting locations for the open house events.

Phase 1: Water Supply and Demand Analysis

- The six-step process outlined in Task 1 is assumed to include up to eight follow up calls with individual data collection group members to address site-specific questions (Step 5).
- The data collected will be available in electronic format.
- For purposes of cost estimate and project execution, Task 1b only entails the data collection effort and inventory of spatial data. Individual mapping efforts are included under each applicable Task in this scope.
- Refinements to the three-step process laid out in Phase 1 Task 2 will be made once data has been collected for both Phases 1 and 2 and there is greater understanding of “what is possible” based on available data. Such refinements will be reviewed with DCWC prior to proceeding.
- One draft of Water Supply and Demand Analysis report will be circulated. Comments will be consolidated by County staff prior to sending to the INTERA-Brendle Team.
- Optional Task: scenario planning. The cost estimate for this optional task includes two working sessions with the DCWC on developing up to three scenarios (high, low, middle) of future water demand conditions for 2030, 2040, and 2050 and a scenario to address the 100-year supreme court ruling. It also entails the technical analysis necessary to develop projected water demands for these three scenarios, develop accompanying results (mapping, tables, etc.), and documentation of the approach. If the DCWC would like to include this subtask, follow up discussions are likely needed to further understand DCWC needs and refine the scope and cost estimate.
- Water quality data will be collected and reviewed to identify priority areas. No additional water quality studies are included in the cost estimate.
- Up to four priority areas will be evaluated using the proposed hybrid approach of 1) a data driven analysis and 2) groundwater modeling technique. It is also assumed that a reasonable level of effort is necessary for the data compilation feeding into our approach. Any significant data discrepancies, additional data processing, challenges associated with the size of the priority area, etc. necessary to feed

into our approach will be addressed with the DCWC prior to proceeding. This discussion will also address potential project budgetary implications.

Phase 2: Land Use Analysis

- We assume Douglas County will provide GIS data for parcel records that include property assessment data to inform existing land use categorization.
- Land use conditions are constantly changing, and property records are rarely 100% accurate, so this approach will provide a high-level “snapshot in time” of existing land use conditions.
- Participation/engagement from municipalities will be necessary for this task to be as accurate as possible; without their involvement, it will likely be necessary to classify most zoned areas within municipalities as “stable.”
- Our approach assumes that we will focus on the six most significant “areas of change” across the County to make efficient use of resources. This approach could be extended county-wide but this would require more time and budget resources to complete.
- The quality and availability of data related to development approvals will be a major driver in the level of granularity and accuracy of area forecasts.
- Participation/engagement from municipalities and/or developers will be necessary for this task to be as accurate as possible.
- Translating housing units to population forecasts and non-residential areas to building square footage and then employment estimates is a highly assumption-based process. Because the County has not created a buildout model in the past, we will need close involvement of County planning and economic development staff to make these assumptions as accurate and locally relevant as possible.
- Estimating development conditions for target years (e.g., 2030, 2040, 2050) will also require significant assumptions about growth and market absorption rates.
- Brendle Group’s hours to support the integration of the land use data with the water planning results will be charged under this task.

Phase 3: Development of the Douglas County Water Plan

- Two drafts of the plan will be circulated. Comments from DCWC and County staff will be consolidated and inconsistencies will be resolved before providing to the INTERA-Brendle Team.
- One draft of the Douglas County Plan will be circulated for comment. Comments will be consolidated by County staff prior to sending to the INTERA-Brendle Team.

Phase 4: Project Management

- The duration of this project is anticipated to be one and a half years upon the notice to proceed, assuming data is readily available, and that all public meeting and stakeholder meetings can be scheduled within the appropriate timeframe to complete the work.
- The INTERA-Brendle Team’s Project Manager will work with one point of contact on project management related tasks. This includes scheduling meetings and work sessions, communications with stakeholders, and other project-related logistical items.
- The billing rates shown in the cost estimate will be fixed from Jan 2025 to June 2026 (assuming a notice to proceed in January 2025). The cost estimate includes a 5% mark-up on ODCS and subconsultants.

B.4. Conflicts of Interest

The INTERA-Brendle Team currently does not have any conflicts of interest.

C. Company References

The INTERA-Brendle Team has successfully completed hundreds of projects involving hydrology, hydrogeology, and water resource planning services. Per the RFP, contact names, titles, addresses, telephone numbers, and email addresses of client representatives are provided below in **Table C-1**. All client representatives are from local governments and public agencies. We are proud of our project accomplishments and welcome the County to contact these references to verify our track record of proven performance.

Table C-1: Client References

Name/Title	Client	Address	Phone	E-Mail
INTERA Incorporated				
Rick McCloud, Water Resources Manager	Centennial Water and Sanitation District	62 Plaza Dr Highlands Ranch, CO 80129	720.240.4915	rmcloud@highlandsranch.org
Lisa Darling, Executive Director	South Metro Water Supply Authority	8400 E Prentice Ave Ste 315, Greenwood Village, CO 80111	720.427.6033	lisadarling@southmetrowater.org
Michelle Probasco, PE, Project Manager	East Cherry Creek Water and Sanitation District	6201 S Gun Club Rd, Aurora, CO 80016	303.901.2547	mprobasco@eccv.org
Daniel J. Arnold, Attorney	Denver Water, Attorney, Office of General Counsel	1600 W 12th Ave, Denver, CO 80204	303.628.6469	daniel.arnold@denverwater.org
Andrea Cole, General Manager	Dominion Water and Sanitation District	9250 E. Costilla Ave, Suite 400, Greenwood Village, CO 80112	720.531.4210	andrea.cole@dominionwsd.com
Heather L. Justus, PG, Water Resource Manager	Parker Water and Sanitation District	13939 Ancestry Dr, Parker, CO 80134	720.842.4225	hjustus@pwsd.org
Brendle Group				
Sara Fox, Senior Water Planner	State of New Mexico Interstate Stream Commission	5550 San Antonio Dr NE Albuquerque, NM 87109-4127	505.469.6340	Sara.Fox@ose.nm.gov
Nick Eagleson, Senior Strategic Planner	Adams County Planning & Development Division	4430 South Adams County Parkway Brighton, Colorado 80601	720.523.6878	NEagleson@adcogov.org
Nathan Alburn, Civil Engineer	Loveland Water and Power	200 N Wilson Ave, Loveland, CO 80537	970.962.3718	Nathan.Alburn@cityofloveland.org

Attachment A
Resumes
(Abridged)



Courtney Black, PE Senior Water Resources Engineer



Years of Experience: 23

Education:

- MS, 2001, Environmental Engineering, University of Florida
- BS, 1999, Civil and Environmental Engineering, Lehigh University

Professional Registrations/Affiliations:

- Registered Professional Engineer, CA, 2004, No. 67976; CO, 2005, No. 40429
- Director-at-Large, Chair of Education Committee, 2010-2013, American Water Resources Association
- Board of Directors, 2019 – Present, Colorado WaterWise

Professional History:

- 2019 – Present Senior Water Resources Engineer – INTERA Incorporated, Westminster, CO
- 2017 – 2019 Senior Water Resources Engineer – Headwaters Corporation, Lakewood, CO
- 2015 – 2016 Regional Drought Information Coordinator – National Integrated Drought Information System (NIDIS), NOAA, Boulder, CO
- 2008 – 2014 Senior Water Resources Engineer – AMEC Foster Wheeler
- 2005 – 2008 Water Resources Engineer and Planner – CDM Smith Consulting, Denver, CO
- 2003 – 2005 Project Engineer – Ducks Unlimited, Inc., Sacramento, CA
- 2001 – 2003 Water Resources Engineer in Training – CDM Smith Consulting, Sacramento, CA

Training:

- Water Leaders Course – Water Education Colorado, 2012
- 40-hr Conflict Resolution Course, 2016

Courtney Black is a Senior Water Resources Engineer at INTERA with a BS degree in civil and environmental engineering, an MS degree in environmental engineering, and over two decades of experience in municipal and basin-wide water resources planning, water rights engineering, stakeholder engagement and coordination, environmental impact study (EIS) planning documents, and wetland design. She has experience in water demand analyses and forecasting, water conservation, drought management, water supply planning, Colorado water rights engineering support, demand and supply modeling, climate change analyses, and stakeholder engagement. She has led water resources projects in Colorado and throughout the U.S. involving the complex economic, legal, social, and technical issues surrounding limited water supplies and increasing demands. Ms. Black has experience collaborating with federal, state and local agencies, academic institutions, municipalities, water rights lawyers, contractors, and wildlife refuges. She has management experience with the entire civil engineering project lifecycle including initial survey, design, bidding, construction management, and project closure.

Relevant Experience

Optimization of Regional Aquifer Storage and Recovery in the South Metro Region, South Metro Water Supply Authority, Denver, CO. 2023 – Present.

Project Manager. A multi-phase project that entails development of optimization model of Aquifer Storage and Recovery (ASR) operations (infrastructure, water storage, water availability, supply/demand, aquifer behavior, physical deliveries between entities, paper exchanges, etc.) in the South Metro region. Currently developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Castle Rock, (2) Centennial Water and Sanitation District, and (3) East Cherry Creek Water and Sanitation District. A conceptual groundwater model (part of the overall optimization model) was developed to simulate aquifer behavior in response to the various injection and extraction scenarios and thus allow for optimization of the overall operations.

Water Supply Gap Analysis, Denver Water, CO. 2020 – Present.

Senior Engineer. Supported a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system.

South Metro Regional Water Supply Plan, South Metro Water Supply Authority, Greenwood Village, CO. 2007.

Engineer. Served as the primary project engineer for development of the SMWSA Regional Water Master Plan addressing how SMWSA providers could secure renewable water

supplies. This involved evaluation of water demands and development of delivery, treatment, and storage alternatives, cost estimates and a phased implementation plan.

Drought Planning, Dominion Water and Sanitation District, CO. 2022 – 2023. *Project Manager.* Developed Drought Management Plan and Rules and Promulgations for the management of drought and water shortages for a wholesale water provider. This planning effort sets the stage for a new water wholesale water provider defining its relationship with retail water providers along with addressing pivotal questions concerning drought response among a water efficient community where additional water savings in periods of drought is limited.

Model Demand Model Update, City of Fort Collins, CO. 2023 – Present. *Project Manager.* Developing a water demand forecast model to incorporate water conservation and demand management strategies to inform water supply planning.

Integrated Water Resource Plans, Castle Pines North Metropolitan District/City of Northglenn, CO. 2006 – 2008. *Engineer.* Developed Integrated Water Resources Plans for Castle Pines North Metropolitan District and the City of Northglenn. Evaluated historical demands and conservation efforts, forecasted future demands, assisted in the development of future water supply alternatives, developed cost estimates, and evaluated these alternatives.

Water Efficiency Plan, Town of Parker, CO. 2024 – Present. *Project Manager.* Updating Parker's Water Efficiency Plan according to State water conservation guidelines, including an assessment of Parker's water efficiency program and demands, working with Parker in selecting new measures, and integrating the latest information available in the water conservation field.

Water Supply Master Plan Update, City of Steamboat Springs/Mount Werner Water and Sanitation District, CO. 2018 – 2019. *Senior Engineer.* Evaluated historical water demand trends to identify how historical demands have been influenced by population growth, climate factors, drought restrictions, water rates, advances in new water saving technologies and water conservation activities. Evaluated performance of meeting established water conservation targets.

Update to the Colorado Guidebook of Best Practices for Municipal Water Conservation, Colorado WaterWise. 2022 – 2024. *Senior Engineer.* Updating Updated Colorado's reference guide on the best practices for municipal water conservation in the State incorporating the latest information and stakeholder input on the latest information.

South Platte and Yampa/White/Green Implementation Plans, Various Clients, CO. 2014 – 2015. *Sr Eng.* Provided technical support and managed components of the Implementation Plans (BIPs) for the South Platte and Yampa/White/Green basins.

Development of the Groundwater Sustainability Plan for the Arroyo Santa Rosa Basin, Camrosa Water District and Arroyo Santa Rosa Groundwater Sustainability Agency, CA. 2021 – 2022. *Senior Engineer.* Supported development of the Groundwater Sustainability Plan (GSP).

Update to Water Supply and Demand Management Policy, City of Fort Collins, CO. 2012. *Project Manager.* Stakeholder facilitation support and thorough review of the city's policy and conservation plan; development of a new per capita water demand for decision making incorporating climate change; a survey of 12 Front Range providers' water demands and water supply planning approaches; and development of recommendations for the policy update.

Development of the Groundwater Sustainability Plan for the Upper Ventura River Basin, Upper Ventura River Groundwater Agency, CA. 2020 – 2021. *Senior Engineer.* Supported development of the GSP of the Upper Ventura River Basin.

Groundwater Model of Aquifer Storage and Recovery System, East Cherry Creek Valley WSD, CO. 2021 – 2023. *Senior Engineer.* Supported the development of a regional MODFLOW model of Denver Basin aquifers under East Cherry Creek Valley (ECCV) service area.

Groundwater Model of Aquifer Storage and Recovery System, East Cherry Creek Valley WSD, CO. 2021 – 2023. *Senior Engineer.* Supported development of a regional MODFLOW model of Denver Basin aquifers under ECCV service area.

Water Conservation Plans, Castle Pines North Metropolitan District and Town of Erie, CO. 2006 – 2014. *Senior Engineer.* Developed the first state approved Water Conservation Plan for Castle Pines North Metropolitan District and authored the 2008 and 2014 conservation plans for Erie.

Water Supply Cost Allocation Tool, South Metro Water Supply Authority, Greenwood Village, CO. 2008. *Engineer.* Managed development of a cost allocation tool that South Metro Water Supply Authority's (SMWSA's) 13 providers could use to allocate the renewable water supply development costs among each provider.



Liberty Flora Water Resources Scientist



Years of Experience: 7

Education:

- MS, 2019, Environmental Science, Indiana University School of Public and Environmental Affairs
- MA, 2019, Public Affairs, Indiana University School of Public and Environmental Affairs
- BS, 2017, Environmental Science, Indiana University School of Public and Environmental Affairs

Professional Registrations/Affiliations:

- Member, IN American Water Works Association

Professional History:

2023 – Present	Water Resources Scientist – INTERA Incorporated, Bloomington, IN
2022 – 2023	Management Consultant – Arcadis, Inc., Louisville, KY
2019 – 2022	Environmental Program Coordinator, City of Bloomington Utilities, Bloomington, IN
2019	Administrative Assistant, City of Bloomington Utilities, Bloomington, IN
2018 – 2019	Water Quality Intern, City of Bloomington Utilities, Bloomington, IN
2017	Intern – Indiana Department of Environmental Management, Indianapolis, IN

Training:

- OSHA 40-Hour HAZWOPER
- ArcGIS Pro, Microsoft Excel, Microsoft Visio

Liberty Flora is a Water Resources Scientist at INTERA with a BS degree in environmental science, an MA degree in public affairs, an MS degree in environmental science, and seven years of experience in the water resources management field. She has delved into complex water resource planning projects requiring unique and innovative solutions, achieving successful outcomes by leveraging her ability to conduct technical analyses and incorporate concepts of public policy into decision-making processes. Upon graduating from Indiana University, Liberty was employed for a municipal utility, in which she successfully managed a program implemented by the utility to maintain the health and wellbeing of the community. At INTERA, Liberty continues to diversify her skillset, adding value to the company and clients. She has the knowledge and expertise to address large, complex issues through research, technical analysis, and stakeholder engagement.

Selected Projects

Water Demand for Central Hamilton County, Indiana American Water, IN. 2023 – Present. Project Manager. Conducting a water demand forecast to support the utility’s long-term water supply planning process. Collecting and incorporating historical water use data and proposed land changes associated with anticipated development into analysis. Aggregating and applying methodologies used to produce previous central Indiana demand forecasts to maintain consistency. Creating maps and tables depicting anticipated growth areas and water use over a 50-year period. Incorporating potential solutions and next steps into technical memorandum delivered to client.

Indiana Water Use Study, Indiana Chamber of Commerce, IN. 2023 –Present. Water Resources Scientist. Team member responsible for providing 10-year update of the original Indiana Chamber of Commerce report, “Modernizing the State’s Approach to a Critical Resource.” Collecting and analyzing historical water use data by five major water demand sectors: (1) public supply, (2) self-supplied domestic, (3) self-supplied thermoelectric power generation, (4) self-supplied industrial and commercial, and (5) self-supplied irrigation and agricultural uses. Identifying data sources to support water use tracking efforts at the state and local levels. Participating in meetings held by Chamber with various stakeholders. Considering relationships between local, state and federal legislative processes and water demand by various users. Providing innovative solutions to issues noted by stakeholders in meetings to encourage sustainable economic growth across the state.

Emergency Response Plan Update, Vincennes Water Utility, IN. 2023 –Present. Task Manager. Leading the water system Emergency Response Plan update. Conducting gap analysis of current plan to identify vulnerabilities and opportunities to improve resilience of water system. Incorporating local and regional plans produced by outside entities for use by the utility in preparing for and responding to emergencies.

Maui Desalination Project, County of Maui Water Supply, Maui, HI. 2023 –Present. Water Resources Scientist. Producing maps to support proposed development of desalination water supply and disposal facilities. Conducting research regarding state water quality standards

that affect feasibility of desalination in selected areas in Maui. Assisting in site selection using rating scheme developed by INTERA and reporting findings to client in technical memorandum format.

East Maui Master Plan, Department of Hawaiian Home Lands, Maui, HI. 2023 –Present. *Water Resources Scientist.* Conducting hydrological, geological, and hydrogeological research as part of Environmental Assessment to support long-term planned public land use by Department of Hawaiian Home Lands. Plan includes evaluation of regional geology, regulations governing water use in the state, site specific resources available for use, and concepts of sustainability to determine feasibility of projects. Creating maps using ArcGIS, estimating the flux of nitrogen and phosphorous from on-site disposal systems and cesspools, and reviewing and analyzing available ground and surface water data.

Vulcan Pit Improvements, City of Decatur Utilities, Decatur, IL. 2023. *Water Resources Scientist.* Supported engineering design of source water intake and main to allow utility to adequately supply water to meet demand. Considered state and local rules and regulations regarding water line design and created drawings and specifications for proposed flow meter and hydrant in the system. Created cost estimates associated with design.

Water Utility Wellhead Protection Plan Update, Vincennes Water Utility, Vincennes, IN. 2023. *Water Resources Scientist.* Reviewed and revised existing wellhead protection plan as required by IN state code. Provided updates to figures, contact information, and supporting content in the plan. Integrated revised wellhead delineation maps with updated potential contaminant source inventory into plan.

Morgan County Water Study, Morgan County, IN. 2023 – Present. *Water Resources Scientist.* Project team member assisting with county-wide project seeking to create sustainable economic growth in the county. Project scope includes conducting regular client-consultant meetings, developing public relations information, installing water level monitors, and conducting water availability analysis with the same methods used for the Wabash River and Licking County projects. Assisting with project management duties to grow and maintain positive relationship with client and other stakeholders. Presenting goals and objectives of study to Farm Bureau, Farm Board, and other public meetings to solicit homeowner volunteer for groundwater level monitoring and water network task.

Water Study of the Wabash River near Lafayette, IN, Indiana Economic Development Commission. 2023 –Present. *Water Resources Scientist.* Supporting groundwater feasibility study of the Wabash River for LEAP Lebanon and the IN Economic Development Corporation. Current project scope includes evaluating potential sites near Wabash River, which requires ArcGIS mapping, groundwater level monitoring, and research regarding legacy pollution which may impact water quality. Supporting groundwater modeling efforts using ArcGIS to create shapefiles and figures.

Water Availability Study, Licking County, OH. 2023. *Water Resources Scientist.* Developed water resources and availability analysis for Licking County, OH using data collected by the Ohio Department of Natural Resources (DNR), U.S. Environmental Protection Agency (EPA), and U.S. Geological Survey (USGS). Analysis considered availability in each watershed sub-basin in the county during each quarter of the year based on historic data. Created maps using ArcGIS to support language in report.

Water System Risk Reduction, Arcadis, Inc., Louisville, KY. 2022. *Management Consultant.* Conducted gap analysis of Emergency Response and Contamination Response Plans for water utilities. Provided guidance to improve plans and increase resilience.

Baseline Water and Wastewater Availability Analysis, Arcadis, Inc., Louisville, KY. 2022. *Management Consultant.* Researched and presented information relating to water rights and availability as a baseline assessment to determine if water and wastewater service providers can serve industries in the preliminary planning phase of development. Researched water law, including, but not limited to, water resource allocation at the state level and wastewater rules and regulations at the local level.

FEMA Grant Writing, Arcadis, Inc., Various Locations. 2022. *Management Consultant.* Supported development of federal grant applications, including Building Resilient Infrastructure and Communities (BRIC) and Solid Waste Infrastructure for Recycling (SWIFR) grants. Created request for information (RFI) based on grant program requirements and coordinated with client to ensure timely information collection.



Allan Foster, PE Water Resources Engineer



Years of Experience: 7

Education:

- MS, 2019, Hydrology, Colorado School of Mines
- BS, 2017, Geological Engineering, Colorado School of Mines

Professional Registrations/Affiliations:

- Professional Engineer, CO, License: PE.0064776

Professional History:

- 2024 – Present Water Resources Engineer – INTERA Incorporated, Westminster, CO
- 2019 – 2024 Engineer and Hydrogeologist – LRE Water, Denver, CO
- 2017 – 2019 Graduate Research Assistant – Colorado School of Mines, Golden, CO
- 2015 – 2016 Technician – Lytle Water Solutions, Highlands Ranch, CO

Training:

- Groundwater Flow, Solute Transport, Geochemical, Electrical Flow
- Python, C++, R, MATLAB, FORTRAN
- MODFLOW 6, MODFLOW USG, MODFLOW 2000, MODFLOW 2005, MODFLOW NWT
- MODFLOW-6 Transport, USG-Transport, MT3DMS, SEAWAT, PHAST, STAMMT-L
- MODPATH, Mod-PATH3DU
- PHREEQC, The Geochemist’s Workbench, Visual MINTEQ
- R2, R3T
- WGEN
- PEST, PEST++, PESTPP-IES
- ZONEBUDGET

Allan Foster is a Water Resources Engineer at INTERA with a BS degree in geological engineering, an MS degree in hydrology, and seven years of experience in water resources. His technical specialties include numerical modeling of environmental systems for decision support; groundwater resource characterization, development, and management; geochemistry; water quality analysis; managed aquifer recharge (MAR); aquifer storage and recovery (ASR); python scripting of workflows and data visualization, and field data collection and interpretation. His passion lies in integrating numerical groundwater flow, solute transport, and geochemical models to support decision-making for solving environmental problems. As a consultant, he has worked on a variety of projects for both municipal and private clients across multiple industries in ten U.S. states and in Australia.

Selected Projects

Collaborative ASR Feasibility Assessment for Donala Water & Sanitation District and Triview Metropolitan District, CO, USA. 2022 – 2024. *Field Engineer, Hydrogeologist, and Modeler.* Collected water quality samples of native groundwater and the proposed source water. Designed and led a water compatibility assessment to identify any potential water quality impacts to the native aquifer system and ASR system operations. Designed and led development and construction of groundwater flow and solute transport models, which explicitly integrated a water rights accounting model to demonstrate marginal hydraulic, economic, and water quality benefits of a collaborative approach between districts. The findings of the study informed recommendations for subsequent project phases. Contributed to reporting and communicating results to the client.

Municipal Wellfield Expansion Design for the City of Steamboat Springs, CO, USA. 2019 – 2024. *Field Engineer, Hydrogeologist, and Modeler.* Worked on a team that performed site investigations, aquifer testing, field data collection, and numerical groundwater modeling in support design of the expansion of an existing municipal wellfield for the City of Steamboat Springs. Contributed as a field engineer that collected and interpreted field data. Developed and calibrated numerical groundwater models to support design efforts. Coupled the groundwater models with numerical solute transport model to incorporate water quality changes into the design. The modeling informed the selection of the number of- and type- of wells to include in the expansion. Supported well design. Led reporting and contributed to client communication of results.

Municipal Wellfield Expansion Design for the City of Aurora, CO, USA. 2019 – 2024. *Project Engineer, Hydrogeologist, and Modeler.* Worked on a team that performed site investigations, aquifer testing, field data collection, and numerical groundwater flow- and transport- modeling for the design a new municipal wellfield for the City of Aurora. Contributed as a field engineer that collected and interpreted field data. Supported wellfield design by conducting alternatives analyses using the models which included multiple types of groundwater wells coupled with estimated water quality predictions. Supported the

design of water quality performance testing. Supported Ranney Collector Well (RCW) design and dynamic decision-making during adverse drilling conditions using the numerical models. Contributed to reporting and client communications of findings from the study.

Crestone Peak Resources / Civitas North Pad Multi-Completion Denver Basin Aquifer Monitoring Well, Aurora, CO, USA. 2021.

Field Engineer and Hydrogeologist. Contributed as a field engineer that supported oversight of monitoring well drilling down to 1,736 feet below ground surface and downhole wireline geophysics testing. Supported monitoring well design through interpretation of the wireline geophysics data to identify the four aquifers that the monitoring well was to be completed in. Provided management oversight of well construction, materials placement, and construction. Interpreted field hydraulic data to support WestBay system design by the project technical lead engineer. Interpreted water quality data and hydraulic packer testing data for verification of completion in- and sampling of- each aquifer interval.

Terry Ranch Project, ASR Feasibility Assessment, City of Greeley, CO, USA. 2019 – 2021. *Field Engineer, Hydrogeologist, and Modeler.* Provided field oversight for ASR pilot cycle testing, well drilling and construction, hydraulic packer testing, aquifer testing hydro-physical logging, sediment sample interval selection and collection, and water quality data collection. Coordinated with multiple labs on water quality analytical procedures and bench-scale testing efforts. Performed water quality analysis to support regulatory requirements, permitting, and geochemical numerical modeling to understand the potential for adverse reactions that may impact regulatory compliance, groundwater and recovered water qualities, and future system operation. Supported reporting of results, client communication of findings, and development of recommendations for subsequent phases of the project. All technical findings and reporting are publicly available at: [Greeley's Water Future \(greeleygov.com\)](http://greeleygov.com)

Box Elder ASR at the Confidential Center for Renewable Energy Site. Confidential Client, CO, USA. 2019 – 2024. *Field Engineer, Hydrogeologist, and Modeler.* Worked on a team that performed site subsurface investigations, aquifer testing, field data collection, and numerical model development to support design of a pilot managed aquifer recharge basin for the City of Aurora. Responsible for test well and monitoring well design, construction, development, and testing, and interpretation of collected field data. Developed numerical groundwater flow and solute transport models to directly support design and permitting of the pilot recharge basin design and siting of pilot monitoring wells. Designed the pilot testing plan and data collection plan for characterizing baseline water quality. Supported the design of the supply and collection wells and pump systems for pilot testing. Led reporting and client communication of findings from the study.

Capitol Hill Monitoring Well and ASR Feasibility Assessment, Denver Water, CO, USA. 2022 – 2023. *Field Engineer, Hydrogeologist, and Modeler.* Provided field oversight for aquifer testing and data analysis, side wall core interval selection using wireline geophysics, and water quality data collection. Coordinated with multiple labs on water quality analytical procedures and bench-scale testing. Performed geochemical numerical modeling to understand the potential for adverse reactions that may impact regulatory compliance, groundwater and recovered water qualities, and system operation. Contributed to reporting, client communication of findings, and development of recommendations for subsequent project phases.

ASR System Assessment and Recommendations, Consolidated Mutual Water Company, CO, USA. 2023. *Project Engineer, Hydrogeologist, and Modeler.* Led review of operational hydraulic and water quality data. Led geochemical numerical modeling efforts for interpretation of the compatibility of the native groundwater and source water quality. This study focused on elevated concentrations of iron and manganese that may be impacting system performance through adverse reactions in addition to system operations methods. Results of the study indicated that iron and manganese were not likely the only controls on poor system performance; inadequate well development and system operation methods were also likely controls. Developed recommendations for the client to further characterize system condition and implement strategies to increase the effectiveness of the system. Led reporting and client communication of results.

ASR Feasibility Assessment, City of Northglenn, CO, USA. 2021 – 2024. *Project Engineer, Hydrogeologist, and Modeler.* Reviewed and interpreted hydraulic and water quality data collected during previous project phases. Performed water quality analysis to support regulatory requirements, permitting, and performed geochemical numerical modeling to understand the potential for adverse reactions that may impact regulatory compliance, groundwater and recovered water qualities, and system operation. Supported the reporting of results, coordinated with treatment engineering teaming partners to supply estimated ranges of abstracted water quality, and developed recommendations for subsequent phases of the project.

Sarah Kaye, AICP

Lead Planner



BIOGRAPHY

Sarah is an enthusiastic member of the Brendle Group team who has worked in both government and the private sector on a broad range of planning topics including energy, transportation, climate, and resiliency. Sarah relishes finding ways to bridge gaps in the often-siloed areas of sustainability, collaborating with customers to create and implement impactful projects.

Sarah's previous work with North Front Range Metropolitan Planning Organization sharpened her ability to bring together politically diverse stakeholders to produce plans and programs that provided benefits to an entire region. Sarah is flourishing as a subject matter expert in the field of integrated land use and water planning, bringing her expertise to projects ranging from code review to metrics development.

What sets Sarah apart is her passion for convening with stakeholders and project partners, facilitating robust dialogues, and developing a deeper understanding of the communities with which she works. Sarah is a true people person and loves meeting with clients and exploring connections.

PROFESSIONAL QUALIFICATIONS

- Master of Urban and Regional Planning from the University of North Carolina
- Bachelor of Science in Environmental Science from the University of Florida
- American Institute of Certified Planners (AICP) Member

AFFILIATIONS

- American Planning Association (APA)
- Colorado Water and Land Use Planning Alliance
- Leadership Northern Colorado Class of 2019

RELEVANT PROJECTS

- Adams County, CO County-Wide Water Baseline Report
- Sonoran Institute Growing Water Smart Metrics Guidebook and Program
- Colorado WaterWise Best Practice Guidebook Update
- City of Fort Collins, CO Water Resource Matters in the Fort Collins Growth Management Area
- State of Colorado Department of Local Affairs Development Code Template
- Xcel Energy Partners in Energy Program
- State of Colorado 2020 Resiliency Framework Update
- Town of Lyons, CO Comprehensive Plan
- Jefferson County, CO Climate Action Plan
- Kansas City, MO Climate Protection & Resiliency Plan
- City of Westminster, CO Sustainability Plan & Design Guidelines
- Summit County, CO Comprehensive Plan
- Adams County, CO Sustainability Plan Implementation





Shaden Musleh, PE
 Principal Water Resources Engineer |
 Director, Colorado Water Resources Services



Years of Experience: 29

Education:

- MS, 2001, Water Resources/Irrigation Engineering (Emphasis on effect of grid size and digital simulation of groundwater flow), Utah State University
- BS, 1994, Agricultural Engineering, Soil and Irrigation, University of Jordan

Professional Registrations/Affiliations:

- Metro Basin Roundtable, Vice-Chair, At-Large Member
- Certified Project Manager, 2008
- Professional Engineer, CO, 2008 (#42368), NM, 2007 (#18110)
- Member, Colorado River Water Users Association
- Member, Colorado Water Congress
- Member, Colorado Groundwater Association
- Member, American Water Resources Association, CO Section
- Member, International Association of Hydrological Sciences

Professional History:

2018 – Present	Principal Water Resources Engineer – INTERA Incorporated, Westminster, CO
2016 – 2018	Principal Water Resources Engineer – Summit Water Consulting, Broomfield, CO
2015 – 2016	Senior Project Manager – Hydros Consulting, Boulder, CO
2004 – 2015	Group Manager & Senior Project Manager – Hydrosphere Resource Consultants, acquired by AMEC Foster Wheeler (now WSP USA), Boulder, CO
2002 – 2004	Geohydrologist – URS Corporation (now AECOM), Denver, CO
2001 – 2002	Project Engineer – Waterstone Environmental Hydrology and Engineering, Boulder, CO
1996 – 2001	Graduate Assistant, Systems Simulation/ Optimization Lab – Irrigation Engineering Department, Utah State University, Logan, UT

Training:

- Western Water Rights and Water Engineering, University of Colorado at Denver, 2005
- MODFLOW (multiple versions), IDSCU, IDS-AWAS, StateMod model (South Platte, Colorado, White, Yampa), ArcGIS, MS-Office, RiverWare, MT3D, MODPATH, GWVistas, GMS, Visual MODFLOW, PMWIN, FORTRAN, Visual Basic, CRAM, StateCU,

Shaden Musleh is a Principal Water Resources Engineer and Colorado Water Resources & Supply Line of Business Lead at INTERA with a BS degree in agricultural engineering, an MS degree in water resources and irrigation engineering, and nearly 30 years of professional experience in water resources engineering, planning, and management. He has developed cooperative solutions to water resources problems in multi-party settings and has led and managed numerous large-scale projects that involved providing management solutions to complex water resources problems. He has led multiple large-scale water planning studies in Colorado for which he estimated gap in supply and modeled projects to meet these gaps. He is well versed in surface and groundwater modeling, water supply/demand modeling under Colorado water law, state water planning, water allocation, water conservation, groundwater availability, water rights, and conjunctive management of surface water and groundwater.

Representative Project Experience

Optimization of Regional Aquifer Storage and Recovery in the South Metro Region, South Metro Water Supply Authority, Denver, CO. 2023 – Present.
Project Principal. A multi-phase project that entails development of optimization model of Aquifer Storage and Recovery (ASR) operations (infrastructure, water storage, water availability, supply/demand, aquifer behavior, physical deliveries between entities, paper exchanges, etc.) in the South Metro region. Currently developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Castle Rock, (2) Centennial Water and Sanitation District and (3) East Cherry Creek Water and Sanitation District. A conceptual groundwater model (part of the optimization model) was developed to simulate aquifer behavior in response to the injection and extraction scenarios and to allow optimization of operations.

Water Supply Gap Analysis , Denver Water, CO. 2020 – Present.
Project Manager. Leads the INTERA TEAM that conducted a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system.

South Platte Implementation Plan/State Water Plan, Colorado Water Conservation Board, CO. 2022 – 2023. *Metro/South Platte Basin Implementation Plan Committee Member.* Oversaw the most recent update to the South Platte Implementation Plan. Reviewed drafts, provided comments, and participated in discussions throughout the process.

South Platte Allocation Model, Colorado Decision Support System, Colorado Water Conservation Board, CO. 2015 – 2016.

Project Manager and Modeling Lead. Lead the development of historical water allocation (water supply/demand) model for the Boulder Creek Basin. This model is used as a planning tool to develop basin wide and statewide policies for the South Platte Basin. The model simulates all types of demands (municipal, industrial, ag, augmentation, etc), river supplies and complex operations (e.g. complex exchanges) in Boulder Creek from 1950-2016.

South Platte Basin Implementation Plan, CO. 2014 – 2015. *Hydrologic Modeling and Agriculture Task Leader.* Assisted in various tasks that included hydrologic modeling and analysis and agricultural analysis using geographic information systems (GIS) and other modeling tools

Water Master Plan for the Upper Yampa River Basin, Upper Yampa Water Conservancy District, CO. 2012 – 2014. *Project Manager and Modeling Lead.* The project included development of complex water allocation (water supply/demand) model to simulate several potential new storage projects, environmental mitigation projects, and water transfers. Included simulating demand/supply under climate change using Tree Ring construction that dates back to year 1000 to optimize system performance under a variety of hydrological conditions.

Groundwater Model of ASR System, East Cherry Creek Water and Sanitation District, CO. 2021 – 2023. *Project Manager.* Led the technical team for development of a regional MODFLOW model of the confined aquifers under ECCV service area. The calibrated model will be used to simulate impacts from future injection and extraction and optimize operations.

Groundwater Investigation, Denver Water, CO. 2018 – 2019. *Project Manager.* Led the technical team that investigated supply/demand for various locations in the Denver Metro Area using models and data analysis.

Yampa/White/Green Basin Implementation Plan, Colorado State Water Plan, Yampa/White Basin Roundtable, CO. 2015 – 2016.

Project Manager and Modeling Lead. Led the technical team, performed modeling, managed stakeholders and facilitated stakeholder meetings. The objective of the plan was to investigate and analyze the state's water supply and demand through the year 2050 and show how the future municipal, industrial, agricultural, recreational, and environmental needs can be met by both existing and proposed water projects under various operational scenarios. Included complex modeling of future gap under various hydrological and operational scenarios and investigated meeting the gap by simulating various proposed projects.

Groundwater Availability, Confidential Client, CO. 2018 – 2019. *Technical Lead.* Participated in investigating groundwater availability and reliability in the South Platte River Basin for a future development. This task included looking into tributary and non-tributary sources.

Recharge and Groundwater Storage, East Cheery Creek District, United Water and Sanitation District, Farmers Reservoir and Irrigation Company, Sand Hills Metropolitan District, City of Boulder, CO. 2012 – 2013. *Project Lead.* Analyzed a MODFLOW groundwater model to evaluate recharge operations including aquifer storage capacity, rise in water table, and estimate accretions to the South Platte River from recharge operations in the South Platte River basin. Provided expert opinions regarding findings and potential injury to Boulder's water rights.

Groundwater Impact and Mitigation, Town of Frederick, CO. 2021 – Present. *Project Manager.* Leads an investigation of high water table conditions under the town. Work includes installing monitoring wells, developing a groundwater model to investigate the reasons for rising groundwater, and proposing mitigation methods for such conditions.

Water Rights Modeling, Denver Water, CO. 2020 – Present. *Water Rights Expert.* Performs modeling work for water rights cases involving Denver Water as an applicant.

Water Rights Engineering and Litigation, City of Thornton, CO. 2021 – Present. *Project Manager and Water Rights Expert.* Provides water rights engineering and modeling support for Thornton's applications in water right cases as well as for Thornton's role as an objector in others' water right cases in the South Platte River Basin.

Development of Groundwater Sustainability Plan for Mound Basin, Mound Basin Groundwater Sustainability Agency, Ventura, CA. 2020 – 2021. *Task Manager.* Participated in the development of the plan report. Managed the effort by the various parties responsible for model MODFLOW model development and writing pieces of the plan report.

Abbye Neel, PE

Lead Water Resource Engineer



BIOGRAPHY

Abbye is a water expert helping to shape the vital intersection between water resources and efficiency through land use planning. With more than five years of utility and local government experience, she has a deep understanding of the dynamics within these sectors, as well as best practices for water engineering and planning within such entities. At Brendle Group, she supports a wide range of projects through the implementation of sustainable water management solutions and climate resiliency approaches.

Abbye has extensive experience developing data-driven water efficiency programs and policies that require collaboration with a variety of stakeholders to implement new programming and updates to municipal and land use codes. During her time as a Research Assistant at Colorado School of Mines, she studied the influence of redevelopment along the Colorado Front Range on water use patterns and understands the implications land use decisions have on water resources.

In addition to her technical background, Abbye has strong communication and facilitation skills that are essential for collaboration and consensus building in the pursuit of creative solutions to complex challenges.

PROFESSIONAL QUALIFICATIONS

- Master of Science in Hydrologic Science and Engineering from Colorado School of Mines
- Bachelor of Arts in Geology from Whitman College
- Water Environment Federation (WEF) Water Leadership Institute (WLI) Graduate
- Professional Engineer (PE)

AFFILIATIONS

- American Water Works Association (AWWA)
- Colorado WaterWise (CWW) Board of Directors
- CWW Data and Tools Committee Lead
- Colorado Water and Land Use Alliance

RELEVANT PROJECTS

- Adams County, CO County-Wide Water Baseline Report
- Adams County, CO Water Audit & Facility Benchmarking
- State of New Mexico Water Security Planning Act Public Engagement
- Sonoran Institute Growing Water Smart Metrics Guidebook and Program
- Colorado WaterWise Best Practice Guidebook Update
- City of Loveland, CO Water Efficiency Implementation Plan
- Larimer County, CO Regional Water Existing Conditions Report
- City of Fort Collins, CO Water Resource Matters in the Fort Collins Growth Management Area
- City of Fort Collins, CO On Call Water Utility Support
- Northern Water Commercial and Industrial Assessments
- National Ski Areas Association (NSAA) Climate Smart Snowmaking Study
- City of Fort Collins, CO On Call Water Utility Support
- Xcel Energy Partners in Energy Program Design & Delivery
- Adams County, CO Sustainability Plan Implementation



Laura Robinson

Senior Analyst



BIOGRAPHY

Laura is a results-driven analyst with 16 years of experience bringing data to life and telling its story through reports and interactive web displays for data-driven decisions. She successfully implements automated reports and online maps and dashboards using GIS, Tableau, SQL, Python, and Arcade scripting.

Laura leverages data and technology to drive transformation and optimize efficiency in a collaborative, cross-functional setting. She is part of Brendle Group's Analytics Service team and uses her expertise to meet client's unique needs by identifying opportunities to improve efficiency, facilitating effective storytelling derived from data, and crafting exceptional reporting systems. Rounding out Laura's expertise, she has a comprehensive understanding of renewable energy principles, risk assessment, and emergency response.

Laura focuses on using technology and analysis to benefit the well-being of the community – minimizing the impacts of climate change while creating safer, more resilient communities.

PROFESSIONAL QUALIFICATIONS

- Bachelor of Arts in Physical and Environmental Geography from California State University
- S-341, GIS Specialist for Incident Management
- FAA Drone Pilot Certification

AFFILIATIONS

- Women of Renewable Industries and Sustainable Energy

RELEVANT PROJECTS

- State of New Mexico Water Security Planning Act Public Engagement
- Sonoran Institute Growing Water Smart Metrics Guidebook and Program
- Xcel Energy Partners in Energy Program Design and Delivery
 - » Broomfield, CO
 - » Colorado Front Range Beneficial Electrification Network
 - » Garfield County, CO
 - » Nederland, CO
- Projects from Previous Employment
 - » Community risk assessment
 - » Municipal population growth forecasting
 - » Alternative response vehicle feasibility study
 - » Apparatus deployment optimization, planning, and forecasting
 - » Incident response dashboards and analytics
 - » Future fire station placement and coverage analysis
 - » Local government property tax assessments
 - » Needs assessment for local option levy
 - » Ethiopian drinking water accessibility study



Shelby Sommer, AICP, MPA

Senior Director of Planning and Engagement
& Vice President



EXPERIENCE SUMMARY

Shelby is a certified community planner with nineteen years of experience helping to shape the vital intersection between communities and climate resilience. From research to implementation, Shelby's portfolio of work is transforming the way communities plan and make progress toward achieving ambitious goals. Her strengths are in leading program and process design for governmental entities, facilitating stakeholder meetings, and elevating equity in decision making.

With a background in public administration and sustainable development, her areas of expertise include sustainability, land use, water, energy, mobility, and climate change mitigation and adaptation. Her land use planning knowledge and strengths span comprehensive planning, development regulations, and development review processes. Her analytical skills in geographic information systems, metrics, and indicators help ensure that progress can be visualized, measured, and monitored. Shelby also brings her creativity to process and program design.

PROFESSIONAL QUALIFICATIONS

- Concentration from the University of Colorado (Denver)
- Bachelor of Environmental Design from the University of Colorado (Boulder)
- Green Building Certificate from the Institute for the Built Environment at Colorado State University
- American Institute of Certified Planners (AICP) Member

AFFILIATIONS

- Water Literate Leaders of Northern Colorado
- Colorado Water and Land Use Alliance
- Larimer County Environmental and Science Advisory Board (2021-2024)
- American Planning Association (APA)
- US Green Building Council (USGBC)
- Rocky Mountain Leadership Program 2019
- Leadership Northern Colorado Class of 2018

RELEVANT PROJECTS

- Adams County, CO County-Wide Water Baseline Report
- State of New Mexico Water Security Planning Act Public Engagement
- Sonoran Institute Growing Water Smart Metrics Guidebook and Program
- Colorado WaterWise Best Practice Guidebook Update
- City of Loveland Water Efficiency Implementation Plan
- Larimer County, CO Regional Water Existing Conditions Report
- City of Fort Collins, CO Water Resource Matters in the Fort Collins Growth Management Area
- Water Research Foundation Integrating Land Use and Water Resources: Planning to Support Water Supply Diversification
- Water Research Foundation Incentives for Green Infrastructure Implementation on Private Property
- State of Colorado Department of Local Affairs Development Code Template
- State of Colorado 2020 Resiliency Framework Update
- Jefferson County, CO Climate Action Plan
- City of Boise, ID Climate Action Roadmap
- Summit County, CO Comprehensive Plan



Paulina Somosa

Associate Planner



BIOGRAPHY

Paulina is driven to make a meaningful impact in sustainability by blending her academic background in environmental science and urban and regional planning with a strong commitment to equity, diversity, and inclusion. Her key strengths lie in data-driven decision-making, policy analysis, and community engagement. Paulina is adept at leveraging technical expertise to promote social and environmental resilience while ensuring that the voices of marginalized communities are heard and considered.

A strong commitment to holistic solutions is driven by Paulina's innovative and diverse perspectives. Her experience working within municipal government as a city planner provides valuable insight into the dynamic nature of operations, policy, and procedures. She also has experience in affordable housing solutions, having conducted research on the topic during her graduate studies and through practical experience as a fair housing investigator in Southern California. This background enables Paulina to analyze complex urban challenges and advocate for inclusive policies that prioritize underrepresented communities.

PROFESSIONAL QUALIFICATIONS

- Master of Urban and Regional Planning from the University of California Irvine
- Bachelor of Arts in Environmental Science with a minor in Spatial Studies from the University of California Santa Barbara

AFFILIATIONS

- American Planning Association (Member)
- City of Fort Collins Climate Equity Committee Member

RELEVANT PROJECTS

- City & County of Denver Office of Climate Action, Sustainability & Resiliency Affordable Housing Study
- State of New Mexico Water Security Planning Act Public Engagement
- Adams County, CO Sustainability Implementation Support
- Xcel Energy Partners in Energy Program Design & Delivery
 - » Commerce City Equity Pilot
 - » Decarbonize DRCOG Facilitation Support
 - » Louisville, CO Beneficial Electrification
 - » Westminster, CO Efficiency Implementation
- Projects from Previous Employment
 - » City of Escondido, CA Spanish Language Access & Inclusion Plan
 - » City of Greeley, CO Housing Needs Assessment
 - » City of Greeley, CO Sunrise Neighborhood Plan



Jeremy White, PhD
Principal Hydrogeologist



Years of Experience: 20

Education:

- PhD, 2014, Hydrogeology, University of South Florida
- MS, 2005, Hydrogeology, University of South Florida
- BS, 2002, Computer Science, Minor in Geology, West Texas A&M University

Professional Registrations/Affiliations:

- Associate editor, *Groundwater*

Professional History:

- 2020 – Present Principal Hydrogeologist – INTERA Incorporated, Westminster, CO
- 2019 – 2020 Hydrologist/Modeling Specialist – US Geological Survey, Austin, TX
- 2017 – 2019 Senior Groundwater Modeler – GNS Science, Wairekei, NZ
- 2013 – 2017 Hydrologist/Modeling Specialist – US Geological Survey, Austin, TX
- 2012 – 2013 Hydrologist – US Geological Survey, Tampa, FL
- 2010 – 2012 Physical Scientist – US Geological Survey, Tampa, FL
- 2006 – 2010 Professional Hydrogeologist – Geosyntec Consultants, Tampa, FL
- 2004 – 2006 Staff Hydrogeologist – Golder Associates, Tampa, FL

Open-Source Community Contributions:

- Lead developer of PEST++
- Lead developer of pyEMU
- Lead developer of PyPestUtils
- Core developer of FloPY
- Contributor to MODFLOW 5 and 6 family of codes

Jeremy White is a Principal Hydrogeologist at INTERA with a BS degree in computer science, MS and PhD degrees in hydrogeology, and 20 years of experience focused on development and construction of environmental models for decision support, with emphasis on uncertainty/risk analysis, data assimilation and optimization under uncertainty. He is the lead developer of several internationally recognized software platforms for uncertainty, data assimilation, and optimization under uncertainty, as well as modeling workflow automation. Using his background in computer science, Dr. White has pioneered new approaches and workflows for environmental simulation that focus on rapid and reproducible modeling analyses. Jeremy has worked on modeling projects around the world and in numerous environmental settings to support both water resources management and remedial activities, and has authored/co-authored over 50 peer-reviewed publications. Jeremy is the lead developer of PEST++ and pyEMU, which are software suites for parameter estimation/data assimilation, uncertainty analysis, and constrained management optimization under uncertainty. Dr. White also contributes to FloPY and has collaborated on the development of several advanced new capabilities for the MODFLOW family of codes including a solution techniques for MODFLOW-5 using general-purpose graphical processing units, the development and implementation of a diffusive-wave MODFLOW-5-coupled surface-water model, as well as the new subsidence process for MODFLOW-6.

Selected Projects

Ruataniwha Basin Integrated Modeling Assessment, Hawke’s Bay Regional Council, NZ. 2022 – Present. *Project Manager.* Implemented stochastic predictive modeling analysis workflow to develop and deploy an integrated surface-water/groundwater model to evaluate groundwater extraction and nitrate-intensive land use impacts on freshwater ecosystems. The modeling analysis results are being used by the regional council to help guide policy and planning in the basin.

Cross Timbers Groundwater Availability Model. 2022 – Present. *Technical Lead.* Overseeing development and deployment of a groundwater availability model for the cross timbers aquifer using automated and reproducible techniques within an uncertainty analysis framework.

Mississippi Alluvial Plain Integrated Water Resource Assessment, Department of Interior, MS. 2016 – 2020. *Technical Advisor.* Supported the multi-faceted integrated groundwater-agricultural-economic assessment. Advised the development of the regional and inset numerical models, advised the design and implementation a regional scale assessment of risk and data worth towards reduce negative ecological and economic outcomes The project goal was to provide regional stakeholders across four states with decision support tools to manage critical groundwater and surface-water resources in a nationally important agricultural area.

GULF Groundwater Flow and Subsidence Assessment, Harris-Galveston Subsidence District, TX. 2019 – 2022. *Technical Advisor.* Supported the development and deployment of the next-generation Houston-area 3-

dimensional (3D) transient groundwater flow and land subsidence model using MODFLOW-6 and the CSUB process. The model was deployed with a high-dimensional uncertainty analysis and data assimilation framework, focusing on uncertainty in the important simulated outputs. The model simulates the entire historical development period and matches the rate and magnitude of groundwater level changes as well as both compaction and cumulative subsidence patterns in space and time. Ultimately, the model will be used to guide future regulatory actions related to subsidence and groundwater use.

Groundwater Management Area 12 Risk Assessment, Post Oak Groundwater Conservation District, TX. 2021 – 2022.

Technical Advisor. Supported uncertainty analysis and enhanced data assimilation of an existing regional groundwater flow model toward providing risk-based analysis of Desired Future Conditions for a focused region on the model.

Lower San Antonio River Model Analysis, San Antonio River Authority, TX. 2016 – 2020. *Technical Advisor.* Advised development of a conceptual and integrated surface-water/groundwater model of the lower San Antonio River Basin. Led design and implementation of the uncertainty analysis and data assimilation and developed a new approach to estimating surface-water capture potential under uncertainty. The model is used to guide decision making related to surface-water/groundwater exchange throughout the river basin.

Coastal Lowlands Water Availability Assessment, Department of Interior, Multiple States. 2016 – 2020. *Technical Advisor.* Advised development of a conceptual and numerical model of the coastal lowlands aquifer system from the Texas-Mexico border to the Florida panhandle. Advised development of the integrated surface-water/groundwater model and led design and implementation of the uncertainty analysis and data assimilation spanning the period 1890 to 2020. The model was developed to serve as a planning tool for the sustainable management of groundwater and surface-water resources across the system.

Edwards Aquifer Groundwater Model Uncertainty Assessment, Edwards Aquifer Authority, San Antonio, TX. 2018 – 2020.

Project Lead. Using an existing 3D transient groundwater model, led the design and implementation of the formal uncertainty analysis and data assimilation process towards understanding risk and uncertainty in water resource management models. Data assimilation included history matching of historic groundwater levels and springsflows with a predictive focus on a hindcast to the drought of record conditions to evaluate the reliability of expected springsflows.

Hauraki Plains Modeling Assessment, Waikato Regional Council, New Zealand. 2017 – 2019. *Project lead.* Led development of a 3D transient integrated surface-water/groundwater flow and multi-species transport model. Advised the model construction process and led design and implementation of the uncertainty analysis and data assimilation process including history matching to both nitrate and tritium concentrations over the historical period. Developed a new model emulation method to facilitate real-time model-based decision making. The modeling analysis and emulation process were used to guide policy-level decision making regarding land use designations and surface-water quality. Led a combined hydrologic-economic tradeoff analysis of the impact and value of nitrate leaching from agricultural settings.

Edwards Aquifer Saline Zone Modeling Assessment, Edwards Aquifer Authority, San Antonio, TX. 2014 – 2017. *Senior Technical Advisor.* Advised the development of a 3D density-dependent (SEAWAT) groundwater model of the Edwards Aquifer. Led design and implementation of uncertainty analysis and data assimilation, including transient history matching of observed groundwater levels and chloride concentration patterns. The model is used to evaluate potential risks associated with poor water quality migrating towards production wells during expected drought conditions to improve understanding of supply reliability.

Honeycreek, Texas SWAT Modeling Assessment, Texas Soil Conservation Board, Austin, TX. 2015. *Project lead.* Led development of a SWAT model of the Honeycreek state natural area in Texas. Led design and implementation of uncertainty analysis and data assimilation. Undertook the modeling analysis to evaluate the risks and efficacy of using the model to evaluate the outcomes of brush removal used to increase water resources in arid regions.

Central and Southern Broward County Water Resource Modeling Assessment, Broward County, FL. 2010 – 2014. *Project Lead.*

Led development of density-dependent groundwater flow models to guide decision making regarding management of drinking water sources under expected future sea-level rise, climate change, and population growth. Led design and implementation of 3D SEAWAT models representing historical and future behavior of the groundwater system for central and southern Broward county. Used formal data assimilation to match historical groundwater levels, chloride concentrations, and surface-water/groundwater exchange estimates.

Urban Miami-Dade Modeling Assessment, Miami-Dade County, FL. 2009 – 2013. Technical Advisor. Supported development of an integrated surface-water/groundwater model of the urban Miami-Dade region including dynamic surface-water routing, gate and pump operations, and coastal seawater boundary. The model was designed for use in evaluating water resource management with sea-level rise and population growth.

Key Publications, Presentations, and Reports

Martin, N., **White, J.T.**. 2024. Water Resources AI-ML Data Uncertainty Risk and Mitigation. Water.

Collenteur, R.A....**White, J.T.**....2024. Data-driven modeling of hydraulic head time series: results and lessons learned from the 2022 groundwater modeling challenge. HESS

Abbas, S.A., Bailey, R.T., Almahawis, M.K, **White, J.T.**, Arnold, J.G., White, M.J.. 2024. Calibration Guide for Watershed Modeling with Distributed Groundwater Modeling: Application for the SWAT+ Model. Hydrological Science Journal.

Fienen, M.N., **White, J.T.**, Hayek, M. 2024. Parameter Estimation with the Gauss Levenberg Marquardt algorithm: an intuitive guide. Groundwater

White, J.T., Fienen, M.N., Moore, C.M., Guthke, A. 2023, Editorial: Rapid, Reproducible, and Robust Environmental Modeling for Decision Support: Worked Examples and Open-Source Software Tools. Frontiers In.

Askar, A.H., **White, J.T.**, Illangasekare, T.H. 2023. Identifying the Source Settings of Deep Brine Leakage from CO2 Geological Repositories Using Observations from Shallow Overlying Formations. Advances in Water Resources.

Knowling, M.J., **White, J.T.**, Grigg, D., Collins, C., Westra, S., Walker, R. and others. 2023. Operationalizing crop model data assimilation for improved on-farm situational awareness. Agricultural and Forest Meteorology

Hughes, J.D., Leake, S.A., Galloway, D.L., and **White, J.T.**, 2022, Documentation for the Skeletal Storage, Compaction, and Subsidence (CSUB) Package of MODFLOW 6: U.S. Geological Survey Techniques and Methods, book 6, chap. A62, 57 p., <https://doi.org/10.3133/tm6A62>.

Fienen, M.N., Dosch, N.C., **White, J.T.**, Leaf, A, Hunt, R.J., 2021. Risk-based wellhead protection decision support: a repeatable workflow approach. Groundwater.

White, J.T., Hunt, R.J., Fienen, M.N, and Doherty, J.E., 2020, Approaches in highly parameterized inversion— PEST++ Version 5, A software suite for parameter estimation, uncertainty analysis, management optimization and sensitivity analysis: U.S. Geological Survey Techniques and Methods, book 7, chap. C26, 52 p.

White, J.T. 2018. A model-independent iterative ensemble smoother for efficient history-matching and uncertainty quantification in very high dimensions. Environmental Modeling and Software.

Brandt, A. Fienen, M.N, and **White, J.T.** Adjudicating Groundwater: A Judge's Guide to Understanding Groundwater and Modeling. Bench Book. The National Judicial College.

White, J.T. 2017. Forecast first: an argument for groundwater modeling in reverse. Groundwater

Bakker, M., Post, V., Langevin, C. D., Hughes, J. D., **White, J. T.**, Starn, J. J. and Fienen, M. N. 2016, Scripting MODFLOW Model Development Using Python and FloPy. Groundwater. doi:10.1111/gwat.12413

Hughes, J.D., Langevin, C.D., and **White, J.T.**, 2014, MODFLOW-based coupled surface-water routing and groundwater flow simulation: Ground Water, DOI: 10.1111/gwat.12216

Hughes, J.D., and **White, J.T.**, 2013, Use of general purpose graphical processing units with MODFLOW: Ground Water, DOI: 10.1111/gwat.12004.



Travis Zielke, CGWP
Senior Hydrogeologist



Years of Experience: 21

Education:

- BS, 1998, Environmental Geology, Colorado State University

Professional Registrations/Affiliations:

- Certified Groundwater Professional, National Groundwater Association

Professional History:

- 2021 – Present Senior Hydrogeologist – INTERA Incorporated, Westminster, CO
- 2010 – 2021 Hydrogeologist and IT Support Professional – Lamp Rynearson, Lakewood, CO
- 2002 – 2010 Hydrogeologist – AMEC, Boulder, CO

Training:

- MODFLOW, Groundwater Vistas, ArcGIS, CDSS/SEO Tools, Visual Basic, Python, Excel Macro Programming, AQTESOLVE, IDS Tools, GFlow, General IT Support

Travis Zielke is a Senior Hydrogeologist at INTERA with a BS degree in environmental geology and over two decades of experience in water supply planning, water rights analysis, modeling of surface and subsurface water supply systems, and litigation support.. He has worked with a number of municipal clients such as Denver Water, Thornton, Lafayette, Castle Rock, Centennial Water and Sanitation District, Northglenn, Berthoud, and many smaller metropolitan districts. His work has included on-site well construction, geologic logging, and pump service work, in addition to groundwater modeling and water rights projects.

Representative Project Experience

Water Supply Gap Analysis, Denver Water, CO. 2020 – Present. Tech Lead. Supported a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system.

Optimization of Regional Aquifer Storage and Recovery in the South Metro Region, South Metro Water Supply Authority, Denver, CO. 2023 – Present. Modeler and Tech Support. Provided various technical support for this multi-phase project that entails development of optimization model of Aquifer Storage and Recovery (ASR) operations (infrastructure, water storage, water availability, supply/demand, aquifer behavior, physical deliveries between entities, paper exchanges, etc.) in the South Metro region. Currently developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Castle Rock, (2) Centennial Water and Sanitation District and (3) East Cherry Creek Water and Sanitation District. A conceptual groundwater model (part of the overall optimization model) was developed to allow for simulating aquifer behavior in response to the various injection and extraction scenarios and thus allow for optimization the overall operations.

Various Services, City of Lafayette, CO. 2010-2021. Water Right Expert. Firm Yield modeling to evaluate a number of water supply improvements under consideration by the city. Firm Yield modeling for water supply calculations used in the Gross Reservoir Environmental Pool application. Decree and Augmentation Plan review for opposition expert reports such as in the Erie and Firestone cases. Evaluation of water supply project proposals, such as those posed periodically by Jon File. Writing, technical support, and editorial review of the 2021 update to the Water Rights manual for the City. Accounting audits in support of Ted Zorich’s daily accounting submittals.

Groundwater Modeling, East Cherry Creek Valley Water, Aurora, CO. 2021 - Present. *Modeler and Hydrogeologist.* Created a groundwater model from the U.S. Geological Survey (USGS) regional Denver basin groundwater model to examine effects from Artificial Storage of water using the district's existing wells. Work involved a geologic review of the aquifers in the project area, calibration of the reduced size model, and scenario analysis for various storage and extraction plans.

Water Rights Engineering and Litigation, City of Thornton, CO. 2021 - Present. *Water Rights Expert.* Provides Water Rights Engineering and modeling support for Thornton's applications in water right cases as well Thornton's role as an objector in others' water right cases in the South Platte River Basin. Created a daily accounting form for a batch of changed shares for use in conjunction with the town's other water supplies.

Hydrogeologic Study, Town of Frederick, CO. 2023 - Present. *Hydrogeologist.* Prepared groundwater level study, located test borings for installation, assisted in setup of monitoring program for water levels, and creation and maintenance of a groundwater model to simulate subsurface conditions under the downtown. Scenario modeling to inform various mitigation scenarios for cost/benefit analysis.

Change of Water Right for Farmers Reservoir and Irrigation Company, Church Ditch, and Lawn Irrigation Return Flows Update, City of Northglenn, CO. 2015 - 2020. *Hydrogeologist.* Prepared historical use analysis and creation of a ditch wide groundwater model for use in a change of water right on the Farmers Reservoir and Irrigation Company ditch and the Church Ditch. Groundwater modeling and historic irrigation analysis for update to lawn irrigation return flows right.

Regional Augmentation Plan, Huerfano County Water Conservancy District, CO. 2017 - 2020. *Hydrogeologist.* Geological research and aquifer analysis for the creation of a county wide augmentation plan for use in business development throughout Huerfano County.

Water Court Application Support and Protection of Existing Water Rights, Bijou Irrigation Company, CO. 2010 - 2021. *Hydrogeologist.* Reviewed numerous water court applications to identify potential injury to client's water rights and assisted negotiations to resolve those issues. Conducted a variety of groundwater analysis in support of recharge program applications for the client and completed work on rebuttal analysis and reports to further negotiations with opposers.

Protection of Existing Water Rights, City of Boulder, CO. 2002 - 2010. *Water Rights Expert.* Work included consumptive use analysis, water rights administration, assessment of water projects, analysis of groundwater pumping impact on streams, analysis of groundwater availability, evaluation of water demand and supply and analysis of the various practices (construction, agricultural, industrial, municipal, etc.) associated with the different aspects of water rights applications.

Reservoir Accounting, Hunter's Overlook Reservoir, Windsor, CO. 2017 - Present. *Hydrogeologist.* Design and installation of a tracking system for precipitation, reservoir water levels, evaporation, and groundwater seepage. Creation and maintenance of the daily accounting form.

Weekly and Monthly Water Right Accounting, Spring Valley, Boulder, CO. 2010 - Present. *Water Right Expert.* Creation of monthly depletion accounting for residential well usage. Lagged depletion calculations for new well installations, and weekly accounting for adjacent water users.

Monthly Water Right Accounting, Columbine Ranches Homeowner's Association, Commerce City, CO. 2010 - Present. *Water Right Expert.* Creation of monthly depletion accounting for residential well usage. Coordination with nearby water users for annual lease of excess credits.

Groundwater Modeling, West Basin Municipal Water District, Carson, CA. 2022 - Present. *Hydrogeologist.* Updating legacy code from PERL to Python to build and execute a large-scale seawater intrusion model. Supporting the annual update to the model and its accompanying report.

Groundwater Modeling, Arroyo Santa Rosa Basin, Camrosa Water District, CA. 2023 - Present. *Hydrogeologist.* Updating the annual modeling for scenario planning purposes. Examining mountain-front recharge in the model and its effects on pertinent locations for use in the annual report.



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Innovation and stewardship for a sustainable tomorrow



Submitted to:



Professional Engineering Services for
**2050 Comprehensive
Douglas County Water
Plan** RFP NO. CD002-2024

Submitted by:

Natural Resources
Consulting Engineers, Inc.



October 31, 2024

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1 Introduction

Natural Resources Consulting Engineers, Inc. (NRCE) as Prime Contractor and Kearns & West (K&W) as Sub-Contractor (Team) are pleased to provide this proposal in response to the Request For Proposal (RFP) numbered CD002-2024 sent by Douglas County (County) for the development of the Douglas County 2050 Comprehensive Water Plan (Water Plan). Developing a comprehensive Water Plan is the County's next step in its strategic long-term water management.

To create a successful Water Plan, the County desires to hire a firm with the necessary expertise and capacity to analyze several facets of the County's water resources and water uses both present and future. The Water Plan project described in the RFP requires the ability to evaluate both groundwater and surface water resources, have effective public engagement, perform economic analysis, understand best practices and land use regulations, and assess key risks such as climate change and population growth.

Our Team is well-qualified and suited to these tasks. NRCE has extensive experience with water rights and water resources throughout the western U.S. NRCE has expert hydrogeologists, hydrologists, and water resource engineers on staff with advanced degrees in their fields. NRCE staff are experienced in a variety of projects that require similar elements of evaluating past, present, and future water supply and demand for all types of water uses. K&W staff are experts in conducting effective public engagement activities, which will be crucial to guiding the project and creating necessary involvement from stakeholders for this project. We believe that our Team has a good understanding of the requirements of this project, as well as the required staff and capacity to complete the project activities on schedule. Our team of nine expert members will enable us to always stay on top of all aspects of the project, including public engagement, research, coordination, and technical analysis.

2 Vendor/Firm Information

NRCE is an employee-owned water resources firm headquartered in Fort Collins, CO. NRCE currently employs a dedicated team of more than 30 technical staff members. NRCE was founded in 1989 and has been serving clients with diverse water rights and water resource needs for over 35 years. NRCE provides state-of-the-art engineering consulting services in civil engineering, water resources, agricultural, and environmental disciplines. Our clients include government agencies, water utilities, irrigation districts, judiciary systems, communities, Tribal councils, attorneys, and other engineering firms throughout the western U.S. The firm's services, capabilities, and qualifications are described in further detail in the following section.

K&W is a national strategic communications firm founded in 1984, with extensive experience in stakeholder engagement, facilitation, public involvement, and community outreach. K&W thrives on finding paths forward on important, controversial, and complex policy projects. K&W's Rocky Mountain regional team of facilitators and mediators are expert meeting planners and community outreach specialists with a unique focus on engaging a broad set of voices in public processes to support collaborative decision-making.

K&W is sensitive to the unique needs of any local, state, and federal agency and customizes process design to be stakeholder-forward, empathetic of differing interests and values, and respectful of all involved,

resulting in meaningful and efficient outcomes. K&W has helped their natural resource and water-focused clients holistically consider water-adjacent policies that impact water resources like land use planning. Their staff excels in navigating complex stakeholder dynamics between water providers, the public, and rural communities to create consensus. They craft tailored messages to equitably inform and engage a wide range of stakeholder groups to meet their clients' needs and produce sustainable outcomes.

NRCE office locations:

Colorado Office- Primary Office 131 Lincoln Ave. Suite 300 Fort Collins, CO 80524	California Office 3927 Martin Luther King Jr. Way Oakland, CA 94609	East Africa Office P.O. Box 5260 // Ras Dashen Street, #5 Asmara, Eritrea
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NRCE primary contact:

Name: Assad Safadi, Senior Vice President
Mailing Address: 131 Lincoln Ave. Suite 300 Fort Collins, CO 80524
Phone: 970-224-1851
Email: asafadi@nrce.com

K&W office locations:

Denver Office- Primary Office 1775 Sherman Street. Suite 1825 Denver, CO 80203	Davis/Sacramento 409C Third Street Davis, CA 95616
Los Angeles Office 633 West Fifth Street 26 th and 28 th Floors Los Angeles, CA 90071	New York 147 Prince Street Brooklyn, NY 11201
San Juan Capistrano Office 31831 Camino Capistrano Suite 110 San Juan Capistrano, CA 92675	Seattle Office 3815 S Othello Street, Ste #375 Seattle, WA 98118
Portland Office 537 SE Ash Street, Suite 305 Portland, OR 97214	San Francisco Office 500 Washington Street Suite 425 San Francisco, CA 94111
San Diego Office 800 B Ave, Suite 203 National City, CA 91950	Washington DC Office 1990 K Street NW Washington, DC 20006

K&W primary contact:

Name: Angela Woolcott, Vice President
Mailing Address: 1775 Sherman Street, Suite 1825, Denver, CO 80203
Phone: 720-504-0221
Email: awoolcott@kearnswest.com

3 Affirmation of understanding of the scope of services

NRCE has reviewed the RFP (RFP NO. CD002-2024) and understands the scope of services and all conditions or requirements contained in the RFP. Our understanding of the project and its requirements will be shown in our detailed approach and timing estimates provided in the following sections.

4 Project Approach

The County faces unique challenges and opportunities related to its water use and future growth. The County sits on several aquifers, making it more reliant on groundwater than other counties in Colorado, and, therefore, requires different solutions for a sustainable water future. This, coupled with the diversity of water users in the County, ranging from agricultural operations to growing municipalities, makes the development of the Water Plan critical to the county's future. K&W understands the dynamic landscape of the County through their current work on the Douglas County Integrated Transit and Multimodal Study. The K&W team will leverage this background, experience, and relationships in their future work with the County and success in developing the Water Plan.

The Water Plan also provides an opportunity to coordinate across different water users to leverage knowledge and understanding to meet all water users' current and future needs. A major need is collective access to groundwater information in the county for all water users to inform decision making, increase transparency, and create sustainable solutions. The NRCE and K&W approach reflects this unique opportunity through the required technical analysis and a myriad of different engagement tactics.

The 2050 Comprehensive Douglas County, Colorado Water Plan (Water Plan) will allow the County to protect and conserve long-term agriculture, environmental, municipal water interests, and manage groundwater resources. The Team of engineers and public engagement professionals from NRCE and K&W will work closely with County staff to develop the Water Plan. The Team anticipates that each phase of plan development will involve committee review, public engagement, and updating of deliverables. The Team anticipates working with the County through each of the four phases of the project. In general, the Team anticipates doing the following in each of the four phases.

Work Plan

The Team understands the need to communicate effectively. Upon the execution of a contract, the Team will provide a work plan, timeline, list of deliverables, and milestones. In addition, the Team will provide monthly progress and presentations to update the County on the progress of the project. K&W will lead public engagement activities and will prepare a public engagement plan to effectively involve the public and other stakeholders in the development and implementation of the Water Plan.

Phase 0: Engagement and Outreach

The Water Plan is the first of its kind for the County, providing an overarching strategy and plan to make key water decisions in the future development and growth of the County into 2050. Engaging residents, individual well owners, agricultural interests, and municipalities in this effort will create an effective and long-lasting Water Plan. In today's post-COVID reality, the Team understands that stakeholders are overextended, have limited capacity and resources, and are experiencing meeting fatigue. An essential part of the proposed outreach strategy is a streamlined approach to help keep project partners, stakeholders, and the broader public informed and engaged at critical technical milestones.

Project Design, Kick-off and Management; and Water Commission Meetings


Regular and ongoing coordinated communication touchpoints help ensure a clear and efficient roadmap for planning such efforts. At a minimum, the Team recommends the following reoccurring internal coordination meetings, in addition to the project kickoff meeting:

- A monthly or bi-monthly check-in call with County staff will be established to discuss project deliverables and coordinate tasks and other items as needed. K&W will capture notes and action items to distribute to team members and develop agendas as necessary.
- A monthly check-in call between NRCE and K&W to coordinate and prepare for outreach and engagement.

Public Engagement Plan and Program Approach

The Water Plan is the first of its kind, providing an overarching strategy and plan to make key decisions in the future development and growth of the County. Engaging residents, agricultural interests, and municipalities in this effort will create an effective and long-lasting Water Plan. In today's post-COVID reality, we hear that stakeholders are overextended, have limited capacity and resources, and are experiencing meeting fatigue. An essential part of our proposed outreach strategy has a streamlined approach to help keep project partners, stakeholders, and the broader public informed and engaged at essential technical milestones.

In addition to the three public meetings and three presentations identified in the procurement documents, K&W will work with the County to strategically identify outreach and engagement tactics using the International Associates Public Participation (IAP2) Public Engagement Spectrum (Figure 1) as a framework. This framework customizes outreach for target audiences to ensure an effective outreach program that informs and consults the public about the process, how they can become involved, and technical findings, while involving and collaborating with more knowledgeable stakeholders like water providers and municipalities.

INCREASING IMPACT ON THE DECISION 					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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Figure 1: International Associates Public Participation (IAP2) Public Engagement Spectrum Framework.

At the project's outset, K&W will conduct a series of stakeholder interviews with a cross-section of stakeholder groups. These interviews will directly inform the engagement strategy and key messaging as the project continues to advance, also allowing the Team flexibility to refine the outreach approach as needed. In addition to the three public meetings and final presentation to the County Board identified in the procurement documents, K&W recommends incorporating ongoing communication tactics to the baseline engagement plan to ensure that accurate and timely information is being disseminated to the community.

Public Meetings

In-person outreach early in the process helps broadly inform and educate the community about the planning effort, consult stakeholders on issues that may impact their daily lives, and establish trusted, open lines of communication with community members. Our Team will work with County staff to strategically identify the best approach to these events and focus on maximizing participation, feedback, and staff time at key project milestones. A public meeting also helps provide an opportunity for the public, and other stakeholders, to share their concerns with project staff later in the process. At least three public meetings will be led and facilitated by K&W at key milestones during the planning process. These events will be broadly promoted to encourage wide-ranging participation and create a shared understanding from community members of the Plan's purpose and needs. All meetings will be open to the public. K&W will coordinate with County staff and NRCE to fully prepare for the meetings including all messaging, promotional materials, handouts, boards, work plans, and post-meeting documentation.

Final Presentation to Board of County Commissioners

At the conclusion of Phase 3, K&W will support NRCE and County staff in developing a final presentation to the Douglas County Board of County Commissioners. The presentation will include a summary of the outreach activities conducted, feedback collected, and how feedback was considered and reflected in the final Water Plan.

Stakeholder Interviews

The number of stakeholders in the County that the Water Plan could impact is as vast as the county's area and the number of water providers. While hosting several public meetings throughout the development of the Water Plan will provide several opportunities for stakeholders to provide input, some leaders and community groups may not be able to participate in those forums. K&W will host a series of virtual stakeholder interviews leading up to each public meeting to identify clarifying questions, shared support, common interests, and opportunities for agreement, as well as contentious topics and concerns. The information collected will be used to refine project messaging and materials for the public meetings. All interviews will be summarized.

Ongoing Digital Communication

The Water Plan will be of high public interest. During its development, it will be important to maintain consistent communications and updates to stakeholders and the broader community between public meetings. This will help reduce misinformation, inform elected officials throughout the County with the latest project updates, and communicate the progress of the Water Plan and upcoming opportunities to provide input into the planning process. K&W will work with County staff and NRCE to develop at least monthly communication updates that will be distributed digitally to existing communication channels.

Final Outreach Summary

At the conclusion of Phase 1, all outreach and engagement will be summarized with key themes heard throughout the process highlighted. K&W will also work with NRCE and County staff to summarize how feedback that was provided was incorporated, or not incorporated, into the final plan and why.

In summary, K&W suggests the following outreach and engagement tasks as part of the project.

Recommended Tasks

- Three public meetings
- Stakeholder interviews
- Ongoing digital communications
- Final presentation to County Board
- Final outreach summary.

Optional Tactics

While the proposed tasks listed above summarize the recommendations of K&W, during the development of the Water Plan additional tactics may be necessary to support the development of the Water Plan. Below is a summary of optional tactics, in addition to the tactics described above, that have been budgeted as optional tasks for K&W.

Topical Focus Groups

Focus groups provide a chance to involve and collaborate with key stakeholders during the Water Plan's development. For example, a focus group with water providers and the Rural Water Authority of Douglas County and Elbert County during the water demand projection and groundwater analyses can help assess what data gaps exist and begin to understand how data can inform the Water Plan. All focus groups will include a highly interactive facilitated exercise to understand interests, unearth and resolve conflict, and gain consensus on recommendations within the Water Plan.

Survey

Engaging with County residents at a corresponding key technical milestone will be imperative during the planning process. K&W will develop a virtual survey that will be developed, distributed, and summarized to reflect the feedback and interests of the community. The survey will involve a broad range of stakeholders to understand their priorities related to land use and inform draft recommendations within the Water Plan. This tactic will be especially helpful to pair with other optional outreach activities, such as tabling community events and planned outreach activities like the public meetings.

Tabling Community Events

To appropriately engage all residents of the county, K&W would attend 10 community events. These events will reduce engagement barriers for residents by going to venues and forums where they are already going. For example, Castle Rock, Parker, and Castle Pines all host farmers markets in the summer that draw local families and provide an excellent venue to involve the county's younger residents. K&W would work with County staff and NRCE to strategically identify the best events to attend. The events would be an opportunity to advertise upcoming public meetings, distribute information about the survey, and educate and inform residents on the progress of the Water Plan. K&W staff would actively engage stakeholders at each event, take meticulous notes, and document feedback shared.

Small Group Meetings

Small group meetings are a helpful tactic to engage specific stakeholder groups focused on creating buy-in and gaining consensus. The small group meetings would be focused on reaching out to specific stakeholder groups to provide a preview of information prior to sharing with the broader public. These meetings would be held virtually and at strategic times throughout the project. For example, additional discussions would be held with water providers, municipalities, and agricultural interests while exploring potential renewable water supply projects or systems, mitigation for growth scenarios, and land use recommendations.

Project Materials

In addition to the outreach activities outlined above, K&W would help develop a project fact sheet, frequently asked questions (FAQ), and water demand summary as part of the public outreach and engagement. These documents will be used throughout the project to educate and inform stakeholders.

In summary, K&W has budgeted the following optional outreach tasks that may be deployed as the Water Plan is developed.

Optional Tasks

- Project survey
- 4 topical focus groups
- 10 community events
- 4 small group discussions
- 3 project materials.

All public engagement tactics will be coordinated with the Water Commission, County staff, and NRCE and summarized in the final Water Plan.

Phase 1: Water Supply and Demand Analysis

Task 1 Water Supply Information Collection

Task 1a – Data Tabulation

As described in the scope of work, data tabulated in this task will mainly come from the county's water providers. At a minimum, NRCE will review and evaluate water supply plans from all water providers, the Colorado Water Plan, and the South Platte/Metro Basin Implementation Plan. NRCE would search public and all available records to compile data. Sources will include well permit searches at the Colorado Division of Water Resources website, as well as research of other water rights and permits relevant to these types of water users. NRCE would also work to establish points of contact with each water provider to allow requests for clarification, further data, and dialogue as necessary.

NRCE would utilize several public sources of data to inventory surface water and renewable sources of water in Douglas County. Data sources will include the US Geological Survey's National Water Information System (USGS – NWIS) as well as surface water measurement and other data from Colorado's Decision Support Systems. NRCE will utilize in-house hydrology experience to perform a basic evaluation of sources of renewable water utilized by the county's providers and reliability of water each year in these sources.

Water providers will be asked to provide information on current wastewater reuse programs, and NRCE will create an inventory of the practice in the county from resulting data, which will include sites, sources, uses, and system capacity as well as any other relevant data. Reservoirs used by county water providers for storage will also be fully inventoried, with an analysis of operations and storage they provide.

Task 1b - Mapping, development of figures and digital data

NRCE's in-house staff specializing in Geographical Information Systems (GIS) will perform mapping of desired features for this task and for the Water Plan. Data will be collected from the most reputable sources available and quality-controlled as necessary to ensure accuracy of resulting maps and spatial database resulting from this task.

Task 2 Water Demand Projection Analysis

NRCE would perform analysis of water supply and demand. The Team will analyze current and projected development and compare it to current water supply. Potential of aquifers and renewable water sources for future supply would also be examined. NRCE would collect data from providers on projected water use and water supply for desired present and future periods. The team would also incorporate projections of population growth and development from other sources such as Douglas County's Comprehensive Master Plan. Demand and use by development type will be assessed to determine water supply requirements for each type.

County water sources will be analyzed and evaluated for yield and compared with current allocations of water rights and uses. The water supply data will mainly come from the groundwater study and renewable water source inventory performed in Tasks 3 and 1a respectively, as well as inventory of publicly available well data. This data will be analyzed in relation to projected future demand scenarios to identify gaps and needs for future water supply.

Task 3: Groundwater Analysis

For this study, NRCE would incorporate data from sources listed in the RFP. NRCE has groundwater engineers and hydrogeologists on staff that have developed groundwater models and conducted groundwater availability studies for similar projects. The NRCE groundwater team would inventory and summarize aquifer accessibility and water availability for Douglas County locations. Qualified hydrogeologists will also acquire and use the public domain MODFLOW model and supporting data from the USGS Colorado Water Science Center. NRCE would examine the model and data on aquifers and water levels, as well as run pumping scenarios into the future to assess water supply availability and constraints. Analysis of previous study and results of modeling would allow NRCE to report in the plan on aquifer water availability. Ability to use the MODFLOW model would allow NRCE to answer more specific questions about what uses aquifers can support to match up with county development scenarios. In addition, NRCE will identify and discuss any areas needing further data or study as a part of this task.

Task 4 Water Supply and Demand Analysis Report

In addition to data and analysis from previous tasks, NRCE would conduct a risk and vulnerability assessment to quantify threats to water supply sources in the county. NRCE would collect data and perform quantitative analysis in areas such as climate uncertainty, runoff timing changes, and population/demand growth. Publicly available studies and data would be collected and analyzed, including projections of future climate, ranges of possible population growth, and hydrologic effects of climate projections. The primary focus of this study would be on potential mitigation actions that could be taken by the County to support additional stability in areas of vulnerability.

NRCE would describe data and analysis from Tasks 1 through 3 as well as the risk and vulnerability assessment in a concise report format with helpful county and area-specific maps. This reporting can help inform the public and policy makers of the present and future water supply and demand. This report will be created with the primary goal of providing a digestible summary of the analyses and highlighting specific areas of concern and vulnerability. Potential solutions and mitigation actions will be suggested along with areas where further study could be beneficial.

Phase 2: Land Use Policy Analysis

NRCE will conduct an analysis to see how current water provider plans and services areas will address future needs. Data will be assembled for all future building and development scenarios desired to provide information to policy makers in land use planning. NRCE can also use its expertise to work with county officials and suggest updates to land use policies. Contact will be established to identify current land use policies and development needs, which will allow NRCE to provide a full review of land use policies that affect water demand.

Phase 3 – Development of the Douglas County Water Plan

NRCE will draft the Water Plan from analysis and information compiled from Phases 1 and 2. Information on groundwater supplies and high-risk aquifers will be incorporated into the Water Plan. In addition, the Water Plan will include an overview of regional connections, assessment of water infrastructure and storage needs, identification of potential renewable water supply projects, integration of agricultural efficiencies, conservation practices, and a cost analysis to implement recommendations. Pending or potential policy changes will be accounted for and discussed in the plan, including implications of the 100-year rule and its potential enforcement.

An early iteration of the draft Water Plan will be distributed to the Douglas County Water Commission (DCWC) for review and comment. K&W will track comments from the DCWC and share them with the Team and County staff. Based on feedback from the DCWC, recommendations will be developed for policy consideration or additional study that is needed. The Team will present the findings from the study to the DCWC and Douglas County Board of County Commissioners for final approval.

Key Personnel

The NRCE team (**Figure 2**) is well qualified to gather and analyze the necessary data to develop a Water Plan that meets the needs of Douglas County. Multiple staff members have advanced degrees in civil engineering, irrigation engineering, water and environmental resources, management strategic communications, and conflict resolution.

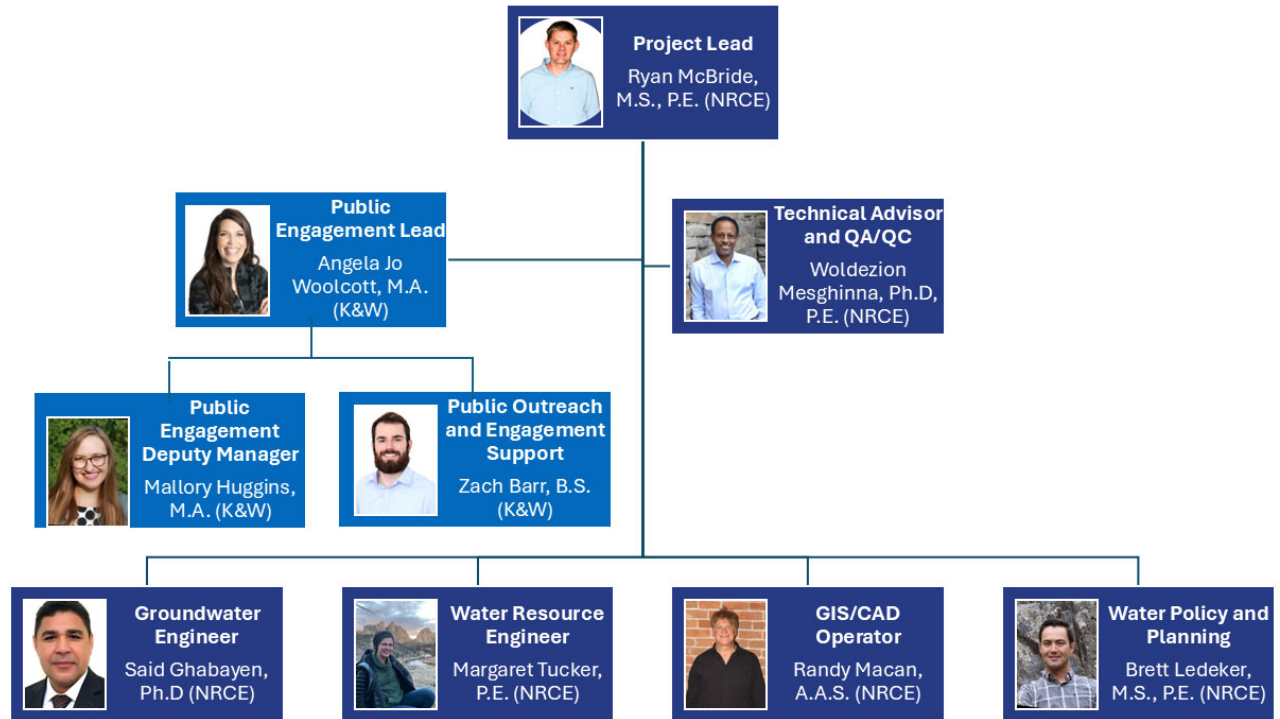


Figure 2: NRCE’s proposed project team.

The following section provides a brief overview of Team personnel and their individual roles in the project.

Woldezion Mesghinna, Ph.D, PE, President and Principal Engineer

Dr. Woldezion Mesghinna has more than 50 years of experience in multiple facets of civil engineering, water resources, wastewater, irrigation, and drainage engineering. He oversees projects throughout the western U.S. and Africa. Dr. Mesghinna’s work has included developing methodologies for undepleted flow determinations, analyzing multiple reservoir operations, analyzing availability of water supply and arability of lands, and designing several large-scale irrigation systems, both within the U.S. and overseas. Dr. Mesghinna has extensive experience in expert witness testimony and has provided technical support to attain settlements of millions of acre-feet of water rights through the western U.S. Dr. Mesghinna’s expertise in water rights and water supply planning will benefit the project. Dr. Mesghinna will use his expertise and function as a senior supervising engineer to oversee several aspects of the project to ensure that high quality standards are met.

Ryan McBride, M.S., PE, Project Lead/Water Resources Engineer

Mr. McBride has over 18 years of experience working as a project manager and project engineer for a wide variety of water resource projects. He has experience in water engineering design, irrigation system evaluation, water resources, and water resource planning and development. Mr. McBride led the development of a water infrastructure rehabilitation and development plan for a small water system in northeast Utah. The plan assessed the current condition of the existing water infrastructure, provided improvement recommendations, provided cost estimates to make the repairs, and estimated future water demands and capacity of the water system. Mr. McBride also led a study involving the impacts of well pumping on an aquifer and met with interested stakeholders, Colorado Basin Roundtable members, and government agencies. He presented the findings of the study at multiple meetings and workshops. Mr.

McBride also led the development of a Land Use Management Plan for a region in northeast Utah in 2021. Mr. McBride was involved in various master planning and water development projects on the west slope of Colorado. His project management skills, water resource expertise, and experience working with government agencies and stakeholders will benefit the project. Mr. McBride will serve as project lead, responsible for all work and for managing communications for the project.

Said Ghabayen, Ph.D, Groundwater Engineer

Dr. Ghabayen brings to NRCE extensive domestic and international experience. He has several years of experience as an associate professor in the civil and environmental engineering department at the University of Gaza and also as a consultant for a USAID-funded project in Palestine. His experience both in the field as well as the classroom includes water resources planning, design, and construction; groundwater and surface water hydrology; water resources economics; environmental assessment; hydraulic modeling and design of water supply and storm water projects; water quality assessment and modeling; and water systems operation and optimization. Dr. Ghabayen has extensive experience working in groundwater flow and transport modeling both in the U.S. and internationally. While working at NRCE, he led the groundwater modelling task in the Walker River Basin adjudication, in which he developed a groundwater flow model to assess the impacts of historical groundwater pumping on Walker River flow in Smith and Mason Valleys as well as Walker Lake water level. He also modified and calibrated the Fort Hall groundwater model and used it to assess the drought resiliency of the Fort Hall Shoshone-Bannock Tribes' groundwater resources. Dr. Ghabayen will oversee and conduct the groundwater study and lend engineering expertise to the project.

Brett Ledeker, M.S., Water Policy & Planning

Mr. Ledeker is a Senior Engineer at NRCE and holds an M.S. in Civil Engineering. Mr. Ledeker provides technical analysis of water supply and wastewater treatment systems, flood protection, irrigation water demands, and other aspects relevant to securing and implementing reserved water rights. Mr. Ledeker performs engineering design, demographic projection and water demand analyses, and project cost analyses. Mr. Ledeker has previous water resource planning experience on several projects, including water resource planning for the Ute Indian Tribe and the Santa Fe Indian School, as well as heading water resource planning efforts for the Moapa, Cahuilla, and Iowa tribes. Mr. Ledeker will function as a senior engineer and perform various technical work and writing for the project.

Margaret Tucker, PE, Water Resources Engineer

Ms. Tucker is an Associate Engineer at NRCE with past experience in a variety of water resource analysis, including water planning. Ms. Tucker has previous experience supporting several water planning efforts, beginning with assisting in drafting raw water and potable water master plans at Colorado Springs Utilities. At NRCE, she assists in various modeling and water resources investigations, including work on water master plan efforts for the Iowa and Moapa Tribes and water quality and restoration planning for the Cherokee Nation. Ms. Tucker will work as a project engineer, collecting and analyzing data and information on tasks throughout the project as well as supplying technical writing.

Randy Macan, GIS/CAD Operator

Mr. Macan has more than 29 years of experience in the production of maps and engineering drawings. He also has experience with coordinate systems and various data and digital imagery formats. Mr. Macan produces topographic, hydrologic, and other analytical maps using AutoCAD MAP 3D, Civil 3D, and ESRI ArcGIS software. He produces and uses GIS data to provide geographical information for a diverse spectrum of tasks. Mr. Macan creates illustrations and charts for company presentations, archives graphic files, and helps maintain the file structure of all NRCE maps, drawings, images, and GIS datasets. Randy

will assist NRCE staff with quality control, analysis, and display of spatial data for water planning and the final report.

Angela Jo Woolcott, Vice President, Public Engagement Lead

Ms. Woolcott brings 25 years of experience in integrated communications, strategic planning, and leading collaborative efforts such as public involvement and stakeholder engagement. Ms. Woolcott’s natural inclination to enhance communication and creatively solve problems around complex issues is evidenced by her ability to reach resolution in a highly efficient and meaningful manner. Ms. Woolcott is well-versed in designing and leading strategic planning efforts and facilitating large-scale multilateral stakeholder meetings. She has deep procedural experience in leading natural resource and water-related efforts, working closely with Colorado’s public and private sectors, across multiple municipalities, and managing difficult and conflict-prone processes. Her work in recent years has taken her around the state, from Fort Collins to Grand Junction, along the I-70 Mountain Corridor, and to Douglas County and Colorado Springs, working on some of the larger, more complex planning-related projects. She holds an M.A. in Conflict Resolution and certification in professional mediation from the University of Denver. As public engagement lead, Ms. Woolcott will lead Phase 0 and work with County staff and NRCE to align the outreach strategy with key technical milestones, oversee project messaging, and lead the preparation, planning, and facilitation of the Technical Advisory Committee and virtual and in-person outreach events.

Mallory Huggins, Director, Public Engagement Deputy Project Manager

Mrs. Huggins brings 15 years of experience facilitating interagency and multi-stakeholder collaboratives and leading community outreach and engagement efforts. Her conflict resolution background and communication expertise has provided her clients with the ability to navigate complex natural resource topics between knowledgeable stakeholders while also communicating the effects to communities. Her most recent work involved leading projects at the intersection of public lands policy and equity. She holds a B.A. in Rhetoric and Communication Studies from the University of Richmond, and an M.A. in Conflict Resolution from Georgetown University. Ms. Huggins will support all outreach and engagement activities for the project as deputy project manager and facilitator.

Zach Barr, Senior Associate, Public Engagement Support

Mr. Barr brings 8 years of experience in supporting water-related planning and infrastructure projects. His work has focused on interagency collaboration in the water, energy, natural resources, and land use sectors. He has supported large planning processes like the Central Valley Flood Protection Plan in California and contentious projects like the Merced County’s Groundwater Sustainability Agency development. Mr. Barr brings a diverse skill set, which includes stakeholder engagement planning and implementation, landowner outreach, grant reporting, and meeting design and facilitation. He will support all outreach activities by developing materials, scheduling meetings, taking and distributing notes, and conducting follow-ups.

Proposed Schedule

The schedule below shows the proposed sequential order of the phases of the project. A more detailed schedule will be provided in response to the Request for Proposal (RFP).

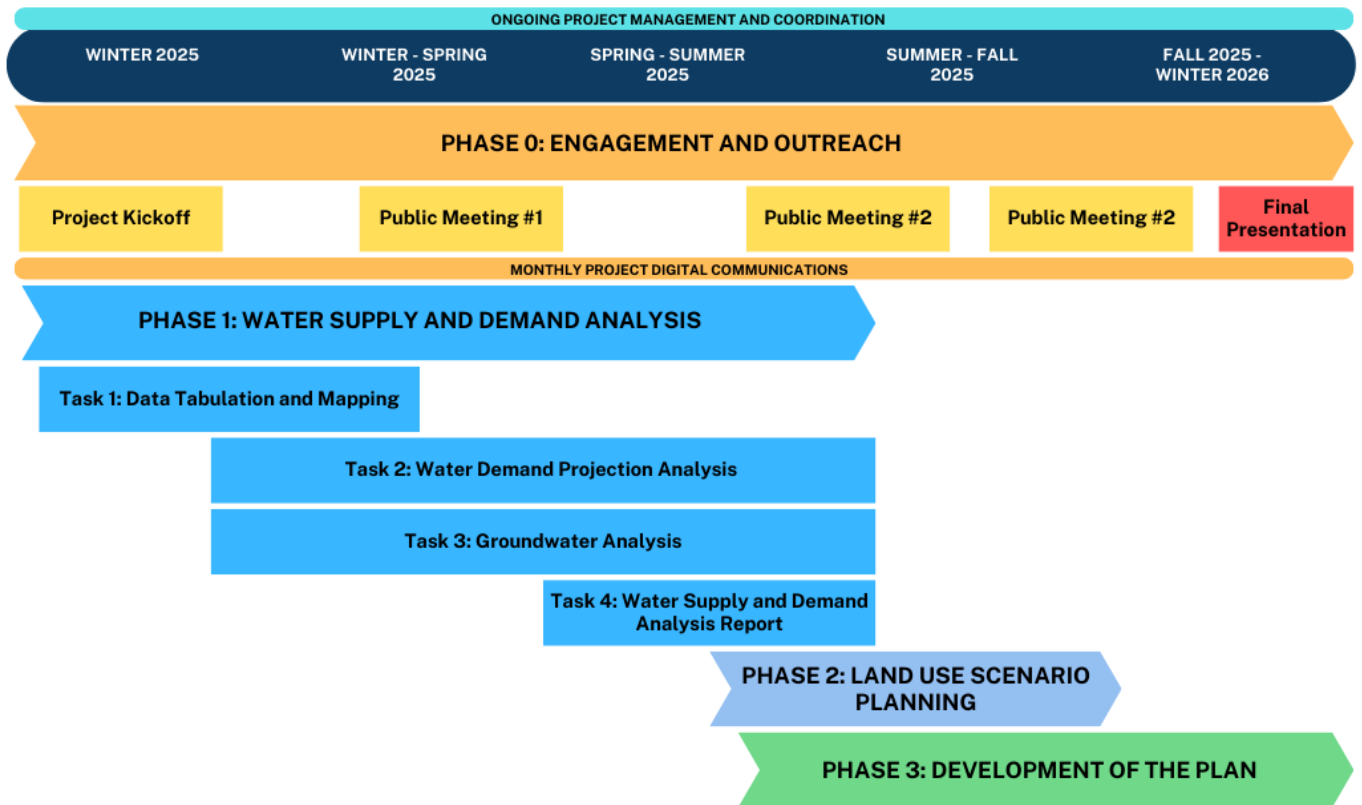


Figure 3: Water Plan implementation schedule.

5 Estimated Hours and Budget

The estimated hours and cost to complete the project are presented in the tables below. Table 1 shows a summary of total estimated costs for the entire project. Estimated hours and cost of optional public engagement tasks are listed separately from the labor cost for the entire project with the baseline of public engagement. Table 2 breaks down hours by task for all tasks including the baseline scenario only for public engagement, while Table 3 summarizes the cost of the labor. Optional public engagement hours and tasks are further presented in Tables 4 and 5. These are tasks that K&W suggests as providing benefits to the process based on their experience, however they are optional and provide some flexibility in the budget and strategies employed. NRCE and K&W also estimated some expenses to cover travel and items needed for public engagement activities; these expenses are presented in Table 6.

Table 1: Total cost estimates for the project.

Item	Estimated Cost
Labor Cost - Baseline Engagement Only	\$443,710.00
Miscellaneous Expenses	\$8,270.00
Total Cost Proposal - Baseline Engagement	\$451,980.00
Item	Estimated Cost
Labor Cost - Topical Focus Groups	\$13,760.00
Labor Cost - Survey	\$6,830.00
Labor Cost - Community Events	\$16,050.00
Labor Cost - Small Group Meetings	\$13,720.00
Project Materials - Optional Tasks	\$8,250.00
Total Cost Proposal - Including All Optional Engagement	\$510,590.00

Table 2: Estimated team hours for each task and Personnel assigned. Includes baseline public engagement tasks only.

Phase	Task	Hours	Personnel	Title
0	General Project Coordination	6	Deb Nudelman	Principal
		68	Angela Woolcott	Vice President
		42	Mallory Huggins	Director
		56	Zach Barr	Senior Associate
		86	TBD	Project Coordinator
	Project Kickoff Meeting	6	Angela Woolcott	Vice President
		6	Mallory Huggins	Director
		6	Zach Barr	Senior Associate
		6	TBD	Project Coordinator
	Stakeholder Interviews	18	Angela Woolcott	Vice President
		18	Mallory Huggins	Director
		36	Zach Barr	Senior Associate
48		TBD	Project Coordinator	

Phase	Task	Hours	Personnel	Title
	Public Meetings	36	Angela Woolcott	Vice President
		36	Mallory Huggins	Director
		60	Zach Barr	Senior Associate
		60	TBD	Project Coordinator
	Final Presentation to County Board	8	Angela Woolcott	Vice President
		8	Mallory Huggins	Director
		8	Zach Barr	Senior Associate
		12	TBD	Project Coordinator
	Final Outreach Summary	5	Angela Woolcott	Vice President
		8	Mallory Huggins	Director
		16	Zach Barr	Senior Associate
		10	TBD	Project Coordinator
	Ongoing Digital Communication	6	Angela Woolcott	Vice President
		12	Mallory Huggins	Director
		24	Zach Barr	Senior Associate
		24	TBD	Project Coordinator
Engagement and Outreach	32	Wold Mesghinna	Principal Engineer	
	40	Ryan McBride	Senior Engineer II	
	24	Randy Macan	Engineering Aide II	
	2	Administrative Staff	Administrative/Clerical	
1	Task 1a: Data Tabulation - Provider data	24	Brett Ledeker	Senior Engineer I
		40	Margaret Tucker	Associate Engineer II
		8	Ryan McBride	Senior Engineer II
		4	Wold Mesghinna	Principal Engineer
		2	Administrative Staff	Administrative/Clerical
	Task 1a: Data Tabulation - Wastewater Reuse Analysis	24	Brett Ledeker	Senior Engineer I
		8	Ryan McBride	Senior Engineer II
	Task 1a: Data Tabulation - Storage Capacity Assessment	16	Brett Ledeker	Senior Engineer I
	Task 1b: Mapping, Development of digital data	40	Randy Macan	Engineering Aide II
		8	Ryan McBride	Senior Engineer II
	Task 1b: Map Creation	40	Randy Macan	Engineering Aide II
	Task 2: Demand Projection and Gap Analysis	60	Brett Ledeker	Senior Engineer I
		24	Said Ghabayen	Senior Engineer I
		80	Margaret Tucker	Associate Engineer II
		80	Ryan McBride	Senior Engineer II
		40	Randy Macan	Engineering Aide II
	2	Administrative Staff	Administrative/Clerical	
Task 3: Groundwater Analysis - Data Review	40	Said Ghabayen	Senior Engineer I	

Table 6: Estimated travel and other non-labor expenses.

Travel Expenses:	Unit Cost	Units	Cost
Vehicle Mileage (per mile)	\$0.64	3360	\$2,150
Per Diem (federal rate per day)	\$80	14	\$1,120
Sub-Total Travel Expenses			\$3,270
K&W Miscellaneous Expenses	Unit Cost	Units	Cost
Travel Mileage (trips)	\$112.00	5	\$560
Venue Rentals	\$600	3	\$1,800
Food	-	-	\$600
Language Access	-	-	\$1,040
Materials	-	-	\$1,000
Sub-Total K&W Miscellaneous	-	-	\$5,000
Total Non-Labor Expenses	-	-	\$8,270

6 References

Client: Ute Indian Tribe

Address: P.O. Box 190, Fort Duchesne, UT 84026

Primary Contact: Jeremy Patterson, Esq

Email: jpatterson@nativelawgroup.com

Phone No: (303) 926-5292

Project Title: Comprehensive Water Development Plan

Completion Date: 2020

Client: Iowa Tribe of Kansas and Nebraska

Address: 3345 B Thrasher Road White Cloud, Kansas 66094

Primary Contact: Timothy Rhodd

Email: Chair@iowas.org

Phone No: 785-595-3258

Project Title: Comprehensive Water Resources Management Plan

Completion Date: Ongoing

Client: Denver Water

Address: 1600 W 12th Ave, Denver, CO 80204, United States

Primary Contact: Marc Waage

Email: Marc.Waage@denverwater.org

Phone No: 1-303-628-6572, 1-303-893-2444

Project Title: Upper Colorado River Water Supply Study

Completion Date: 2020

Client: Bureau of Reclamation

Address: 500 Fir Street, Boulder, NV 89005

Primary Contact: Jeremy Dodds, Water Accounting and Verification Group Manager

Email: jdodds@usbr.gov

Phone No: 702-293-8164

Project Title: Exploration of Quantification Methods for Agricultural Water Savings in the Lower Colorado River Basin

Completion Date: 2021

Client: Douglas County Public Works Department

Address: 100 Third St, Castle Rock, CO 80104

Primary Contact: Zeke Lynch, Assistant Public Works Director – Engineering, Douglas County

Email: zlynch@douglasco.us

Phone No: (303) 660-7490

Project Title: Douglas County Integrated Transit and Multimodal Study

Completion Date: Ongoing

7 Potential Conflicts of Interest Disclosure

Neither NRCE nor K&W have any known conflicts of interest in performing this scope of work for Douglas County. Our firms and team will be able to work solely in the interest of the County to complete the project.

DOUGLAS COUNTY GOVERNMENT

Department of Community Development

100 Third Street

Castle Rock, Colorado 80104

Telephone: 303-660-7460

www.douglas.co.us

REQUEST FOR INFORMATION (RFI) NO.

000-000000001

Douglas County 2050 Comprehensive Water Plan

**YOUR RESPONSE MUST BE RECEIVED NO LATER THAN
JUNE 28TH, 2024 @ 5:00 P.M.**

RFI CERTIFICATION

We offer to furnish to Douglas County the information requested in accordance with the specifications and subject to the terms and conditions described herein:

NAME: Natural Resources Consulting Engineers, Inc.

ADDRESS: 131 Lincoln Ave., Suite 300

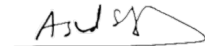
CITY: Fort Collins STATE: Colorado ZIP: 80524

TELEPHONE NUMBER: 970-224-1851 FAX NUMBER: 970-224-1885

E-MAIL ADDRESS: asafadi@nrce.com

BY: Assad Safadi, Ph.D.

(Printed or Typed Name)



(Written Signature)

TAXPAYER I.D. NUMBER: 94-3155495

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said response and furthermore to potentially award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful firm.

SECTION ONE ~ GENERAL AND DETAILED PROJECT INFORMATION:

A. Scope of Services:

Through this Request for Information (RFI), the Douglas County Government, hereinafter referred to as the County, respectfully requests information from responsible, qualified firms for the provision of a Douglas County 2050 Comprehensive Water Plan (Water Plan), as specified. It is the intention of the County to review all RFI responses, short-list those responses, and post an actual Request for Proposal (RFP). Only those companies, who have submitted a potentially acceptable response to this RFI will be allowed to submit a response during the formal RFP process.

This RFI process should be considered "Step One" of a multi-step solicitation process.



Natural Resources Consulting Engineers, Inc.

	CALIFORNIA	COLORADO	EAST AFRICA
LOCATION	3927 Martin Luther King Jr. Way Oakland, California 94609 USA	131 Lincoln Avenue, Suite 300 Fort Collins, Colorado 80524 USA	P.O. Box 5260 Ras Dashen Street, #5 Asmara, Eritrea
PHONE	510-547-0750	970-224-1851	011-291-1-120574
FACSIMILE	510-547-0793	970-224-1885	011-291-1-120629
EMAIL	oakland@nrce.com	office@nrce.com	eritrea@nrce.com

June 27, 2024

Sabrina Bach
Department of Community Development
100 Third Street
Castle Rock, Colorado 80104

Reference: Response to the Request for Information (RFI) RFI-000000001 Douglas County 2050 Comprehensive Water Plan

Dear Ms. Bach,

Natural Resources Consulting Engineers, Inc. (NRCE) as Prime Contractor and Kearns & West (K&W) as Sub-Contractor (Team) are pleased to provide this letter of interest in response to the Request for Information (RFI) numbered RFI-000000001 advertised on June 5th, 2024, by Douglas County (County) for the development of the Douglas County 2050 Comprehensive Water Plan (Water Plan). Developing a comprehensive Water Plan is the County's next step in its strategic long-term water management.

To create a successful Water Plan, the County desires to hire a firm with the necessary expertise and capacity to analyze several facets of the County's water resources and water uses both present and future. The Water Plan project described in the RFI requires the ability to evaluate both groundwater and surface water resources, have effective public engagement, perform economic analysis, understand best practices and land use regulations, and assess key risks such as climate change and population growth.

Our Team is well-qualified and suited to these tasks. NRCE has extensive experience with water rights and water resources all over the western U.S. NRCE has expert hydrogeologists, hydrologists, and water resource engineers on staff with advanced degrees in their fields. NRCE staff are experienced in a variety of projects that require similar elements of evaluating past, present, and future water supply and demand for all types of water uses. K&W staff are experts in conducting effective public engagement activities, which will be crucial to guiding the project and creating necessary involvement from stakeholders for this project. We believe that our Team has a good understanding of the requirements of this project, as well as the required staff and capacity to complete the project activities on schedule. Our team of eight expert members will enable us to always stay on top of all aspects of the project, including public engagement, research, coordination, and technical analysis.

Project Understanding and Approach

The Water Plan will allow Douglas County to protect and conserve long-term agriculture, environmental, and municipal water interests. The Team will work closely with County staff to develop the Water Plan. The Team anticipates that each phase of plan development will involve committee review, public engagement, and updating of deliverables. The Team anticipates working with the County through each of the three phases of the project. In general, the Team anticipates doing the following in each of the three phases.

Phase 1: Water Supply and Demand Analysis

During Phase 1, K&W will lead public engagement activities to keep project partners, stakeholders, and the broader public informed and engaged at essential technical milestones. More information about the proposed outreach to support the technical work is provided at the end of this section.

In this phase, NRCE will search available data sources to gather data on water providers. At a minimum, NRCE will review and evaluate water supply plans from all water providers, the Colorado Water Plan, and the South Platte/Metro Basin Implementation Plan. NRCE would search public and all available records to compile data. Sources will include well permit searches at the Colorado Division of Water Resources website, as well as research of other water rights and permits relevant to these types of water users. NRCE will prepare a water supply profile for water providers. Maps of water supplier's boundaries and services areas will be prepared. Data will be collected and reviewed regarding the operations and planning of Douglas County's water providers. NRCE has groundwater engineers and hydrogeologists on staff that have developed groundwater models and conducted groundwater availability studies for similar projects.

A Comprehensive Risk and Vulnerability Assessment is recommended and will require quantitative and qualitative assessment of risks in several categories. Categories could include demand, climate and hydrology, watershed, operational and infrastructure, administrative and legal, and health and social. NRCE would collect data and perform quantitative analysis in areas such as climate uncertainty, runoff timing changes, and population/demand growth. Primary focus would be on potential mitigation actions that could be taken by the County to support additional stability in areas of vulnerability.

NRCE would perform analysis of water supply and demand. The Team will analyze current and projected development and compare it to current water supply. The information gathered from the Colorado Department of Water Resources (CDWR) well database and other sources will be used to determine the gap between the projected demand through 2050 and the current water supply. The water sources will be analyzed and evaluated for yield and compared with current allocations of water rights and uses. Demand and use by development type will be assessed to determine water supply requirements for each type.

Phase 2: Land Use Scenario Planning

The Team understands that the County would like to develop draft land use policies. In this phase, NRCE will work closely with K&W and County Staff. Developing land use policies requires analysis that considers environmental, social, and economic factors to ensure sustainable development. The Team understands that the Water Plan will help guide land use and development policy, water requirements, best practices, and reasonable regulations and conservation standards for the full spectrum of present and future development types. Current and future land use scenarios that are developed in the water demand projection in Phase 1 will be analyzed from a planning and regulatory perspective in this phase of the project. Future scenarios with modeling will be analyzed including present day, 2050, and full build-out. NRCE will conduct an analysis to see how current water provider plans and services areas will address future needs. Once the data is gathered and analyzed, NRCE can use its expertise to suggest updates to land use policies.

Phase 3: Draft, Review, and Finalize Water Plan

NRCE will draft the Water Plan from analysis and information compiled from Phases 1 and 2. Information on groundwater supplies and high-risk aquifers will be incorporated into the Water Plan. In addition, the Water Plan will include an overview of regional connections, assessment of water infrastructure and storage needs, identification of potential renewable water supply projects, integration of agricultural efficiencies, conservation

practices, and a cost analysis to implement recommendations. An early iteration of the draft Water Plan will be distributed to the Douglas County Water Commission (DCWC) for review and comment. K&W will track comments from the DCWC and share them with the Team and County staff. Based on feedback from the DCWC, recommendations will be developed for policy consideration or additional study that is needed. The Team will present the findings from the study to the DCWC and Douglas County Board of County Commissioners for final approval.

Outreach Approach

Project Design, Kick-off and Management; and Water Commission Meetings


Regular and ongoing coordinated communication touchpoints help ensure a clear and efficient roadmap for planning such efforts. At a minimum, we recommend the following reoccurring communication tactics:

- On a monthly basis, K&W will work with County staff, IT department, and NRCE to update the project website, which includes making all digital materials 508-compliant.
- A monthly check-in call with County staff will be established to discuss project deliverables and coordinate tasks and other items as needed. K&W will capture notes and action items to distribute to team members.
- The DCWC will be an important body of experts to support the development of the Water Plan. The DCWC will act as a sounding board and strategic advisor for technical analysis, data gaps, recommendations, and outreach and engagement events. The project team plans to meet at least five times over the project period. Potential topics for discussion may include:
 - Data gaps
 - Trend analyses
 - Implementation planning and phasing
 - Water supply planning
 - Public Outreach findings.

Public Engagement Plan and Program Approach

The Water Plan is the first of its kind, providing an overarching strategy and plan to make key decisions in the future development and growth of the County. Engaging residents, agricultural interests, and municipalities in this effort will create an effective and long-lasting Water Plan. In today's post-COVID reality, we hear that stakeholders are overextended, have limited capacity and resources, and are experiencing meeting fatigue. An essential part of our proposed outreach strategy has a streamlined approach to help keep project partners, stakeholders, and the broader public informed and engaged at essential technical milestones.

In addition to the three public meetings and three presentations identified in the procurement documents, K&W will work with the County to strategically identify outreach and engagement tactics using the International Associates Public Participation (IAP2) Public Engagement Spectrum (Figure 1) as a framework. This framework customizes outreach for target audiences to ensure an effective outreach program that informs and consults the public about the process, how they can become involved, and technical findings, while involving and collaborating with more knowledgeable stakeholders like water providers and municipalities.

INCREASING IMPACT ON THE DECISION 					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

© IAP2 International Federation 2018. All rights reserved. 20181112_v1

Figure 1: International Associates Public Participation (IAP2) Public Engagement Spectrum Framework

K&W will develop a Public Engagement Plan that outlines outreach objectives, key messages, target audiences, a proposed outreach schedule, and outreach activities. Target audiences will be organized into stakeholder groups with corresponding tailored messages and outreach activities. For example, the messages for residents will differ from those for water providers. The Water Plan will be a guiding document for the engagement process and will encompass a range of tactics to implement an effective and transparent engagement process. The range of menu options could include:

- **Virtual Webinar or Pre-Recorded Public Meeting**

A virtual webinar and/or a pre-recorded public meeting is a great way to educate and inform a target audience. While in-person polling technology can help consult, this tactic is excellent for sharing much information with an audience and collecting targeted feedback in a controlled environment. A virtual webinar could also be used in coordination with a public survey to increase participation.

- **Public Meetings**

In-person outreach events early in the process help broadly inform and educate the community about the planning effort, consult participants on issues that may impact their daily lives, and establish trusted, open lines of communication with community members. Our Team will work with County staff to strategically identify the best approach to these events and focus on maximizing participation, feedback, and staff time at key project milestones. A public meeting also helps provide an opportunity for the public, and other stakeholders, to share their concerns with project staff later in the process. At least three public meetings will be led and facilitated by the Team throughout the planning process.



- **Topical Workshops**

Workshops provide a chance to involve and collaborate with key stakeholders during the Water Plan's development. For example, a workshop with water providers and the Rural Water Authority of Douglas County and Elbert County after Phase 1 can help assess what data gaps exist and begin to understand how data can inform the Water Plan. Workshops will include a highly interactive facilitated exercise to understand interests, unearth and resolve conflict, and gain consensus on recommendations within the Water Plan. Additional workshops can also be held in Phase 2 with municipalities to better understand the intersection of their land use codes and recommendations as part of the Water Plan. Internal workshops may also be used to develop goals at the outset of the project in addition to the project kickoff.

- **Surveys**

Residents of the County are key to engage at corresponding technical milestones during the planning process. Therefore, virtual surveys will be developed, distributed, and summarized during Phases 2 and 3. The surveys will involve stakeholders to understand their interests related to land use,

- **Stakeholder One-on-Ones, Small Group Meetings, and Other Presentations**

The number of stakeholders in the County that the Water Plan could impact is as vast as the county's area and the number of water providers. While the robust engagement process will provide several opportunities for all stakeholders to provide input, some stakeholders may not be able to participate in those forums. Additional virtual or in-person one-on-ones, small-group discussions, or presentations will be held throughout the planning process to increase consensus. These discussions will be held at strategic points in the project to help highlight issues and refine critical information. This tactic will be extremely important while exploring potential renewable water supply projects or systems, mitigation for growth scenarios, and land use recommendations.

All public engagement tactics will be coordinated with the Water Commission, County staff, and NRCE. To increase support and buy-in to the Water Plan, our Team recommends additional community engagement tactics above and beyond the three public meetings and presentations as outlined above.

Work Plan

The Team understands the need to communicate effectively. Upon the execution of a contract, the Team will provide a work plan, timeline, list of deliverables, and milestones. In addition, the Team will provide monthly progress and presentations to update the staff on the progress of the project. K&W will lead public engagement activities and will prepare a public engagement plan to effectively involve the public and other stakeholders in the development and implementation of the Water Plan.

Proposed Schedule

The schedule below shows the proposed sequential order of the phases of the project. A more detailed schedule will be provided in response to the Request for Proposal (RFP).

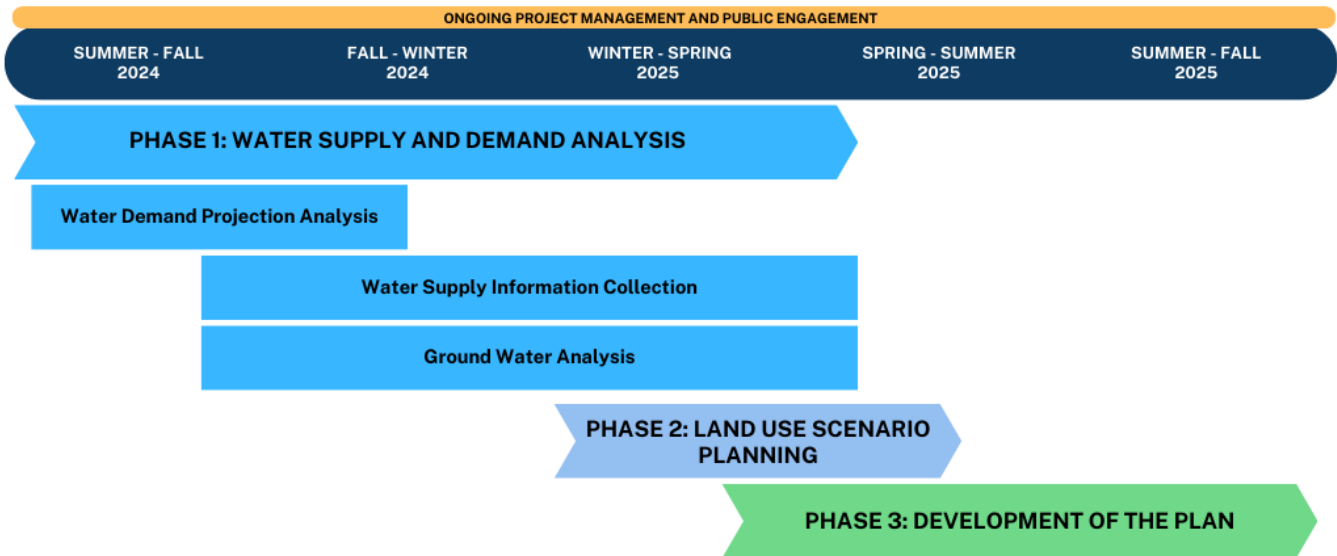


Figure 2: Water Plan Implementation Schedule

Firm Description

NRCE is an employee-owned water resources firm headquartered in Fort Collins, CO. NRCE currently employs a dedicated team of more than 30 technical staff members. NRCE was founded in 1989 and has been serving clients with diverse water rights and water resource needs for over 35 years. NRCE provides state-of-the-art engineering consulting services in civil engineering, water resources, agricultural, and environmental disciplines. Our clients include government agencies, water utilities, irrigation districts, judiciary systems, communities, Tribal councils, attorneys, and other engineering firms throughout the western U.S.

K&W is a national strategic communications and public engagement firm founded in 1984, with 40 years of experience in stakeholder engagement, facilitation, public involvement, and community outreach. K&W’s Denver office is made up of deeply qualified facilitators, mediators, strategic planners, and community outreach specialists. Their strong local relationships allow them a unique opportunity to engage with a broad set of voices in public policy dialogues and planning efforts to support collaborative decision-making outcomes. K&W’s team of 120 employees, facilitators, and mediators are expert meeting planners and community outreach specialists with a unique focus on engaging a broad set of voices in public policy dialogues and planning processes to support collaborative decision-making.

The Team’s familiarity with Douglas County, Douglas County Water Issues, and prior project experience can be found in Appendix A.

Affirmation of understanding of the scope of services

NRCE has reviewed the RFI and the draft RFP and understands the scope of services and all conditions or requirements contained in the RFI.

Firm’s “Mission Statement”

At NRCE, we are committed to delivering exceptional solutions in water resources, irrigation, and municipal water and wastewater engineering. We recognize the need for both niche specialization and strategic oversight in every project. Our approach is rooted in capability, integrity, and vision, ensuring we address our clients' challenges with expertise and forward-thinking strategies.

Kearns & West fosters creative, inclusive, equitable, and enduring solutions to public interest challenges by cultivating collaboration and connection among the communities and institutions we serve.

Standard of Quality Statement

Natural Resources Consulting Engineers, Inc. has established and implemented a quality assurance/quality control (QA/QC) program. This program encompasses every aspect of our scientific and engineering work and is designed to provide clients with assurance of the overall technical integrity of each project.

The NRCE QA/QC Program provides:

- Assurance of NRCE commitment to quality, integrity, and confidentiality
- Early identification and correction of potential problems
- Efficient use of personnel and equipment on individual projects
- Assignment of highly trained, credentialed scientists and engineers to projects
- Continuing education for technical professionals and technicians.

Disclosure of conflicts of interest

NRCE and K&W do not have any conflict of interest related to this project.

References

Client: Ute Indian Tribe

Address: P.O. Box 190, Fort Duchesne, UT 84026

Primary Contact: Jeremy Patterson, Esq

Email: jpatterson@nativelawgroup.com

Phone No: (303) 926-5292

Project Title: Comprehensive Water Development Plan

Completion Date: 2020

Client: Iowa Tribe of Kansas and Nebraska

Address: 3345 B Thrasher Road White Cloud, Kansas 66094

Primary Contact: Timothy Rhodd

Email: Chair@iowas.org

Phone No: 785-595-3258

Project Title: Comprehensive Water Resources Management Plan

Completion Date: Ongoing

Client: Denver Water
Address: 1600 W 12th Ave, Denver, CO 80204, United States
Primary Contact: Marc Waage
Email: Marc.Waage@denverwater.org
Phone No: 1-303-628-6572, 1-303-893-2444
Project Title: Upper Colorado River Water Supply Study
Completion Date: 2020

Client: Bureau of Reclamation
Address: 500 Fir Street, Boulder, NV 89005
Primary Contact: Jeremy Dodds, Water Accounting and Verification Group Manager
Email: jdodds@usbr.gov
Phone No: 702-293-8164
Project Title: Exploration of Quantification Methods for Agricultural Water Savings in the Lower Colorado River Basin
Completion Date: 2021

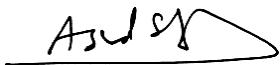
Client: City of Fort Collins
Address: 281 North College Avenue, Fort Collins, CO 80524
Primary Contact: Sylvia Tatman-Burruss, Senior Policy & Project Manager, City Manager's Office
Email: statman-burruss@fcgov.com
Phone No: (970) 416-2354
Project Title: Hughes Stadium Engagement
Completion Date: Ongoing

Questions/Addendums

NRCE had no questions regarding the RFI and reviewed the questions and answers document provided on June 20, 2024.

We appreciate your consideration and look forward to your review of our proposal. NRCE accepts all the terms and conditions in the RFI. I am the contact person and representative with the authority to contract for the offeror (NRCE). Please contact me at +1 (970) 222-5290 or asafadi@nrce.com with any questions or requests for further information.

Sincerely,
NATURAL RESOURCES CONSULTING ENGINEERS, INC.



Assad Safadi, Ph.D.
Senior Vice President

Appendix A

1.0 Familiarity with Douglas County and County Water Issues

Douglas County (County) faces unique challenges and opportunities related to its water use and future growth. The County sits on several aquifers, making it more reliant on groundwater than other counties in Colorado; the County, therefore, also requires different solutions for a sustainable water future. This, coupled with the diversity of water users in the County ranging from agricultural operations to growing municipalities, makes the development of the Comprehensive Water Plan (Water Plan) critical to the county's future. The Water Plan must balance the protection of the water supply with economic growth and opportunities for its residents through appropriate land use code updates.

The Water Plan also provides an opportunity to coordinate across different water users to leverage knowledge and understanding to meet all water users' current and future needs. A major need is collective access to groundwater information in the County for all water users to inform decision making, increase transparency, and create sustainable solutions. Our Team's approach reflects this opportunity through our unique ability to provide the required technical analysis and effective engagement tactics.

2.0 Water Supply Planning and Water Availability Studies Experience

NRCE is a civil, environmental, and water resources consulting engineering firm that provides consulting services for a wide variety of clients in virtually every aspect of water resources management. NRCE has over 30 years of experience in water resources in the western U.S. NRCE has a successful history of working on high profile and complex projects involving diverse regional and local interests.

NRCE has extensive experience in water resources development, use, and management in a variety of watersheds and locations throughout the U.S. and the world. NRCE has been in business for over 30 years, specializing in water resources engineering, irrigation engineering, groundwater engineering, and water supply planning. NRCE has comprehensive and extensive experience with both water resources and water use planning. Our clients are located throughout the western U.S. and beyond. This experience uniquely positions the company to understand our clients and provide valuable expertise for all aspects of water resource planning. NRCE is fully operational with Computer Aided Design (CAD) and Geographic Information System (GIS) technical support providing professional plans, maps, and decision support information. Our staff is experienced and skilled at conveying information through technical reports and planning documents.

K&W is a national strategic communications firm founded in 1984, with extensive experience in stakeholder engagement, facilitation, public involvement, and community outreach. K&W thrives on finding paths forward on important, controversial, and complex policy projects. K&W's Rocky Mountain regional team of facilitators and mediators are expert meeting planners and community outreach specialists with a unique focus on engaging a broad set of voices in public processes to support collaborative decision-making.

K&W is sensitive to the unique needs of any local, state, and federal agency and customizes the process to be stakeholder-forward, empathetic of differing interests and values, respectful of all involved, resulting in meaningful and efficient outcomes. They have helped their natural resource and water-focused clients holistically consider water-adjacent policies that impact water resources like land use planning. Their staff excels in navigating complex stakeholder dynamics between water providers, the public, and other key agencies to create consensus. K&W crafts

tailored messages to equitably inform and engage a wide range of stakeholder groups to meet the client's needs and produce sustainable outcomes.

NRCE has been hired to do similar projects in the past. NRCE has worked with multiple Tribes to develop water plans. The plans were prepared to support pending and future decision-making regarding the Tribe's water needs. NRCE examined existing community and irrigation water supply systems, developed projected demand through a 100-year planning period to assess future demands on both systems, inventoried available water resources, and created a development plan capable of meeting projected future requirements. The plans ensured that water development for the Tribes was compatible with the Tribe's overall development needs, including consideration of cultural and traditional practices. The plans were intended to help provide a general quantification of future demands for consideration in infrastructure improvement planning.

To complete the water plans, NRCE reviewed past engineering reports, agreements, water commissioner reports, water right databases, and water policies and plans to determine what information was available and identify missing information that needed to be developed. NRCE met with water users, irrigators, Tribal Water Resources Department staff, Tribal Water Commissions, federal agencies, and Tribal members to gather necessary information. NRCE facilitated meetings to gather comments from Tribal members and water users to encourage public engagement in the plan. Through these meetings, NRCE was able to refine and develop goals for the water plan. NRCE was able to identify risks and vulnerabilities that affect the Tribe and work to implement measures to minimize risks to Tribal members.

Below are ten examples of projects completed by NRCE and K&W that involved similar or relevant elements to the proposed project.

Bureau of Reclamation Lower Colorado River Basin Pilot Study

NRCE was retained by the US Bureau of Reclamation to participate in an agricultural water savings pilot study (Study) and consultation effort to explore methods currently in use to quantify agricultural water conservation and to recommend approaches to improve methods of quantifying agricultural water conservation in the Lower Colorado River Basin (LCRB). As part of the Study, NRCE reviewed past documents related to supply and demand in the LCRB, researched and evaluated academic and technical literature, conducted three interactive workshops with project participants, and prepared a draft and final report. NRCE met with project participants multiple times in interactive workshops throughout the process to discuss ideas, concerns, and expectations. Recommendations provided to NRCE by the project participants during the meetings, site visits, and workshops were incorporated into the final report. This project was completed in 2021.

Ute Indian Tribe Comprehensive Water Development Plan

NRCE provided technical support to the Ute Indian Tribe in preparing a Comprehensive Water Development Plan (CWDP) that was completed in February 2020. The primary purpose of the CWDP was to collect, assemble, compile, organize, and analyze pertinent data and information related to water resources within the Uintah and Ouray Reservation. In addition, the present water uses for irrigated agriculture, domestic, municipal, commercial, industrial recreation, and other uses were inventoried and assembled. The present and future water rights of the Tribe were addressed. Furthermore, the CWDP was a multifaceted and versatile effort to develop and promote both sustainable economic development and improvement of the standard of living and wellbeing of the Ute Indian Tribe population. Water conservation and environmental sustainability were also taken into consideration, which involved quantifying the available water supply, ascertaining Tribal water rights, assessing current uses, identifying ways to manage and enhance existing supplies, and developing new supplies to satisfy future needs. The CWDP also helped water managers and Tribal leaders formulate the management strategies and policies that will ensure adequate future water

supplies of the Ute Indian Tribe population. In addition to presenting basic water-related data, the CDWP will be a valuable resource for those who contribute to water-related decisions.

Iowa Tribe of Kansas and Nebraska Comprehensive Water Resources Management Plan

NRCE was contracted by the Iowa Tribe to provide technical assistance to the Tribe in the form of a Comprehensive Water Resources Management Plan and was tasked with identifying existing water uses, defining future water uses, and providing an inventory of the Tribe's water resources. The project is ongoing as of June 2024, and NRCE's analyses have included demographic projection, surface water resources evaluation, groundwater resources evaluation, determination of crop irrigation water requirements, determination of indirect flow requirements and environmental water uses, economic development and water demand planning, water rights marketing assessment, water rights settlement strategy development, and conceptualization of a water resources monitoring plan.

Cheyenne Water and Wastewater Master Plan

NRCE was subcontracted by Black & Veatch, Corp. to assess the raw water supply and delivery system for the City of Cheyenne. Tasks included a system inventory, existing water supply system model updates, drought vulnerability assessment, evaluation of the updated model, and a system improvement plan. The existing water supply model was developed in 1993 as part of the previous master plan and was updated using recent data for the system. In addition, a hydraulic model of the raw water transmission system was developed along with an improvement and expansion plan, which identified options to improve the collection and transmission capabilities of the system. The groundwater supply was also evaluated, including the technical and regulatory issues relating to groundwater resource use and future development.

Douglas County Public Works Integrated Transit and Multimodal Study

Kearns & West is designing and implementing the community engagement for Douglas County's Integrated Transit and Multimodal Study. This effort will improve existing transit services and find ways to provide reasonable and reliable transit to people who do not own or have access to their own transportation, who do not own a phone, and/or who have limited personal mobility. The study focuses on the northern area of Douglas County, including the City of Castle Pines, the Town of Castle Rock, Highlands Ranch, the City of Lone Tree, and the Town of Parker. Kearns & West developed the project's Community Engagement Plan, interviewed participating jurisdictions to understand needs and priorities, is providing strategic guidance to engage critical and underserved populations, and designing iterative and innovative engagement solutions – including focus groups, one-on-one consultation, and open houses – to help the project team identify places where the current transit network does not connect people to the places they want to go, and potential near- and long-term improvements to the existing system.

Colorado Department of Transportation, Front Range Passenger Rail

Population growth along the Front Range creates complex infrastructure and environmental challenges that contribute to traffic congestion, create unpredictable travel times, and stress the region's economic competitiveness and quality of life. Front Range Passenger Rail aims to develop a passenger rail train service operating from Pueblo to Fort Collins, with a future vision of connecting Colorado to New Mexico and Wyoming. K&W is currently working with the Colorado Department of Transportation (CDOT) and the Front Range Passenger Rail District to develop a Service Development Plan (SDP) for the Federal Railroad Administration (FRA). The SDP will define the where, when, and how future rail service will look like.

K&W is the engagement and outreach lead for the SDP. Support includes developing a robust public involvement plan, providing outreach and engagement opportunities to disproportionately impacted communities through grassroots engagement, administering communication systems management, developing messaging and materials for a wide range of target audiences, and facilitating services for stakeholder coalitions and the broader public across multiple municipalities including Adams County.

Environmental Protection Agency Region 8, Commerce City – North Denver Environmental Justice Forum

The neighborhoods of Commerce City and North Denver (CC-ND) continue to be disproportionately impacted by local environmental justice issues and historical impacts related to climate change and public health. K&W is working alongside EPA Region 8 and continues to facilitate an ongoing engagement process, consisting of community-based organizations, local government, and state agency representatives, to establish an environmental justice forum for the community. This forum will serve to help CC-ND residents, community-based organizations, local governments, and agencies identify opportunities for partnership, connect with funding and resources, and build ongoing collaboration to address growing concerns related to climate change. K&W provides facilitation and coaching for EPA Region 8 and the planning committee, helps members to identify common goals amongst competing interests, and builds lasting trust that contribute to establishing partnerships.

City of Fort Collins, Former Hughes Stadium Land Use Engagement

In 2020, a citizen-initiated ballot measure passed requesting that the City of Fort Collins rezone the Hugh Stadium property as a “Public Open Lands” district. K&W was chosen by the City to design a communications and engagement plan to solicit stakeholder input into potential development scenarios for City Council review. This project also includes developing consistent project messaging, facilitating discussions with relevant stakeholders, and managing digital engagement focused on educating and engaging the larger community.

City of Westminster, Water 2025 Stakeholder Engagement

Water 2025 is a long-term planning project to replace the city's aging Semper Water Treatment Facility by 2025 and ensure high-quality drinking water for the community. Members of the K&W staff* acted as the day-to-day leads for engagement strategy and facilitation of their stakeholder advisory committee. The complex process included regular meetings and charettes to review and assess private and public land parcels to ultimately reach a final recommendation for where the future drinking water facility will be constructed. *This work was performed by K&W staff while employed at a different company.

California Department of Water Resources — 2017 Central Valley Flood Protection Plan Update Facilitation

The Central Valley Flood Protection Plan (CVFPP) guides California’s participation in managing flood risk and describes a programmatic vision for flood system improvements over time in accordance with the requirements of the Central Valley Flood Protection Act of 2008. The 2017 CVFPP Update addresses implementation progress and recommends refinements to programmatic investments and policies needed to implement the CVFPP over the next 30 years. K&W served as the stakeholder engagement lead for the 2017 CVFPP Update, which featured an extensive, multi-faceted outreach process with stakeholders ranging from local flood entities; agricultural interests; non-governmental organizations; Tribal communities; small and/or disadvantaged communities; and local, state, and federal agencies and elected officials. K&W facilitated work groups, coordinated formal and informal briefings, facilitated coordination between the State’s Department of Water Resources and representatives from Regional Flood Management Planning areas, and designed and implemented an array of additional engagement opportunities, including open houses, public workshops, and webinars. Additionally, K&W facilitated the Interagency Advisory Committee, a group that guided the development of the CVFPP’s Conservation Strategy, which outlines a process for ecosystem functions improvement through the integration of ecological restoration with flood risk reduction.

3.0 Firm's Capacity to Support Project

The Team has extensive experience working with clients to better understand their water supply and demand. Through a detailed assessment process, the Team will gather and analyze data on existing water systems, consumption patterns, and potential future demands to tailor solutions that meet specific needs and challenges. The Team has the resources needed to complete the project on time and on budget. The Team includes a multidisciplinary group of engineers, hydrologists, environmental scientists, planners, GIS specialists, and public engagement specialists. Their expertise is crucial for gathering and analyzing water use data, projecting future population growth, preparing reports, engaging with the public, and analyzing land use policy. The Team has the time and capacity necessary to complete the project.

The key personnel who will be working on this project are qualified to complete a water plan. These personnel include highly educated professionals with advanced degrees in civil engineering, water resources, irrigation engineering, and hydrology. Key personnel also include professional engineers licensed in Colorado. Our team is familiar and experienced in water rights and regulatory frameworks all throughout the western U.S., including Colorado. NRCE's key personnel each have many years of experience working on water policy, planning, and implementation. The Project Lead for the development of the water plan and has more than 18 years of experience in water supply planning, water rights, water policy, engineering design, and expert report development. The project lead also holds a bachelor's degree in civil engineering and a master's degree in irrigation engineering.

The Team is uniquely qualified to conduct and successfully complete this project. Multiple staff members have advanced degrees in civil engineering, irrigation engineering, water and environmental resources, management strategic communications, and conflict resolution. In addition, NRCE has multiple Professional Engineers on staff. NRCE has extensive work experience in preparing water development and water master plans. Our highly skilled team members have experience in facilitating community meetings, gathering public comments, reviewing and analyzing existing water plans, GIS mapping, identifying risks, and implementing measures to mitigate risk. The Team is well qualified to gather and analyze the necessary data to develop a water plan that meets the needs of Douglas County.



Prepared for

Douglas County 2050 Comprehensive Water Plan

FORSGREN
Associates Inc.

June 28, 2024

Department of Community Development
Douglas County
100 Third Street
Castle Rock, CO 80104

RE: RFI No. 000-00, Douglas County 2050 Comprehensive Water Plan

Dear Douglas County Water Commission (DCWC) Members and County Staff:

Water supply is vital to Douglas County's future, and that must continue to be reflected in the County's land use planning processes. This Comprehensive Water Plan presents a tremendous opportunity to align the County's water supply interests and offer a clear understanding of current and future water sufficiency across the county. You can then take meaningful steps to promote policies and collaborate with water providers and other stakeholders to optimize the use of those supplies.

We are excited about the opportunity to partner with you in this initiative. Forsgren is again teamed with LRE Water and Michael Baker International (MBI) to collaborate with you on this Plan. We successfully teamed on the Arapahoe County Water Supply Study and the award-winning El Paso County Water Master Plan, both having very similar objectives. We also teamed with LRE Water for the Elbert County Water Master Plan. Our firms have developed a strong working relationship resulting in other successful engagements over the years.

Our uniquely talented team offers unmatched experience and value. I am a proud Douglas County resident and would be your Project Manager, having also led the Arapahoe and Elbert County Water Supply Studies, the Elbert and El Paso County Water Master Plans, and the Douglas County Regional Water Conservation Program. Mr. Craig Dossey will be our Technical Advisor; he was our client for the El Paso County Water Master Plan. LRE Water will perform our mapping, data analysis and groundwater modeling. MBI will lead our public engagement and land use planning integration.

We will stress close collaboration with Douglas County staff and DCWC oversight, effective project management, and robust public/stakeholder engagement. I have attended all the DCWC meetings and understand that:

- There is no need to “reinvent the wheel.” We can leverage much of the available water supply/ demand information from the South Metro Water Supply Authority, its Douglas County members, and other water providers.
- There has been little engagement of well owners in the rural areas, and there must be a clear understanding of their water supplies and how to address possible site-specific shortages over the long term.
- The County needs to take a “fresh look” at the status of the Denver Basin water resources, and how to extend their use.

I would respectfully ask for the opportunity to present how our combination of regional water planning, land use planning, and public engagement experience can work for you. Please call 720.232.6644, or email me at wkoger@forsgren.com if you need anything further.

Sincerely,



Will Koger, P.E.
Vice President, Division Manager

DOUGLAS COUNTY GOVERNMENT

Department of Community Development

100 Third Street

Castle Rock, Colorado 80104

Telephone: 303-660-7460

www.douglas.co.us

REQUEST FOR INFORMATION (RFI)

NO. 000-00

PROJECT TITLE

**YOUR RESPONSE MUST BE RECEIVED NO LATER THAN
MONTH, DAY, 20XX @ 4:00 P.M.**

RFI CERTIFICATION

We offer to furnish to Douglas County the information requested in accordance with the specifications and subject to the terms and conditions described herein:

NAME: Will Koger

ADDRESS: 56 Inverness Drive East, Ste 112

CITY: Englewood STATE: CO ZIP: 80112

TELEPHONE NUMBER: 720.214.5884 FAX NUMBER: _____

E-MAIL ADDRESS: BY: wkoger@forsgren.com

Wilbur Koger

(Printed or Typed Name)



(Written Signature)

TAXPAYER I.D. NUMBER: 82-0255723

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said response and furthermore to potentially award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful firm.

SECTION ONE ~ GENERAL AND DETAILED PROJECT INFORMATION:

A. Scope of Services:

Through this Request for Information (RFI), the Douglas County Government, hereinafter referred to as the County, respectfully requests information from responsible, qualified firms for the provision of a Douglas County 2050 Comprehensive Water Plan (Water Plan), as specified. It is the intention of the County to review all RFI responses, short-list those responses, and post an actual Request for Proposal (RFP). Only those companies, who have submitted a potentially acceptable response to this RFI will be allowed to submit a response during the formal RFP process.

This RFI process should be considered "Step One" of a multi-step solicitation process.

Acknowledgment:

Forsgren acknowledges receipt of Addendum No. 1.

Affirmation:

Forsgren hereby affirms that we understand the scope of services and all conditions or requirements contained in the RFI. We understand that the scope of services is partially complete and will be refined following the RFI responses.

Mission Statement:

Engineering Stronger Communities

Standard of Quality Statement:

The standard of care for all professional engineering, consulting and related services performed or furnished by Engineer and its employees will be the care and skill ordinarily used by members of Engineer's profession practicing under the same or similar circumstances at the same time and in the same locality. Engineer makes no warranties, express or implied, under this Agreement or otherwise, in connection with Engineer's services.

Conflict of Interest:

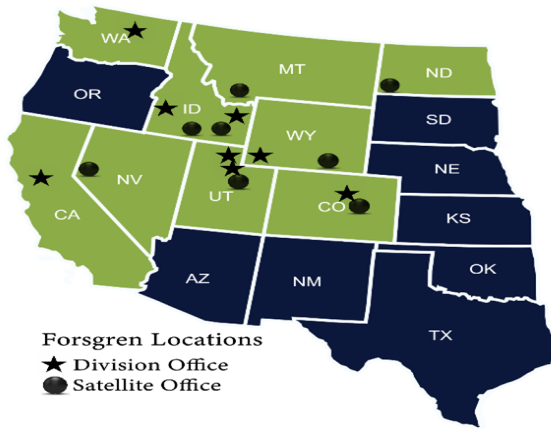
Although our respective firms have some client relationships within Douglas County, none constitute a conflict of interest.



FIRM AND TEAM QUALIFICATIONS

We have re-assembled a team with extensive experience in Douglas County and throughout the Front Range, with an in-depth understanding of the region's challenges specific to water and land use. Forsgren, LRE Water, and Michael Baker International (MBI) will build on prior successes working together to provide you with a well-rounded, highly qualified and determined team to fulfill your goals for this Comprehensive Water Plan.

FORSGREN ASSOCIATES, INC.
56 Inverness Dr East, Ste 112 | Englewood, CO 80112
(720) 214-5884



Forsgren is an employee-owned, multi-disciplined regional firm with over 150 engineers, scientists, technicians, surveyors, and support specialists. We will perform essentially all work on the Comprehensive Water Plan at our **local office in the Inverness Business Park, only 15 minutes from Douglas County's administration building.** But we can also draw on the resources of a coordinated network of 16 offices in 9 states throughout the West.

Our regional coverage and relational organization allow us to respond promptly and appropriately to a broad range of client needs, with expertise tailored to those needs. We provide the right person for the right task-without unnecessary costs or overhead. Established in Rexburg, Idaho in 1962, Forsgren continues to build on its reputation for excellence with over 12 years in Colorado. As a result, most of our work is for repeat and referred clients.

We strive to be the best at what we do, and stay current with the latest technologies for efficient engineering operations. Our depth of in-house expertise and staffing allow us to provide Douglas County with personal, cost-effective service, promptly responding to your water planning needs. We are confident that we will not only meet, but exceed your expectations.

More than 60 percent of Forsgren's work is related to planning, design and construction oversight of water supply, water distribution, wastewater collection, water reuse, and treatment projects. Forsgren's engineers and scientists are committed to keeping clean, safe, and reliable water flowing. Our prior and current engagements that have uniquely prepared us for the Douglas County 2050 Comprehensive Water Plan (DCC Water Plan) include:

- ➔ **Arapahoe County Water Supply Study** - Evaluating sufficiency of water supply planning to meet projected 2050 demands, ranging from areas served by Denver and Aurora to a wide swath of the county primarily dependent on Denver Basin groundwater. **TEAMED WITH LRE WATER AND MBI**
- ➔ **Elbert County Water Master Plan** - Building on our 2018 Water Supply Study to update evaluation of Denver Basin groundwater to meet projected demands through 2050, and recommending policy changes to extend its use. **TEAMED WITH LRE WATER**
- ➔ **El Paso County Water Master Plan** - Colorado's first county-wide water master plan encompassing the Colorado Springs metro area and rural eastern El Paso County. **TEAMED WITH LRE WATER AND MBI**
- ➔ **Elbert County Water Supply Study** - Analysis of existing water resources and maximizing their use vs. projected demands for a largely rural county near metro Denver
- ➔ **Elbert County Water/Wastewater Planning for Agate-** Planning for water/wastewater service to a small rural community along I-70 east of Denver
- ➔ **Basin Implementation Plan Update for the Arkansas River Basin** - "Local Expert" to update the programmatic needs for optimizing water use across the basin, a component of the updated Colorado Water Plan - **TEAMED WITH LRE WATER**
- ➔ **Pikes Peak Regional Water Authority (PPRWA) Regional Reuse Study** - Feasibility study regarding diversion, storage, treatment and delivery of reusable return flows from Fountain Creek to serve Colorado Springs and surrounding communities. **TEAMED WITH LRE WATER**
- ➔ **PPRWA Regional Water Supply Infrastructure Study** - Feasibility study regarding diversion, storage, treatment and delivery of renewable water over a 70-mile corridor to serve Colorado Springs and other communities
- ➔ **El Paso County Water Loop Study** - Feasibility study regarding diversion, storage, treatment and delivery of reusable return flows from Fountain Creek to serve suburban communities around Colorado Springs.
- ➔ **El Paso County's American Rescue Plan Act (ARPA) Funding Program for Water/Wastewater Improvements** - Program manager for grant allocation and oversight

FIRM AND TEAM QUALIFICATIONS

LRE WATER

1221 Auroria Parkway | Denver, CO 90204
 (303) 455-9589

LRE Water understands that water is local, and that success of the DCC Water Plan requires comprehensive understanding of surface and groundwater availability, water resource management, water rights administration, and water supply planning throughout the county and state. Their interdisciplinary company is focused on bringing creative solutions to water issues. Their staff of over 60 technical professionals provide services in the areas of water rights and water supply planning, groundwater, environmental permitting, and water innovation and technology.

Over 50 years, LRE Water has provided leadership in engineering and consulting services related to planning, managing, and developing water resources throughout the Rocky Mountain West. It is this unique combination of leadership and technical expertise that their clients rely upon when planning for and managing their most precious resource: water.

LRE Water is uniquely qualified for this DCC Water Plan given their extensive work in the region including very relevant current and prior studies, and teaming experience:

- ➔ **Elbert County Water Master Plan - TEAMED WITH FORSGREN**
- ➔ **Arapahoe County Water Supply Study - TEAMED WITH FORSGREN**
- ➔ **El Paso County Water Master Plan - TEAMED WITH FORSGREN AND MBI**
- ➔ **Basin Implementation Plan Update for the Arkansas River Basin - TEAMED WITH FORSGREN**
- ➔ **PPRWA Regional Reuse Study - TEAMED WITH FORSGREN**
- ➔ **Eastern Arapahoe County Water Supply Plan Update**
- ➔ **Watkins/Bennett Supply and Demand Analysis**

MICHAEL BAKER INTERNATIONAL (MBI)

165 S Union Blvd, Suite 1000 | Lakewood, CO 80228
 (720) 270.9041

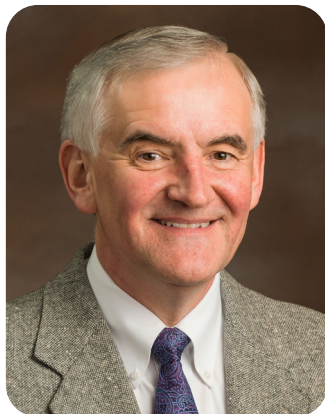
MBI has delivered a wide variety of planning and engineering services for Colorado and across the nation. They create and maintain strong professional relationships through delivery of high-quality, cost-effective, and timely professional services. With over 80 repeat Colorado clients, MBI's high-quality work and positive client relationships drive mutual success.

MBI's staff will contribute expertise, creativity, and dedication to solve the unique needs of Douglas County. Leveraging their experience on recent and similar planning projects, they will design and deliver an engagement process that allows for broad participation and understanding of the plan's importance. Using collaborative techniques that have proven successful, they will help the team deliver a plan that has key stakeholder support.

- ➔ **Arapahoe County Water Supply Study - TEAMED WITH FORSGREN AND LRE WATER**
- ➔ **El Paso County Water Master Plan - TEAMED WITH FORSGREN AND LRE WATER**
- ➔ **Pikes Peak Regional Office of Emergency Management - Hazard Mitigation Plan - TEAMED WITH FORSGREN**

KEY STAFF

Our Team will once again work together as a single team bringing together unmatched expertise in county water plans. Qualifications of our lead team members follow.



WILL KOGER, PE

Will is going to lead the Water Plan Team and serve as your primary point of contact. Will was the Assistant General Manager/Authority Engineer at Arapahoe County Water and Wastewater Authority (ACWWA) and Castle Rock’s Town Engineer and participated in the South Metro Water Supply Authority on behalf of ACWWA, and the Town of Castle Rock. He also served on the Board of Directors for the Plum Creek Water Reclamation Authority. Will leads or led the following efforts as project/program manager:

- Elbert County Water Master Plan
- Arapahoe County Water Supply Study
- El Paso County Water Master Plan
- Elbert County Water Supply Study
- Arapahoe and Douglas Counties Regional Water Supply System-- Appraisal and Feasibility Studies for US Bureau of Reclamation Funding
- Arapahoe County Water and Wastewater Public Improvement District--Capital Improvements Program
- Douglas County Regional Water Conservation Planning Program
- El Paso County ARPA Funding Program for Water/Wastewater Improvements
- Pikes Peak Regional Water Authority (PPRWA) Regional Reuse Study
- El Paso County Water Loop Study
- PPRWA Regional Water Supply Infrastructure Study



WILLIAM (BILL) FRONCZAK, PE, ESQ.

Bill is a groundwater expert and will lead our team’s mapping and data analysis, and groundwater modeling analysis tasks.

- As Assistant Project Manager for the Arapahoe County Water Supply Study, led mapping/data analysis, and preparation of a groundwater model to refine the estimated productivity of the Denver Basin aquifers.
- For the Elbert County Water Master Plan, led the analysis of Denver Basin groundwater within the county and its sufficiency to serve projected growth through 2050. Assisted with public engagement including convening a focus group on wells and groundwater.
- Bill was Chief of Water Supply for the Colorado Division of Water Resources, where he focused on administration and enforcement of water rights for the Colorado Groundwater Commission, and coordinated water rights administration strategy with Water Division 1 and the State Engineer.
- As Project Manager for the Eastern Arapahoe County Water Supply Plan Update and Watkins/Bennett Supply and Demand Analysis, Bill developed a comprehensive understanding of the water challenges and opportunities throughout the County.
- Through his commercial water work, Bill has assisted oil and gas operators in understanding the complexities of water resources development in Arapahoe and Adams Counties.



CRAIG DOSSEY, ESQ.

Craig will serve as our Technical Advisor for the DCC Water Plan. He is the former Planning and Community Development Director for El Paso County and was our client for that county’s Water Master Plan. Craig is now the President of Vertex Consulting Group. His value to the Study is shaped by:

- A technical advisory role for the Arapahoe County Water Supply Study
- Championing long-range planning efforts to develop the first of its kind Water Master Plan for El Paso County as well as a new statutory Master Plan, which effectively updated numerous prior planning efforts across the County
- Almost 20 years of experience in planning, land development, project management, and government administration of water and land-use related projects
- Primary land use reviewer and project manager tasked with ensuring that each project complied with the County’s regulations, including the County’s Approval of Location and “1041” Regulations and all site design-related standards

Michael Baker
INTERNATIONAL



ANNE KUECHENMEISTER, AICP

Anne will lead the stakeholder/public participation and the land use tasks. She will also collaborate with the team for recommendations for regulatory modification.

- Urban planner specializing in public engagement. Her public engagement work builds a thoughtful process paired with effective, creative, and innovative tools and strategies for engagement.
- As a task leader for the Arapahoe County Water Supply Study, Anne led our extensive public outreach that included facilitating a stakeholder advisory committee, online engagement surveys, informational handouts and web postings, a virtual public information session and two regional open houses. She also collaborated with the team to integrate public feedback into recommended water policies.
- Also a task leader for the El Paso County Water Master Plan, Anne managed public outreach via an online engagement program and open house, and advised on integrating water issues into land use planning.



MIKE WARESAK, PE

Mike will coordinate the engineering and technical tasks for the DCC Water Plan. He is a senior-level engineer with over 35 years of experience preparing water supply, distribution and treatment studies and designs. Mike’s projects include:

- Willows Water District Condition Assessment & Capital Improvements Plan
- El Paso County Water Loop Study
- Elbert County Water Supply Study
- Del Paso Manor Water District, CA Master Plan Update
- Monument Wells 3/9 Water Treatment Plant Engineering Report and Design
- Stratmoor Hills Water District Project Needs Assessment
- Cimarron Water Treatment Plant Engineering Report and Design

Michael Baker
INTERNATIONAL



TED HEYD

Ted is a Senior Planner who will help our team evaluate water conservation strategies related to land use planning. As a task leader for the Arapahoe County Water Supply Study, he led our team in estimating possible water savings that could be achieved through 2050 by applying water-wise (drought tolerant) landscaping to commercial and residential development. Ted's work involved a review of jurisdictions' landscaping regulations and recommendations across the county. He then prepared a quantitative analysis demonstrating the substantial water savings that could be achieved over time.



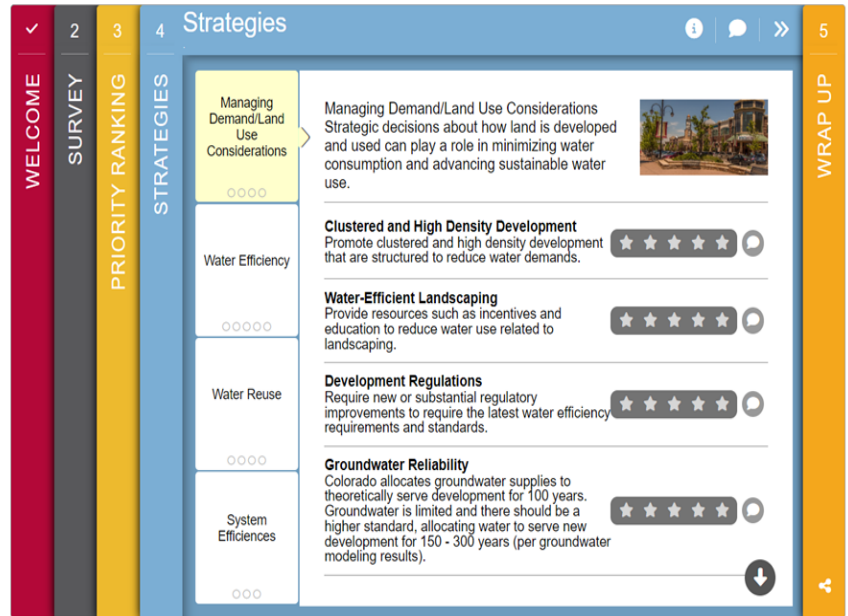
PROJECT APPROACH

The DCC Water Plan is the means to an end; that of building flexibility and resilience for a broad range of land uses with respect to water resources, considering continued growth and extended regional drought. There is simply no more important goal in assuring a bright future for the County. Our Team stands ready to help with this effort as described in this section, first with an introduction to our project management and public engagement functions. We then follow the County’s outline of completing the work in three phases, with three specific tasks in the first phase. We would ask for your feedback on this project approach narrative and then follow with a detailed task list, possibly in response to a request for proposals (RFP).

Project Management

Forsgren will provide project management--start to finish. We know that good communication is essential to that function! Our project manager, Will Koger, will maintain regular contact with the County’s Project Manager. Our task leaders and specialists will also be included as we progress through each of the tasks ahead. We will provide ongoing communication and responsiveness—consisting of phone calls, face-to-face and virtual meetings as well as email. Our work must reflect the County’s direction, and that can only happen if we’re talking regularly and collaborating closely throughout the project.

Performance, budget, and schedule are the measure of good project management. We have included a proposed schedule in this submittal and will develop a budget with further input from the DCWC and County staff. Once agreed upon, we will use the budget and schedule to track progress on the DCC Water Plan. Each major task will be identified in our regular monthly invoices which will also include hours by staff and expenses, with a summary of the work performed. Additional details on charges are always available upon request.



Our team successfully used the on-line MetroQuest engagement platform for the Arapahoe County Water Supply Study and the El Paso County Water Master Plan. This user-friendly tool can include a survey, an on-line comment map, and strategy / priority ranking exercise in a highly visual format.

PROJECT APPROACH

YOU'RE INVITED
ARAPAHOE COUNTY WATER SUPPLY STUDY OPEN HOUSES

APRIL 24 | 5 - 7 PM
SMOKY HILL LIBRARY
5430 S. Biscay Cir.,
Centennial, CO

MAY 9 | 5 - 7 PM
KELVER LIBRARY
585 S. Main St, Byers, CO

April 24th
Native and water wise
landscaping and
planting experts from:
DENVER BOTANIC
GARDENS
WILD
ONES

ARAPAHOE COUNTY

We will include the budget and schedule in a Project Management Plan that will also show staffing assigned by task. All work will be completed at the direction of the County Project Manager. At a minimum, our Project Manager will schedule monthly coordination meetings with the County’s Project Manager, but with much more contact throughout the month. Other team members will be included depending on the focus of each meeting or conference.

Stakeholder / Public Engagement

As all stakeholders and community members need reliable, resilient water supplies and systems, a broad spectrum of input is important. Community members can provide input on priorities, experiences, needs and perceptions of water. To obtain the most useful input on proposed strategies, we must first provide some cursory level of education.

The Forsgren team has successfully applied a range of community engagement tools for county-wide water planning--most recently for Arapahoe, Elbert and El Paso Counties. On the next page is a menu of possibilities to choose from, and we would collaborate with you to select the right mix for Douglas County. In developing our final engagement plan, we will also work with you to identify key stakeholders, key project needs, preferences and priorities, and desired goals for engagement.

ENGAGEMENT AND OUTREACH STRATEGIES MENU

The following strategies are recommended as options for this plan, final strategies will be selected through scoping.

Strategy	In person, digital, hybrid	Description	Why we are recommending this strategy
Project Advisory Committee	Hybrid	Representation from water suppliers, planners, HOA and neighborhood groups, developers, and others who are interested and/or have a stake in water supply.	This group helps guide the process and outcomes, and shares project information with their networks to boost engagement and input. The diverse representation helps bring a holistic perspective to the work.
Website	Digital	A page on Douglas County's website with project information, milestone updates, and opportunities for engagement	The County website is a familiar resource for many in the community and provides a centralized location for input.
Project Interest Sign Up	Digital	A link and QR code can be used to complete an interest form to receive project updates. This will be posted on the website, in emails and newsletters and on physical flyers.	We will share project updates and engagement opportunities with those who sign up.
Engagement Hub (MetroQuest and/or Social Pinpoint)	Digital	An engagement hub offers a user friendly and more robust way to gather broad input. We can ask about priorities, strategies, tradeoffs, and more using a variety of survey formats. Demo	We have had excellent response rates with these tools, garnering input from hundreds of respondents and collecting thousands of datapoints for water supply studies. The input is used to inform plan recommendations.
Outreach Packages	Digital	Social media and newsletter templates provided to the advisory committee and project team at milestones for broad distribution.	These materials will help advertise engagement opportunities and provide project updates. Advisory members will receive ready-to-go content for distribution, expanding the reach of the project.
Project One-Pager	Hybrid	A one-pager that describe the project, the goals, the outcomes, timeline and how to provide input or ask questions. This is a resource we can use throughout the duration of the study. Available in print and digital format.	This resource provides a clear and consistent project description for all team members and can readily be shared when inquiries come in. It will also direct people to the interest form sign up so they can stay connected.
Public Open House	In person	An opportunity to share information about the project, dialogue with stakeholders and answer questions. The location, time and resources are tailored to the preferences and needs of the study.	Participants appreciate an opportunity to ask specific questions and talk to a variety of experts, and they can digest information at their own pace.
Virtual Public Meeting	Virtual	Held as an online meeting; participants log on to listen to a presentation and can ask questions using the chat, when responding to digital polling and by unmuting.	This format is useful for engaging community members who prefer a remote, digital format and would like a more formal presentation.
Existing Events	In person	Attending existing, planned events in the community with study information is a great way to get new audiences engaged in a study.	Attending these events opens doors to engaging with a wider cross-section of the community, reaching new audiences.
Community Responsive Resources	In person or virtual	Bring in resources that respond to community priorities and preferred strategies at public meetings or in digital outreach.	As the team learns about community priorities and preferences, we can invite relevant organizations to attend our events to share resources and education. An example is groups offering tips and supplies for water-wise landscaping.
Focus Groups	In person	Groups come together to discuss strategies and provide support on implementation.	This format can allow for more in-depth discussion on proposed strategies and implementation measures and how they could be refined for maximum effect in a specific context.
Stakeholder Specific Engagement	In person	Structure engagement specific to a particular group in the community, this could be youth, elderly, HOAs, etc. To have a more robust touch point, tailored to their needs.	This could be helpful to gain the confidence of a group(s) that is particularly skeptical of the plan and its outcome.

PHASE I – WATER SUPPLY AND DEMAND ANALYSIS

The water supply and demand analysis is a logical starting point, and we will accomplish that in three major tasks as described in the RFI and expanded upon below.

Task 1: Water Provider Data Collection

A. Collect Water Provider Data

1. Obtain, review and evaluate available water supply plans from all water providers (including municipalities, water districts, special districts, water companies, and community well systems) and regional entities that extend into the county such as the South Metro Water Supply Authority.
2. Reference the Colorado Water Plan and its provisions applicable to Douglas County and its water providers.
3. Reference the Basin Implementation Plans that apply to Douglas County and its water provide.
4. Prepare a comprehensive water supply and water use profile for Douglas County water providers starting with the template provided in the RFI, and presenting the water information to the DCWC. Some of that data will be available from the State's database. We performed very similar tasks for the El Paso County Water Master Plan and for a handful of regional water infrastructure studies.

LRE Water developed the municipal water efficiency plan (HB04-1365) data portal for the Colorado Water Conservation Board (CWCB), and understands how to efficiently extract and use information within the required reports to support water supply and demand analyses on a regional level.

- #### B. Tabulate water resource supplies and reliability and source of supply use data including:
- a. Tributary, non-tributary, not-nontributary, alluvial water (well), surface water, water rights, water storage rights, contracts, or commitments of water providers and transfer of water from providers external to Douglas County.
 - b. Determine and tabulate the average annual yield and safe yield of the surface and groundwater water rights identified above and extrapolated in 10-year increments through 2050.
 - c. Analyze the extent of current wastewater reuse and identify the source of the reuse water, noting whether it is derived from renewable or nonrenewable resources.
- #### C. Note other water information, as applicable, including current and projected water conservation efforts by County water providers to extend supplies and serve new growth through 2050.
- #### D. Analyze the results of the information gathered, including annual water production history, and current and projected water use for each municipality or water district.
- #### E. Mapping, development of figures and digital data

Develop a comprehensive mapping and data system to support the discussion of opportunities and challenges associated with water supply planning throughout Douglas County. Colorado water is unique in that water providers account for all water used from the source of supply to the point of return, including system losses or even lawn irrigation return flows that occur between. Not only is the water tracked, but the specific types of use or at specific places is limited by permits or court decrees.

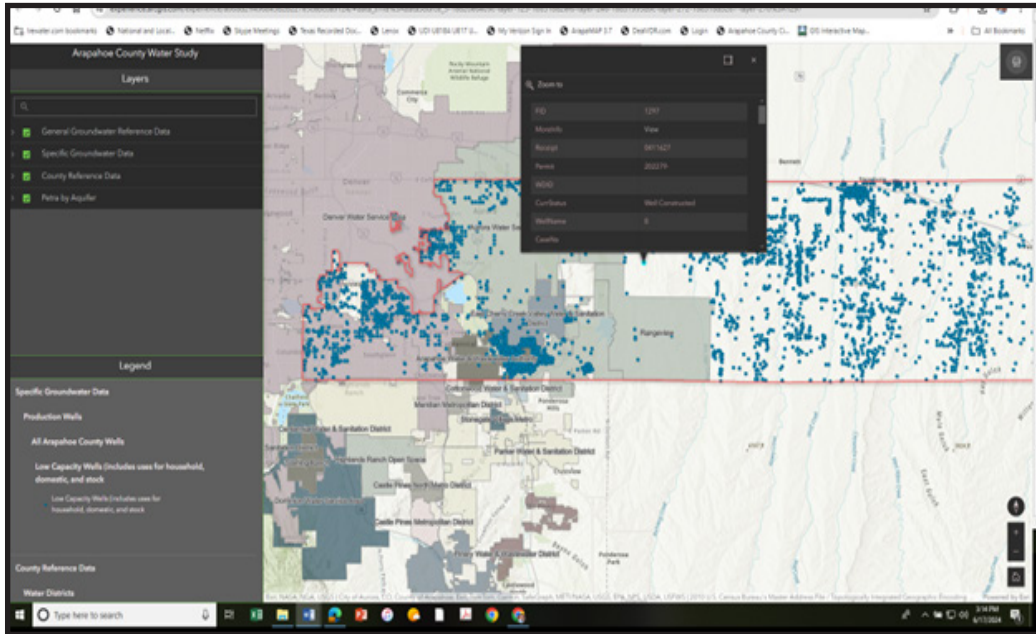
Further, most municipal water supplies have varying degrees of reliability or annual firm yield based on climate, changes in river administration, declining water levels in aquifers, or contractual obligations or limitations. To understand the limits (also known as institutional barriers) is to understand the potential for future shortages and the opportunities for cooperation, sharing, and interconnection between water providers.

Concerning the mapping, development of figures, and digital data, our team has performed this type of analysis for Arapahoe, Elbert, and El Paso Counties. We will first collect digital and other publicly available data and organize it into a geodatabase and interactive GIS map.

Once this is done, the GIS map can serve two purposes. The first is to assist the County in its decision-making regarding the use of groundwater to support new development and growth. The second is for public use as a tool to understand the groundwater resources they rely on, and create the ability to rapidly find accurate, concise information regarding their groundwater. This mapping will also incorporate data developed during the groundwater analysis to again provide the County with a visual tool to understanding groundwater availability for future development and growth.

Our team envisions the development of a GIS database with layers for water wells, water rights, water providers' boundaries and service areas, water providers' existing and projected facilities, and County

data. The database will also have hyperlinks to Colorado Division of Water Resources (DWR) and other publicly available data as demonstrated in the figures below. Finally, the database will house the groundwater analysis data.



Water providers and wells, Arapahoe County

The data collected could include the following:

- ◆ County GIS/digital data
- ◆ County existing and future growth scenarios
- ◆ County administrative boundaries related to 18A designations
- ◆ Identified water provider boundaries, service areas, current and future zoning plans, and to the extent available, existing and projected water facilities that can be shared
- ◆ GIS data from DWR regarding:
 - Well permit and structure data (both Denver Basin and alluvial)
 - Pre-213 and other data regarding Denver Basin groundwater (i.e. not nontributary [NNT], nontributary [NT], and deemed consent boundaries)
 - Active surface water rights
 - Regional Denver Basin data sets available from the USGS (water levels, geophysical data, etc.)
 - Groundwater analysis data (PETRA analysis)

This GIS map and underlying data will be used in the DCC Water Plan to:

- ◆ Assist in the identification of data gaps and information needs.
- ◆ Assist in identifying overlap of service areas, areas of cooperation between service areas, areas of possible interconnections, and other water-sharing services (regional facilities).
- ◆ Assist in the identification of barriers to sharing water services.

Task 2: Water Demand Projection Analysis

Our team will analyze currently planned and 2050 projected development, and full buildout projected water demands by water providers as compared to current water supply. This will include analysis for land within existing water provider service areas and areas expected to develop with individual wells. We will then use this analysis to develop a county-wide gap analysis between water supply and demand, much as we did for El Paso and Arapahoe Counties.

The 2023 Colorado Water Plan used a scenario planning process with five different forecasts using different assumptions about the state’s growth. These included “business as usual, weak economy, cooperative growth, adaptive innovation, and hot growth.” Arapahoe County considered the “weak economy” scenario to be too pessimistic, possibly leading to underestimating future water demands. They settled on the “business as usual” forecast at the low end and the “hot growth” scenario at the upper end, effectively bracketing potential water demand conditions. Our team then used those scenarios to identify a range of demands for analysis.

We will use the DWR well database to catalogue the location of Denver Basin wells as described under “mapping” and assign an estimated production level to approximate the total, current supply from these sources to support the gap analysis. Our team will forecast future consumption by assuming wells currently in production will continue to produce at the current rate (with decline curves by aquifer) and by adding the anticipated consumption from future wells. We will use the County’s growth analysis to project a new well count in rural areas. The intent is to account for the current and future production for this sector in the gap analysis through 2050.

Task 3: Groundwater Analysis

The groundwater analysis is an integral part of the DCC Water Plan and we recommend that this analysis be accomplished concurrently with the rest of the Plan, and by the same team. Having performed similarly in our work with Arapahoe County, we found organizing in that way promoted excellent coordination of the analysis with the broader water study.

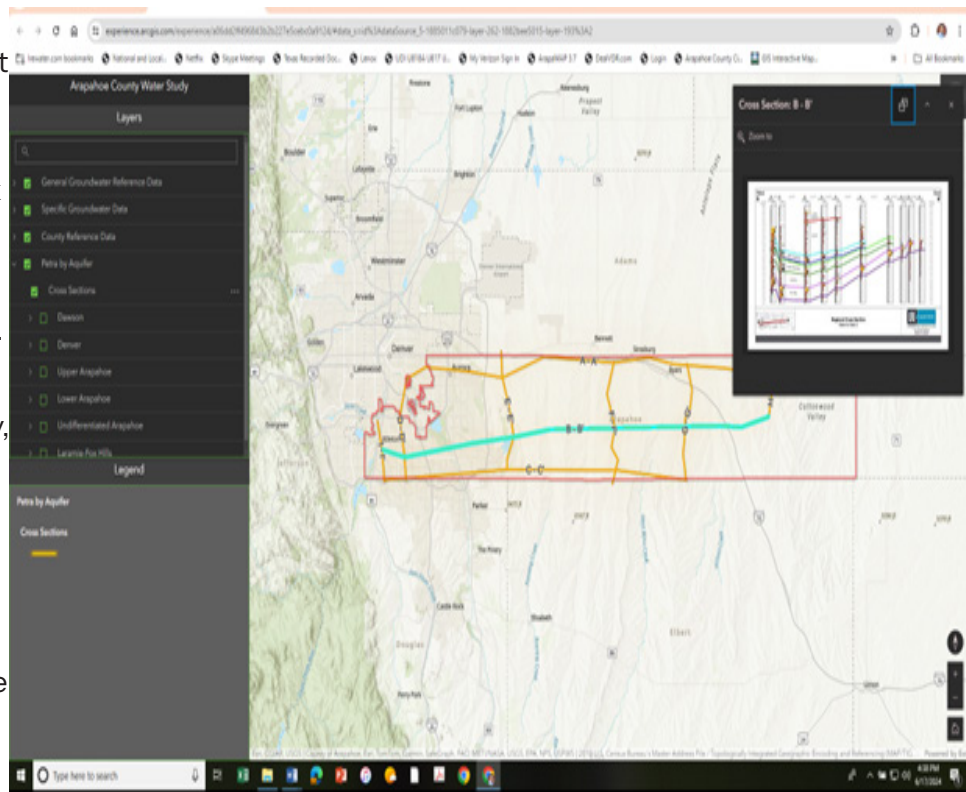
While several Douglas County water providers have increased their use of renewable water for existing and future development (surface water and alluvial groundwater), development in the unincorporated areas of the County continues to rely upon nonrenewable Denver Basin groundwater. Although this has been the primary supply for the region, the resource is not consistent across the county and is declining rapidly in some locations.

Allocation of groundwater is straightforward and governed by state law. However, the ability to withdraw the computed allocation can be strained due to fine-grained geology and potential well-to-well impacts on a local and regional scale. This means significant water rights on paper can have a physical supply of wet water that is substantially less. For water providers, residents, and developers dependent upon this nonrenewable resource, this presents a significant challenge. The focus of this analysis will be to identify those areas where the physical supply of groundwater does not meet the computed allocation.

Water quality can also be a major concern for water providers, residents, and developers. Denver Basin supplies are susceptible to elevated levels of radium, uranium, selenium, arsenic and other naturally occurring constituents, in addition to the more typical iron and manganese exceedances. Total dissolved solids (TDS) can also be an issue, primarily in Laramie-Fox Hills wells.

Our team has been directly involved in Denver Basin groundwater analyses and issues for water providers throughout Douglas County. Through these projects and other groundwater projects for private individuals throughout the county, we have compiled a significant amount of groundwater data. We will use this previously compiled public data as the foundation for the work to be completed under the groundwater analysis.

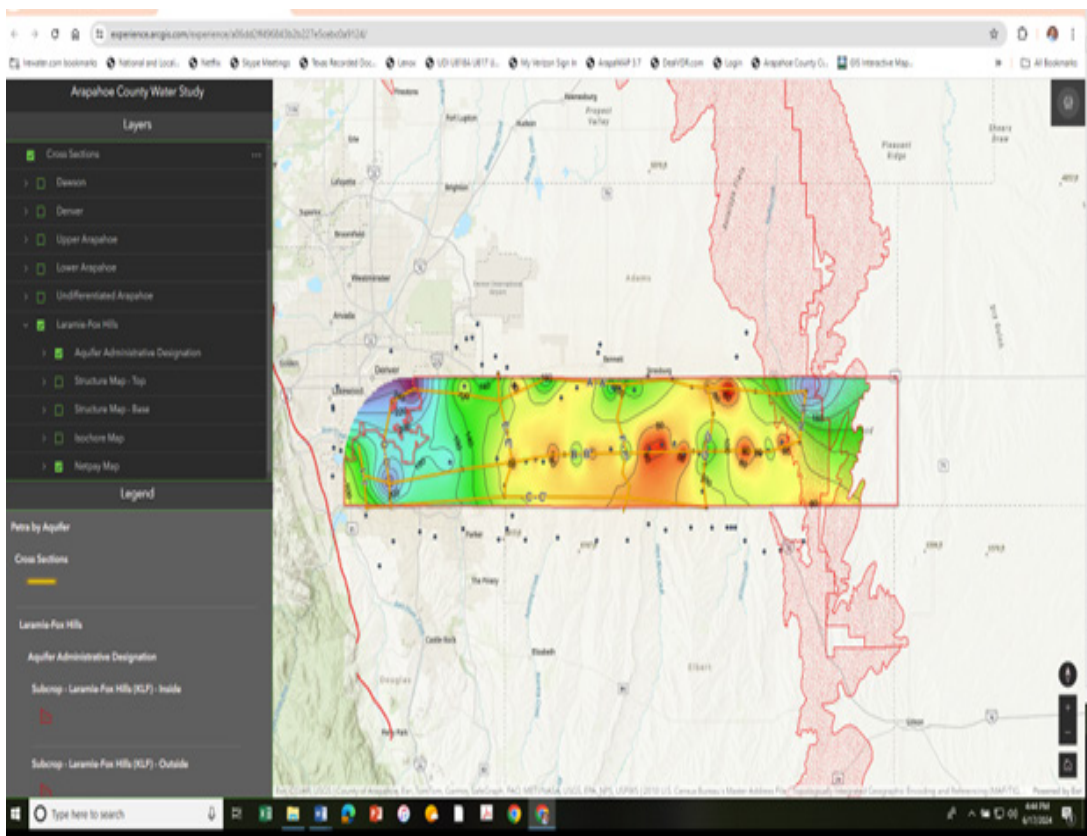
Moreover, a key component of that analysis will be the use of a PETRA model. This model uses geophysical and raster logs from numerous public resources (DWR, USGS, Colorado Geological Survey, Colorado Energy & Carbon Management Commission) to develop a picture of the Denver Basin aquifers. This model will help us analyze these data to further refine the amount of groundwater that is physically available for appropriation. We will use collected data and geophysical and raster logs within the county to create cross-sections that define the extent of Denver Basin groundwater; depth, net sand, thickness, and productivity.



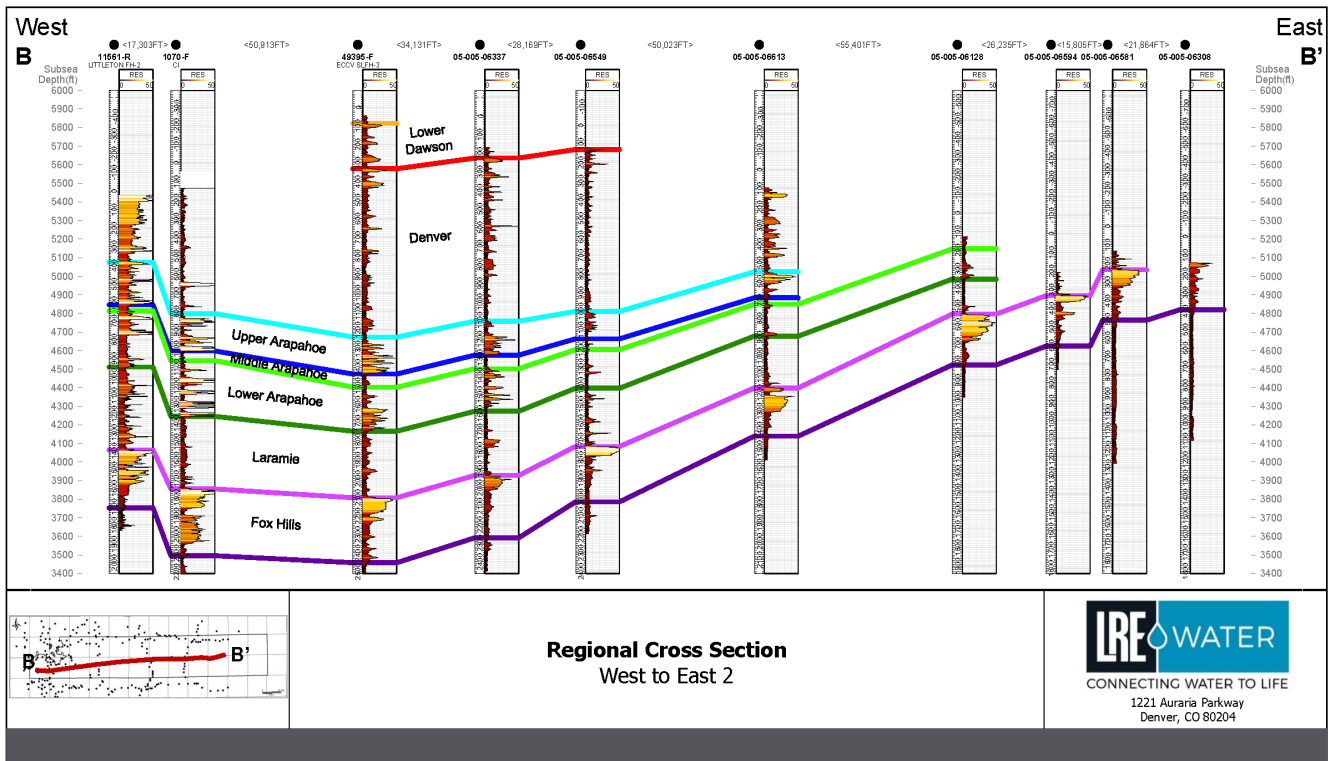
Map of cross-sections for groundwater analysis, Arapahoe County

To accomplish this, our team will:

- ◆ Map unincorporated lands within the county and prepare a water inventory of these lands
- ◆ Compile water rights, well permits, and Denver Basin groundwater data from DWR
- ◆ Collect a representative sample of geophysical logs, raster logs, and Colorado Energy & Carbon Management Commission logs to evaluate the Denver Basin aquifers across the county, with a primary focus on unincorporated areas
- ◆ Use the PETRA model along with other regional data sets to estimate physically available groundwater in the county and, using the water rights and well permit data, compare to the amount of Denver Basin groundwater allocated by state regulations
- ◆ Total the amount of alluvial groundwater being withdrawn based on DWR records
- ◆ Estimate current well yields, annual recharge and water level trends, and compare these to prior published results to evaluate changes that will influence future availability of Denver Basin supplies; review implications for County regulations pertaining to groundwater development
- ◆ Analyze and extrapolate conditions expected through the year 2050 in 10-year increments
- ◆ Review and analyze current and potential future water statutes and regulations affecting groundwater use
- ◆ Review areas of the county where there are complaints or evidence of significant groundwater declines and reductions in available supply. Assess construction of existing wells in these areas and whether the reductions result from poor well construction or localized zones of low well productivity and/or significant declines
- ◆ Evaluate aquifer declines regionally and locally
- ◆ Collect data on water quality from USGS, EPA, CDPHE, or Douglas County Health, where available, and map areas with potential water quality issues
- ◆ Identify data gaps and recommend strategies to address, including a possible Denver Basin aquifer monitoring plan for consistent evaluation of water levels now and in the future



Groundwater model output for Laramie-Fox Hills aquifer, Arapahoe County



Aquifers cross-section, Arapahoe County

PHASE 2 – LAND USE POLICY ANALYSIS

Our team will prepare a Land Use Policy Analysis and assist in developing draft land use policies. The work will include the following tasks:

- A. Update information to describe existing, 2050, and full buildout conditions. Scenarios will include present day, 2050, and full buildout consistent with modeling performed for the South Metro Water Supply Authority (SMWSA) Master Plan, other water provider plans and county land use approvals.
- B. Existing land use conditions: Determine those land uses that are currently in place or legally vested to develop as approved.
- C. Future land use conditions: Determine those land uses that are anticipated in local comprehensive plans, approved development plans, and augmented by County or other local agency staff knowledge of pending major development proposals and their impact on water supply/demand.
- D. Full buildout conditions: Without a cap on expected total population, forecast development patterns to reflect an ultimate land use scenario.
- E. Data should be based on state demographer estimates, supplemented by regional estimates/forecasts where appropriate. If available data appears inconsistent with known development trends, we will work with client to recommend adjustments.

Our team will analyze how current water provider plans and service areas align with and address future needs as currently envisioned in the land use scenarios.

PHASE 3 – DEVELOPMENT OF THE DCC WATER PLAN

In Phase 3, our team will create the overall DCC Water Plan using the information from Phases 1 and 2, including the groundwater analysis. We will facilitate meetings with the DCWC to develop policy recommendations based on our study observations, analysis and findings. We will also identify and discuss renewable water alternatives that could serve the county in the future. Our team will lead up to three public meetings while creating the Plan to present the information developed and listen to public concerns.

Throughout performance of the work, our team will prepare correspondence, meeting summaries, and technical memoranda documenting activities and recommendations. As those documents are prepared, they will be compiled by topical sections and then “knitted together” to create the DCC Water Plan. We will submit a draft report to the County staff and then meet to receive review comments. We will then prepare a draft of the report for public comment.

We could extend the schedule to first present the Plan to the DCWC and BOCC before releasing for public comment if requested. (For Arapahoe County, we will present draft findings to their planning commission and BOCC prior to public release.) Once public comments are received we will prepare a “pre-final” version of the report and join County staff in presenting to the DCWC, Planning Commission and BOCC for adoption. Following those meetings, we will incorporate final comments received and produce a final report.

The DCC Water Plan is expected to include the following sections:

1. Executive Summary presented in a user-friendly format, easily understood and accessible to the public, such as a summary or brochure condensing the findings
2. Maps and graphics to enhance readability and ease-of-use
3. Summary of Phase 1 – Water Supply and Demand Analysis – Full report to be included as an appendix, possibly with a stand-alone report for the groundwater analysis.
4. Summary of Phase 2 – Land Use Policy Analysis- Full report to be included as an appendix
5. Public Engagement Summary

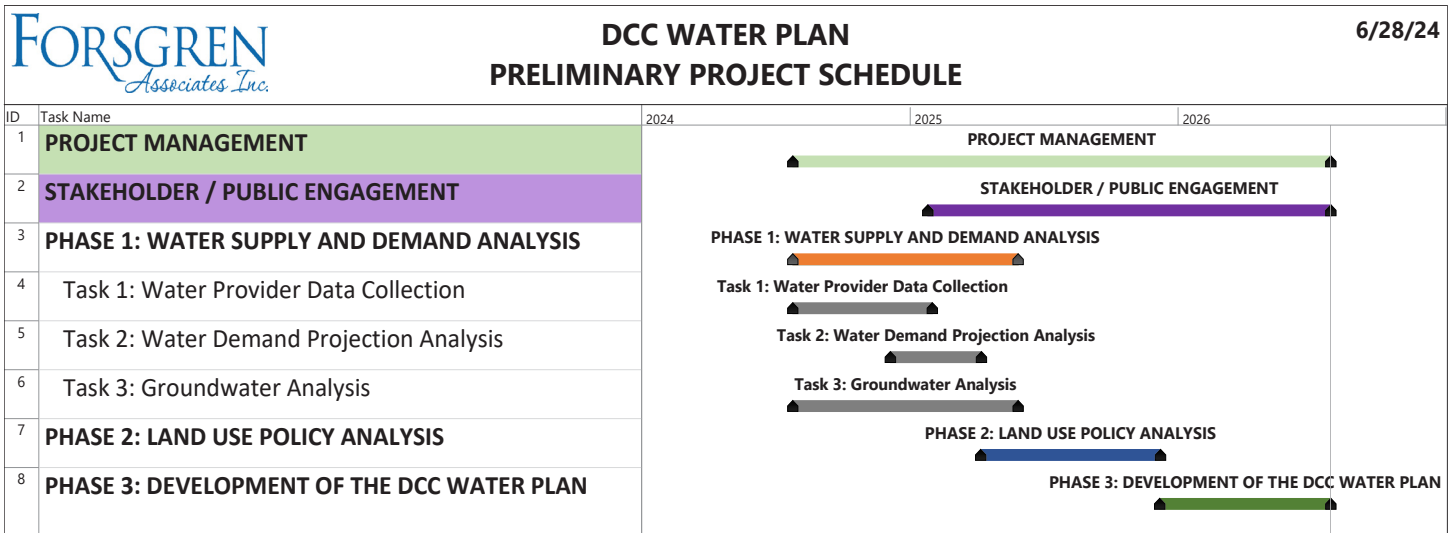
The DCC Water Plan will also include:

1. Overview of regional connections and opportunities for new interconnections, including:
 - a. Mapping of water supply interconnections between water providers
 - b. Summary of intergovernmental agreements and opportunities for new interconnections
2. Assessment of water infrastructure and storage needs
 - Review and analysis of Reuter-Hess reservoir’s current and future conditions/operations
 - Review and analysis of the Water Infrastructure and Supply Efficiency (WISE) project
 - Review and analysis of aquifer storage and recovery (ASR) opportunities and potential locations
 - Review and assessment of proposed water storage locations in Douglas County
3. Identification of potential renewable water supply projects or systems that could serve the future needs of Douglas County.
 - Water project reviews and evaluations including the assessment of project yields, costs, permitting, local support and opposition, and federal environmental compliance issues, and 1041 Regulations (Matters of State Concern).
4. Identification of water reclamation and reuse opportunities and analysis of requirements
5. Integration of agricultural efficiencies, if applicable
6. Conservation practices, including assessment of technologies, regulations, and incentives to extend water supply for all water user types
7. Options for extending the life of the Denver Basin aquifers (e.g., change pumping rate from a
8. 100-year basis to a 300-year basis) based on findings in the groundwater analysis.
9. Identification of higher risk aquifer areas of reliability and quality, including the costs of replacing wells.
10. Discussion of impacts on existing rural well users in county growth scenarios and mitigation
11. Cost analysis to implement recommendations that may close the supply gap (if applicable) identified in Phase 1 – Water Supply and Demand Analysis

Our team will give a final presentation of the report’s findings and recommendations to the DCWC and BOCC. We will also plan to give up to three additional public presentations.

We estimate that the DCC Water Plan will take approximately 24 months after Notice to Proceed is issued. The general task and phase timelines and inter-relationships are shown in the chart below. Although the time shown is sufficient, it will require a well-organized approach and prompt performance. We would welcome your feedback on the estimated schedule and finalize once the scope of services is confirmed through the RFP process.

Our Team is ready to start immediately after Notice to Proceed and well experienced in delivering studies of this type. We recognize that scope changes, delayed feedback from reviewers, and difficulty scheduling meetings have the potential to delay the work, but will work closely with you to overcome those potential delays to the extent possible.



Reference #1

Arapahoe County
Loretta Daniel, Long-Range Planner
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Reference #2

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Reference #3

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Marc Dettenrieder, Director of Community and
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215 Comanche St
Kiowa, CO 80117
☎ 720.595.3617
✉ marc.dettenrieder@elbertcounty-co.gov

Reference #4

Town of Monument
Tom Tharnish, Public Works Director
645 Beacon Lite Road
Monument, CO 80132
☎ 719.884.8039
✉ ttharnish@tomgov.org

Reference #5

Woodmoor Water and Sanitation District
Jessie Shaffer, District Manager
1845 Woodmoor Drive
Monument, CO 80132
☎ 719.488.2525
✉ jessies@woodmoorwater.com

“
Forsgren Associates has completed several projects for the Town over the last several years and is well versed in our system needs and has always completed their assigned projects in a timely manner and on budget.
”
-Tom Tharnish
Director of Public Works
Town of Monument
August 3, 2020 Memo to the Board of Trustees

REFERENCES

DOUGLAS COUNTY GOVERNMENT

Department of Community Development
100 Third Street Castle Rock,

Colorado 80104

Telephone: 303-660-7460 www.douglas.co.us

REQUEST FOR INFORMATION (RFI)

NO. 000-00

PROJECT TITLE

**YOUR RESPONSE MUST BE RECEIVED NO LATER THAN
MONTH, DAY, 20XX @ 4:00 P.M.**

RFI CERTIFICATION

We offer to furnish to Douglas County the information requested in accordance with the specifications and subject to the terms and conditions described herein:

NAME: EKI Environment & Water, Inc.

ADDRESS: 2001 Junipero Serra Boulevard, Suite 300

CITY: Daly City, STATE: CA ZIP: 94014

TELEPHONE NUMBER: (650) 292-9100 FAX NUMBER: (650) 552-9012

E-MAIL ADDRESS: alee@ekiconsult.com

BY: Andree Lee

(Printed or Typed Name)

Andree Lee

(Written Signature)

TAXPAYER I.D. NUMBER: 94-3087395

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said response and furthermore to potentially award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful firm.

INFORMATION AND QUALIFICATIONS FOR

DOUGLAS COUNTY
Department of
Community Development

2050 COMPREHENSIVE WATER PLAN



28 June 2024

Lauren Pulver
Douglas County Government, Department of Community Development
100 Third Street
Castle Rock, Colorado 80104

Subject: Response to Request for Information for the Douglas County 2050 Comprehensive Water Plan
(EKI C40161.00)

Dear Ms. Pulver:

EKI Environment & Water, Inc. (EKI) is pleased to submit this Information Response for the Douglas County 2050 Comprehensive Water Plan (Water Plan). EKI brings a highly qualified team with the experience and expertise required to successfully develop a Water Plan that reflects the priorities of the County, stakeholders, and customers. Our approach will provide an innovative and resilient plan that supports reliable water supply and water service. We have decades of experience working on similar integrated water resources planning and engineering projects, and the County will benefit from our unique qualifications as narrated below:

Proven Leadership. Our proposed team has a track record of navigating complex water resource regulations, jurisdictions, and topics, especially in changing regulatory environments and areas with several suppliers, non-government organizations, tribal entities, etc. EKI aims to support the County's long-term planning efforts to increase supply reliability for its residents, bringing a fresh perspective of vetted methodologies that are applicable to the County. Our Project Manager, Brad Arnold, PE, and Principal in Charge, Andree Lee, both bring exhaustive experience in water planning and resolving issues for utility suppliers and agencies across multiple states. Mr. Arnold is a licensed Professional Engineer in the State of Colorado and has supported private and public agency clients with water supply planning and analyses, state and federal-level policy navigation, watershed program management, and water rights issues. Ms. Lee specializes in working across entities to achieve collaborative solutions to complex water supply challenges. She brings extensive experience in integrated planning and One Water planning. Anona Dutton, PG, CHg, who will be providing QAQC for this project, is a recognized leader in water resources and water infrastructure planning in the Western United States.

Qualified Team with Practical Technical Approach: EKI has proven experience in all disciplines required to complete the Long-Term Water Plan, including water demand estimation, water system hydraulic modeling, groundwater and aquifers, system facility evaluations, alternatives feasibility studies, and development of risk-based Capital Improvement Programs (CIPs) that consider funding sources and rates. Brad, our Project Manager, has led both water supply and groundwater management projects for large utility agencies spanning over several districts and jurisdictions. He continues to lead EKI's water rights practice and assist clients with surface water and groundwater projects. EKI understands the County's desire to augment supply, increase storage, and improve

"I'd like to take a moment to thank EKI ... for the fantastic efforts and products you've produced across these 2 plus years. Valley Water's Water Conservation Strategic Plan has been an incredible asset. The supplemental materials you produced have already ensured the plan will not be a report on a shelf somewhere, but a living tool for us to reference, query, and analyze to meet our targets and to benefit our 2 million customers."

- Justin Burks, Valley Water

reliability of service, our team has repeatedly demonstrated the capability to support municipalities with similar goals. The attached proposal includes the preliminary scope of work, schedule, and the Statement of Qualifications of our team. EKI has developed a practical approach that focuses on an efficient process while addressing the specific planning needs of the County.

Our Commitment to Douglas County. Over the last several years, EKI has worked closely with water agencies and regulators to understand the impacts of new regulations on groundwater supply allocations and reliability across multiple basins, we have developed Urban Water Management Plans (UWMPs) for more than 40 entities with follow-on reporting, we have also conducted numerous special studies (such as Water Supply Reliability Studies). EKI has been instrumental in streamlining processes and building consensus among districts and stakeholders while taking care of each district's/agency's specific needs for future planning. We have also demonstrated the ability to present planning, engineering, and other technical information to technical staff, boards, public, and stakeholder groups in a comprehensive manner with well-written work products, compelling graphics, and dynamic presentations. With more than 30 years of dedicated water resource planning experience, EKI will be able to commit and bring resources to deliver a plan for Douglas County.

We are in receipt of Addendum No.1 – Questions & Answers – 1, uploaded by the County on 06/20/2024 on the Bidnet portal ([Douglas County 2050 Comprehensive Water Plan - Bid Information - {3} | BidNet Direct](#)).

We appreciate the opportunity to submit our Information on this important effort. Should you have any questions, please contact our Project Manager at barnold@ekiconsult.com.

Very truly yours,

EKI ENVIRONMENT & WATER, INC.



Andree Lee
Vice President/One Water Practice Lead

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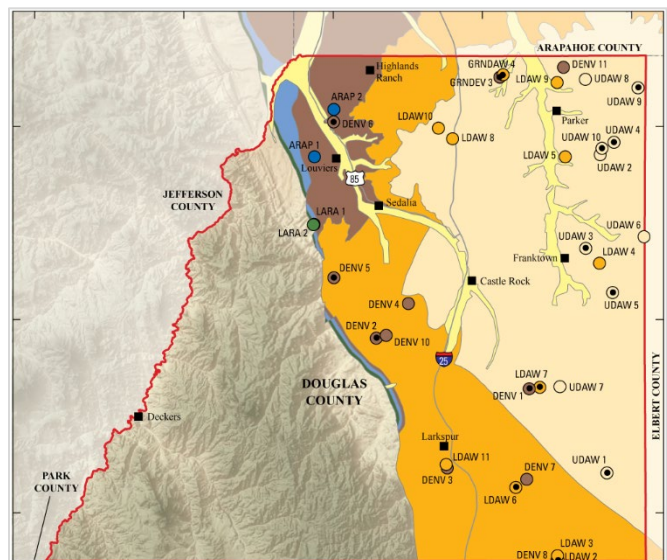
1. PROJECT UNDERSTANDING AND APPROACH

EKI understands that the Douglas County Water Commission (DCWC) was formed by the Board of County Commissioners to develop the 2050 Comprehensive Douglas County Water Plan (Water Plan). The Water Plan will inform strategic policies for water supply, storage, use, conservation, reclamation, and infrastructure. Throughout the development process, the DCWC seeks to engage with the community to broaden public awareness of water supply issues and seek input on community priorities regarding water resources. The development of the Water Plan demonstrates Douglas County’s (County) proactive stance on water resources issues and long-term supply planning. The Water Plan will provide a fresh look at the state of, and risks to, the County’s water supplies and infrastructure and will identify opportunities to improve local resilience. EKI’s understanding of County water issues, as well as the proposed approach to Water Plan development, are further described below.

EKI’s Understanding of Douglas County Water Resources and its Issues

The County covers 844 square miles of residential, commercial, agricultural, and open land. Although approximately 41% of the County is agricultural land, less than one percent of this farmland is irrigated¹, making agriculture a small portion of the County’s overall water demand. Meanwhile, the County’s population is expected to grow to 465,000 by 2050², placing significantly greater demand on the County’s water resources and water supply portfolio. The County is home to over thirty water suppliers, which obtain water primarily from the Denver Groundwater Basin and the South Platte River system. Approximately 70% of Douglas County residents are served by three major water providers: Centennial Water and Sanitation District, Castle Rock Water, and Parker Water and Sanitation District (Parker Water). The remainder are served by smaller water districts or private wells, with rural water users depending almost exclusively on private wells. These users may face the greatest risk of supply issues due to changing hydrologic conditions, competing water uses, and other factors.

Groundwater: Approximately two thirds of Douglas County overlies non-tributary and not non-tributary portions of the Upper Dawson, Lower Dawson, Denver, Lower Arapahoe, and Laramie Fox Hills aquifers, outside of any designated basin. The southwestern third of the County overlies the less productive Pike Rampart fractured rock aquifer system. Colorado Department of Water Resources (CDWR) data indicate that approximately 12,900 water supply wells have been constructed in Douglas County, including 10,300 domestic wells and 447 municipal wells.³ Most of these wells draw from the Dawson, Denver, and Arapahoe aquifers, which exhibited alarming water level declines from 2012 to 2019.⁴ As such, EKI understands that County water suppliers are actively pursuing projects to



Source: <https://www.usgs.gov/media/images/douglas-county-groundwater-network-map>

¹ https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Colorado/cp08035.pdf

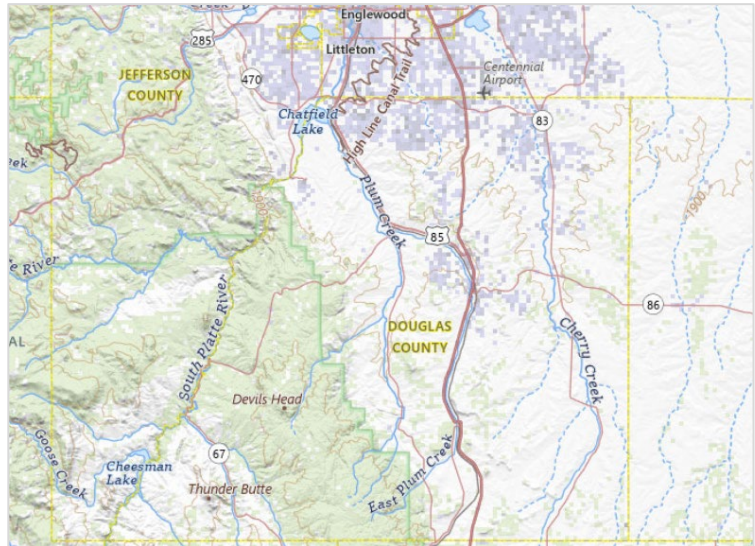
² <https://data.colorado.gov/Demographics/Colorado-Population-Projections-Douglas-County/idyx-tk76/data>

³ <https://dwr.state.co.us/Tools/WellPermits?submitButton=Submit&SelectedGeoValue=countyDiv&SelectedCountyId=18&SelectedPermitStatusNum=9&SelectedPermitUse=Domestic>

⁴ Malenda, H.F., and Penn, C.A., 2020, Groundwater levels in the Denver Basin bedrock aquifers of Douglas County, Colorado, 2011–19: U.S. Geological Survey Scientific Investigations Report 2020–5076, 44 p., <https://doi.org/10.3133/sir20205076>.

reduce their reliance on Denver Basin groundwater, such as Parker Water’s participation in the Platte Valley Water Partnership.

Surface Water: The County is situated within the South Platte River Basin and several County suppliers hold rights to divert and use or store water from the river or its tributaries. Typical of snowpack hydrology, the highest runoff volumes in the South Platte River Basin typically occur in spring and early summer months, with that runoff stored in 48 jurisdictional dams across the County for later use and some suppliers considering Aquifer Storage and Recovery (ASR) as an alternative method. Several suppliers in the County have prioritized the transition from groundwater to obtaining or expanding rights to utilize locally available surface water resources.



Source: <https://www.topozone.com/colorado/douglas-co/stream/>

The County faces unique challenges and considerations with managing water resources, including:

- Rapid population growth of the Denver metro area
- Depleting groundwater resources
- Public involvement and perception of water management
- Navigation of State regulatory framework (e.g., water rights)
- Climate-related uncertainties and drought

As described in the approach below, this understanding of County water issues will serve as the basis to inform EKI’s Water Plan development.

Our Approach

EKI’s approach to developing the Water Plan is centered around four key strategies described further below.

1. FOSTER A CONSISTENT VISION AND STRATEGY FOR COORDINATED WATER MANAGEMENT

The Water Plan’s success will require involvement from the DCWC, County water suppliers, and local communities. As such, EKI’s approach involves engaging with County stakeholders at the onset of the planning process. Through these outreach efforts, we will establish consistent goals and priorities and generate “ownership” of and “buy in” to the development process and final Water Plan.

EKI also recognizes that understanding community values and priorities is core to successful planning. As there is no “one size fits all approach” to engaging with the community, we can apply a range of strategies to align with the County’s specific goals. Through the initial coordination with the County staff, we will identify the key stakeholders (i.e., water suppliers, local institutions, and knowledgeable persons), along with their known priorities and challenges. The County’s Request for Information (RFI) contains an example Water Supplier Survey that includes requests for water provider data collection and management that will be necessary to create a County water portfolio. In the spirit of developing a coordinated vision and strategy for water management in the County, EKI additionally proposes adding a prompt for suppliers to describe their individual priorities and input

for the Water Plan. We will then design a custom engagement strategy, right-sized to the County’s needs. The strategy will focus on including water suppliers at key points in the planning process to maximize value.



2. MAXIMIZE WATER RESILIENCE THROUGH FRESH PERSPECTIVES AND INNOVATIVE SOLUTIONS

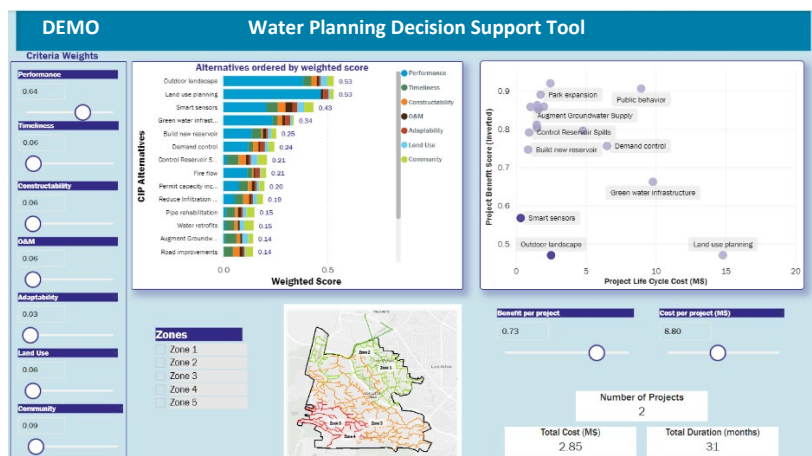
Developing strategies that enable Douglas County to continue to thrive for the next quarter century will require unique perspectives, outside-the-box thinking, and informed decision making. EKI understands that the County and its water suppliers have taken major strides in fair and sustainable water management, including by establishing the Platte Valley Water Partnership, Douglas County Water Alternatives Program, and Rural Water Authority of Douglas County and by employing novel techniques to conserve, store, and reuse the County’s water. When identifying and evaluating Douglas County’s options to further improve its reliability, the EKI Team brings the benefit of a set of “fresh eyes” on the issues and options pertinent to the County, while at the same time leveraging decades of experience on related matters. EKI’s experience helping its clients develop and implement robust and holistic management plans for surface water, groundwater, conjunctive use, and water reuse, position us uniquely to support Douglas County in embracing innovative solutions to water management challenges.

3. PROVIDE A SYSTEMATIC AND TRANSPARENT ALTERNATIVES EVALUATION PROCESS

The EKI Team will develop evaluation criteria in close collaboration with the County and water suppliers that will allow for assessment and ranking of renewable water supply alternatives that may serve the County in the future. EKI proposes a four-step process to: (1) broadly identify the range of supply options across potential water supply and demand management actions, (2) establish criteria for evaluation, (3) further develop supply options and assess performance through hydrologic and hydraulic modeling, and (4) conduct scoring and build portfolios that align with County’s needs.

4. ENABLE SUCCESSFUL IMPLEMENTATION AND ADAPTIVE MANAGEMENT THROUGH INNOVATIVE TOOLS THAT SUPPORT DECISION-MAKING

The success of the Water Plan will depend on the ability to synthesize and communicate what is learned during its development in a meaningful and digestible format that supports decision making and adaptive implementation. To that end, EKI is prepared to offer the County a custom, dynamic and interactive Decision Support Tool and Project Prioritization Dashboard. These tools will allow the County to clearly



assess the collective costs and benefits of potential strategies in a consistent manner and track Water Plan implementation progress.

Work Plan

The DCWC provided a very detailed Scope of Work in the RFI. As such, only a high-level description of our approach to accomplishing key elements of the Water Plan tasks are described below, with a particular focus on maximizing the value of the planning efforts and demonstrating EKI's unique capabilities in performing the Scope of Work outlined in the RFI.

PHASE 1 – WATER SUPPLY AND DEMAND ANALYSIS

EKI's Demonstrated Demand and Supply Analysis Methodology

To understand the potential water supply gap to be addressed through the Water Plan, EKI will prepare an inventory of the County's current supplies and water use for all County water suppliers. The inventory of County water supply and demands will be informed by both a review of publicly available plans and information and water supplier survey responses gathered through a data request form, similar to that included as Exhibit A to the RFI. EKI will assess the reliability of the supplies considering risks that could impact supply availability, such as climate and hydrologic risks, water quality risks, regulatory risk, and others. Additionally, EKI will inventory water infrastructure in the County and prepare informative maps and graphics using ArcGIS that show water suppliers, water features, infrastructure, and other County resources deemed relevant.

Additionally in Phase 1, EKI will forecast future County water consumption to facilitate effective planning through 2050. This forecast will be informed by planned project and water management actions provided by County water suppliers in the data request described above, well locations and production level estimated from the CDWR database, and growth analysis as provided by the County for rural areas.

The supply and demand analyses described above will be summarized in a comprehensive "Water Supply and Demand Analysis Report" (Report). This Report will include a gap analysis between County water supply and demands for currently planned development, 2050 projected development, and full build out projected water demands by water supplier. It is assumed that EKI will provide a draft Report for County review, then submit a final Report that addresses any County comments.

Groundwater Expertise

EKI is prepared to complete the groundwater analysis requested by Douglas County concurrently with the other tasks associated with development of the Water Plan as part of a unified approach to water resources assessment and planning. The EKI Team offers extensive expertise in groundwater geohydrology, as well as surface water and One Water planning, allowing for a coordinated and efficient approach. EKI's experience includes groundwater supply assessment and development, basin safe yield assessments, aquifer testing, groundwater quality assessments, and numerical groundwater modeling. Additionally, EKI supports ASR and groundwater augmentation and recharge, including direct or indirect potable reuse purposes. Under the proposed groundwater analysis, EKI will collect all relevant, publicly available data, and data provided by Douglas County and its groundwater users, to characterize the health of the County's groundwater resources. The analysis will include detailed investigation of local conditions over time, assessment and projection of available groundwater, recommendations for future data collection, and can include custom application of the USGS Denver Basin Groundwater Model or development of a local numerical model. This assessment would complement the supply and demand assessment to provide a comprehensive understanding of the County's overall water resources.

PHASE 2 – LAND USE POLICY ANALYSIS

Under Phase 2, EKI will refine the demand projections developed in Phase 1 based on current and future land uses outlined in County and local planning documents, the expected water needs associated with approved developments, and projected population growth and development trends from the State Demographer. Water demands based on land use will be calculated using water demand factors identified in literature and other public sources. These water demands may also be evaluated based on published methodologies and sources, as appropriate. EKI will distinguish between potable and non-potable demands by land use and certain end-uses (e.g., irrigation) for consideration in developing water reuse alternatives. Projected water demands will be calculated for multiple development scenarios including current conditions, 2050, and full build out under a range of uncertainties including development rates and climate conditions.

PHASE 3 – DEVELOPMENT OF THE DOUGLAS COUNTY WATER PLAN

EKI's approach for Phase 3 includes five key steps: (1) understand the County's and water suppliers' priorities for the Water Plan, (2) development and analysis of water supply alternatives, (3) preparation of a comprehensive Water Plan, (4) development of policy recommendations, and (5) public meetings and engagement.

Understand County Water Needs: To develop an integrated and broadly supported Water Plan, the first step is to establish a consistent vision within the County and water suppliers. During the beginning stages of Phase 3, EKI proposes facilitating a workshop between DCWC and County water suppliers to seek input on Water Plan goals, desired outcomes, and water supply challenges to be addressed.

Water Supply Alternatives Analysis: Based on feedback gathered in the above workshop and findings from Phase 1 and Phase 2, EKI will develop a portfolio of renewable water alternatives to serve the County in the future. The EKI Team will develop evaluation criteria and assess supply alternatives using a four-step process to: (1) broadly identify the range of supply options across potential water supply and demand management actions, (2) establish criteria for evaluation, (3) further develop supply options and assess performance through hydrologic and hydraulic modeling, and (4) conduct scoring and build portfolios that align with County's needs. Water supply alternatives included in the evaluation shall include but are not limited to: renewable water supply projects or systems, reclamation and reuse, conservation and agricultural efficiencies, and extending the life of the Denver Basin aquifers. The alternatives analysis will consider potential water supply benefits, costs, implementation timeline, among other factors, and can be supported through a Decision Support Tool as described above.

Preparation of the Water Plan: EKI will produce a comprehensive Water Plan that includes information and findings from all project phases. The Water Plan will provide an overview of County water suppliers, resources, infrastructure, and risks, identify current and projected County water needs, and detail the water supply alternatives analysis. The Water Plan will additionally include a record of all public engagement efforts performed throughout the Water Plan development process (e.g., public meetings, supplier workshops, development of informational materials, etc.). It is assumed that EKI will provide a draft Water Plan for County review and submit a final Water Plan that addresses any County comments.

Development of Policy Recommendations: EKI will continuously meet or otherwise communicate with DCWC throughout Water Plan development to keep DCWC informed on progress. During these meetings, EKI will work with DCWC to develop policy recommendations, additional studies, or other strategies based on the findings from all phases. Following completion of the draft Water Plan, EKI will participate in up to three public meetings (i.e., DCWC or Board of County commission meetings) to present the Water Plan's final findings and recommendations.

Public Engagement and Education: As specified in the RFI, EKI will lead and participate in up to three additional public meetings to present updates and request feedback during the Water Plan development process. It is

assumed that EKI will prepare all meeting materials and coordinate with DCWC to schedule and notice these meetings.

PROJECT MANAGEMENT

EKI’s project management approach focuses on providing proactive communications and high-quality work products that will achieve the County’s requirements and objectives in a timely manner and within the County’s budget, while successfully resolving project challenges. EKI’s approach to management of the Water Plan will include the following:

- Development and implementation of a detailed Work Plan (i.e., Project Management Plan) to direct, coordinate, and monitor the activities of the project with respect to budget, schedule, and contractual obligations;
- Frequent and clear communication between EKI and the County (at least monthly);
- Presentation of project updates at key points of Water Plan development at publicly noticed DWCCW meetings;
- Development of a public engagement program to facilitate stakeholder workshops and other forms of public engagement; and
- Implementation of QA/QC to ensure work products meet or exceed expectations.

Timeline

EKI anticipates that the work outlined above will take two years to complete. A more detailed schedule will be provided in response to the RFP. EKI is prepared to begin Phase 1 immediately following authorization to proceed, with Tasks 1 and 2 to be completed within the first year. Task 3 will conclude approximately six months after the first two tasks. Phase 2 will commence immediately following the completion of Phase 1, Task 2 and is anticipated to last approximately six months. Phase 3 will proceed concurrently with Phases 1 and 2, beginning partway through Phase 1 and continuing until the Water Plan is complete, by the end of the second year. An illustrated timeline is provided below. Note that the years and quarters indicate time relative to authorization to proceed with the project and may not align with calendar years.

TASK	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1 - Water Supply and Demand Analysis								
Task 1 - Water Supply Information Collection								
Task 2 - Water Demand Projection Analysis								
Task 3 - Groundwater Analysis								
Phase 2 - Land Use Policy Analysis								
Phase 3 - Development of the Douglas County Water Plan								

LEGEND

Task duration

2. EKI'S STATEMENT OF QUALIFICATIONS

About EKI Environment & Water, Inc.

EKI Environment & Water, Inc. (EKI) is an employee-owned company that has provided comprehensive water resources and engineering services to public and private sector clients for over 35 years. EKI has maintained steady growth and financial stability since our founding in 1989. Our staff of 120+ employees include engineers, geologists, hydrogeologists, environmental scientists, computer-aided designers, geographic information system (GIS), and database specialists in offices throughout the United States. *Our locally stationed team will operate from the Denver metro area.*

EKI has been doing business in Colorado since 1995, with an office in Centennial, CO. Our local team is stationed in the Denver metro area.

EKI's staff includes an effective mix of disciplines comprising water resources, engineering, environmental, and litigation support. This complementary mix is an asset to understanding and effectively resolving a wide variety of complex technical challenges. Our project managers form strong professional relationships with clients and work hard to understand each project's technical, financial, and regulatory constraints. Communication within EKI is facilitated by frequent team meetings and one-on-one check-ins with team members. Each project manager is supported by an officer of the firm and a team of highly skilled technical staff.



COMPANY PHILOSOPHY

EKI takes a solution-oriented approach to projects that builds from a strong technical foundation and emphasizes proactive and effective communication. The size of our firm, the high level of experience and continuity of our multi-disciplinary staff, and our established credibility in our fields of expertise and with regulatory agencies allows us to effectively support our clients to meet their objectives across a variety of sectors and issues.

CLIENT LOYALTY

EKI takes pride in repeat business from satisfied clients. The low turnover of our staff permits the development of long-term working relationships with our clients and each other. Our project management team offers continuity, tenacious attention to detail, responsiveness, and quality service.

DEMONSTRATED EXPERTISE IN WATER SUPPLY PLANNING AND WATER AVAILABILITY STUDIES

Our multidisciplinary team brings experience in a wide range of water resources planning and assessment services including preparation of water supply and demand and reliability evaluation for counties, districts, and agencies. Specifically, EKI's water resources planning services that have supported the development of related efforts include:

- Water resource planning, including integrated water resources/"One Water" plans, water supply and demand forecasting, water efficiency strategic plans;
- Water supply system planning, design, and construction management;
- Water Supply Reliability Studies (WSRS), Urban Water Management Plans (UWMPs), Water Shortage Contingency Plans (WSCPs), Annual Water Supply and Demand Assessments (AWSDAs); Drought

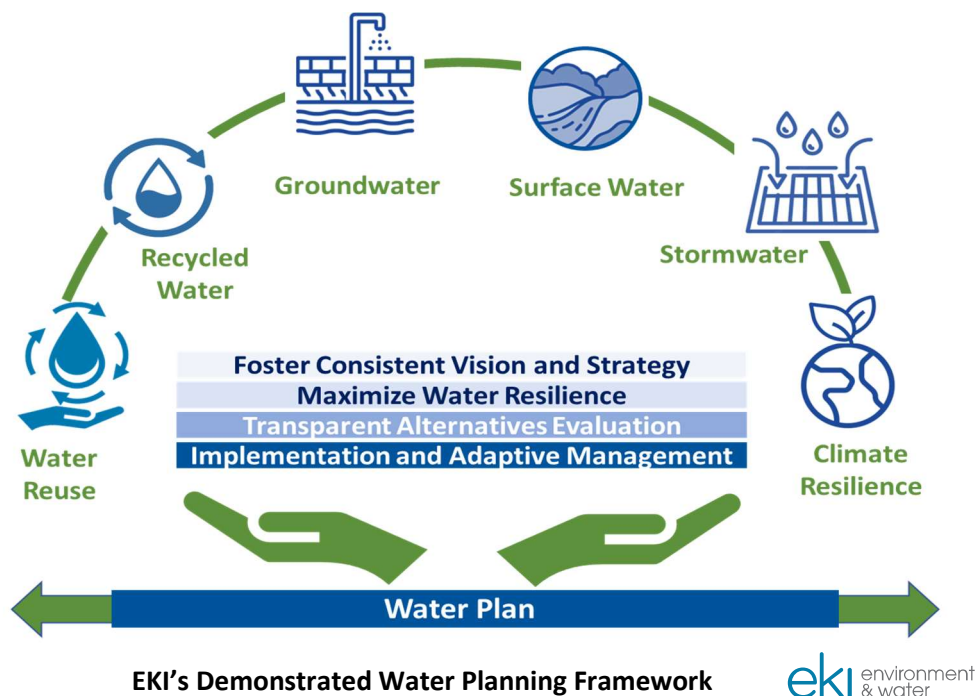
Response Plans, Water Supply Assessments (WSAs), and Water/Wastewater/Recycled Water Master Plans;

- Water bank siting and development, water supply portfolio development and management and feasibility assessments, including water transfers, and aquifer storage and recovery (ASR) projects;
- Surface water rights evaluations, scoping, and navigating water transfer procedures.
- Assessment and development of groundwater supplies, including basin safe yield assessments, aquifer testing, groundwater quality assessments, and numerical groundwater modeling;
- Evaluation of managed aquifer recharge, including recycled water for direct or indirect potable reuse (IPR/DPR) purposes;
- Strategic and technical support for sustainable groundwater management;
- Grant tracking, procurement, and administration;
- Stakeholder engagement; and,
- Litigation support and local and state regulatory and permitting support.

EKI's Well-Founded Water Planning Approach

The EKI Team has decades of specialized experience in matters related to all water systems that will be evaluated as part of the County's Water Plan. The proposed EKI team has supported water agencies in master planning and Capital Improvement Program (CIP) development for two decades. EKI's approach is based on sound engineering and close engagement with an agency's staff. Our team has supported clients in building and implementing strategies to secure and maintain water supply reliability, including recycled water; on-site reuse; local surface water; water transfers; groundwater; stormwater capture and recharge; brackish water desalination; and water conservation. We have a strong reputation for delivering results based on sound science and engineering principles and effective stakeholder engagement and interagency coordination.

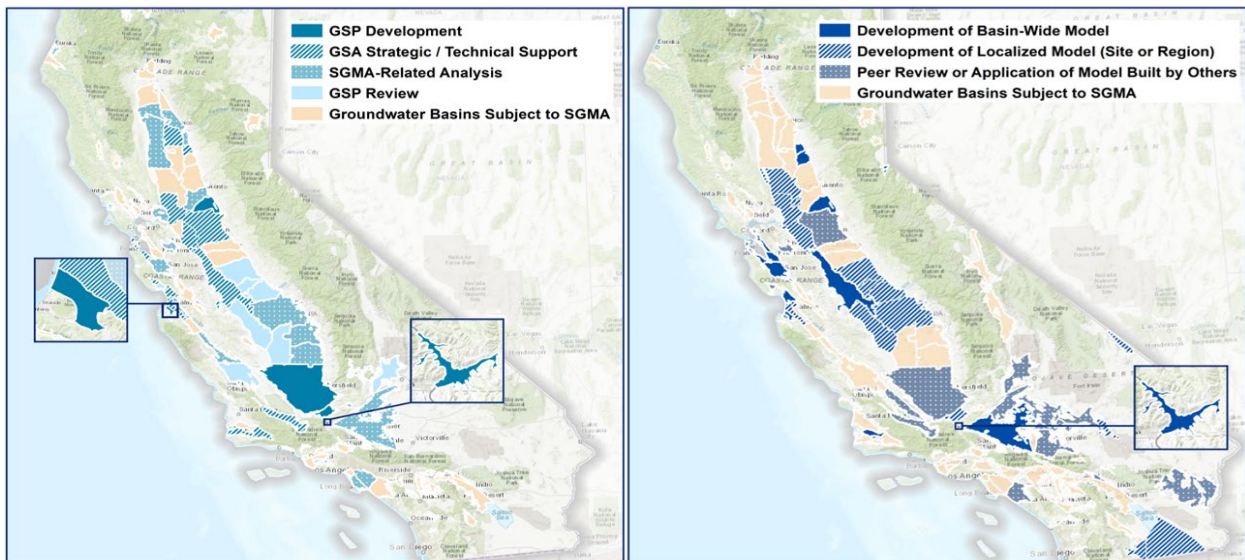
Our approach to developing a Water Plan is centered around four key strategies as shown in figure below that is geared towards management of water resources, climate change resiliency, and protection of public health, while providing long term economic, environmental, and social benefits.



EKI's Groundwater Management Experience

EKI is broadly involved in groundwater management. We are actively leading the implementation of more than 10 Groundwater Sustainability Plans (GSPs) jurisdictionally and technically complex groundwater basins. We have conducted detailed technical review of more than 40 GSPs, including an inventory of the planned water supply projects and demand management actions, many of which include groundwater banking and recharge projects. This background provides us with an unparalleled perspective on the issues and opportunities within basins similar to those underlying Douglas County.

EKI has also applied numerical groundwater models in over 40 basins, including for the development of basin-scale water budget and sustainable yield assessments and to assess the feasibility of groundwater management and supply augmentation projects (e.g., water banking and enhanced aquifer recharge). EKI Team brings broad expertise in hydrogeology and water resources engineering to support the County in continuing its supply development, tracking, and monitoring efforts, achieving Colorado Water Plan and Basin Implementation Plan objectives, and complying with state regulations such as Colorado Revised Statutes § 29-20 Part 3 Adequate Water Supply.



EKI is working with local agencies to develop Groundwater Sustainability Plans that comply with state regulations and satisfy the interests of a variety of water users.

Blue shading indicates the groundwater basins in which EKI has developed and/or applied numerical models.

Firm Capacity and Ability to Commit Services and Resources

EKI has been in business for 35 years, has never missed payroll, has strong Dun & Bradstreet (D&B) rating, and is annually valued by our outside appraiser as a requirement of our Employee Stock Ownership Plan. We have 120+ employees, and the accounting department has a credit reference letter if needed that identifies our vendors and bank. EKI will be able to furnish any additional documents in support of financial qualifications upon request.

EKI understands that continuity of key personnel assigned to a project is also a key factor in project success. Our proposed team is dedicated and has the availability and capacity to complete tasks and deliverables as required by the County, within schedule and on time. The following pages include additional information about the proposed members of the EKI team. Our proposed schedule includes the appropriate staff resources that will be committed to completing the tasks and services described herein.

Relevant Project Experience

Detailed information for five projects with strong similarities to the Water Plan envisioned by Douglas County are presented below, along with references for the EKI Team.

REGIONAL WATER SUPPLY RELIABILITY STUDIES AND RELATED INTEGRATED WATER RESOURCES PLANNING SERVICES, CAL WATER

EKI has supported Cal Water on a variety of Water Planning-related projects since 2015.

Water Supply Reliability Studies (WSRS): EKI has been hired to prepare multiple local and regional water supply reliability studies for Cal Water Districts, using integrated resource planning processes. These studies address challenges from changing water supply reliability conditions, new regulatory requirements, demand growth, and insufficient diversity in water supply sources.

The WSRS include supply and demand forecasts through the 2050 planning horizon, an evaluation of supply reliability gaps, identification and evaluation of potential water supply alternative options, and an implementation plan for the preferred options. EKI's initial work supported Cal Water's WSRS in the Bay Area, and included evaluation of several projects including: (1) brackish groundwater desalination, (2) recycled water to offset irrigation demand and generate in lieu recharge of the Westside Basin, and (3) augmented ASR in the Westside Basin. EKI screened and ranked the projects against multiple quantitative and qualitative criteria including, cost, yield, reliability, water quality, permitting, etc. In 2022 EKI initiated work on the Delta Region WSRS to assess the reliability of multiple federal, state, and local water sources and analyze project opportunities to increase regional reliability.

UWMPs, AWSDAs, and WSAs: EKI has provided a range of water planning services to Cal Water since 2015 related to assessing the impacts of California's Sustainable Groundwater Management Act (SGMA), development of its 25 2020 UWMPs and WSCPs, preparation of multiple SB-610 compliant WSAs, and successful submission of 25 2022 AWSDAs.

Surface Water and Groundwater: EKI has supported Cal Water in the identification and development of groundwater and local surface water supplies, including estimating yield, optimizing well locations and surface water diversions, and supporting decision-making regarding infrastructure investments.

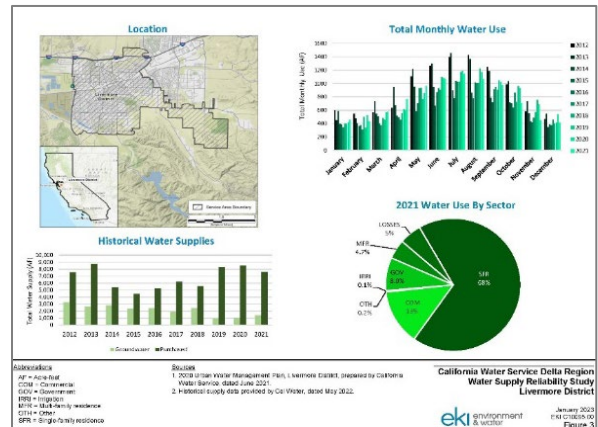
Customer Contact and Project Facts:

Ken Jenkins, Chief Water Resources Sustainability Officer
 Cal Water
 1720 North First Street,
 San Jose, CA 95112
 Ph: (310) 257-1484 x71484
kjenkins@calwater.com

Project Duration: 2015 – current

Key Personnel Involved:

Anona Dutton, Andree Lee, Sarah Hodson, Tina Wang



Tasks Completed are Comparable to Tasks Anticipated

- ✓ Water Supply Reliability Studies that follow One Water approach
- ✓ 25 UWMPs, WSCPs and AWSDAs
- ✓ >20 WSAs
- ✓ Groundwater, surface water, and recycled water analysis
- ✓ Unique perspective into regional water supply reliability issues
- ✓ Cost-Effective identification of available sources
- ✓ Comprehensive understanding of projects and programs to increase future supply and reliability

WATER PLANNING PROJECTS, VALLEY WATER

Since 2020 EKI has supported Valley Water in evaluations of existing water banks and siting studies for potential new water banks. Work efforts have included in-depth analysis of existing water bank performance and risk factors, including those related to water quality (including treatment cost estimates) and declining groundwater levels, and systemizing the process to support Client's ongoing assessment of water bank performance and risk factors.

Siting assessments have included due diligence investigations of proposed banking opportunities, and geographical screening of the entire San Joaquin Valley to identify potential new banking opportunities. To identify the most suitable area for potential water bank development, EKI utilized a multi-level screening approach that included: (1) Phase 1 - an initial screening based on Client-defined objectives and screening criteria to ensure that subsequent evaluations focused on the most promising geographic areas, and (2) Phase 2 - more detailed screening that identified the promising areas based on technical feasibility, institutional and regulatory considerations, and cost.

To systemize the screening process, EKI developed a geographic information system (GIS) based screening tool that automatically processes multiple geospatial data sets to identify the most promising candidate water bank locations. The candidate sites are identified with a systematic ranking and screening of the geospatial datasets using a customized, value-based scoring framework for each dataset/criterion. The screening tool assigns scores for each criterion, creates a geospatial representation of the scoring based on the geographic datasets, and overlays the datasets to isolate areas with the highest scores and that meet predetermined objectives. Identified candidate locations are then subjected to Phase 2 assessments that include technical constraints, property values, contractual or partnership issues, political and stakeholder perspectives, water rights, supply reliability and infrastructure/conveyance needs. Based on EKI's work and our specific recommendation for target locations and next steps, Valley Water is now moving forward towards the development of new water banking, transfer and exchange opportunities.

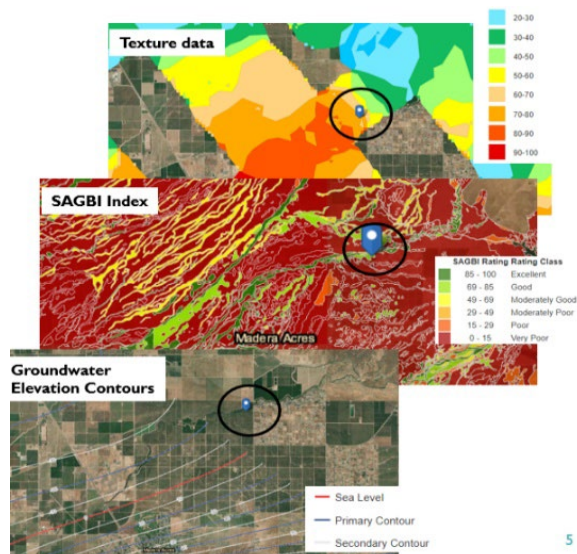
Reference Contact and Project Facts:

Metra Richert, Water Supply Planning and Conservation Manager
Valley Water
5750 Almaden Expressway,
San Jose, CA 95118
Ph: (408) 630-2978
mrichert@valleywater.org

Project Duration: 2021 - Present

Key Personnel Involved:

Andree Lee, Anona Dutton, Brad Arnold



Tasks Completed are Comparable to Tasks Anticipated

- ✓ Valley-wide analysis of optimal water banking locations based on key hydrogeologic, and infrastructure, and institutional criteria
- ✓ Systemized project siting and ranking process
- ✓ Evaluation of water sources, water rights, conveyance, local ordinances, permitting requirements, cost-estimates, etc.
- ✓ Identification of multi-benefit and partnership and funding opportunities
- ✓ Due diligence on multiple existing and potential water banking sites

WATER RESOURCES CONSULTING, ARVIN-EDISON WATER STORAGE DISTRICT

EKI has provided a wide variety of water resources consulting services to AEWS D since 2016, much of which is aligned with and relevant to the work to be performed for Douglas County. Some of the related services that EKI has conducted for AEWS D have included:

- Preparation of GSPs in the Kern County and White Wolf Subbasins, including multi-party coordination.
- GSP implementation activities including supply project prioritization, monitoring program refinement, annual reporting, and tracking of sustainability indicators (e.g., water levels, subsidence, and water quality).
- Development of a groundwater flow model that includes subsidence simulations, and an operational Decision Support Tool.
- Predictive modeling, including well siting and climate change evaluations, to support SGMA implementation objectives.
- Hydrogeologic field investigations, including pumping tests.
- Development of a framework for a well mitigation program/policy.
- Securing grants.
- Ongoing project management, administration, inter- and intra-basin coordination, and stakeholder outreach activities.

EKI provides AEWS D with other grant support services. Our team proactively identifies funding opportunities, provides strategic project planning for GSP implementation, prepares grant applications and/or provides technical support for grant application development, and provides grant management support to AEWS D. EKI recently developed a grants management tool to track the status of submitted applications, keep records of all AEWS D grant materials, track the awarded funding and budgets for each grant, provide an overview of the status of each grant, and manage awarded grants. EKI continues to update the grants management tool and identify funding opportunities for AEWS D. EKI supported AEWS D in preparing two successful USBR WaterSMART grant applications to install drought recovery wells, develop a conjunctive use modeling tool, update the Arvin-Edison Groundwater Flow model and upgrade the decision support tool. EKI is currently providing technical work related to the groundwater flow model and the decision support tool.

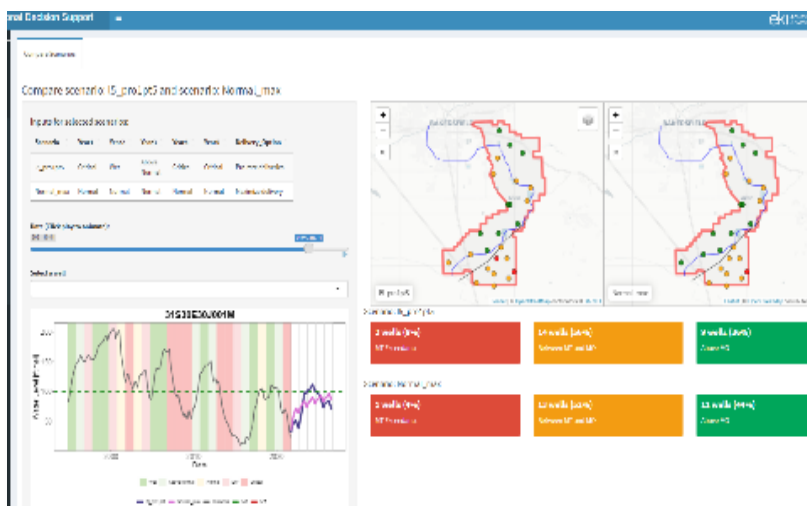
Customer Contact and Project Facts:

Jeevan Muhar, PE, Engineer-Manager
 Arvin-Edison Water Storage District
 PO Box 175, Arvin, CA 93203
 Ph: (661) 854-5573 ;
 Mobile: (661) 747-0062
jmuhar@aebsd.org

Project Duration: 2016 – current

Key Personnel Involved:

Anona Dutton, Andree Lee, Aaron Lewis, Sarah Hodson, Sarah Gerenday



EKI's Integrated Decision Support Tool for the AEWS D Groundwater Flow Model

Tasks Completed are Comparable to Tasks Anticipated

- ✓ Hydrogeologic Field Investigations
- ✓ HCM and Cross-Sections and Groundwater Flow Modeling
- ✓ Predictive Modeling, Well Siting, Climate Change Simulations
- ✓ DST Development
- ✓ Model User Guide and Training
- ✓ Grant Tracking, Application, Procurement, and Management

WATER RESOURCES PLANNING AND DEVELOPMENT SUPPORT, BAY AREA WATER SUPPLY AND CONSERVATION AGENCY (BAWSCA) AND THE MEMBER AGENCIES

EKI is also directly supporting BAWSCA with the development of its Long-Term Reliable Water Supply Strategy 2050 (Strategy 2050), which will include demand projections out to 2050, as well as the development and assessment of water supply projects and portfolios, and facilitating decision-making on long-term water supply investments among the 26 BAWSCA member agencies and other stakeholders.

EKI led a consensus-based decision making process to establish the objective for Strategy 2050. EKI used a variety of engagement tools, including stakeholder surveys, workshops, and roundtable discussions, to establish the BAWSCA’s region’s needs for Strategy 2050. EKI then prepared a work plan for developing Strategy 2050 to meet the identified needs and to establish a process for guiding decision-making and tracking process.

EKI also led the development of a Drought Allocation Plan which defines the approach to allocating available water among the BAWSCA member agencies during shortages caused by drought. EKI led the technical analysis, model development, and report documentation and supported facilitation of a series of member agency workshops to reach consensus among the BAWSCA agencies on the allocation methodology.

EKI also supported BAWSCA on its 2017 Drought Report, and is currently supporting BAWSCA on its 2021-2023 Drought Report, to document and evaluate the effectiveness of actions taken during recent drought and inform future drought response. EKI designed and implemented a survey of the member agencies to help BAWSCA better understand the effectiveness of its last regional and local Drought Reponse Measures (DRMs). EKI also developed a compelling infographic for BAWSCA to illustrate the timeline of drought actions and resultant water savings, and drafted content for the previous [2017 Drought Report](#). EKI also worked cooperatively with BAWSCA during the development of the 2015 and 2020 UWMP cycles to ensure that agencies had a consistent and well-informed approach to addressing the significant supply shortfalls being projected for the Regional Water System.

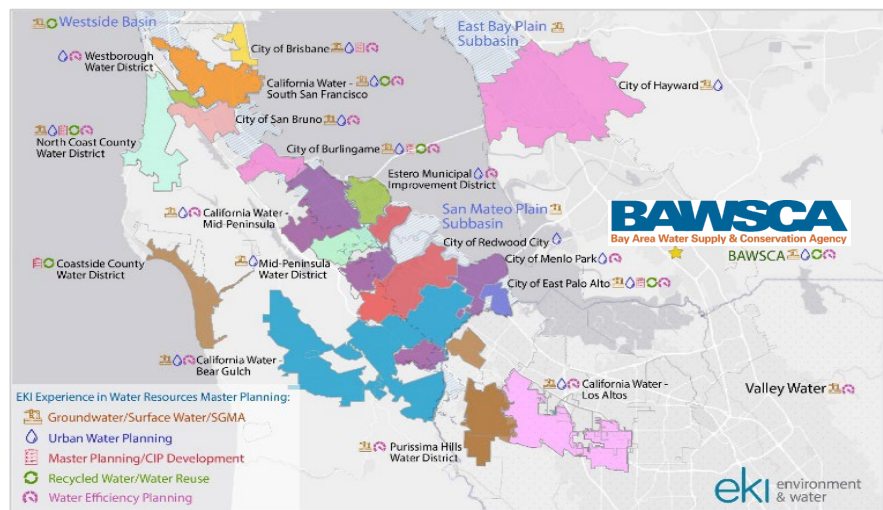
Reference Contact and Project Facts:

Tom Francis
 Water Resources Manager
 Bay Area Water Supply &
 Conservation Agency
 155 Bovet Road, Suite 650
 San Mateo, CA 94402
 Ph: (650) 349-3000
 tfrancis@bawasca.org

Project Duration: 2017 - Present

Key Personnel Involved:

Andree Lee, Anona Dutton, Tina Wang, Vanessa De Anda



EKI’s Water Resources Planning Experience Spans the Bay Area - BAWSCA

Tasks Completed are Comparable to Tasks Anticipated

- ✓ Water Supply Strategy
- ✓ Water Supply Reliability Planning
- ✓ Stakeholder Engagement and Consensus Building
- ✓ Water Demand and Conservation Projections
- ✓ Water Shortage Contingency Planning

EKI provided significant strategic and technical support to BAWSCA for more than a decade, including leadership for prior demand and conservation studies, BAWSCA’s Regional Water Conservation Program and Conservation Strategic Plan, Drought Reports, and implementation of its 2015 Long-Term Reliable Water Supply Strategy (Strategy).

Water Supply and Reliability Projects for BAWSCA Agencies. EKI has also worked directly for half of all BAWSCA agencies on water resources-related projects and has long established working relationships with nearly all the BAWSCA Member Agencies as shown in figure below. EKI has developed UWMPs, WSCPs, AWSDAs, master planning studies, Capital Improvement Plans (CIP), water and sewer system infrastructure, and WSAs for these BAWSCA Member Agencies.

CONJUNCTIVE USE STUDY AND WATER SUPPLY EVALUATION UPDATE, ZONE 7 WATER AGENCY

EKI performed a Conjunctive Use (CU) Study to support Zone 7 to identify the preferred integration of known and potential future water supply sources and new infrastructure and what this integration might mean for yield, operations, and reliability. The CU Study considered and systematically evaluated a variety of sources and options, including optimization of the local groundwater basin, recharge of imported and reclaimed water, investments in Los Vaqueros and Sites reservoirs, increased recycled water use (including IPR), and water bank operations, among other things. Issues related to operations, water quality, infrastructure and permitting needs, cost, climate change and other aspects are being directly quantified as part of the reliability and preferred alternatives assessment. EKI also supported preparation of a Water Supply Evaluation Update, which quantitatively analyzed the reliability of Zone 7’s water supply given alternative supply portfolios under a wide range of hydrologic conditions (i.e., over a 70-year projection) using a probability-based water supply model.

In addition, EKI is supporting Zone 7 with ongoing SGMA implementation efforts, including developing the 2021 Alternative GSP for the Livermore Valley Basin that included a detailed analysis of basin conditions and management options. As part of this effort, EKI refined the hydrogeologic conceptual model of the basin (including detailed geologic interpretation and development of multiple cross-sections) and is currently updating the basin groundwater flow model. GIP is supporting EKI with this effort. Geophysical data collected and interpreted by EKI Team member **GIP** was relied upon to develop the cross-sections and update the conceptual model.

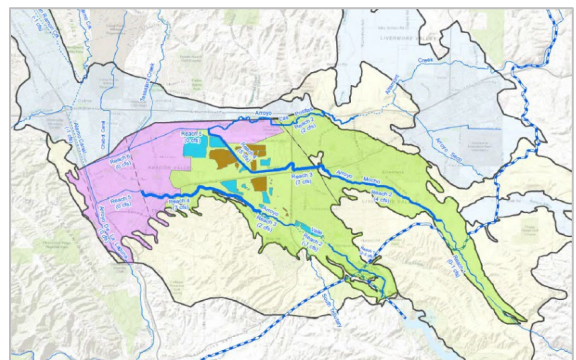
Reference Contact and Project Facts:

Tom Rooze, P.G.
Zone 7 Water Agency
100 North Canyons Parkway
Livermore, CA 94551
Ph: (925) 454-5069
trooze@zone7water.com

Project Duration: 2017 - Present

Key Personnel Involved:

Anona Dutton, Aaron Lewis, Tina Wang, Tyler Colyer, Chris Pittner



Tasks Completed are Comparable to Tasks Anticipated

- ✓ Groundwater development planning and investigations
- ✓ Plan for Project monitoring and performance evaluation
- ✓ Review of permitting, partnerships and other operational considerations

Overview of Project Experience

Below is a list of similar projects that EKI has worked on in the past five years that demonstrates the breadth of our Sustainable Water Planning-related experience using Alternative Water approaches.

Client	Project Highlights	Services Provided							
		Demand & Supply Assessment	Groundwater Analyses	Master Planning	Risk-Based CIP / Project Development	Urban Water Management	Decision Support Tools	Alternative Supply Evaluation	Stakeholder Engagement
California Water (Cal Water) Service Company	<p>Since 2016 EKI has assisted Cal Water with a wide variety of planning and engineering services in support of Water Planning-related efforts:</p> <ul style="list-style-type: none"> 25 2020 UWMPs and WSCPs, 2022 and 2023 AWSDAs, Over 20 WSAs Multiple Water Supply Reliability Studies, including assessment of demand, climate change, supply shortfalls, and groundwater, surface water, recycled water modeling and project development options. Groundwater well siting and analysis and Sustainable Groundwater Management support. 	✓	✓		✓	✓	✓	✓	✓
BAWSCA Services	<p>Since 2013, EKI has assisted BAWSCA with a wide variety of planning and engineering services in support of Water Planning-related efforts:</p> <ul style="list-style-type: none"> Long-Term Reliable Water Supply Strategy scoping, development and implementation. One Water Reliability Roundtable. Drought response assessment. Regional Water Supply Reliability Model. 	✓				✓		✓	✓
Zone 7 Water Agency	<p>Since 2018, EKI has provided engineering and water resources support services in support of One Water-related efforts:</p> <ul style="list-style-type: none"> Recycled water distribution alternatives and Potable reuse alternatives Groundwater augmentation alternatives Grant funding assistance 	✓	✓	✓				✓	✓
City of East Palo Alto	<p>Since 2014 EKI has supported the City with implementation of its Water Supply Strategy, which included several Water Planning-related efforts:</p> <ul style="list-style-type: none"> Securing first-ever transfer in the regional water system. Securing grant funding. Developing and permitting local groundwater sources. 2022 Water System Master Plan, including development of a new hydraulic model in InfoWater Pro and a risk-based CIP. 2015 and 2020 UWMPs, WSCPs, AWSDAs, and several WSAs. 	✓		✓	✓	✓		✓	✓

Client	Project Highlights	Services Provided							
		Demand & Supply Assessment	Groundwater Analyses	Master Planning	Risk-Based CIP / Project Development	Urban Water Management	Decision Support Tools	Alternative Supply Evaluation	Stakeholder Engagement
North Coast County Water District	<p>Since 2020, EKI has provided on-call engineering and water resources support services in support of One Water-related efforts:</p> <ul style="list-style-type: none"> ▪ CIP budgeting and prioritization. ▪ Construction of a new hydraulic model in InfoWater and hydraulic and storage evaluations. ▪ Alternative Water Supply Studies for groundwater supplies and recycled water expansion. ▪ Groundwater supply development. ▪ Pipeline and Groundwater Supply System Design and Construction Support ▪ 2020 UWMP and 2022 AWSDA. ▪ Grant Funding support – procured \$6.6 million in grants for the District. ▪ As needed hydraulic modeling support. 	✓	✓		✓	✓		✓	✓
City of Lathrop	<p>Since 2013 EKI has supported the City with a wide variety of planning and engineering services, in support of Water Planning-related efforts:</p> <ul style="list-style-type: none"> ▪ 2019 and 2023 water, wastewater, and recycled master plans (collectively referred to as the Integrated Water Master Plans [IWRMPs]), including development of new hydraulic models in InfoWater Pro and InfoSWMM and risk-based CIPs. ▪ Extensive stakeholder outreach effort as part of the development of its 2019 IWRMP and successful adoption. ▪ 2015 and 2020 UWMPs, 2022 AWSDA, WSAs. ▪ PFAS and other water quality support for groundwater supply evaluation. ▪ Successful basin boundary modification as part of SGMA. ▪ Program management for \$25M expansion of wastewater treatment and recycled water facilities. 	✓	✓	✓	✓	✓		✓	✓
Valley of the Moon Water District	<p>Since 2014 EKI has supported the District in terms of increasing the capacity, resiliency, and reliability of its system and One Water-related efforts:</p> <ul style="list-style-type: none"> ▪ 2019 Water System Master Plan, including the development of a new hydraulic model in InfoWater and a 20-year CIP program. ▪ 2015 and 2020 UWMPs, 2022 AWSDA, WSAs. ▪ CIP Design and Construction Support – Wells, ASR wells, & pipeline design. ▪ As needed hydraulic modeling support. 	✓	✓	✓	✓	✓	✓		✓

Client	Project Highlights	Services Provided							
		Demand & Supply Assessment	Groundwater Analyses	Master Planning	Risk-Based CIP / Project Development	Urban Water Management	Decision Support Tools	Alternative Supply Evaluation	Stakeholder Engagement
Coastside County Water District	<p>Since 2018, EKI has provided on-call engineering and water resources support services in support of One Water-related efforts:</p> <ul style="list-style-type: none"> ▪ CIP budgeting and prioritization; CIP pipeline, tank, pressure reducing valve projects design and construction support. ▪ System-wide storage evaluation. ▪ On-call hydraulic modeling using the District’s existing WaterCAD model. ▪ Grant funding assistance. 	✓			✓			✓	✓
City of Brisbane	<p>Since 2014, EKI has provided on-call engineering and water resources support services in support of One Water-related efforts:</p> <ul style="list-style-type: none"> ▪ CIP pipeline and booster pump station design and construction support. ▪ Hydraulic Modeling using WaterCAD and SewerCAD. ▪ 2017 Water Master Plan and Sewer System Master Plans. ▪ 2014 and 2022 WSCPs and WSAs. ▪ Risk and Resilience Assessment and Emergency Response Plan. ▪ Assessment of groundwater resources development potential. 	✓		✓	✓	✓	✓	✓	
Diablo Water District and Ironhouse Sanitary District	<p>Since 2018, EKI has provided engineering and water resources support services in support of One Water-related efforts:</p> <ul style="list-style-type: none"> ▪ Recycled water distribution and potable reuse alternatives. ▪ Water supply alternatives development and “blue sky” planning. ▪ Grant funding assistance. 	✓					✓		
Marina Coast Water District	<p>Since 2014, EKI has provided engineering and water resources support services in support of One Water-related efforts:</p> <ul style="list-style-type: none"> ▪ Alternatives to mitigate seawater intrusion and augment groundwater supplies and meet new demands for development, including IPR with highly-treated recycled water. ▪ SGMA compliance (GSP development and implementation). ▪ Grant funding support. 	✓	✓	✓			✓	✓	

Our Proposed Team

At EKI, we are aware of the importance our clients place on the selection of a capable Project Manager supported by technical specialists to effectively guide their projects to completion. We understand that successful completion of a project is founded on the performance and experience of key individuals. For Douglas County, in particular, we are aware that a project management team that is local and understands your needs, processes, and interrelated efforts is essential to the success of this project. To meet this project's needs, EKI has resources to assemble a well-rounded team of dedicated and specialized professionals who are proficient in all aspects of water planning, supply and demand assessment and modeling, identifying and estimating reliability gaps, evaluating alternative sources and options, water shortage contingency planning, and urban water management planning. EKI's proposed team has demonstrated capability towards consistent leadership across all aspects of water resources planning work.

Our proposed team brings demonstrated experience in:

- *Water Planning, Water System Master Plan, Distribution System, and Asset Management*
- *Long-Term Supply Planning and Strategy*
- *Water Supply and Demand Assessments*
- *Integrated Water Resources Planning*
- *Groundwater Sustainability Planning*

EKI's highly trained engineering, hydraulic and hydrogeologic modeling, data analysis, and GIS staff will support the management team to accomplish their action items for the County's Water Plan and its related tasks. Additional staff may provide support, as appropriate. EKI's proposed staff has the resources and experience to complete the County's scope of work and is available and ready to work as an extension of the County staff with minimal assistance to develop a roadmap for implementing realistic strategies to secure and maintain current water supplies and develop new ones.

EKI's proposed Project Manager, Brad J. Arnold, PE, BC.WRE, is a licensed Civil Professional Engineer (PE) in multiple states including Colorado and holds a post-license credential as a "Board-Certified Water Resources Engineering" (BC.WRE) by the American Society of Civil Engineers' (ASCE) American Academy of Water Resources Engineers (AAWRE). He will provide day-to-day oversight of the contract and project management to the County, ensuring all deliverables are completed as scheduled. He is supported by Andree Lee, our proposed Principal in Charge, who brings exhaustive experience in water planning across entities to bring collaborative solutions to long-term water supply planning.

**EKI Project Manager (Contact Person):
Brad J. Arnold, PE, BC.WRE
Proposed Project Manager**

**E-mail: barnold@ekiconsult.com
Phone: (262) 490-2271**

Mr. Arnold has 10+ years' experience managing water resources projects for water suppliers and agencies, focused on policy navigation, watershed programs, water rights issues, etc.

Brad and Andree are supported by our engineering staff - Sarah Hodson, PE and Sarah Gerenday PhD, both are located in Denver, Colorado and are familiar with the County's water system and its issues. Our team together brings the right mix of knowledge and experience of surface and groundwater planning that the County staff can benefit from.

Short bios of the management team and other key staff are included in this section below. Detailed resumes with the summary of qualifications and experience of each proposed staff member are included as **Appendix A**.

BRAD J. ARNOLD, PE, BC.WRE – PROJECT MANAGER AND WATER SUPPLY AND WATER TRANSFERS



- Professional Civil Engineer in Colorado (#64273)
- Professional Engineer in California (C #83497)
- Board-Certified Water Resources Engineer (BC.WRE) from American Academy of Water Resources Engineers (AAWRE) under the American Society of Civil Engineers
- MS, Civil & Environmental Engineering: Water Resources Management, University of California, Davis, 2018
- MS, Agricultural & Natural Resources Engineering, University of California, Davis, 2013
- BS, Mechanical Engineering, Milwaukee School of Engineering, 2010

Relevant Experience Highlights

- GSP Planning and Implementation
- Integrated Regional Water Management (IRWM)
- Watershed Program Management
- Water Rights Issues
- Water Use Efficiency Planning
- Agricultural Water Supply and Demand

Mr. Arnold has over a decade of professional and research experience managing water resources projects for utility suppliers and water agencies. He has supported private and public agency clients with their water supply planning and analyses, state and federal-level policy navigation, watershed program management, and water rights issues. His work has included the analysis and optimization of clients' water rights portfolio, to help perfect and protect their water supply assets and entitlements (e.g., investigations of historic diversions and uses, and review of opportunities to better utilize rights via storage and/or conjunctive use). He has worked on water transfer and supply augmentation negotiations, navigating client relationships, and exploring mutually beneficial opportunities to procure water supplies. Prior to EKI, Mr. Arnold briefly worked for a Public Agency Supplier's Imported Water Unit, supporting their analyses of groundwater banking opportunities and proposed water storage projects.

As Project Manager, Mr. Arnold will perform all project management tasks, including client communications, invoicing and coordination, coordination of tasks amongst the EKI team and will ensure all work products are being developed completely and efficiently as possible to meet all deadlines. He will be the main point of contact (PoC) for the County. Mr. Arnold will also support efforts to conduct technical analyses, research and review, and development of deliverables related to water supply and transfer options, including review of water rights procurement and limitations, and the applicability towards and coordination with groundwater banking opportunities.

ANDREE (JOHNSON) LEE – PRINCIPAL IN CHARGE/ LONG-TERM SUPPLY



- BA, Geography/Environmental Studies, University of California, Los Angeles, 2006

Ms. Lee has 16 years of experience supporting agencies and public sector clients with water resources projects. She specializes in working across entities to achieve collaborative solutions to complex water supply challenges. Ms. Lee has

managed the development of water planning efforts, including visionary and high-profile regional efforts across California. She has worked closely with agencies throughout the western United States a on water supply and demand forecasting, water supply development and strategic planning, water conservation planning and implementation, and water transfers. She also provides western water policy leadership as the Urban Water Institute Chair.

Relevant Experience Highlights

- Water Management Planning and Strategy
- Facilitation and Consensus-Building
- Stakeholder Engagement
- Water Use Efficiency Planning and Implementation
- Drought Management
- Water Supply Assessment, Planning, and Development
- Water Resilience Planning
- Water Supply Reliability Planning

Ms. Lee will provide strategic and technical direction, support communication and coordination efforts and ensure that appropriate staff resources are made available to meet project needs. She will also lead long-term supply planning

ANONA DUTTON, PG, CHG – QAQC



- Professional Geologist in California (#7683)
- Certified Hydrogeologist in California (#841)
- M.S., Hydrogeology, Stanford University, 2000
- B.S., Environmental Sciences, Stanford University, 1998

Ms. Dutton has over 20 years of experience managing water resources projects. She is deeply involved in water resources evaluations throughout the State and is recognized as an expert in her field. She has worked widely in the Bay Area and California to assist municipalities with their water supply and system security. She has managed the development of multiple conjunctive use and water supply reliability studies, including for Cal Water, Valley Water, Diablo Water District, and Zone 7. Ms. Dutton has worked closely with BAWSCA and more than half of the BAWSCA agencies on a variety of water resources planning and development projects, including recent efforts related to the 2020 UWMPs and WSCPs; WSAs; groundwater, recycled water and surface water development; Water Supply Reliability Modeling; and drought response. Ms. Dutton oversees the development of water system master plans involving hydraulic modeling, water supply and water demand projections, and infrastructure needs. Ms. Dutton also supports agencies and public sector clients with groundwater supply development, water transfers, and SGMA compliance. Ms. Dutton has also led the successful development of grant proposals that have secured millions of dollars for her clients.

Relevant Experience Highlights

- Strategic and technical support for Water Planning
- Comprehensive Supply Reliability Studies
- UWMPs and WSAs
- Water Use Efficiency Planning and Implementation
- Drought Management
- Water Resilience Planning
- Groundwater expertise
- Facilitated more than \$25M of Federal & State grant funds

Ms. Dutton will provide strategic and technical direction, support communication and coordination efforts and ensure that appropriate staff resources are made available to meet project needs.

SARAH HODSON, PE – ENGINEERING PROJECT SUPPORT



- Professional Engineer, California (#95003)
- M.S., Environmental Engineering, University of California, Berkeley, 2021
- B.S., Civil and Environmental Engineering, University of California, Berkeley, 2020

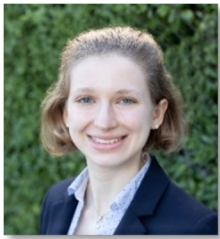
Ms. Hodson provides technical support on a broad range of water resources and engineering projects, including extensive technical experience leading information processing, policy review, and drafting reports for varying audiences. She has been supporting public agency clients with supply allocation studies, water supply planning efforts, and hydrologic modeling and analyses tools. She is particularly interested in the intersection of watershed-level programmatic efforts with planning efforts aimed at ensuring robust and reliability water supplies. Ms. Hodson has also provided support for infrastructure design and groundwater analyses. Ms. Hodson is located in Denver, CO and will serve as key project staff given her familiarity with local issues and regulations.

Relevant Experience Highlights

- Water Supply Reliability Studies
- Water Supply Resilience Planning
- Supply Infrastructure Design
- Integrated Resources and One Water Planning
- Stakeholder Engagement
- Federal & State grant fund application and facilitation

As Project Staff, Ms. Hodson will provide technical support and contribute to the development of project deliverables.

SARAH GERENDAY, PHD – HYDROGEOLOGY AND MODELING



- PhD, Earth Science, University of California, Santa Barbara, 2022
- BS, Earth Science, Rice University, Houston, Texas, 2017

Dr. Gerenday provides technical support on a broad range of water resource projects. She develops water supply assessments and management plans, supports their implementation, conducts geospatial analysis to identify impacts of current and proposed management activities, analyzes data and develops models to assess groundwater conditions, and coordinates work with clients and stakeholders. Dr. Gerenday has authored technical reports and peer-reviewed articles on use of recycled water and MAR feasibility in the context of groundwater management and water quality regulations. Dr. Gerenday is located in Denver, CO and will serve as key project staff given her familiarity with local issues and regulations.

Relevant Experience Highlights

- Geospatial Analysis
- Managed Aquifer Recharge Feasibility and Pilots
- Geochemical modeling and groundwater particle tracking
- Grant Applications
- Technical Writing

Dr. Gerenday will provide technical support for hydrogeologic studies, including geospatial assessments, data analysis, and development of water banking options.

VANESSA DE ANDA – PROJECT SUPPORT



- M.S., Environmental Science and Management, University of California-Santa Barbara, 2017
- B.S., Environmental Science, University of California-Los Angeles, 2014

Ms. De Anda has over six years of experience providing integrated water resources management services to water districts and municipalities throughout Southern California. Through her work with the LACPW on the Los Angeles County Water Plan, as well as with the Greater Los Angeles County and the Antelope Valley Integrated Regional Water Management (IRWM) regions, Ms. De Anda has collaborated with suppliers and stakeholders across Los Angeles County to develop strategies aimed at achieving regional water supply reliability. Ms. De Anda has also supported the successful development of grant proposals that have secured over \$40 million for clients in Los Angeles County. Ms. De Anda has extensive experience developing water demand projections, evaluating and assessing available water supplies under various levels of hydrologic conditions, and evaluating the availability to meet future demands. Ms. De Anda has assisted multiple urban water suppliers throughout California in developing their 2020 UWMPs updates. She has also assisted in the development of multiple WSAs across a broad range of development types.

Relevant Experience Highlights

- Demand Forecasting
- Strategic and technical support for BAWSCA and its agencies
- Integrated Regional Water Planning and Management
- Comprehensive Supply Reliability Studies
- UWMPs and WSAs
- Water Use Efficiency Planning
- Water Resilience Planning
- Stakeholder Engagement

As Project Staff, Ms. De Anda will provide technical support and contribute to the development of project deliverables.

References (including 4 from Public Agencies)

Reference 1

Contact: Ken Jenkins, Chief Water Resources Sustainability Officer

Agency: California Water Service (Cal Water)

Address: 1720 North First Street, San Jose, CA 95112

Phone: (310) 257-1484 x71484

Email: kjenkins@calwater.com

Services Provided: Surface Water and Groundwater Studies and Strategic Planning Support, Urban Water Management Planning, Water Supply Reliability Planning

Key Personnel Involved: Anona Dutton, Andree Lee, Sarah Hodson, Tina Wang

Reference 2

Contact: Metra Richert, Water Supply Planning and Conservation Manager

Agency: Valley Water

Address: 5750 Almaden Expressway, San Jose, CA 95118

Phone: (408) 630-2978

Email: mrichert@valleywater.org

Services Provided: Water Banking and Siting Studies and Conservation Strategic Planning

Key Personnel Involved: Anona Dutton, Andree Lee, Brad Arnold

Reference 3

Contact: Jeevan Muhar, PE, Engineer-Manager

Agency: Arvin-Edison Water Storage District

Address: PO Box 175, Arvin, CA 93203

Phone: Direct: (661) 854-5573 ; Mobile: (661) 747-0062

Email: jmuhar@aewsd.org

Services Provided: Groundwater Sustainability Planning, Implementation, and Management, Groundwater Modeling, Decision Support Tool, Integrated Water Demand Assessment, Grant Tracking Tool

Key Personnel Involved: Anona Dutton, Andree Lee, Aaron Lewis, Sarah Hodson, Sarah Gerenday

Reference 4

Contact: Ken Minn, PE, Groundwater Resource Manager

Agency: Zone 7 Water Agency

Address: 100 North Canyons Parkway, Livermore, CA 94551

Phone: (925) 454-5069

Email: kminn@zone7water.com

Services Provided: Water Supply Evaluation and Conjunctive Use Study, Groundwater Modeling and Development, Alternative Groundwater Sustainability Planning

Key Personnel Involved: Anona Dutton, Aaron Lewis, Tina Wang, Tyler Colyer, Chris Pittner

Reference 5

Contact: Thomas Francis, Water Resources Manager

Agency: Bay Area Water Supply & Conservation Agency (BAWSCA)

Address: 155 Bovet Road, #650. San Mateo, CA 94402

Phone: (650) 349-3000

Email: tfrancis@bawasca.org

Services Provided: Strategic Water Supply Planning and Development, Demand and Conservation Planning and Modeling, Water Supply Reliability Planning, Drought Reports, Urban Water Management Planning, Water Shortage Contingency Planning, Annual Water Supply and Demand Assessments, Water Supply Assessments, Grant Tracking and Grant Tool

Key Personnel Involved: Andree Lee, Anona Dutton, Tina Wang, Vanessa De Anda

3. AFFIRMATION OF UNDERSTANDING OF THE SCOPE OF SERVICES AND ALL CONDITIONS OR REQUIREMENTS CONTAINED IN THE RFI

EKI would like to confirm the understanding OF THE Scope of Services and All Conditions or Requirements Contained in the Douglas County’s RFI for 2050 Comprehensive Water Plan.

4. COPY OF YOUR EKI'S "MISSION STATEMENT" AND "STANDARD OF QUALITY STATEMENT"

EKI's Mission Statement and Core Values

Mission Statement: Employee owned and committed to investing in our people and making an impact by solving our clients' environmental, water resources, and engineering challenges.

Core Values: EKI provides full-spectrum environmental, water, wastewater and water resources services. Our clients value our synthesized solutions, responsiveness, quality, ingenuity and results.

EKI's QA/QC Process

Having a solid QA/QC process is critical when developing a highly competitive grant application and is integral to overall Project success. During EKI's QA/QC process we manage, identify, analyze, plan and track throughout the span of the Project. Using meetings, reviews, and tools (such as schedule tracking, budget tracking, scoring criteria checklists), together with our standard procedures for performing QA/QC, results in a robust process. EKI's standard QA/QC procedure for preparing Water Planning Projects related materials is to have an EKI team member, who did not work on the proposal, review the deliverables against the appropriate guidelines/scoring criteria to ensure all boxes are being checked and questions are being fully answered. This iterative process repeats throughout the Project whereby we communicate with the Client/Agency, deliberate internally and with Client/Agency, and document via our QA/QC tracking tools to monitor and keep the Project on track and moving forward.



EKI's goal is to successfully resolve project challenges while providing the quality that accomplishes our Client's requirements and objectives in a timely manner and within the established budget. EKI's approach to the management of this project will include the following:

- Frequent and clear communications between the EKI team members and with the County;
- Risk, cost, and schedule control by identifying issues early in the project to be able to implement effective corrective measures;
- Monitor project costs on a regular basis to be able to proactively identify cost trends early such that corrective measures can be implemented to maximize potential cost savings; and
- Implement quality control throughout the project duration.



PROJECT COORDINATION AND COMMUNICATIONS

The EKI Team believes that communication is vital for establishing effective client relationships. In our previous water resources planning projects, frequent and transparent communication between EKI and our clients has been essential for maintaining project momentum, facilitating decision-making, and ensuring Client Project Managers are informed of any potential issues impacting project timelines and budgets.

EKI has a proven track record of actively engaging with clients throughout project implementation. Initially, we convene a kickoff meeting to align objectives, strategic approaches, and technical methodologies. This forum allows for the identification of key data requirements, deliverables, and critical decision points. Throughout the project lifecycle, EKI maintains close contact with our clients through scheduled meetings to present interim findings and solicit feedback on strategic directions. This approach ensures alignment with project goals, minimizes schedule and budget risks, and avoids unexpected surprises during project execution. Our successful completion of the previous scope of work with the County under budget while providing different levels of flexibility needed under its different tasks proves the effectiveness of this approach and our ability in its execution.

Drawing from our successful experiences, we propose establishing monthly coordination meetings between the County PM and the EKI Team, unless agreed upon otherwise, to coordinate approach and establish a common understanding of the project’s progress. These meetings would serve as forums for progress updates, issue resolution, action item review, and presentation of findings. Additionally, our team will remain readily available for ad-hoc meetings or more frequent verbal and email exchanges to address any emerging needs or concerns promptly.

“EKI did a fantastic job helping North Coast County Water District to secure a DWR Urban and Multibenefit Drought Relief Grant. Your team identified the opportunity, helped to refine our project to make it competitive, and put together a winning application in a short timeframe. Thank you for making the process so easy for us!”

*-Adrienne Carr
General Manager
North Coast County Water District*

WORK, SCHEDULE, AND BUDGET MANAGEMENT

EKI will develop a detailed scope of work for this project that will include a detailed list of deliverables and scope and budget estimates. EKI will use this detailed scope and budget to manage project implementation. Specifically, EKI will employ the following practices to ensure effective and transparent project management.

- We will employ our internal budget tracking tools that allow our project managers to efficiently track project progress and estimates-to-completion and allocate project resources. We will communicate the budget status through monthly status reports, which will include a summary of work performed, upcoming tasks, and project issues.
- Project schedules will be regularly reviewed and updated, as needed, based on coordination with County staff.



5. DISCLOSURE OF CONFLICTS OF INTEREST

EKI or our proposed team members do not have any potential known Conflicts of Interest that pertain to this project or the Douglas County or may result during the course of this project.

APPENDIX A: RESUMES

Brad J. Arnold, PE, BC.WRE

Water Resources Engineer & Planner

Mr. Arnold has over a decade of professional and research experience managing water resources projects for utility suppliers and agencies. He has been supporting private and public agency clients with water supply planning and analyses, state and federal-level policy navigation, watershed program management, and water rights issues. His work and research have included the investigation of water supply and storage systems, conjunctive use opportunities, and other options to optimize supplier portfolios. Mr. Arnold has provided project support for a wide range of integrated studies and plans, technical analyses, and stakeholder outreach via watershed-level modeling, and for groundwater systems subject to California's Sustainable Groundwater Management Act (SGMA) program. He is a licensed Civil Professional Engineer (PE) in California, and holds a post-license credential as a "Board-Certified Water Resources Engineer" (BC.WRE) by the American Society of Civil Engineers' (ASCE) American Academy of Water Resources Engineers (AAWRE). His most recent work has involved supporting public sector clients with complex water rights protection and reliability assessments, modeling, and improvements for newly implemented mandated reporting. Mr. Arnold has been involved in several data management and user interface efforts, using spreadsheet and programming tools to collect, refine, and display hydrologic, diversion, and supply and demand data.

Relevant Experience

- **Multi-State Surface Water Management Practices Survey.** *North Dakota Department of Water Resources.* EKI is conducting a survey of local surface water management practices across 21 states in the Mid-West and Western United States. This survey will evaluate key trends in surface water management practices, policies, and regulations to inform decision-making and support policy recommendations in the North Dakota Department of Water Resources. The survey relies on both publicly available data, as well as public agency outreach to gather additional information as necessary. Mr. Arnold is the project manager, leading the team in survey for Rocky Mountain Region and adjacent states, including Colorado, Utah, Nebraska, and Wyoming.
- **Imported Water Supply Strategy.** *Santa Clara Valley Water District (Valley Water).* Santa Clara County, CA. Senior Engineer (employed by Valley Water). With Valley Water, Mr. Arnold led technical analyses and efforts to better understand Valley Water's imported water supplies from the California State Water Project (SWP) and federal



Education

- MSc Civil & Environmental Eng, Univ. of California, Davis, 2018
- MSc Agricultural & Natural Resources Eng, Univ. of California, Davis, 2013
- BSc Mechanical Eng, Milwaukee School of Engineering, 2010

Registrations/Certifications

- Professional Civil Engineer, California (#83497), Colorado (#64273), Wisconsin (#100529-6), North Dakota (#40506)
- AAWRE Board-Certified Water Resources Engineer (Cert #00810)

Affiliations

- Water Education Foundation "California Water Leaders" 2021 Class

Technical Expertise

- SGMA Planning
- GSP Implementation
- Integrated Regional Water Management (IRWM)
- Watershed Program Management
- Water Rights Issues
- Water Use Efficiency Planning
- Agricultural Water Supply and Demand

Central Valley Project (CVP) systems. His work included the assessment of surface water supply yields, securing water transfer options, and evaluating the feasibility of developing new non-potable water supply and storage options, such as via conjunctive use projects (i.e., groundwater recharge and ‘banking’) in California’s Central Valley. He supported Valley Water in negotiating water transfers and exchanges with other CVP and SWP contractors, and water rights holders in North-Central California, securing the agreements, approvals, and environmental review necessary to facilitate these activities. His work involved frequent coordination with DWR (SWP) and U.S. Bureau of Reclamation staff regarding contract interpretations and amendments, storage carryover, and water rights petitions to secure flexibility in supply conveyance options.

- **SGMA Program and Groundwater Management Support.** *Eastside San Joaquin Groundwater Sustainability Agency (Eastside GSA) and Eastern San Joaquin Groundwater Authority (GWA).* Calaveras and San Joaquin Counties, CA. *White Wolf Subbasin Groundwater Sustainability Agency (WWGSA).* Kern County, CA. Mr. Arnold’s recent SGMA work included administrative lead as Point of Contact (POC) for the Eastside GSA and its member agencies located in the critically-overdrafted Eastern San Joaquin Groundwater Subbasin – GSA covered Calaveras and Stanislaus Counties within Subbasin, working with the GWA. His recent work includes providing technical support services the WWGSA, supporting coordination and governance discussions, and participation in and engagement with the technical committees to help guide Groundwater Sustainability Plan (GSP) implementation efforts, monitoring efforts, Subbasin hydrogeologic modeling, and analyses of GSA-proposed ‘Project & Management Actions’ (PMAs). Prior to this role Mr. Arnold acted briefly as a DWR North-Central Region Office POC (while employed by DWR) for the North American, North and South Yuba Groundwater Subbasins, providing direct technical and regulatory assistance to applicable GSAs. He also helped develop Assembly Bill (AB) 3030 Groundwater Management Plan updates as a consultant under prior non-SGMA management efforts for former clients in Northern Kern County. He also has experience collecting and preparing monitoring well data for upload to California’s Statewide Groundwater Elevation Monitoring (CASGEM) system and the “SGMA Portal” clearinghouse.
- **Water Rights Program Administration.** *Calaveras County Water District (CCWD), Utica Water and Power Authority (UWPA), and Marin Municipal Water District (MMWD).* Multiple Counties, CA. Mr. Arnold has supported several agencies’ water rights administration efforts, including engagement with California State Water Resources Control Board (SWRCB) regulators and relevant legislative monitoring, compliance with mandated diversion and use reporting, drought and SWRCB curtailment action responses, hydrologic modeling, and other related work (e.g., submission of change petitions, time extensions, and other requests). He led efforts in developing complex water rights models aimed at improving accounting of reported diversions, uses, and storage carryover for rights holders and coordination with other in-watershed agencies. He managed the SWRCB-permitted appropriative rights, senior (pre-1914) rights claims, and riparian claims within several key watersheds across California’s Central Sierra Nevada Mountains Region – used for municipal, domestic, hydropower, and other uses. He led several contract and partnership negotiations related to multi-agency water rights allocations, joint reporting, supply coordination, and in analysis of competing water rights claims. Mr. Arnold has also served as a lead technical expert and has provided water rights details and findings in various SWRCB and legal proceedings, as well as formal presentations and statements made to elected officials, regulators, and in other various professional and legal settings.

- **Conjunctive Use Support.** *Multiple Clients.* Kern County, CA. Mr. Arnold has supported the development of specific conjunctive use projects, both the planning and storage accounting, and development of facilities (e.g., artificial recharge ponds). He has helped coordinate surface and groundwater recharge utilization as a consultant for clients in Northern Kern County; specifically recharge ponds and basins, pumping recovery infrastructure, etc., most recently supporting the WWGSA in analyzing recharge losses and recovery strategies. These projects considered a variety of sources and options, infrastructure and permitting needs, for relying on the recharge of imported water and water rights entitlements for local contractors and external partner agencies (e.g., Semitropic Water Storage District groundwater banking efforts). Mr. Arnold also supported public agency staff with the data collection and monitoring efforts related to administering existing conjunctive use programs.
- **Water Use Efficiency (WUE) Analyses and California 2018 ‘Urban WUE Standards’ Legislation Planning.** *Calaveras County Water District.* Calaveras County and Mountain Counties Region, CA. Water Resources Program Manager (while employed by CCWD). Mr. Arnold led the development of CCWD’s multi-year effort to monitor, analyze, and prepare for enactment of the 2018 ‘Urban WUE Standards’ Legislation by the SWRCB – once implemented will govern per capita urban water use by residential and certain commercial, industrial, and institutional (CII) water uses, and will penalize excessive distribution systems losses. His work has focused on the analyses of conveyance and distribution systems losses, system improvements benefits and risks analyses, and related service area coordination. Mr. Arnold has also incorporated metered and billed water user data into standardized audits comparing with preliminary state methodology (e.g., remote landscape irrigation quantification, American Water Works Association [AWWA] loss standards) aimed at detailing non-compliance risks and supplier metering options. This work has included active engagement with other public water suppliers facing similar issues in meeting the proposed standards and working through legislative affairs channels such as the Association of California Water Agencies (ACWA). Mr. Arnold has presented at ACWA-sponsored and other events related to these WUE Standards concepts.
- **Water Supply & Demand Balance and Agricultural Water Use Data Interfaces.** *California Department of Water Resources (DWR)* CA. Water Resources Engineer (employed by DWR). Mr. Arnold supported the development of California state-wide water supply and demand data procurement and processing efforts in support of DWR’s Bulletin 118 California Water Plan Update (B118). His work involved outreach to suppliers, regional stakeholders, and other entities. He detailed watershed, county, and supplier-level hydrologic data using spreadsheet and programming (Python) tools he developed for compiling and providing accessible user interfacing to these large datasets. Outcomes involved tools used to compile and display complex information related to water diversions, uses, and contributions to downstream and in-basin uses and users.
- **Water Resources Planning Studies.** *Multiple Clients.* CA. Mr. Arnold has helped prepare numerous water resources planning studies in California, including Agricultural Water Management Plans (AWMPs) for irrigation supplier clients in Northern Kern County, Urban Water Management Plans (UWMPs) and Water Shortage Contingency Plans (WSCPs) for suppliers in North-Central California, most recently supporting California Forever, LLC. review of potential water supply options and reliability considerations to meet planned urban development in Solano County, California. At CCWD, Mr. Arnold helped prepare U.S. Environmental Protection Agency required Watershed Sanitary

Surveys for three large Upper Watershed sources and planning documents required under America's Water Infrastructure Act of 2018 (AWIA) for their public water systems. Mr. Arnold has prepared comprehensive water supply, (per capita) demand, and distribution system losses analyses per DWR's ongoing requirements, specifically Urban Water Loss Audits per AWWA methodology, and annual Water Supply & Demand Assessments (AWSDAs). His experience in this topic extends to watershed-level planning studies, participation in multi-jurisdictional studies (e.g., Federal Emergency Management Agency [FEMA] Local Hazard Mitigation Planning), and long-term forecasting of supply-demand issues, water rights utilization, and hydrologic climate change considerations.

Andree (Johnson) Lee

Vice President

Ms. Lee has 17 years of experience managing water resources projects for public agencies. She specializes in working across entities to achieve collaborative solutions to complex water supply challenges. She brings extensive experience on integrated planning and One Water planning for agencies throughout California, as well as direct experience planning for and implementing complex, multi-party water transfer and banking efforts. Ms. Lee has led several water supply and transfers strategies and related projects for agencies throughout California. She has been instrumental in building consensus for alternatives and intergarded sources for reliability within local and regional entities. She has extensive expertise in water demand forecasting, drought contingency planning, and drought response.

Relevant Experience

- **California Water Service Company.** *Regional Water Supply Reliability Study. Multiple Counties.* Ms. Lee was the Technical Advisor for reliability study for Bay Area districts. She assisted in identifying sources of water supply and demand, analyzing resulting gaps under various forecasting scenarios, including climate change, and developing a plan to implement additional supply and demand management options to meet the defined water resource needs.
- **Amador Water Agency.** *Water Transfer Strategic Services.* Ms. Lee is the Project Manager supporting Amador Water Agency in implementing a water transfer of its conserved surface water supply. She is leading preparation of the accounting for conserved water available for transfer, developing documentation of water rights and transfer operational constraints, and supporting the Agency in negotiations with buyers, wheeling entities, regulatory entities, and other interested parties.
- **Purissima Hills Water District.** *Water Supply Strategy.* Ms. Lee is the Project Manager supporting Purissima Hills Water District (PHWD) in evaluating its water supply options, specifically focused on water transfer and exchange options. Options evaluated included in-region transfers, water supply partnerships and exchanges, out-of-region transfers, in-lieu exchanges, and new wholesale relationships. EKI developed an initial list of 16 supply options and conducted initial assessment of feasibility, partners, supply benefits, and cost. EKI then facilitated a screening workshop with PHWD staff to select preferred options and led follow-up investigations of preferred



Education

- B.A., Geography and Environmental Studies
University of California,
2006

Affiliations

- Urban Water Institute,
Board Chair (2022 – present)
- Urban Water Institute,
Board Secretary (2020-2022)

Technical Expertise

- Water Supply Reliability Planning
- Water Supply Assessment, Planning, and Development
- Drought Management
- Water Resilience Planning
- Water Use Efficiency Planning and Implementation
- Successful Grant Procurement
- Funding Strategy
- Coalition Building and Stakeholder Coordination
- Integrated Regional Water Management Planning
- Stakeholder Engagement

options. EKI is currently supporting PHWD in additional investigations of preferred options, including technical and institutional analysis and negotiation of contract terms.

- **California Water Service Company.** *Groundwater Recharge Study. California.* Ms. Lee managed the evaluation of a groundwater recharge program in the Visalia area. Quantified water supply needs and potential benefits and constraints of Cal Water implementing a recharge project in the Visalia area. Identified water supply options, availability, and costs, evaluated recharge potential of specific site identified for potential purchase.
- **Marin Municipal Water District.** *Emergency Water Transfer and Wheeling Support.* Ms. Lee was the Project Manager supporting MMWD in developing water transfer options and wheeling terms in conjunction with the MMWD-EBMU Emergency Intertie Project. Ms. Lee supported the District in identifying transfer options, negotiating agreement parameters, identifying regulatory considerations, and establishing conveyance mechanisms.
- **Ramona Municipal Water District.** *Annexation Water Supply Support.* Ms. Lee is the Project Manager supporting RMWD in developing water supply options for potential annexation of the Barona Indian Reservation into the District service area. Ms. Lee supported the District in identifying options including annexation into Metropolitan Water District service area, transfers with local agencies, and out-of-region transfers.
- **Inland Empire Utilities Agency (IEUA).** *State Water Project Reliability Study for IEUA Service Area.* Arvin, CA. Ms. Lee is the Project Manager for the State Water Project Reliability Analysis (SWPRA) for the IEUA service area. This project identifies potential Metropolitan Water District (MWD) water supply shortfalls for the IEUA member agencies, focusing on reliability and water supply impacts from State Water Project (SWP) conditions under range of hydrologic and regulatory scenarios. This initial effort focuses on SWP/MWD supply availability, identification of water supply gaps, assessment of indirect impacts of MWD/SWP supply gaps to IEUA recycled water, and initial identification of indirect impacts of supply gaps to IEUA member agencies. Additionally, EKI will evaluate the indirect water quality and supply impacts of the SWP/MWD water supply gaps to IEUA member agencies.
- **Los Angeles County Department of Public Works.** *County Water Plan. Los Angeles County.* Ms. Lee was the Project manager for countywide water plan to establish path to water resilience for over 200 water management entities. She led all aspects of project development. Ms. Lee facilitated more than 100 stakeholder workshops and listening sessions. She prepared technical analysis to establish regional targets and actions for water supply reliability, groundwater management, watershed wildfire management, and small water system support. She developed plan website and communication materials.
- **Multiple Clients.** *Joint Agency Water Supply Study. Riverside County.* Ms. Lee was the Technical Lead for joint study among Eastern Municipal Water District (MWD), Western MWD, Elsinore Valley MWD, and Rancho California MWD. She developed water supply concepts that were identified in an initial board brainstorming session. Ms. Lee established a framework for comparing these concepts and facilitated workshops with agency management to seek input and recommend next steps.
- **Valley Water,** *Conservation Portfolios for Water Supply Master, Santa Clara County, CA.* Ms. Lee is leading the development of a water conservation targets and program portfolios for Valley Water’s

Water Supply Master Plan 2050. The project includes detailed analysis of remaining water savings potential and anticipated future passive conservation savings, identification of potential long-term water conservation targets, development of potential water conservation measures, cost-benefit analysis, and preparation of conservation portfolios to meet potential savings targets.

- **Bay Area Water Supply and Conservation Agency. *Conservation Strategic Plan.*** Bay Area, CA. Ms. Lee was the Client Project Manager for development and implementation of strategic plan to support 26 BAWSCA member agencies in preparing for and complying with statewide “Making Water Conservation a California Way of Life” water use efficiency requirements per AB 1668 and SB 606. Ms. Lee led the assessment member agency baseline capabilities and actions needed to enable compliance. She developed and implemented an action plan, including modifications to BAWSCA’s Regional Water Conservation Program to prepare the BAWSCA member agencies to meet the new requirements.
- **Bay Area Water Supply and Conservation Agency. *Bay Area Regional Reliability Shared Water Access Program.*** Ms. Lee was the BAWSCA Project Manager for the BARR SWAP program. She led the development of conceptual and pilot “paper” transfer arrangements for a three-party Bay Area conceptual transfer program, including regulatory considerations, accounting practices, and operational logistics.

Anona L. Dutton, PG, CHG

Vice President / Principal-in-Charge

Director of Water Resources Practice

Ms. Dutton has over twenty years of professional experience managing water resources projects. She has worked on resolving water resources issues in the states of California, Oregon, Nevada, Washington, Arizona, and New Mexico. Ms. Dutton has managed multi-million dollar efforts to secure reliable water supplies for water agencies and developers. She has led technical efforts to minimize the water footprint of new and existing development, assessing groundwater and surface water supply yields and augmentation options (i.e., recharge and banking), securing water transfer options, and evaluating the feasibility of developing new water supply sources such as recycled water, desalination water, and other non-potable sources.

Ms. Dutton is deeply involved in implementation of the Sustainable Groundwater Management Act (SGMA) throughout California, including provision of strategic and technical support for Groundwater Sustainability Agency (GSA) formation, basin boundary adjustments, Groundwater Sustainability Plan (GSP) development and implementation, and securing grant funding. Her work to support public sector clients includes Water Supply Assessments (WSAs), Water System Master Plans, Urban Water Management Plans (UWMPs), and Water Conservation Plans.

Relevant Experience

- California Water Service Company (Cal Water).** *Multiple Water Resources Studies.* Ms. Dutton led the preparation of multiple local and regional water supply reliability studies (WSRS) for Cal Water Districts throughout California, using integrated resource planning processes to create a long-term supply reliability strategy through 2050. These studies address challenges from changing water supply reliability conditions, new regulatory requirements, growth in water demands, and insufficient diversity in existing water supply sources. The reliability studies include supply and demand forecasts through the 2050 planning horizon, an evaluation of supply reliability gaps, identification and evaluation of potential water supply alternatives to address supply gaps, identification and assessment of preferred water supply options, and their implementation. She has also overseen all of the work EKI has provided to Cal Water since 2015 related to assessing the impacts of the SGMA, development of its 25 2020 UWMPs and subsequent AWSDAs, preparation of multiple SB-610 compliant WSAs, and analysis of groundwater and local surface water production potential.



Education

- M.S., Hydrogeology, Stanford University, 2000
- B.S., Environmental Sciences, Stanford University, 1998

Registrations/Certifications

- Professional Geologist in California (#7683)
- Certified Hydrogeologist in California (#841)
- LEED Green Associate
- Water Use Efficiency Practitioner – Grade 1

Technical Expertise

- Comprehensive Supply Reliability Studies
- Integrated Water Planning and Management
- UWMPs and WSAs
- Water Use Efficiency Planning and Implementation
- Water Resilience Planning
- SGMA and Groundwater expertise
- GSP Development and Implementation
- Stakeholder Engagement
- Grant Funding Expertise

- **Valley Water.** *Multiple Water Banking Related Analysis.* Ms. Dutton leads EKI's efforts to date to support Valley Water in the assessment of multiple water banking opportunities. Work efforts have included in-depth analysis of existing water bank performance and risk factors, including those related to water quality (including treatment cost estimates) and declining groundwater levels, and systemizing the process to support Valley Water's on-going assessment of water bank performance. Work efforts have also include conducting due diligence on two potential water banking opportunities, as well as a Valley-wide inventory to identify potential locations to develop a new water bank. Ms. Dutton also oversaw the development of Valley Water's *2021 Water Conservation Strategic Plan* and associated outreach.
- **Zone 7 Water Agency.** *Conjunctive Use Feasibility Study.* Ms. Dutton is leading the development of a Conjunctive Use (CU) Study to identify the preferred integration of known and potential future sources and new infrastructure and what this integration might mean for yield, operations, and reliability. The CU Study considered a variety of sources and options, including optimization of the groundwater basin, recharge of imported and reclaimed water, investments in LVE and Sites reservoir, and water bank operation. Issues related to operations, water quality, infrastructure and permitting needs, cost, climate change and other aspects were quantified as part of the reliability and preferred alternatives assessment. In a companion effort, Ms. Dutton is developing Zone 7's Alternative GSP.
- **Sonoma & Marin County Agencies.** *Various Water Resources Projects.* Ms. Dutton oversaw the development of water demand projections and evaluated water conservation opportunities for nine Sonoma and Marin County water agencies that purchase water from the Sonoma County Water Agency in support of their 2020 UWMPs and other planning efforts. Following that effort, Ms. Dutton oversaw the development of UWMPs and/or WSAs for several Sonoma and Marin County entities, including Valley of the Moon Water District, Marin Municipal Water District, North Marin Water District, and the cities of Sonoma and Petaluma. Ms. Dutton continues to actively support these agencies with a variety of water resources tasks that include: securing grants, augmenting their water supply portfolio with groundwater and Aquifer Storage and Recovery (ASR) wells, and developing strategic water conservation plans.
- **City of East Palo Alto.** *Water Supply Strategy.* Ms. Dutton managed the development and implementation of a comprehensive water strategy to address the water shortage crisis within the City. She supported the City in negotiating a water transfer agreement for the first-ever transfers of Individual Supply Guarantee (ISG) within the San Francisco Regional Water System. She managed the successful installation and testing of a new groundwater production well, including hydrogeologic investigation, numerical groundwater modeling, water quality sampling, aquifer testing, and test well design and construction. She assisted the City in the reactivation and permitting of its existing Gloria Way Well and oversaw the design of the groundwater treatment system for that well.
- **Multiple Clients.** *Water Supply Alternative Studies.* Ms. Dutton has performed assessments of water supply alternatives for proposed new large-scale, master-planned communities located throughout California. Ms. Dutton has prepared projections of the water demand of these developments, estimated historic water use at the project sites, and evaluated the potential water supply, transport, and treatment options, including quantifying the volume of water available from each water source, its reliability during design drought scenarios, and the political and technical constraints associated with development of each water source. Source water reliability evaluations have been conducted for

groundwater and the State Water Project, Central Valley Project, Stanislaus River, Russian River, Semitropic and the Hetch-Hetchy systems. Through these efforts she has supported the diligence and review of several water transfers, including of SWP and local surface water.

- **Sustainable Groundwater Management Act (SGMA).** *Multiple Clients, CA.* Ms. Dutton’s recent SGMA work includes supporting coordination among GSA member agencies and between multiple GSAs, securing Proposition 1, Proposition 68 and Technical Support Services grant funding, basin boundary modifications, GSP preparation and implementation, and Annual Report preparation. As part of SGMA compliance, she oversees stakeholder engagement efforts, assessments of groundwater conditions, numerical groundwater modeling, development of sustainability criteria, and projects and management actions (P/MAs) – including water transfers and banking programs. Her SGMA projects span California including:
 - Delta-Mendota Subbasin
 - Castac Lake Valley Basin
 - Cosumnes Subbasin
 - Merced Subbasin
 - Cuyama Valley Basin
 - Kern County Subbasin
 - Livermore Valley Basin
 - White Wolf Subbasin
 - Santa Inez Valley Basin
 - Eastern San Joaquin Subbasin
 - San Mateo Plain Subbasin
 - Kaweah Subbasin
 - Chowchilla Subbasin
 - North Yuba Subbasin
 - Turlock Subbasin
 - Monterey Subbasin
 - East Bay Plain Subbasin
 - Kings Subbasin
- **Private Equity Fund.** *Water Asset Evaluation.* In support of a major confidential transaction, Ms. Dutton led the due diligence efforts on 25 separate water banking assets located in California. The evaluation included an assessment of the physical aspects of the facility; the water rights associated with the water supply, conveyance, storage and return; potential risk factors related to issues such as permitting, water quality, declining water levels, and subsidence; and issues related to climate change and market competition on asset performance and yield. Portfolio performance was quantitatively evaluated using a stochastic model and conducting sensitivity analysis related to parameters such as hydrology, market competition, etc.
- **Large Agricultural Entity.** *Water Bank Development.* Ms. Dutton is overseeing EKI’s work to develop up to 10 water banks to support a large private entity in their efforts to increase their local water supply reliability. Work efforts have included conducting site specific desktop analysis to identify likely areas that will be conducive to recharge in the vicinity of major conveyance infrastructure that could be used to transport water for recharge.

Technical and Strategic Water Resources Support. *South of Kern River GSAs.* Since 2016 Ms. Dutton has provided strategic technical support to Arvin-Edison Water Storage District, Tejon-Castac Water District, Wheeler Ridge-Maricopa Water Storage District in groundwater sustainability matters. She is leading efforts to comply with SGMA in the White Wolf and Kern County Subbasins, including GSP preparation and implementation. She is supporting the costing, prioritization and implementation of P/MAs related to procuring grant funds and developing land-repurposing and other demand reduction programs, in addition to supply augmentation projects (water transfers and banking projects). She developed a water rights-based water budget and groundwater allocation method that considered native safe yield, the surface water imports and water banking operations, and historical water use information for the GSAs and local landowners.

Sarah Hodson, PE Water Resources Engineer

Ms. Hodson provides technical support on a broad range of water resource and engineering projects. She has extensive technical experience with policy review, data processing, geospatial analysis, and drafting reports. Her educational background combined with her technical skills make Ms. Hodson a strong asset on both water resources and engineering projects, including water supply planning, regulatory compliance, stakeholder outreach, and design of water infrastructure.



Relevant Experience

- Multi-State Surface Water Management Practices Survey.** *North Dakota Department of Water Resources.* EKI is conducting a survey of local surface water management practices across 21 states in the Mid-West and Western United States. This survey will evaluate key trends in surface water management practices, policies, and regulations to inform decision-making and support policy recommendations in the North Dakota Department of Water Resources. The survey relies on both publicly available data, as well as public agency outreach to gather additional information as necessary. Ms. Hodson is leading the survey for Rocky Mountain Region and adjacent states, including Colorado, Utah, Nebraska, and Wyoming.
- Development of a County Drought Resilience Plan.** *Mendocino County, California.* EKI is developing a Senate Bill (SB) 552-compliant Drought Resilience Plan (DRP) for the County. The DRP includes an inventory of County water users and uses, a risk assessment to assess the probability of County-wide water shortage events, and the development of short and long-term response strategies to mitigate the identified risks. As part of this effort, EKI is conducting significant outreach to County water suppliers to gather information related to supplier-specific historical drought impacts and planning efforts. EKI will facilitate meetings of a County Drought Task Force made up of key County water stakeholders to inform the DRP development process.
- Formation of Mendocino County Water Agency and Technical Assistance as Water Resources Specialist.** *Mendocino County, California.* EKI provided technical and staff augmentation services to reform Mendocino County Water Agency (MCWA) and help transition current responsibilities from different departments of

Education

- M.S., Environmental Engineering, University of California, Berkeley, 2021
- B.S., Civil and Environmental Engineering, University of California, Berkeley, 2020

Affiliations

- Colorado Groundwater Association, Education and Outreach Committee

Registrations/Certifications

- Professional Civil Engineer, CA (#95003)
- 40-hour HAZWOPER Training

Technical Expertise

- Water Supply Assessments
- Stakeholder Engagement
- Water Supply and Demand Analysis
- Water Supply Reliability /Risk Assessments
- Grant Funding Expertise
- Groundwater Sustainability Plan Development and Implementation

the County to the reformed MCWA. EKI acts as the Mendocino County Water Specialist in the interim, providing staff augmentation services and undertaking existing and mandated duties of the MCWA managed by the Department of Transportation, Executive Office, and other County Departments. In conjunction, EKI worked on proposing and implementing a sustainable staffing structure and organization model using County's existing resources, prospective hires, and available expertise at UC Cooperative Extension in Mendocino. EKI also serves as the main point of contact for the County in dealing with water-related state and federal agencies and is supporting the County in optimizing its available funding to apply for grant applications to finance prioritized water and infrastructure projects. Ms. Hodson provided support in the development of grant applications to state programs and in developing a framework to establish the MCWA.

- **Water Supply Assessments, Mid-Peninsula Water District. San Mateo County, California.** EKI has prepared multiple Water Supply Assessments (WSAs) pursuant to Senate Bill 610 (SB 610) for the Mid-Peninsula Water District. Each project involved the development of water demand projections for the proposed projects, evaluate available water supplies under various levels of hydrologic conditions, and identify the potential impacts to district supply availability that may result from implementation of the proposed projects. Ms. Hodson served as the lead author for three of these WSAs, which included data compilation from various public and District sources and development of written materials to support the supply availability and reliability sections of the WSAs.
- **Urban and Multibenefit Drought Relief Funding Grant Application. Water Agencies in Sonoma and San Mateo Counties, California.** Ms. Hodson assisted with the preparation of two applications across six water agencies for eight individual projects – one application was prepared jointly by the Cities of Brisbane and East Palo Alto, Mid-Peninsula Water District, North Coast County Water District, and Purissima Hills Water District and one application was prepared by Valley of the Moon Water District. The total amount asked statewide for this highly competitive grant was \$1.4 billion, for \$180 million in available funds. The two applications received approximately \$10.5 million from DWR to fund three individual projects.
- **Groundwater Sustainability Plan Development, Delta-Mendota and Kern County Subbasins, Central Valley, California.** EKI is currently providing the 23 Groundwater Sustainability Agencies (GSAs) in the Delta-Mendota Subbasin and 22 GSAs in the Kern County Subbasin with strategic Sustainable Groundwater Management Act (SGMA) support to help address the Inadequate Determination letter(s) received from the Department of Water Resources (DWR) in spring 2023. The EKI team has facilitated multi-agency collaboration and communication, serving as the technical liaison between local entities and regulating agencies, including the DWR and the State Water Resources Control Board (State Board). EKI has worked closely with the Technical Working Groups in both Subbasins to coordinate with DWR and State Board technical staff to achieve groundwater sustainability and achieve SGMA compliance. Ms. Hodson has provided technical support during this process to respond to DWR and the State Board's identified deficiencies with the Subbasins Groundwater Sustainability Plans (GSPs). Ms. Hodson was able to distilling complex technical topics into clear presentation materials to facilitate communication to the GSAs and other stakeholders.
- **Multi-District Groundwater Risk Assessment. California Water Service. California.** EKI recently provided technical support to the California Water Service (Cal Water) to conduct a comprehensive

assessment of groundwater supply risk across thirteen Cal Water districts throughout California, in response to implementation of the Sustainable Groundwater Management Act (SGMA). EKI reviewed several sources of publicly available data, including groundwater conditions and trends, historical and recent water use data, and water quality conditions and trends. Additionally, EKI reviewed local sources of information to gain further understanding of potential administrative and regulatory actions that may affect the districts. EKI identified risk factors that could affect district groundwater supply reliability and, for each factor, created evaluation criteria to categorize potential risk. EKI prepared cut sheets for each district to present relevant groundwater supply-related information and potential impacts in a concise and informative format. These cut sheets serve as a succinct reference for district staff to quickly and easily understand potential implications to future groundwater supply in their individual districts. EKI's work has provided Cal Water with the technical foundation needed to better understand and prepare for how their groundwater reliability and operations might be impacted under SGMA. Ms. Hodson led the risk assessment and preparation of final cut sheets.

Sarah Gerenday, PhD

Environmental Geologist

Dr. Gerenday provides technical support on a broad range of water resource projects. She develops water supply assessments and management plans, supports their implementation, conducts geospatial analysis to identify impacts of current and proposed management activities, analyzes data and develops models to assess groundwater conditions, and coordinates work with clients and stakeholders.

Dr. Gerenday has authored technical reports and peer-reviewed articles on water management and feasibility of managed aquifer recharge and has developed successful grant applications for multiple clients. Her educational background combined with her technical skills make Dr. Gerenday a strong asset on for water resources projects, including groundwater conditions assessments, water demand and conservation planning, and recharge facility development.



Relevant Experience

- **Groundwater Sustainability Plan Development.** *San Luis & Delta-Mendota Water Authority (SLDMWA), Merced County, CA.* EKI is providing technical and strategic support to SLDMWA and 41 water agencies to develop a Groundwater Sustainability Plan for the Delta-Mendota Subbasin. Dr. Gerenday is involved in assessment of existing groundwater conditions, development of sustainable management criteria, analyzing impacts to groundwater users, preparing technical materials, and incorporating work products into a single, subbasin-wide Plan. Additionally, she facilitates meetings with state regulators and the public.
- **Water Supply Assessment.** *Multiple Public Agency Clients, CA.* Dr. Gerenday has provided water supply assessments on behalf of multiple water agencies to determine whether sufficient water is available for proposed developments under normal, single dry year, and multiple dry year scenarios, over a 20-year planning horizon. Her contributions include tabulating data and calculating expected water demand and available supply under multiple water year scenarios.
- **Water Transfer Strategic Services.** *Amador Water Agency, Amador County, CA.* Amador Water Agency retained EKI to assist with strategic management of water resources. Dr. Gerenday compiled information on Amador Water Agency's existing water rights and resources, in addition to past agreements and pending applications, in order to assess the potential for future water transfers.
- **Groundwater Basin Adjudication.** *Las Posas Subbasin, Ventura County, CA.* Dr. Gerenday provided technical support for the legal adjudication of groundwater rights in the subbasin. Her

Education

- Ph.D., Earth Science, University of California, Santa Barbara, 2022
- B.S., Earth Science, Rice University, Houston, Texas, 2017

Affiliations

- WaterReuse

Technical Expertise

- Geospatial Analysis
- Managed Aquifer Recharge Feasibility and Pilots
- Geochemical modeling and groundwater particle tracking
- Grant Applications
- Technical Writing

contributions included analysis of native safe yield and groundwater allocations, along with assessment of existing, proposed, and alternative management structures for administering water allocations.

- **Hydrogeologic Modeling and Recharge Suitability Assessment.** *Multiple Public Agency Clients, CA.* Dr. Gerenday constructs three-dimensional geologic models of aquifers and aquitards using Leapfrog Works. Her hydrogeologic knowledge and research skills enable Dr. Gerenday to combine these models with groundwater depths, water quality data, and soil properties to identify suitable locations for groundwater recharge projects.
- **Aquifer Storage and Recovery Project.** *Valley of the Moon Water District, Sonoma County, CA.* Valley of the Moon Water District is developing an aquifer storage and recovery project as part of the District's Drought Resiliency Program. As Environmental Geologist, Dr. Gerenday conducted geochemical modeling to predict potential effects of introducing recharge water to the aquifers, drafted portions of the feasibility study report, and advised on data gathering efforts.
- **Sustainable Groundwater Management Support.** *Arvin-Edison Water Storage District and White Wolf Groundwater Sustainability Agency, Kern County, CA.* Dr. Gerenday assesses trends in landowner recharge efforts, researches legal authorities to implement new projects, and facilitates meetings with stakeholders to solicit feedback on proposed water management strategies. Dr. Gerenday also supports development and maintenance of a custom groundwater flow model by processing groundwater monitoring and recharge data, assessing results of airborne electromagnetic surveys, and conducting geospatial analysis.
- **WaterSMART Project Design Grant Application.** *Westland Water District, Fresno County, CA.* Dr. Gerenday helped to develop application materials for a United States Bureau of Reclamation (USBR) WaterSMART grant. USBR awarded \$200,000 to Westland Water District for planning and design of upgrades to water conveyance infrastructure and diversification of the District's water portfolio. Dr. Gerenday's contributions included writing, editing, and development of figures.
- **Sustainable Groundwater Management Implementation Grant Application.** *Multiple Public Agency Clients, CA.* Dr. Gerenday contributed to the preparation of grant application materials. Her work efforts included drafting scopes of work for the projects to be funded, developing a budget, conducting geospatial analysis, and facilitating interagency collaboration. The California Department of Water Resources awarded up to \$6.4 million per client for construction and/or planning projects to increase the sustainability of the clients' water portfolios.
- **Multi-benefit Land Repurposing Program (MLRP) Grant Application.** *Multiple Public Agency Clients, CA.* Dr. Gerenday assisted the preparation of grant applications and supported strategy development for land repurposing programs. Grants funded by the California Department of Conservation (DOC) provided up to \$8.9 million per client for land repurposing programs that result in groundwater conservation. Her contributions included developing grant materials and facilitating collaboration among water agencies, community partners, DOC, and other stakeholders.

Tyler F. Colyer, PE

Civil and Environmental Engineer

Mr. Colyer is a Professional Civil Engineer with 14 years of experience in design, planning, and construction management of potable water, wastewater, and recycled water infrastructure, as well as experience in water quality and water resources planning. He has worked with multidiscipline design teams on projects related to water treatment systems, pipelines, tanks, pump stations, water wells, aquifer storage and recovery, and other related infrastructure. Additionally, Mr. Colyer has assisted clients with master planning, regulatory compliance, and funding strategies and applications. He has taken projects from feasibility-level planning through to project construction and completion, and brings this holistic experience to each project.



Relevant Experience

- Aquifer Storage and Recovery Project.** *Valley of the Moon Water District, El Verano, CA.* Project Manager. Mr. Colyer is overseeing the implementation of the District's Aquifer Storage and Recovery (ASR) project at two well sites. The project includes studies to determine the feasibility of ASR at the two sites, performing pilot studies at each site, and the design and construction of ASR infrastructure including a new ASR well, conversion of another existing supply well to an ASR Well, and construction of monitoring wells at each site. The drilling portion of the ASR project was recently completed and Mr. Colyer provided construction and testing oversight. Mr. Colyer has recently completed the preparation of a feasibility study to determine whether the Park Avenue Well and Well 5A are suitable for ASR operations and is preparing to perform pilot studies at each site. Additionally, EKI assisted the District in obtaining approximately \$3 million of drought-relief funding from the Department of Water Resources to support the ASR project.
- Recycled Water Feasibility Study.** *Diablo Water District (DWD) and Ironhouse Sanitary District (ISD), Oakley, CA.* Project Engineer. Mr. Colyer prepared a recycled water feasibility study to identify recycled water projects that will benefit the mutual customer base shared by DWD and ISD. ISD currently produces recycled water that is appropriate for unrestricted reuse but primarily discharges this effluent to the San Joaquin River. The feasibility study developed and evaluated numerous recycled water projects including recycled water distribution alternatives, potable reuse alternatives, and groundwater augmentation alternatives. Project

Education

- M.S., Civil and Environmental Engineering, University of California, Berkeley, 2010
- B.S., Environmental Engineering, University of California, Riverside, 2009

Registrations/Certifications

- Professional Engineer, CA (C #80141)
- Professional Civil Engineer AZ (#64179)
- 40-hour OSHA HAZWOPER Training Course

Technical Expertise

- Infrastructure Design and Construction Engineering
- Water Augmentation Studies
- Recycled Water Feasibility Studies
- Pipeline and Pump Station Design
- Water Treatment
- Aquifer Storage and Recovery

cost and energy use estimates were prepared for each alternative, as well as an evaluation of qualitative criteria such as constructability, ease of maintenance, and community benefits.

- **Recycled Water Feasibility Study for Indirect Potable Reuse.** *Marina Coast Water District, Marina, CA.* Project Engineer. Mr. Colyer prepared the recycled water feasibility study that identified preferred locations for indirect potable reuse injection wells and associated infrastructure. The study included development of a groundwater flow model to determine travel time of water between potential injection well sites and existing production wells. Project costs and energy use estimates were prepared for each alternative. Qualitative criteria such as constructability, ease of maintenance, and community benefits were also evaluated for each alternative. To fund a portion of the study Mr. Colyer prepared a successful application on behalf of MCWD for a State Water Resources Control Board (SWRCB), Clean Water State Revolving Fund recycled water planning grant.
- **Water System Master Plan.** *City of East Palo Alto, East Palo Alto, CA.* Project Manager. Mr. Colyer oversaw the preparation of the City of East Palo Alto's Water System Master Plan Update. The project included construction of a new all-pipe hydraulic model, water demand projections, a risk-based capital improvement plan and a recycled water feasibility evaluation. Cost estimates and schedules were prepared for each recommended capital improvement project.
- **Design for Groundwater Treatment System.** *East Palo Alto, CA.* Project Engineer. Mr. Colyer prepared engineering plans and specifications for the construction of a groundwater treatment system for potable water use at the City of East Palo Alto's Gloria Way Well. The system includes a submersible well pump, iron and manganese treatment system, chemical amendments, Hetch-Hetchy blending system with high service pump station, and a surge tank. The project was challenging as the well site is located within a densely populated residential neighborhood. Mr. Colyer also assisted the City with the reactivation and permitting of the existing Gloria Way Well, as well as provided engineering services during construction for the Project. In addition, Mr. Colyer worked closely with the City to secure \$3 million of Proposition 84 grant funding to support the City's groundwater development efforts.
- **Reservoir Improvement Projects.** *Alameda County Water District, Fremont, CA.* Project Manager. Mr. Colyer is currently preparing the civil and mechanical design for the structural rehabilitation of two large reservoirs (over 14 million gallons each) for the District. The project involves replacement of key valves, valve stem extensions and operators, the liner for one of the reservoirs, and general site civil work to facilitate the structural work.
- **Design of Pressure Reducing Valve Stations.** *Coastside County Water District, Half Moon Bay, CA.* Project Engineer. This project involved installation of (1) two new pressure reducing valve (PRV) stations, at Wave Avenue and Frontage Road and at Casa Del Mar Drive and Frontage Road, and approximately 520 linear feet (LF) of new 8-inch ductile iron pipe (DIP) between Beach Avenue and Casa Del Mar Drive to create a new pressure zone in the Casa Del Mar neighborhood and (2) installation of a new PRV station on at Grand Boulevard and approximately 140 (LF) of new 6-inch DIP along Grand Boulevard to add a new connection from the District's main transmission main to downtown Half Moon Bay. Mr. Colyer oversaw the preparation of the design documents for this project.

Jonathan P. N. Sutter, PE

Supervising Engineer

Mr. Sutter has fifteen (15) years of project experience in potable water, wastewater, stormwater and recycled water utility design, master planning, construction management and water resources planning. For several municipal stormwater, sanitary sewer, and potable water projects he has been responsible for all phases of design, cost estimation, project management, construction management, budgeting, scheduling and coordinating with and on behalf of clients. As part of his master planning work, he created and managed hydraulic models for potable and recycled water distribution and wastewater collection systems. Mr. Sutter currently serves as District Engineer for Coastside County Water District and North Coast County Water District.



Relevant Experience

- Zone 7 Water Agency, Conjunctive Use Study and Water Supply Evaluation.** Livermore, CA. Project Manager. Mr. Sutter is managing the development of a Conjunctive Use (CU) Study for Zone 7 to identify the preferred integration of known and potential future sources and new infrastructure and what this integration might mean for yield, operations, and reliability. The CU Study is considering a variety of sources and options, including optimization of the groundwater basin, recharge of imported and reclaimed water, investments in Los Vaqueros Expansion (LVE) and Sites reservoir, and water bank operation, among other things. Issues related to operations, water quality, infrastructure and permitting needs, cost, climate change and other aspects are being directly quantified as part of the reliability and preferred alternatives assessment. As a companion effort, Mr. Sutter is also managing the development of a new water supply reliability model and updated Water Supply Evaluation report.
- Water Master Plan and On-Call Hydraulic Modeling, Valley of the Moon Water District, El Verano, CA.** Project Manager. EKI prepared the District's Water Master Plan, which will serve as the basis for the District's 25-year capital improvement program. Mr. Sutter managed the development of a zone analysis of demands; storage and supply capacity assessment; construction, calibration, and analysis of a new hydraulic model; the development of a recommended capital improvement program; and preparation of the Final Master Plan Report. He presented to Board of Directors to present findings during the development of the Water Master

Education

- M.S., Civil and Environmental Engineering, Stanford University, 2012
- B.S., Civil Engineering, Columbia University, 2008

Registrations/Certifications

- Professional Civil Engineer, CA (#81606)
- 40-hour OSHA HAZWOPER Training Course

Technical Expertise

- Water System Modeling
- Water Supply Planning
- Pipeline Design

Plan. He managed the evaluation of a potential site on Richards Boulevard for a new storage tank, including a hydraulic modeling evaluation and preparation of a conceptual site plan, constructability review, and opinion of costs. He is currently managing on-call hydraulic modeling tasks.

- **Capital Improvement Program Management and On-Call Water System Hydraulic Modeling, Coastside County Water District, California.** Project Manager. EKI is currently supporting the District to prioritize, program, manage, and design its near-term capital improvement projects. Led by Mr. Sutter, EKI performed a detailed review of the District's 10-year CIP budget, prepared a near-term (2-year) and long-term (10-year) implementation schedules and cash flows, and presented to the District's Board of Directors and Facilities Subcommittee. He managed consultants for the District's welded-steel water storage tank seismic evaluation. Based in part on information gathered as part of this seismic evaluation, he prepared a systemwide storage evaluation that identified system storage needs and recommended storage projects. He led efforts to update the District's hydraulic model and use the model to support alternatives analysis and other studies on an on-call basis. EKI performed analyses to evaluate the installation of new PRVs to create a new pressure zone; the abandonment of an existing storage tank and required pump station modifications; and operating another storage tank at a lower maximum level based on a seismic evaluation recommendation.
- **Integrated Water Resources Master Plan and On-Call Hydraulic Modeling, City of Lathrop, California.** Project Manager. Mr. Sutter served as project manager for the preparation of the City's Integrated Water Resources Master Plan, which included comprehensive updates to the Water System, Wastewater System, and Recycled Water System Master Plans. He led efforts to update the City's infrastructure and land use GIS databases to develop new GIS-integrated hydraulic models, evaluate the City's potable and recycled water demands and wastewater flows projections, evaluate the City's future water supply and reliability, and develop recommended Capital Improvement Programs for each utility. He led coordination efforts with City staff and participated in the outreach efforts with the project stakeholders, including the City's development community. He currently serves as project manager for on-call hydraulic modeling for the City. He has managed hydraulic modeling analyses to evaluate required water, sewer, and recycled water infrastructure needed to support new major developments. Potable water system analysis included fire flow and storage evaluations and modeling of developmental phasing to identify required infrastructure construction trigger points. Recycled water hydraulic analyses were conducted on multiple recycled water transmission main improvement alternatives to identify the most cost-effective solution for meeting City design requirements.
- **Water Main Replacement and Rehabilitation Projects. Coastside County Water District.** Half Moon Bay, CA. Project Manager. Mr. Sutter has successfully managed the design, permitting, and construction of several water line projects for the District including: Highway 92 Potable Water Pipeline Replacement Phase 1 - emergency replacement of over 5,600 linear feet (LF) of 1950s era welded steel (WS) pipe with approximately 4,150 LF of ductile iron pipe (DIP) by open trench construction and 1,500 LF of high-density polyethylene (HDPE) pipe installed by horizontal directional drilling (HDD) under three creeks in private property.
 - Grandview Water Main Replacement Project - design of new 6-inch and 8-inch DIP to replace approximately 3,400 LF of 2-inch polyvinyl chloride (PVC) and 6-inch cast iron pipe (CIP), including a bore and jack installation of a 16-inch steel casing under Highway 1. The project

also included the installation of a new pressure reducing valve (PRV) station to create a new pressure zone.

- Replacement of 8-Inch Pipeline Under Pilarcitos Creek at Pilarcitos Avenue (Strawflower) - installation of an approximately 450 LF 10-inch HDPE pipeline installed using HDD under the creek.
- Ferdinand Avenue Water Main Replacement Project - installation of approximately 1,590 feet of 6-inch DIP to replace existing 4-inch WS water mains.
- Pine Willow Oak Water Main Replacement Project - design of a new 8-inch DIP to replace approximately 4,400 LF of 8-inch and 4-inch CIP.
- Miramontes Point Road Water Main Replacement Project - multi-phased project to replace approximately 3,600 LF of 10-inch DI pipe and 2,200 LF of 6-inch DI pipe that prematurely failed using iPVC pipe.
- Highway 1 South Emergency Pipeline Replacement Project - replacement of a 2-inch galvanized steel pipe potable water main that extends 3,300 linear feet southward along and within the Highway 1 right-of-way using HDD.
- El Granada Pipeline Replacement Final Phase Project – replacement of a 1940’s era, 10-inch potable water transmission main that included installation of 420 LF of 20-inch HDPE water pipeline installed by HDD under a creek, in addition to approximately 900 linear feet of 16-inch and 6-inch ductile iron pipeline installed using open trench methods.
- **Other Water Main Replacement and Rehabilitation Projects.** *Various Bay Area Clients.* CA. Project Manager. Mr. Sutter has successfully managed the design of over 45,000 LF of new water mains for projects with Bay Area clients including Valley of the Moon Water District, North Coast County Water District, City of Brisbane and the Town of Hillsborough. Projects included several trenchless installations and rehabilitation projects, installation of new pressure regulating valve stations (PRVs), projects critically interfaced with the SFPUC for crossing its supply pipelines, work within the Caltrans right-of-way and work within sensitive habitat areas. He has led designs for innovative water line rehabilitation methods, including reinforced fabric lining systems.
- **City of Brisbane, Glen Park Pump Station Upgrades Project.** Brisbane, CA. Project Manager. EKI is preparing the design for the replacement of the Glen Park Pump Station, a critical component of the City’s potable water distribution system, pumping to fill the 500,000-gallon Margaret Tank and serve residents located in the highest-pressure zones in the City’s system. The project will replace the existing pump station and building and increase the pump station firm capacity from 450 gallons per minute (gpm) to 1,450 gpm. Mr. Sutter is overseeing the multidiscipline design team., also the structures are installed in a steep vegetated area and under major PG&E facilities.

Christopher Pittner, PE, QISP

Environmental/Civil Engineer

Mr. Pittner has six years of experience in potable water, recycled water and wastewater systems design. Specifically, distribution hydraulic modeling, design CIP cost estimation, master planning of water supplies and distribution system improvements. Mr. Pittner is efficient at identifying system deficiencies and recommending improvements to improve system capacities, simplify operations, and improve system resiliency and redundancy. He is involved with design of more than 2,600-LF of water pipes for public and private agencies. Mr. Pittner has knowledge in water and wastewater treatment, water resources, geotechnical engineering, and construction and operations testing of wastewater treatment systems.



Relevant Experience

- Water Master Plan. Valley of the Moon Water District.** El Verano, CA. Project Engineer. EKI has prepared the Valley of the Moon Water District's Water Master Plan which will serve as the basis for the District's 25-year capital improvement program. Completed work on the Master Plan includes a zone analysis of demands; a storage and supply capacity assessment; construction, calibration, and analysis of a new hydraulic model; and development of a recommended capital improvement program. Based on these efforts, Mr. Pittner has identified system deficiencies and recommended improvements to improve system capacities, simplify operations, and improve system resiliency and redundancy.
- Integrated Water Resources Master Plan. City of Lathrop, CA.** Project Engineer. This project includes comprehensive updates to the City's Water System, Wastewater System and Recycled Water System Master Plans and associated CIPs. Mr. Pittner has updated the City's infrastructure and land use GIS databases to develop new GIS-integrated water and recycled water hydraulic models, calibrated hydraulic models with fire hydrant flow data. Additionally, he evaluated the City's potable and recycled water demands, wastewater flows projections, as well as the City's future water supply and reliability. Mr. Pittner also assisted in updating the City's 2015 Urban Water Management Plan, which includes an evaluation of the City's future water supply and reliability, as well as conservation efforts. Based on the successful completion of the IWRMP in 2015, Mr. Pittner is currently assisting with the 2023 update to the City's IWRMP.

Education

- M.S.c, Civil and Environmental Engineering, California Polytechnic State University San Luis Obispo, 2018
- B.S., Environmental Engineering, California Polytechnic State University San Luis Obispo, 2018

Registrations/Certifications

- Professional Civil Engineer, California No. 93576
- Qualified Industrial Stormwater Practitioner (QISP)

Technical Expertise

- Water, Wastewater, and Recycled Water Master Planning
- CIP Program Development
- Hydraulic Modeling
- Infrastructure Design and Construction Engineering

- **On-Call Water and Recycled Water System Hydraulic Modeling.** *City of Brisbane, CA.* Project Engineer. Mr. Pittner is currently serving as the on-call hydraulic modeler for the City of Brisbane. Mr. Pittner has provided hydraulic analysis of new or alternative operational scenarios, evaluation of various fire flow demand conditions, and analysis of potential hydraulic impacts on the City's distribution system. Mr. Pittner has assisted the City with analysis of a new Humboldt Road PRV and has identified recommended PRV sizing and settings to increase fire flow availability at a local school.
- **Water System Hydraulic Modeling.** *North Coast County Water District. Pacifica, CA.* Project Engineer. Mr. Pittner is providing as-needed engineering services for the District including planning and hydraulic modeling of specific capital improvement projects. Mr. Pittner was the project engineer for feasibility study for rehabilitation or replacement of the District's main 21-inch transmission line that cross under Interstate 280.
- **Glen Park Pump Station Upgrades Project.** *City of Brisbane. Brisbane, CA.* Project Engineer. Mr. Pittner is currently designing the replacement of the Glen Park Pump Station, a critical component of the City's potable water distribution system, pumping to fill the 500,000-gallon Margaret Tank and serve residents located in the highest-pressure zones in the City's system. Mr. Pittner began by updating the existing hydrant model to better represent current operations and size the new pumps. During this process, EKI conducted pump tests that indicated a discrepancy between the modeled system and observed results and identified a hydraulic restriction in the City's distribution system that was limiting flow from the pump station. Through this analysis EKI recommended a short intertie to that will provide significant cost savings in pump sizing and operational energy costs for the City.
- **Hayford Siphon Replacement Project.** *Placer County Water Agency. Colfax, CA.* Project Engineer. EKI is providing engineering design services to the Placer County Water Agency to support the replacement of approximately 2,100 LF of 36-in diameter transmission pipelines and appurtenances. Project challenges include the design, permitting and installation by auger boring under a Union Pacific Railroad.
- **Sewer Planning for New Development.** *Golden Oak Real Estate, Hayward, CA.* Project Engineer. Mr. Pittner is performing a sanitary sewer study to support the construction of a 40-town home development. The study shall assess the impact of the proposed project on the existing sewer and determine if any improvements are required to support the project.

Tina Wang, PE

Water Resources Engineer

Ms. Wang has ten years of experience working in water resources engineering. She has project experience supporting public and private sector clients with water resources planning, which includes developing water and sewer master plans, Urban Water Management Plans, Water Supply Assessments, drought response plans, as well as conducting supply reliability assessments. She has also provided technical support on Sustainable Groundwater Management Act (SGMA) implementation, water system permitting, water right evaluations, and water transfers.



Relevant Experience

- **Water Supply Reliability Study for Delta Region Districts.** *California Water Service (Cal Water)*. California. Project Manager. EKI is supporting a water supply reliability study for Cal Water’s Dixon, Livermore, and Stockton Districts. The study aims proactively identify potential water supply shortfalls and potential projects to address projected shortfalls. As part of this effort, Ms. Wang lead design of planning scenarios through engagement of Cal Water staff and the technical team, as well as analysis of supply reliability using various numerical models.
- **Strategic Planning and Water Supply Reliability Evaluation.** *Bay Area Water Supply and Conservation Agency (BAWSCA)*. San Francisco Bay Area, CA. Project Engineer. EKI supported the development of the BAWSCA’s regional water supply reliability model, which aims to provide a comprehensive assessment of spatial-temporal water supply conditions and constraints that incorporates all water supplies and demands of BAWSCA member agencies. As a project engineer, Ms. Wang assisted in the development of modeling schematics, key assumptions, and performance measurements. The challenge of this process is to develop a unified approach to represent the various regional and local water sources available to BAWSCA member agencies. As part of this effort, Ms. Wang conducted data gathering and reviewed regional models to identify policy and physical constraints, as well as assisted in developing a framework of model operating rules.
- **Integrated Water Resources Master Plan 2019, 2023.** *City of Lathrop*, CA. Ms. Wang is the assistant project manager and technical lead for preparation of the City’s Integrated Water Resources Master Plan update, a comprehensive master planning process involving water, sewer, and recycled water systems. Ms.

Education

- M.S., Civil and Environmental Engineering, Stanford University, 2014
- B.S., Environmental Engineering, Economics, Northwestern University, 2012

Registrations/Certifications

- Professional Civil Engineer, CA (C #85789)
- 40-hour OSHA HAZWOPER Training Course

Technical Expertise

- Hydraulic Modeling
- UWMPs, WSAs, and AWSDAs
- Water Shortage Contingency Plans (WSCPs)
- Drought Response Actions Effectiveness Assessment
- Demand Analysis and Reliability Assessment
- Stakeholder Engagement and Facilitation

Wang managed updates to the City's infrastructure and land use GIS databases, evaluated water and wastewater flow projections, evaluation of system performance through hydraulic modeling, and capital improvement program development. Ms. Wang also led the effort of updating the City's 2020 Urban Water Management Plan, which includes an evaluation of the City's future water supply and reliability, and was the project engineer for the City's 2019 Integrated Water Resources Master Plan.

- **On-Call Water System Hydraulic Modeling.** *Coastside County Water District.* Half Moon Bay, CA. Ms. Wang is the project engineer for updating Coastside County Water District's existing hydraulic model and performing on-call modeling analyses. She conducted modeling analysis to evaluate the installation of new PRVs to create a new pressure zone, abandonment of an existing storage tank and required pump station modifications; and operating another storage tank at a lower maximum level based on a seismic evaluation recommendation. Ms. Wang has also performed an extended period simulation (EPS) model calibration and an evaluation of a new proposed booster station.
- **Recycled Water Feasibility Study,** *Marina Coast Water District (MCWD).* Marina, CA. Project Engineer. EKI has conducted a feasibility study of indirect potable reuse alternatives through groundwater recharge and replenishment on behalf of MCWD. The study evaluated the physical, hydrogeologic, engineering, cost-related, and regulatory factors for a range of potential alternatives. As project engineer, Ms. Wang supported development of the hydrogeologic conceptual model that served as the foundation of the local groundwater model, as well as development of cost estimates and engineering evaluation of project alternatives.
- **Urban Water Management Plan Updates.** *Multiple Water Suppliers.* CA. Project Engineer. Ms. Wang was the project manager and technical lead for the development of 2020 UWMPs and Water Shortage Contingency Plans (WSCPs) for various water suppliers in the San Francisco Bay area and the Central Valley. The documents serve as updates for the 2015 UWMPs and WSCPs and required significant new contents as a result of the *Making Water Conservation a California Way of Life* legislation. Ms. Wang managed future demand analyses and reliability assessments of purchased water and recycled water supplies. Ms. Wang also led evaluation of historical drought response data and the design of both consumer and agency actions within each WSCP stage. As part of the process, she applied EKI's spreadsheet model (Drought Response Tool) to quantitatively assess effectiveness of the drought response actions.
- **Water Supply Assessments (WSAs).** *Multiple Water Suppliers.* San Francisco Bay Area, CA. Project Engineer. Ms. Wang was the project engineer for the preparation of Senate Bill 610-compliant Water Supply Assessments (WSAs) for various San Francisco Bay Area developments as well as planning updates. Several Water Supply assessments were prepared as support document to the development of Environmental Impact Reports. The projects include a variety of land uses, including residential, office/R&D, hotel, transit center, and other commercial uses. Using historical water use data from similar land uses, Ms. Wang compared and cross-checked methodologies developed based on literature, codes, and ordinances. Using a water demand estimation method that incorporates project details in land use, population, and conservation efforts, Ms. Wang provided evaluations of the projects' future water demand and its supply and demand implications during normal and dry periods.

- **SGMA Implementation Support.** *MCWD*. Marina, CA. Project Manager. Ms. Wang was the project manager and engineer for development of MCWD's Groundwater Sustainability Plan (GSP) within the Monterey Subbasin, which was adopted by MCWD and submitted to the California Department of Water Resources (DWR) in January 2022. As part of the process, Ms. Wang supported MCWD in securing grant funding, including preparation of detailed scope of work, budget estimate, project timelines; and assisted MCWD in grant implementation such as managing project budget and schedule according to the grant agreement, submitting grant invoices for disbursement of funds, and completing grant-required deliverables. One of the challenges of this GSP is to co-author a single document for the entire basin in close collaboration with another GSA. As part of this process, Ms. Wang supported coordination between GSAs by negotiating coordination agreements, developing a coordinated work process, organizing regular staff and committee meetings, and peer reviewing work products.
- **2021-2023 Drought Report.** *BAWSCA*. San Francisco Bay Area, CA. Project Manager. Ms. Wang is leading preparation of BAWSCA's 2021-2023 Drought Report that will document BAWSCA, its member agencies, and other entities' activities and efforts in response to the 2021-2023 drought. Ms. Wang is managing data collection and stakeholder outreach to gather information on drought response measures and inputs on the contents of the report. The report will also include a detail analysis of the effectiveness various drought response measures.
- **Development of EKI's Drought Response Tool.** *Multiple Water Suppliers*. California-wide. Project Engineer. Ms. Wang supported development of EKI's Drought Response Tool (DRT), an Excel-based spreadsheet model used by over 80 California water agencies to facilitate rapid response to drought conditions and for WSCP drought planning in 2015 and 2020. The DRT is used to help agencies identify water savings opportunities, by customer sector and major end-use, and to quantify and compare the potential water savings benefits of implementing various suites of drought response actions. As a project engineer, Ms. Wang compiled numerous water conservation studies in urban settings and developed the drought response evaluation module. The module helps quantify potential water use reduction of various water conservation measures for each of the retail agencies based on an end use water savings methodology. The DRT is a uniquely efficient way of meeting the new 2020 WSCP requirement for quantifying water shortage measure effectiveness (CWC § 10632 (a) (4)(E)). Agencies have utilized the DRT to respond to the 2012-2016 historical drought as well as to develop and their WSCPs as a part of the 2015 and 2020 UWMP development processes.
- **Water Strategy and Supply Management.** *City of Burlingame*, CA. Project Engineer. EKI is providing on-going services related to water strategy and water supply management to the City of Burlingame. As a project engineer, Ms. Wang has managed City production data and assisted the City with water conservation planning, annual reporting to the BAWSCA, and compliance tracking towards the SWRCB-mandated water conservation monitoring.
- **Water Strategy and Transfer Evaluation.** *City of East Palo Alto*, CA. Project Engineer. EKI managed the development and implementation of a comprehensive water strategy to address the water shortage crisis within the City of East Palo Alto, which is a Disadvantaged Community. As part of this effort, Ms. Wang supported the City in negotiating a water transfer agreement for the first-ever transfer of Individual Supply Guarantee (ISG) within the San Francisco Regional Water System.

Aaron J. Lewis, PE

Hydrogeologist/Water Resources Engineer

Mr. Lewis has over seven years of consulting experience supporting public and private clients in developing strategic responses to the Sustainable Groundwater Management Act (SGMA), including the preparation of Groundwater Sustainability Plans (GSPs) and development of numerical groundwater flow and transport models, and providing other technical and management services related to groundwater supply and quality. He has an educational background in geology, hydrogeology, water resources and environmental engineering, including academic research experience in subsurface contaminant transport and mobility, hydrothermal resource investigations, and environmental biotechnologies.



Relevant Experience

- Groundwater Sustainability Plan (GSP) Preparation.** *Arvin-Edison Water Storage District, Wheeler Ridge-Maricopa Water Storage District, Tejon-Castac Water District, Marina Coast Water District, Zone 7 Water Agency.* Kern County, Monterey County, Alameda County, CA. Developer and Lead Data Analyst. Mr. Lewis provides strategic and technical support in the development of GSPs or GSP components for multiple agencies throughout California. This effort has involved the development of Hydrogeologic Conceptual Models, Groundwater Conditions Assessments, Water Budgets, Sustainable Management Criteria, Projects & Management Actions, and GSP Implementation Plans. Mr. Lewis has taken a lead role in data analysis and database management as it pertains to GSP development and strategic planning. He has also been actively engaged in local stakeholder outreach and interbasin/intrabasin coordination efforts.
- Numerical Groundwater Flow Modeling and Decision Support Tool Development.** *Arvin-Edison Water Storage District, Tejon Castac Water District, Marina Coast Water District. Zone 7 Water Agency.* Monterey County, Kern County, Alameda County, CA. Lead Modeler. Mr. Lewis has taken lead role in developing numerical groundwater flow models for groundwater basins across California in support of SGMA GSP development and to assist in planning future well infrastructure improvements recycled water initiatives within these Basins. This effort has involved collecting and interpreting well log, water quality, and lithologic data to characterize hydrogeologic

Education

- M.S., Civil and Environmental Engineering, Stanford University, 2016
- B.S., Geological and Earth Sciences, Stanford University, 2015

Registrations/ Certifications

- Professional Civil Engineer, CA (#95279)
- Forty-hour HAZWOPER Training Course

Technical Expertise

- GSP Development
- SGMA Strategic Support
- Hydrogeologic Modeling
- Groundwater Flow Modeling
- Decision Support Tool Development
- Litigation Support

properties and inform model grid development and parameterization, preparing input and calibration datasets, agricultural water demand and soil moisture balance calculations, model calibration, water budget development, and projected scenario simulations and analysis including contaminant fate and transport evaluations. The models have specific focuses in characterizing groundwater-surface water interactions and in assessing impacts of proposed groundwater reuse and replenishment projects. Additionally, Mr. Lewis has led the development of accompanying, interactive Decision Support Tool (DST) platforms that allow users to directly assign, run, and evaluate predictive model scenarios using a web-based graphical user interface to support operational management planning and decision-making under future hydrologic and water supply availability uncertainties.

- **Integrated Water Demand and Soil Moisture Balance Modeling.** *Arvin-Edison Water Storage District, Marina Coast Water District, Zone 7 Water Agency.* Kern, Monterey, and Alameda Counties, CA. Lead Developer. Mr. Lewis is taking a lead role in developing integrated agricultural and urban water demand and soil moisture balance models for multiple water agencies throughout California in support of SGMA GSP implementation, and conjunctive water use planning. This effort involves the development and calibration of various soil moisture accounting models using the California Department of Water Resources' (DWR) Integrated Water Flow Model Demand Calculator (IDC) and the United States Geological Survey (USGS) Soil Water Balance (SWB) model platforms and other custom soil moisture balance protocols. The models have specific focuses in quantifying recharge and runoff rates and estimating private agricultural groundwater demands to inform development of integrated hydrologic flow models and SGMA water budgets.
- **Numerical Model Review and Technical Support.** *White Wolf Groundwater Sustainability Agency (GSA), Cuyama Basin Water District, Marina Coast Water District.* Kern County, Santa Barbara County, Monterey County, CA. Hydrogeologist. Mr. Lewis has been involved in the review of multiple integrated hydrologic flow and reactive transport models (including MODFLOW finite difference and Integrated Water Flow Model (IWFEM) finite element frameworks) for various clients throughout California. This effort has involved the following reviewing hydrogeologic conceptualizations of the Basins relative to existing local and regional data and information, testing and analyzing numerical model input, calibration, and output files to determine model accuracy and performance relative to historical water level and water quality monitoring data, reviewing water budget information in relation to other existing models and resources, as well as high-level analysis of model applicability and utility for developing and implementing GSPs to meet SGMA compliance within the Basins.
- **Litigation Support.** *Marina Coast Water District.* Monterey County, CA. Role. Mr. Lewis is supporting the preparation of expert testimony to the California State Water Resources Control Board Administrative Hearing Office on behalf of Marina Coast Water District. Lead Developer. Mr. Lewis is leading the development and review of numerical groundwater flow and contaminant transport models and is supporting preparation of written expert testimony to discuss the potential impacts of the California America Water (CalAm) Monterey Peninsula Water Supply Project on MCWD's municipal groundwater supplies. The Project includes a groundwater intake system consisting of 10 subsurface slant wells that will draw seawater and groundwater from aquifers that underlie MCWD's Service Area.

Vanessa De Anda

Water Resources Planner

Ms. De Anda has seven years of experience providing services in integrated water resources management. She has worked closely with clients to identify funding opportunities for priority projects and developed recommendations for funding pursuits, as well as developed strategies to increase the potential for success in future funding cycles. Ms. De Anda has also supported the successful development of grant proposals that have secured over \$60M for clients. She also provided grant administration services, such as coordinating with the grantor and grantee, facilitating the execution of grant agreements, and submitting quarterly invoices and progress reports. Furthermore, through her work with the Los Angeles County Public Works (LACPW) on the Los Angeles County Water Plan, as well as with the Greater Los Angeles County (GLAC) Region, Ms. De Anda has collaborated with suppliers and stakeholders across Los Angeles County to develop strategies aimed at achieving supply reliability and securing funding.



Relevant Experience

- **LACPW, GLAC Integrated Regional Water Management (IRWM) Proposition 1 Round 1 & 2 Implementation Grant.** Los Angeles County, CA. Ms. De Anda collaborated with local project sponsors to develop a scope, schedule, and budget for the projects seeking Proposition 1 Round 1 and Round 2 funding. She ensured that the applications were consistent with the guidelines provided by the CA Department of Water Resources (DWR). Ms. De Anda assisted in the application submittal process, ensuring that high-quality applications were submitted in a timely manner. The GLAC IRWM Region received approximately \$35M in both rounds.
- **Antelope Valley State Water Contractors Association (AVSWCA).** *Antelope Valley IRWM Plan Update and Proposition 1 Round 1 & 2 Implementation Grant.* Los Angeles County, CA. Ms. De Anda managed the Antelope Valley IRWM Program for five years, including identifying funding opportunities for the region. Ms. De Anda identified projects highly qualified for Proposition 1 Implementation Grant funding and collaborated with project sponsors to develop a scope, schedule, and budget for these projects. She coordinated with the applicant, project sponsors, and DWR to ensure that high-quality applications were completed and submitted in a timely manner. The region was awarded approximately \$2M in both rounds. Ms. De Anda also provided grant administration services, such as coordinating with DWR and

Education

- Masters, Environmental Science and Management, University of California-Santa Barbara, 2017
- Bachelors, Environmental Science, University of California-Los Angeles, 2014

Technical Expertise

- Strategic Funding Planning
- Grant Writing
- Project Development
- Assessment of Project Benefits
- Grant Administration Services
- Integrated Regional Water Planning and Management
- Stakeholder Engagement

local project sponsors, facilitating the execution of grant agreements, and submitting quarterly invoices and progress reports to DWR.

- **Antelope Valley-East Kern Water Agency (AVEK), *Urban and Multibenefit Drought Relief Grant***. Los Angeles County, CA. Ms. De Anda assisted in the preparation of a grant application under the DWR Urban and Multibenefit Drought Relief Grant Program. She coordinated with AVEK and the DWR to ensure that a cohesive, high-quality application was completed and submitted in a timely manner. AVEK was successfully awarded \$5M.
- **Coachella Valley Water District (CVWD), *5-Year Non-Potable Capital Improvement Program (CIP) Funding Plan***. Coachella, CA. Ms. De Anda supported the development of a five-year funding plan to fund priority sanitation and non-potable water projects from CVWD's Sanitation CIP. The funding plan included a review of funding opportunities for project eligibility and prioritization of projects. Ms. De Anda also identified next steps and timing for CVWD to achieve application submittals that would align with project and funding program timing.
- **CVWD, *Drinking Water State Revolving Fund (DWSRF) Planning Grant for Potable Water Consolidation Project***. Coachella, CA. Ms. De Anda assisted CVWD in preparing a planning DWSRF grant application for its potable water consolidation efforts in the East Coachella Valley region. Work included developing a list of projects to include in the planning application, preparing the DWSRF planning application including project scope, cost estimate, and schedule, developing maps, and coordinating with CVWD and the State Water Resources Control Board (SWRCB).
- **Elsinore Valley Municipal Water District (EVMWD), *Title XVI Application FY 2021***. CA. Ms. De Anda supported the development and submittal of the Regional Water Reclamation Facility Expansion Grant Application for the WaterSMART: Title XVI Water Reclamation and Reuse Program. Ms. De Anda collaborated with EVMWD staff to demonstrate the extent to which the project will secure and extend water supplies by producing and using new non-potable supplies. She assisted in the development, revision, and submission of the grant application materials on behalf of EVMWD in a timely manner.
- **EVMWD, *Five Year Grant Strategic Plan***. Lake Elsinore, CA. Ms. De Anda worked closely with EVMWD staff to review pertinent project documents and develop a priority project list. She then identified funding opportunities and developed recommendations for funding pursuits, as well as developed a strategy to increase the potential for success in future funding cycles.
- **Mt. View Sanitary District (MVSD), *On-Call Funding Support***. CA. Ms. De Anda assisted in tracking potential funding opportunities for MVSD's CIP. Work included reviewing MVSD's CIP projects, funding priorities, and known funding programs. She also prepared a funding tracking list with potential funding opportunities to present to MVSD during monthly meetings and prepared funding applications as requested.
- **Purisima Hills Water District (PHWD), *Santa Clara Valley Water District GP5 Funding Application for PHWD Leak Detection Project***. City of Martinez, CA. Project Manager. Ms. De Anda collaborated with PHWD to develop a scope, schedule, and budget for the PHWD Leak Detection Project and ensured that a cohesive, high-quality application was completed and submitted to Santa Clara Valley Water District in a timely manner.

William Lennon

Hydrogeologist

Mr. Lennon is a hydrogeologist with expertise in groundwater management and field studies. He has played pivotal roles in projects including drafting technical memoranda for monitoring well siting and design as well as preparing post-construction reports for water facility improvements. Additionally, his involvement in developing bid documents for new wells highlights his proficiency in design and construction processes, showcasing his ability to turn technical specifications into actionable plans for implementation.

Mr. Lennon excels in practice areas within the field of hydrogeology and water resources management. Proficient in conceptualizing and implementing improvements for water recharge and recovery facilities, as well as designing monitoring wells and groundwater field studies. His skill set includes utilizing geographic information systems (GIS), groundwater modeling software, and data analysis tools to support decision-making processes and optimize project outcomes. Additionally, his experience in water resource management encompasses groundwater analysis, aquifer characterization, and sustainable water supply assessments.

Relevant Experience

- **Patterson Irrigation District**, *Technical Support for New Monitoring Wells*. Patterson, CA. Hydrogeologist. Mr. Lennon helped write and provide the findings for a technical memorandum that outlines EKI's proposed siting and preliminary design of additional monitoring wells within the district service area. The memo detailed a two-phase installation approach, including technical justifications, alternative locations, and cost estimates based on existing data and groundwater conditions.
- **Pajaro Valley Water Management Agency**, *Recharge and Recovery Facility Improvements*. Watsonville, CA. Hydrogeologist. Mr. Lennon prepared a post-construction completion report summarizing well drilling operations, including well construction as-builts, borehole and development logs, and relevant data. The report also provided analysis on the aquifer pump test of newly completed recovery wells. Additionally, he helped develop bid documents for constructing up to ten new recovery wells and ten new monitoring wells, including specifications, bid packages, and a bid review summary to aid in selecting the drilling contractor.



Education

- Master of Science, Hydrologic Sciences, University of California Davis, 2023
- Bachelor of Science, Watershed Science, Colorado State University, 2020

Certifications

- 40-hour OSHA HAZWOPER Training Course

Affiliations

- American Geophysical Union Member

Technical Expertise

- Hydrogeological Investigation
- Well Design and Construction
- Water Level and Quality Monitoring

- **California Forever**, *Groundwater Field Studies*. Solano County, CA. Hydrogeologist. Mr. Lennon assisted with planning and conducting constant-rate pumping tests at selected agricultural wells, including instrumentation installation, groundwater level monitoring, and data analysis. This effort aimed to evaluate aquifer properties and sustainable pumping rates, with concurrent testing reducing the required fieldwork days.
- **California Forever**, *Groundwater Report*. Solano County, CA. Hydrogeologist. Mr. Lennon assisted in preparing a Water Supply Assessment (WSA) and associated technical studies to support the Administrative Draft Environmental Impact Report (ADEIR) for the California Forever Project, focusing on evaluating water supply sufficiency for the Specific Plan area over a 20-year horizon under various hydrologic conditions.
- **Consumnes Groundwater Authority**, *Monitoring Report WY23-25*. Elk Grove, CA. Hydrogeologist. Mr. Lennon helped compile groundwater elevation data from Representative Monitoring Wells (RMWs), supplemental wells, and public databases such as the Sustainable Groundwater Management Act (SGMA) Data Viewer. Additionally, he summarized analytical data from RMW samples and public databases like the SGMA Data Viewer and the Safe Drinking Water Information System (SDWIS).
- **Marina Coast Water District**, *Installation of Three Monitoring Wells*. Marina, CA. Hydrogeologist. Mr. Lennon provided drilling cost estimates for clustered and nested well options at each site, deciding on final well designs considering cost constraints, preparing technical specifications and bid packages.
- **Zone 7 Water Agency**, *Livermore Valley Hydrogeologic Investigations and Groundwater*. Livermore, CA. Hydrogeologist. Mr. Lennon helped maintain and coordinate a network of water level transducers and barometric sensors across the Livermore Valley Subbasin. His responsibilities include overseeing deployment, troubleshooting in the field, collecting data, and assisting in analyzing the downloaded data to assess drawdown at pump test wells and other nearby wells.
- **Merced Subbasin Groundwater Sustainability Agency (GSA)**, *Subbasin GSA SGMA Support*. Merced, CA. Hydrogeologist. Mr. Lennon assisted in the maintenance and coordination of a network of water level transducers and barometric sensors across the Merced Subbasin GSA. His duties involve overseeing deployment, troubleshooting in the field, and collecting data.

28 June 2024

Lauren Pulver
Douglas County Government, Department of Community Development
100 Third Street
Castle Rock, Colorado 80104

Subject: Response to Request for Information for the Douglas County 2050 Comprehensive Water Plan
(EKI C40161.00)

Dear Ms. Pulver:

EKI Environment & Water, Inc. (EKI) has reviewed the County's Standard Public Contract for Services (Exhibit A) as attached to the RFI. We have a few exceptions as noted below and will be able to execute the contract.

Section 2. SCOPE OF SERVICES, 3rd paragraph: The Consultant agrees to diligently and professionally perform all the services described herein consistent with the professional skill and care ordinarily provided by architects practicing in the same or similar locality under the same or similar circumstances ("standard of care"), and in a manner satisfactory to the Authorized Representative. It is also understood and agreed that the Consultant shall not, in performing services hereunder, undertake any action or activity prohibited by the terms of any lease, permit, license or other agreement in effect during the term hereof between the Consultant and the County for the use and occupancy by the Consultant of any County facilities or space.

Section 8. INDEMNIFICATION: The County cannot and by this Contract does not agree to indemnify, hold harmless, exonerate or assume the defense of the Consultant or any other person or entity whatsoever, for any purpose whatsoever. The Consultant shall defend, indemnify and hold harmless the County, its commissioners, officials, officers, directors, agents and employees from any and all claims, demands, suits, actions or proceedings of any kind or nature whatsoever negligent or intentionally wrongful performance of, including Workers' Compensation claims, in any way resulting from or arising from the services rendered under this Contract; provided, however, that the Consultant need not indemnify or save harmless the County, its officers, agents and employees from damages resulting from the sole negligence of the County's commissioners, officials, officers, directors, agents and employees or any third parties for whom the Consultant is not legally liable. The Consultant shall have not duty to hire counsel to defend an indemnified party but that the time of a settlement or adjudication of a matter, the Consultant shall pay the reasonable attorney's fees and costs of the indemnified parties to the extend such fees and costs arise out of the negligence or intentionally wrongful acts of the Consultant.

11. ASSIGNMENT: The Consultant covenants and agrees that it will not assign or transfer its rights hereunder, or subcontract any work hereunder, either in whole or in part without the prior written approval of the Authorized Representative. Any attempt by the Consultant to assign or transfer its rights hereunder shall, at the option of the Authorized Representative, void the assignment or automatically terminate this Contract and all rights of the Consultant hereunder. The County covenants and agrees that it will not assign or transfer its hereunder, either in whole or in part, without the prior written approval of the Consultant.

13. OWNERSHIP OF DOCUMENTS: Drawings, specifications, guidelines and any other documents prepared by the Consultant in connection with this Contract shall ~~be~~ **upon payment to Consultant for the preparation of said materials, become** the property of the County.

14. ASSIGNMENT OF COPYRIGHTS: The Consultant assigns to the County the copyrights to all works prepared, developed, or created pursuant to this Contract **upon payment to Consultant for the preparation of said works**, including the right to: 1) reproduce the work; 2) prepare derivative works; 3) distribute copies to the public by sale, rental, lease, or lending; 4) perform the works publicly; and 5) to display the work publicly. The Consultant waives its rights to claim authorship of the works, ~~to prevent its name from being used wrongly in connection with the works, and to prevent distortion of the works.~~

15. TERMINATION: The County shall have the right to terminate this Contract, with or without cause, by giving written notice to the Consultant of such termination and specifying the effective date thereof, which notice shall be given at least ten (10) days before the effective date of such termination. In such event **upon payment of amounts owed to Consultant**, all finished or unfinished documents, data, studies and reports prepared by the Consultant pursuant to this Contract shall become the County's property. The Consultant shall be entitled to receive compensation in accordance with this Contract for any satisfactory work completed pursuant to the terms of this Contract prior to the date of notice of termination. Notwithstanding the above, the Consultant shall not be relieved of liability to the County for damages sustained by the County by virtue of any breach of the Contract by the Consultant. **The Consultant shall have the right to terminate this Contract, with cause, by giving written notice to the County of such termination and specifying the effective date thereof, which notice shall be given at least ten (10) days before the effective date of such termination.**

19. COMPLIANCE WITH ALL LAWS AND REGULATIONS: ~~All~~ **Subject to the standard of care applicable to Consultant's work**, all of the work performed under this Contract by the Consultant shall comply with all applicable laws, rules, regulations and codes of the United States and the State of Colorado. The Consultant shall also comply with all applicable ordinances, regulations, and resolutions of the County and shall commit no trespass on any public or private property in the performance of any of the work embraced by this Contract.

We appreciate the opportunity to submit our Information on this important effort. Should you have any questions, please contact our Project Manager at barnold@ekiconsult.com.

Very truly yours,

EKI ENVIRONMENT & WATER, INC.



Andree Lee
Vice President/One Water Practice Lead

DOUGLAS COUNTY GOVERNMENT

Department of Community Development

100 Third Street

Castle Rock, Colorado 80104

Telephone: 303-660-7460

www.douglas.co.us

REQUEST FOR INFORMATION (RFI)

NO. 000-00

PROJECT TITLE

**YOUR RESPONSE MUST BE RECEIVED NO LATER THAN
MONTH, DAY, 20XX @ 4:00 P.M.**

RFI CERTIFICATION

We offer to furnish to Douglas County the information requested in accordance with the specifications and subject to the terms and conditions described herein:

NAME: BBA Water Consultants, Inc

ADDRESS: 333 W. Hampden Ave., Suite 1050

CITY: Englewood STATE: CO ZIP: 80110

TELEPHONE NUMBER: 303-806-8952 FAX NUMBER: 303-806-8953

E-MAIL ADDRESS: BY: csanchez@bbawater.com

Christopher J. Sanchez

(Printed or Typed Name)



(Written Signature)

TAXPAYER I.D. NUMBER: 84-0930776

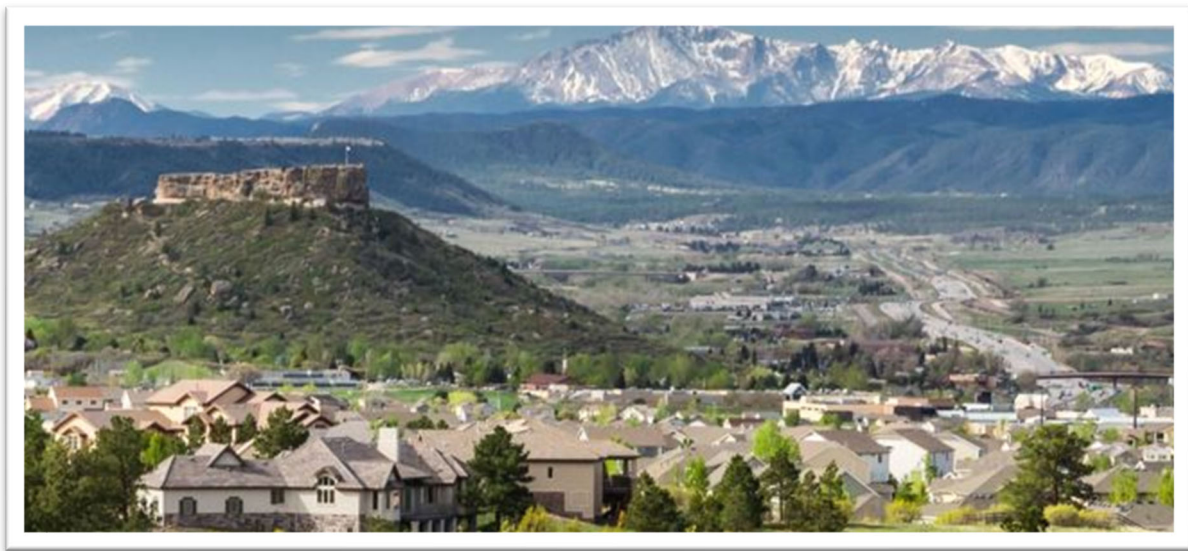
Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said response and furthermore to potentially award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful firm.

**Douglas County, Colorado
and the
Douglas County Water Commission**

2050 Comprehensive Water Plan

**REQUEST FOR INFORMATION
JUNE 28, 2024**



Prepared for:



Douglas County Colorado
c/o Sabrina Bach
100 Third Street
Castle Rock, CO 80104
sbach@douglas.co.us

Prepared by:



BBA Water Consultants, Inc.
333 West Hampden Avenue
Suite 1050
Englewood, CO 80110
csanchez@bbawater.com



Christopher J. Sanchez
Jeffrey A. Clark
Daniel O. Niemela
Jonathan D. George
Kristina L. Wynne
Austin P. Malotte
Michael A. Saylor
Charles E. Stanzione

June 28, 2024

Douglas County Colorado
c/o Sabrina Bach
100 Third Street
Castle Rock, CO 802104

By email to: sbach@douglas.co.us

RE: RFI Douglas County 2050 Comprehensive Water Master Plan

Douglas County:

We are writing to express our sincere interest in providing our water resource engineering consulting services in support of Douglas County's goal of creating a County-wide 2050 Comprehensive Water Plan (Water Plan). We understand that this goal is one of the primary objectives of the newly formed Douglas County Water Commission. We commend the County for taking the initiative to conduct such an important step in the future planning for the County and the enhanced management of water resources. This letter constitutes our response to Request for Information (RFI) for potential consideration to provide our services to conduct the research and analysis and prepare this important document.

Introduction to BBA

BBA Water Consultants, or BBA, has been one of Colorado's premier water resources engineering consulting firms since it was founded in 1980. We specialize in water supply planning and development, ground and surface water hydrology and collaborative water solutions. BBA has extensive experience with water supply planning, water rights investigations, water rights changes of use cases, and water court support, representing various clients both as an applicant and as an objector throughout Colorado. We also are seasoned experts in ground water supplies, including the Denver Basin aquifers. We regularly determine the appropriate level of modeling or other analysis to evaluate any water resources challenge. We work with a broad spectrum of water users throughout the State, including all levels of governments, cities, special districts, water users, industries, ski areas, development, agricultural users and environmental interests

Through this broad experience, BBA is absolutely capable of providing the expertise and experience to support the County's objectives and complete the comprehensive Master Plan.

On behalf of BBA, I will be the primary point of contact for further communications with the project. My contact information is:

Christopher J. Sanchez, P.G.
BBA Water Consultants
333 West Hampden Avenue, Suite 1050
Englewood, CO 80110
Phone: (303) 806-8952 Email: csanchez@bbawater.com

I am a hydrogeologist with over 30 years of experience with Colorado ground and surface water supplies and water rights issues. Also leading much of the work at BBA will be my partner Jeff Clark, Principal - Hydrologist. His contact info is the same, with the exception of his email address; jjclark@bbawater.com. Jeff has over 35 years of experience with water resources and water supply planning in Colorado. Both of our resumes are included with the attached *Statement of Qualifications*. I will be in water court on July 22, 2024, the targeted date for presentations to the DCWC, and as a result, Jeff Clark will lead our presentation to the DCWC assuming that it occurs on July 22.

The entire staff at BBA is made up of outstanding individuals from a variety of backgrounds, each with different skills and qualifications. We have a very flexible 'layered' work structure that allows us to match the skills and qualifications best suited for a given job, and at different experience levels to be as efficient and cost-effective as possible. Following refinement of the Scope of Work and short and long-term work tasks, we will identify a team of professionals that will best match the County's needs for this project.

Initial Reactions to Project Scope of Work

We have reviewed the RFI and the attached draft Scope of Work regarding the development of the proposed Master Plan. Overall, the broad concepts outlined in the Scope of Work are presented in a logical order. In our experience, thought needs to be given to the details of each Phase and the various inputs to each step in order to determine final sequencing. Initially, we concur that certain phases may not need to be done sequentially, particularly Phases I and II. We also concur that the Denver Basin ground water study can be completed separately. The creation of the Master Plan Phase III will be the logical culmination of all of the prior work, and needs to be the last step.

Based on our initial review of all of the steps of the draft SOW, we offer the following consideration that may also need to be incorporated into the analysis and the work efforts:

- It will be important to spend time up-front identifying and specifying the goals and objectives of the Master Plan. In other words, bring into focus the target that we're aiming for. What purposes will it achieve? Who will use it, and how? Perhaps equally important will be to identify what aspects should this Master Plan not cover?

- It will also be important to ensure broad-based support and collaboration among all water users and stakeholders. This could include all of the ‘municipal’ water providers within the County, nearby entities such as Aurora and Denver Water, SMWSA, Statewide Water Plan and all of its action-arms, etc. While these considerations may not fall directly on the consultant completing the Master Plan, it will be important components of the construction of the Master Plan and consensus-building and buy-in.
- A ‘Master Plan’ often includes considerations for water quality, the role of water conservation, climate change influences, effluent re-use (local or large-scale), LIRF’s, interconnections, collaboration on standards, etc. The existing draft SOW references these concepts, but perhaps should be more specific regarding the goals for these aspects. Will the Master Plan be intended to be an information exchange on these aspects? Or will it try to provide some direction and standards for water users within the County?
- Similarly, consideration should be given to the role of the Master Plan with regards to Denver Basin ground water. Will it provide status updates and information? Or will it provide specific ‘targets or standards to apply to various users within the County.
- In our experience with projects like this, it will be important to discuss early on the appropriate levels and methods of communication between the County and BBA. This would include points of contact, best methods of communication, frequency of communications, etc. It will also be important to collaborate on setting and tracking target deadlines and budgets, check-in meetings, meetings with outside collaborators (other water providers, agencies).

BBA Corporate Fine Print

BBA Water Consultants, Inc. is a trade name under the formal name Bishop-Brogden Associates, Inc. We are registered with the Colorado Secretary of State to conduct business within the State and are currently in Good Standing. Our Entity Identification Number (EIN) is 84-0930776 and we are happy to provide you with our Certificate of Fact of Good Standing upon request. We maintain a high degree of professional insurance which meets or exceeds the requirements described in Section 2 and Exhibit C of the RFI. We will provide a specific term sheet indicating such coverage in the name of Douglas County as an additional insured upon engagement for this project.

Familiarity with Douglas County, Representative Projects and References

BBA has extensive experience with Douglas County water resources as well as clients and projects very comparable to the desired Master Plan. This experience is summarized in the attached *Statement of Qualifications*.

Subcontractors

BBA has the expertise to complete all of the water-resources related aspects of this project. With regards to Phase 2 of the proposed project, we anticipate teaming up with specialists in land use planning to interact with the County and others as needed to meet the needs of this phase. BBA has excellent relationships with and works frequently with several contractors that specialize in this type of work, but we would initially target collaborating with JVA, HKS, JR Engineering or

others. We anticipate identifying an appropriate partner after the specifics of this phase are further developed.

Affirmation

We have reviewed the RFI and affirm our understanding of the scope of work and all of the conditions and requirements described within that document.

Conflicts of Interest

You will note in our *Statement of Qualifications* that we presently represent two water providers located in Douglas County, Stonegate Village Metro District and Centennial Water & Sanitation District on certain facets of their responsibilities. We do not see any apparent reason why our representation of these entities would present a conflict of interest for this scope of work, and in fact may be aligned with their individual goals and objectives. However, we believe that a candid discussion with these entities may be appropriate to address any potential concerns.

We are excited to be considered for such an important and challenging project!

Very truly yours,

BBA Water Consultants, Inc.



Christopher J. Sanchez, P.G.
Principal - Hydrogeologist



Jeff Clark
Principal - Hydrologist

CJS/JAC/jeb
Enclosures
GO-Progen



APPENDIX A

Statement of Qualifications and Past Projects Experience

BBA Water’s Experience and Expertise

Since 1980, BBA Water has provided expert science and inspired solutions for a wide variety of clients across the state of Colorado. We use our expertise to address the development and control of surface and ground water supplies for both public and private sector clients throughout the arid west. Our firm delivers a complete range of multi-disciplinary services and has the capabilities to support every aspect of water-related issues and manages projects of significant complexity and legality.

Our experienced team will use their extensive technical knowledge and experience to assist Douglas County with the analysis and creation of the 2050 Comprehensive Water Master Plan (Master Plan).

This project will require expertise in water rights planning, water demand analysis, water resources evaluations, surface and ground water hydrology, knowledge of regional water operations, Division 1 water rights administration, amount other things. We have selected several projects that demonstrate our knowledge in these areas. These projects are described in detail in the following pages.

BBA EXPERTISE

- Water resources planning
- Water supply development
- Water rights investigations
- Surface water hydrology
- Ground water hydrology
- Well design and testing
- Well permitting
- Modeling of surface and ground water
- Technical litigation support
- Valuations and appraisals
- Water accounting
- Expert testimony

Woodmoor Water and Sanitation District No. 1 – Ongoing

Water Supply Planning

BBA has supported Woodmoor Water and Sanitation District No. 1 with the design and implementation of nearly all of its water supply wells and has assisted the District with detailed long term planning and modeling of its Denver Basin well field. Planning efforts have included a detailed operational model of well operations which have enabled effective well planning and operations.

BBA has assisted Woodmoor with the acquisition and water court change process of renewable surface water supplies. This process has involved regional planning efforts including the identification of water supply alternatives. BBA has represented the District in regional water supply planning discussions and collaborations.

Woodmoor has been an active participant in water court cases, including objections to water rights changes in Division 2. BBA supported Woodmoor in water court with applications as well as oppositions, including expert testimony. BBA's involvement has helped Woodmoor to develop and implement its robust water supply systems.

PROJECT OVERVIEW

Primary Contact:

Jessie Shaffer
District Manager
719 488-2525
Jessies@woodmoorwater.com
BBA Water Project Team

Involved

- Dan Niemela, Principal
- Rachael Frei, P.E.

Key Technical Experience

- 24+ years of water supply planning and well implementations
- Construction of numerous Denver Basin wells
- Development of operational well model
- Vital in implementation of renewable water supplies

Town of Lochbuie

BBA has worked with the Town to implement its water supply system since 1998 which has included the bulk of growth in the Town. Services have included implementation of water supply wells, water rights acquisition including due diligence investigations, quantification of historical consumptive use, and water court change processes.

Lochbuie produces its water supply from the Beebe Draw alluvial aquifer which has been the source of water supply for South Metro entities including East Cherry Creek Valley Water and Sanitation District and Arapahoe County Water and Waste Water Authority. BBA worked with these entities both in and out of water court to establish fair protections of well operations in the same aquifer system and stipulated protections of the Town's water supplies.

Lochbuie is experiencing fast growth and BBA continues to work with the Town to keep up with its water resource needs in a competitive location with limited water resource alternatives.

PROJECT OVERVIEW

Primary Contact:

AJ Euckert
Town Administrator
719 488-2525
ajeuckert@lochbuie.com
BBA Water Project Team

Involved

- Chris Sanchez, Principal
- John Shuler, Project Hydrologist

Key Technical Experience

- 28+ years experience with water supply planning, well installations and water supply change cases
- Supported the installation of key well infrastructure
- Protected Town water supplies with effective stipulated settlements
- Assisted with the addition of new water supplies

Stonegate Village Metropolitan District – Well Implementation and Water Supply Development

BBA has worked with Stonegate since 1990 and has supported the District with the implementation and operation of all of its Denver Basin water supply wells. BBA supported Stonegate with the implementation of an alluvial augmentation plan in the Cherry Creek alluvial aquifer which enables the diversion and reuse of return flows.

BBA continues to support Stonegate with long-term monitoring of well performance, support of ASR operations and water supply planning.

BBA represented Stonegate in its participation with the South Metro Water Supply Authority, including the Ground Water Technical Group and the Cherry Creek Modeling Technical Group.

PROJECT OVERVIEW

Primary Contact:

AJ Euckert
Town Administrator
719 488-2525
ajeuckert@lochbuie.com
BBA Water Project Team

Involved

- Chris Sanchez, Principal
- John Shuler, Project Hydrologist

Key Technical Experience

- 28+ years experience with water supply planning, well installations and water supply change cases
- Supported the installation of key well infrastructure
- Protected Town water supplies with effective stipulated settlements
- Assisted with the addition of new water supplies

City of Lafayette – Water Demand Study and Planning

The City of Lafayette, Colorado, recently completed a revised Comprehensive Development Plan for the current and future growth areas. Using this as a platform, BBA conducted a thorough analysis of the water demands for this area, as well as its extra-territorial water supply service areas. This study started with an evaluation of all existing water user accounts in order to generate a ‘unit’ water demand for various user-types. This unit demand was adjusted for density and then compared to ‘industry standard’ unit demands for various user-types to generate planning demands for future growth areas. This resulted in a total estimated build-out water demand, along with several growth-rate projections to consider for planning purposes.

There were two additional facets of the Water Demand study that may factor into future growth water demand projections: review of water conservation programs and potential impacts from climate change studies. A thorough review of both facets was completed, and then incorporated into the long-range build-out water demands.

Additionally, BBA provides long term water supply planning and strategy consulting regarding the management of existing water supplies and evaluation of potential future water supplies.

PROJECT OVERVIEW

Primary Contact:

Cari Bischoff
Water Resources Manager
City of Lafayette
303-604-3542
cari.bischoff@lafayetteco.gov

BBA Water Project Team

Involved

- Jeff Clark, Principal
- Paul Bruss, P.E.

Key Technical Experience

- Analysis of historical water metering records
- Water demand analysis
- Review of water conservation programs
- Review of climate change studies and impacts on water supplies
- Water supply planning

City of Sterling

BBA Water has provided on-going water supply planning and water rights consulting services for this large municipal water provider in Northeastern Colorado since our founding in 1980. Our work for the City includes assistance in maintaining its water supply, water rights, and augmentation plan. The City of Sterling is 100% dependent upon an alluvial ground water supply. The out-of-priority depletions caused by well pumping are replaced via a complex augmentation plan in which the City utilizes changed shares of senior irrigation rights, recharge accretions as well as releases from storage. BBA assists the City in the operation of their augmentation plan on a nearly daily basis by creating and updating various operational projection and accounting forms, working with City staff with regard to data collection, recharge deliveries and ditch operation as well as working with Division 1 regarding proper administration of the augmentation plan. Through this work, our staff has gained considerable experience in augmentation plan operations, ditch and streamflow measurement, recharge optimization, and Division 1 administration. In addition, BBA has created and continued to modify a complex long-term planning projection tool, developed in Microsoft Excel, which is used to estimate when additional supplies are needed, when various infrastructure components should be constructed and when new water rights need to be acquired under various development scenarios. Multiple water rights options are evaluated to meet the future water requirements.

PROJECT OVERVIEW

Primary Contact:

Don Saling
City Manager
City of Sterling
970-522-9700
saling@sterlingcolo.com

BBA Water Project Team Involved

- Kristina Wynne, P.H.
- Jon George, P.E.

Key Technical Experience

- South Platte River administration
- General water rights support
- Recharge optimization
- Augmentation plan accounting development
- On-going augmentation plan management
- Expert technical reports

CHRISTOPHER J. SANCHEZ, P.G.

Principal - Hydrogeologist

EDUCATION

B.A. in Geology, 1994, The Colorado College, Colorado Springs, Colorado

Emphasis in ground water geology. Received Distinction for completing a senior thesis entitled "Analysis of Lawn Irrigation Return Flows in the Southeast Denver Area". Recipient of the Donald B. Gould Scholarship Award in Geology.

Graduate course work at the University of Colorado, Denver.

Graduate course work at Colorado School of Mines.

PROFESSIONAL

Board of Examiners of Water Well Construction and Pump Installation Contractors, Chairman – appointed to the Board by Governor Hickenlooper, June 2018; reappointed by Governor Polis, June 2022.

American Water Resources Association – Colorado Section - President, Board of Directors, 2004
Colorado Ground Water Association
National Ground Water Association
Association of Ground Water Scientists and Engineers
Geological Society of America

REGISTRATION

Registered Professional Geologist in the State of Wyoming. PG-3248

Registered Professional Geologist in the State of Utah. PG 5552449-2250

EXPERIENCE RECORD

1994-Present BBA Water Consultants, Inc. (aka Bishop-Brogden Associates, Inc.), Englewood, Colorado.
Principal, Hydrogeologist. Responsible for studies of ground and surface water supplies. Experience includes the implementation, maintenance and testing of over 100 water supply wells, water demand and supply investigations, water rights and water supply planning, water supply well field implementation, ground and surface water hydrology including mine hydrology, ground water modeling, ground and surface water quantifications, analyses of water rights administration and injury, analyses of ground water/surface water interaction, historic use water rights analyses, water rights augmentation plan development, water rights valuations, drainage basin yield analyses, geologic analyses, geophysical log interpretation, and structural geology concerning ground water supplies and water rights issues. Responsible for well construction management, well rehabilitation implementation

CHRISTOPHER J. SANCHEZ P.G. - Continued

and analyses, pumping test management, pumping test data analysis, and expert testimony for water and civil court proceedings as well as hearings before State and local government agencies.

Summer 1993 Bishop-Brogden Associates, Inc., Englewood, Colorado.
Intern. Completed an analysis of lawn irrigation return flows in the southeast Denver area. Provided support for various client projects.

Summer 1992 Keck Geology Consortium, Quetico Wilderness, Ontario, Canada.
Research Program Participant. Mapped the geology of regional fault zone. Analyzed and interpreted structural geologic data. Co-wrote abstracts for publication.

PUBLICATIONS AND PRESENTATIONS

“Fundamentals of Groundwater Flow and Applications in Colorado Water Courts” Groundwater 101 – The Water Law and Administration Program Series, Colorado Bar Association CLE, Denver, CO, October 27, 2022 (co-author: Matthew J. Seitz P.E. P.G.).

“New Drought Challenges, Legislation and Solutions, Groundwater, The Science and The Law”, Colorado Law Institute, CLE International, Snowmass Village, June 8, 2018.

“History of Colorado Water Rights”, Colorado Water Well Contractors Association Annual Conference, in partnership with Colorado Ground Water Association, Denver, CO, January 10 – 12, 2018.

“Overview of Groundwater from the Technical Perspective”, Groundwater 101 Update, Water Court Practice Program – Technical and Engineering Program Series, Colorado Bar Association CLE, Denver, CO, October 13, 2017 (co-author: Scott G. Mefford, C.P.G.).

“Groundwater and Aquifer Mechanics – Part I”: American Bar Association, Section of Environment, Energy and Resources, 32nd Annual Water Law Conference Proceedings, Las Vegas, NV, June 2014 (co-author: Timothy A. Crawford P.G.).

“Meaningful Water Quality Sampling vis-a-vis Oil and Gas Drilling – Colorado Aquifer Overview in the Context of the Recently Enacted Statewide Groundwater Baseline Sampling and Monitoring Rules”, Water, Oil and Gas 101, Colorado Bar Association CLE, Denver, CO, April 10, 2013.

“Considerations for Analyzing Colorado Ground Water: A Technical Perspective: University of Denver Water Law Review, Volume 15/Issue 1/Fall 2011 (co-author: Luke W. Harris, P.E.).

“Monitoring and Management of Nonrenewable Ground Water Resources – Case Study: Denver Basin Aquifers”, American Water Resources Association 2006 Summer Specialty Conference – Adaptive Management of Water Resources, Conference Proceedings, June 26-28, 2006 (co-author: Daniel O. Niemela).

CHRISTOPHER J. SANCHEZ P.G. - Continued

“Drilling Fluid Loss Events in the Denver Basin Aquifers”, H2GEO: Geotechnical Engineering For Water Resources, Geotechnical Practice Publication No. 2, Proceedings, October 22, 2004 (co-author: Michael McHugh).

“Practical Approaches to Water Supply Investigations in Fractured Rock Aquifers in Colorado and Related Case Studies”, Fractured Rock Aquifers 2002, National Ground Water Association, March 13 -15, 2002. “Structure of the Side Lake Shear Zone from Central Kahshahpiwi Lake to Northern Keefer Lake, Quetico Provincial Park, Southern Ontario”, Sixth Keck Research Symposium in Geology, 1993, and Geological Society of America, North-Central Section, 27th Annual Meeting, 1993 (co-author: Andrea L. Troolin).

JEFFREY A. CLARK

Principal – Hydrologist

EDUCATION

B.S. in Watershed Science, 1985, Colorado State University, Ft. Collins, Colorado

PROFESSIONAL AFFILIATIONS

American Water Resources Association Colorado Section
American Institute of Hydrology Colorado Section

EXPERIENCE RECORD

- 2004-Present BBA Water Consultants, Inc., Englewood, Colorado.
2004 – 2007, Senior Project Manager - Hydrologist
2007 – Present, Principal – Hydrologist: Responsible for managing and performing various water rights and water supply investigations; including historic use analysis, market valuation of water rights, water resource strategic plans, water operations studies, hydrology analysis and assessment and resolution of water right and water administration issues. Assist clients with the development of augmentation plans, substitute water supply plans, change of water rights and protection of water rights, support for various permits and approvals; provide expert testimony and trial support. Serve as client contact and project manager; supervise technical support staff; prepare letters and reports summarizing the findings of various investigations and analyses.
- 1998-2004 City of Aurora, Colorado.
Senior Water Resource Engineer. Senior team leader and project manager for various water resource planning and development projects. Responsible for water system planning, water operations planning, water supply research and development, water acquisition, contract negotiations, water court transfers and budget and contract management. Worked cooperatively with numerous other water providers, government agencies, stakeholder groups and the general public to develop and manage water resources. Managed the development of a comprehensive computer system model, reservoir feasibility studies and other environmental, financial and political investigations.
- 1993-1998 Centennial Water & Sanitation District, Highlands Ranch, Colorado.
Water Resource Engineer II. Project manager for an integrated ground water and surface water supply system. Project highlights include the acquisition, pre-design and development of a gravel-pit reservoir, negotiation of water supply contracts, facilities development, management of an aquifer storage and recovery program and development of water operations and accounting programs. Conducted various water supply and demand planning analysis, water acquisition analysis and financial planning projections for water operations and facilities.
- 1989-1993 City of Thornton, Colorado.
Water Resources Administrator. Managed all water resource activities within the upper South Platte River basin. Project highlights include the completion of water court transfers,

JEFFREY A. CLARK - Continued

management of various ranch properties, water rights management and protection, coordination with other water providers regarding operations and assisted with the development of decisions support system for South Platte water administration.

1987-1989 Spronk Water Engineers, Denver, Colorado.

Staff Engineer. Performed various hydrologic and engineering evaluations including water rights evaluations, water right appraisals, water court transfers, augmentation plans, development of water accounting forms and system operations studies. Assisted in the development of a hydrologic model of the Arkansas River basin.

1985-1987 Division of Water Resources, State of Colorado.

Deputy Water Commissioner. Responsible for the daily administration of water rights within the Boulder Creek watershed. Coordinated with various water users, public and private entities and other stakeholders regarding water administration and water operations. Assisted the general public, water attorneys and water consultants regarding water operations, data and water rights. Assisted hydrographers in the measuring and recording of flow data, assisted in the preparation of water rights tabulations and abandonment lists and assisted with well augmentation compliance.

RFI
RESPONSE

Douglas County 2050 Comprehensive Water Plan



Prepared for



Prepared by



JUNE 28, 2024



DOUGLAS COUNTY GOVERNMENT

Department of Community Development
100 Third Street
Castle Rock, Colorado 80104
Telephone: 303-660-7460
www.douglas.co.us

REQUEST FOR INFORMATION (RFI)
NO. 000-00
PROJECT TITLE

**YOUR RESPONSE MUST BE RECEIVED NO LATER THAN
MONTH, DAY, 20XX @ 4:00 P.M.**

RFI CERTIFICATION

We offer to furnish to Douglas County the information requested in accordance with the specifications and subject to the terms and conditions described herein:

NAME: INTERA Incorporated

ADDRESS: 9600 Great Hills Trail Suite 300 W

CITY: Austin STATE: TX ZIP: 78759

TELEPHONE NUMBER: 512 - 425 - 2000 FAX NUMBER: _____

E-MAIL ADDRESS: SMusleh@intera.com

BY: Shaden Musleh
(Printed or Typed Name)

Shaden Musleh
(Written Signature)

TAXPAYER I.D. NUMBER: 74-3010638

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said response and furthermore to potentially award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful firm.

SECTION ONE ~ GENERAL AND DETAILED PROJECT INFORMATION:

A. Scope of Services:

Through this Request for Information (RFI), the Douglas County Government, hereinafter referred to as the County, respectfully requests information from responsible, qualified firms for the provision of a Douglas County 2050 Comprehensive Water Plan (Water Plan), as specified. It is the intention of the County to review all RFI responses, short-list those responses, and post an actual Request for Proposal (RFP). Only those companies, who have submitted a potentially acceptable response to this RFI will be allowed to submit a response during the formal RFP process.

This RFI process should be considered "Step One" of a multi-step solicitation process.



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Appendix B – Abridged Resumes



A. Cover Letter

June 28, 2024

Douglas County Government
Department of Community Development
100 Third Street
Castle Rock, Colorado 80104

RE: Response to Request for Information - Douglas County Water Plan

Dear Douglas County Water Commission,

INTERA Incorporated (INTERA) is pleased to submit this response to the above-referenced Request for Information (RFI) to Douglas County (County) and the Douglas County Water Commission (DCWC). Established in 1974, INTERA is a geosciences and engineering consulting company focused on developing scientifically sound, practical, and reliable solutions to water resource and environmental challenges. We bring a successful track record in Colorado of delivering outstanding service to public and municipal agencies responsible for supplying, managing, and protecting water resources. INTERA's Colorado staff consists of 22 water resource engineers and hydrogeologists. INTERA has chosen to have the Brendle Group, who brings specialty expertise in water and land use planning and stakeholder and public engagement, on our Team.

Brendle Group was founded in 1996 and is a woman-owned engineering, planning, analytics, engagement, and communications firm with demonstrated project experience in providing water, energy, and climate solutions for local and state governments. Together our Team brings exceptional qualifications for developing Douglas County's Water Plan, which are highlighted below:

- Recent experience on the South Metro Water Supply Authority (SMWSA) Aquifer Storage and Recovery (ASR) Regional study.
- Over two decades of water resources planning experience in the South Metro Area.
- Extensive expertise with regional and State planning processes.
- Well versed in in developing water demands and water resources planning.
- Cutting-edge expertise in land use planning and the integration of water..
- Proven nationwide experience in developing county and regional water plans that are heavily focused on groundwater supplies.
- Over 50 years of innovation and expertise in modeling and groundwater investigations. from INTERA.

Our proposed approach to developing a Douglas County Water Plan, provided herein, is structured in a similar manner as the draft scope of work in the RFI, with modifications to accommodate our recommended changes. Please note that our approach is not a full scope of work but rather focuses on areas that build on the draft scope in the RFI. Our most significant proposed modifications are highlighted below:

Phase 1: Water Supply and Demand Analysis

- Task 1 – Mapping is critical to all aspects of the project. We recommend interweaving mapping and visual datasets throughout the scope, calling out candidate maps that would enhance the evaluation and presentation of key data and results. Mapping and digital datasets may not need to be called out as an individual task unless the County is seeking a visual interface tool/product.
- Task 2 – Our proposal includes developing forecasted demands for at a minimum, a low demand scenario and a high demand scenario to capture a range of possible future demands.
- Task 3 – We added an additional task that focuses on the “gap” or as detailed in our proposal, reliance on nonrenewable groundwater. This is called out as “Task 3” in our proposal.



- Task 4 – This was called out as Task 3 in the RFI draft scope. Our proposal lays out a three-step process including a broad overview of the Denver Basin and other aquifers underlying both Douglas County and surrounding counties (Step 1) and then narrows in on priority vulnerable areas for more in-depth technical analysis (Steps 2 and 3).
- Task 5 – We added an additional task that focus on identifying actions that may be taken to address the vulnerabilities identified through the reliance on non-renewable groundwater evaluation and the groundwater analysis in our proposed Tasks 3 and 4, respectively.

Phase 2: Land Use Policy Analysis

- The request for forecasting development conditions under an ultimate land use scenario (i.e., “full build out conditions”) without a cap on total population is unclear. In most land use planning processes, full built out refers to the development of all undeveloped and underutilized land in accordance with approved comprehensive/future land use plans. We recommend that the Request for Proposals (RFP) clarify if it is the intent of the County to develop a scenario showing build out of undeveloped and underutilized land without adhering to local comprehensive plans or if there is alternative future land use scenario(s) that should be considered.
- Land use buildout analyses estimate the number of housing units and non-residential space that could be developed – this is a bottom-up approach that can then translate into an estimated population. Using State Demographer estimates is a top-down approach that assumes a given growth rate and is not traditionally informed by a land use buildout analysis. We recommend that the RFP focus on the bottom-up approach to forecasting buildout population based on development potential. The top-down approach can be used as a check to inform the potential rate of growth, but not the specific location of the growth nor the ultimate potential of County development.

Phase 3: Development of the Douglas County Water Plan

We recommend a variety of improvements to the scope of work. Two notable suggestions are highlighted below:

- Incorporate a stakeholder process driven process that provides input on the Plan throughout the development process.
- Consider implementing a scoping process to better understand other areas where Douglas County services intersect with water, in addition to water supply availability and land use planning (e.g. emergency preparedness and response with natural disasters such as drought, floods, and wildfire; environmental health; watershed health and parks and open space; public works stormwater and drainage; water conservation, etc.). This scoping process brings more of a holistic or “one-water” approach to the Plan and could contribute to possible solutions in meeting water supply challenges within the County.

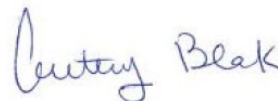
Our Team is highly qualified and confident that we can provide you with a valuable and relevant Douglas County Water Plan. We bring a breadth and depth of experience in water supply and demand planning, insight into regional and local South Metro groundwater studies that can inform the County Plan and provide opportunity for further collaboration with other South Metro entities, along with specialized expertise in land use planning and public and stakeholder engagement. In addition, we also have extensive experience developing State and federal applications for grant monies, if the County is seeking funding support. We welcome the opportunity to work with you in whatever capacity is preferable for the DCWC.

Should you have any questions regarding our proposal, please do not hesitate to contact us. Shaden Musleh may be contacted at 720.318.4725 or by email at smusleh@intera.com. We appreciate the opportunity to submit our proposal and look forward to supporting the County with this important project.

Sincerely,
INTERA Incorporated



Shaden Musleh, PE (*authorized signer*)
Principal Water Resources Engineer



Courtney Black, PE
Senior Water Resources Engineer

B. Required RFI Response Narrative

The INTERA Team brings the broad corporate and personnel qualifications and experience needed to excel in providing water planning services to Douglas County. Our responses to the mandatory information, identified in the County's RFI, are provided below.

B.1 Detailed Narrative of Key Project Elements/Goals

Our approach described below is generally structured using Exhibit B of the RFI with modifications to accommodate our recommended changes and proposed efficiencies. The proposed changes are based on our Team's breadth of experience working in the South Metro area for over two decades along with our State and national expertise in developing regional water plans that are heavily focused on groundwater supplies.

Phase 1: Water Supply and Demand Analysis

Task 1: Water Supply Information Collection. Data collection processes and subsequent evaluation of supplies, particularly involving multiple agencies with complex water supply portfolios and needs, is often a time intensive process. Efficiencies and processes that can be instilled at the front end can go a long way in preserving the budget as well as in developing an appropriate platform of data that provides meaningful results. These are challenges we have successfully navigated and learned from both locally in Douglas County and elsewhere. A member of our proposed Team, Courtney Black, was deeply involved in SMWSA's 2007 master planning efforts which was very similar in scope to the proposed scope in the RFI, involving data collection on demands, supplies, infrastructure, etc. Additionally, our Team just recently completed a collection of groundwater information for SMWSA's Regional ASR project, working with South Metro water providers including Castle Rock Water and Centennial Water and Sanitation District.

In addition to the data collection process outlined in the RFI, SMWSA is in the process of updating their water master plan, which to our understanding, is a compilation of much of these data for the SMWSA member agencies. If publicly available near the onset of the County planning effort, this may be a starting point to build on. We also propose distributing a survey to the Douglas County water providers, as an initial first cut in acquiring their water supply and planning information. Following the survey, targeted follow-up correspondence with individual providers may be necessary to further understand water supply portfolios and to further refine the evaluation needed to produce results at an appropriate resolution for regional county planning purposes.

Our existing relationships with many providers in the South Metro region will be of asset during this process. Examples of key information to collect and evaluate at an individual water provider level during this task entails: characterization of water providers' water supply portfolios, level of reliance on Denver Basin groundwater, existing and planned renewable water supplies, future planned water infrastructure including wells and the aquifers in which these wells will be drilled, reuse operations, concerns related to the sustainability of their Denver Basin groundwater, projected water supply yields through 2050 and buildout, and providers' projected water supply gaps and water supply challenges. In addition, INTERA will work with the Rural Water Foundation of Douglas County and other identified unincorporated well-user representatives to acquire relevant data.

We recommend including a technical memorandum or report summarizing the approach, results, and key findings from the water supply collection effort. This technical memorandum/report may be included as an appendix in the final Douglas County Water Plan and be summarized in a chapter of the Plan.

The RFI's example scope also includes a separate task for mapping, development of figures, and digital data. We believe mapping and other visual resources are one of the most critical factors for success of regional planning efforts. Graphical representations are not only critical to showing available data, but key to the evaluation process and to conveying results to audiences. We plan to develop well thought out maps that "tell the story" and that are interwoven throughout each step of the planning process.

Rather than a separate task, an updated scope of work could call out specific maps that would enhance the evaluation and presentation of the water supply gaps, vulnerabilities, etc. Examples of such maps include population, water providers with renewable supplies and extent of these supplies, existing and projected 2050 and buildout water demands, well locations, density of wells by aquifer, groundwater extractions by aquifer, areas vulnerable to a water supply shortage, etc. We also propose building on existing digital data sets and mapping efforts, available through the State's Colorado Decision Support System (CDSS) and through other regional planning efforts, prior to reaching out to individual entities for mapping needs. For example, SMWSA recently worked with an outside consultant in developing an updated map of the South Metro area with service area boundaries for all existing members and all WISE infrastructure and facilities.

INTERA brings a breadth of expertise in providing visuals to complement groundwater studies, which have proven to provide insight, generate interest, and assist with decision making for stakeholders that do not specialize in groundwater. We are familiar and worked with many publicly available spatial datasets and would welcome the opportunity to show examples of how we have worked with these data and local specific data to develop these visuals during the interview process.

Task 2: Water Demand Projection Analysis. The RFI proposes developing water demands for current conditions, 2050 and buildout. While this is standard practice, many entities, including the State through the Colorado Water Plan, are developing multiple water demand forecast scenarios to capture a variety of factors that play a critical role in future water demands. Some of these factors include rate of population growth, land use development patterns and the intensity of future water-using landscaping, a warming climate, water rates, and conservation measures. We propose developing a minimum of two demand forecast curves that capture a low water demand scenario and a high-water demand scenario to show a representative band of possible future demands. This "book-end" approach is not only intended to show a representative band of possible future water demands, but can also inform county decision-making and policy by showing different outcomes if water demands can be lowered in the future. We are currently working with multiple water providers throughout the Front Range on water demand forecasting and water conservation planning efforts and welcome the opportunity to discuss this with you in further detail.

Water demand projections will need to be developed for both water provider service areas as well as for independent well owners, particularly in unincorporated Douglas County. Currently available water demand projections by water providers will likely feed into this analysis, along with the results of the land use analysis developed for Phase 2. Water demand projections for unincorporated Douglas County relying on wells will likely entail assumptions on water use per individual domestic wells based on existing data and literature. Assumptions will also be necessary (e.g. water use per square foot of development or water use per person) for areas where existing water demand forecasting data is not available. The land use analysis conducted in Phase 2, will be informative for these water demand forecasts and serve as a valuable "check point." For instance, areas with projected high rates of new development, should be reflected with an appropriate level of increasing water demands.

We recommend including a technical memorandum or report summarizing the approach, results, and key findings from the demand forecasting exercise. This technical memorandum/report may be included as an appendix in the final Douglas County Water Plan and be summarized in a chapter of the Plan.

Task 3: Reliance on Non-renewable Groundwater (*This is a new task not included in the RFI*). The purpose of this task is to identify the areas in Douglas County that are highly reliant on Denver Basin and other nonrenewable groundwater based on existing and projected water demands coupled with individual water providers’ current actions and future plans on reducing their dependency on the Denver Basin. Task 3 essentially combines data gathered from Tasks 1 and 2 to qualitatively and where possible, quantitatively, spatially assess the reliance on nonrenewable groundwater. This assessment is to include three snapshots: current conditions, demand in 2050, and demands at buildout to coincide with the proposed water demand projection timeframes in Task 2.

Quantitatively, nonrenewable groundwater reliance may be expressed in the equation below for a single time snapshot (e.g. current, 2050, buildout) as:

$$\text{Nonrenewable groundwater reliance} = \text{Water Demands} - \text{renewable supplies} - \text{reuse}$$

Note: This assumes that water demands would account for an assumed level of water conservation and renewable supplies may consist of surface water supplies that water providers are importing to the area (e.g. WISE and other South Platte water rights).

Reliance on nonrenewable groundwater is an important parameter for developing current and projected groundwater extractions, informing Task 4 – Groundwater Analysis. This information not only feeds into estimating existing and future Denver Basin groundwater withdrawals (e.g. additional stress placed on the Denver Basin) but can also be an initial step to prioritizing which areas of the Denver Basin are exceptionally vulnerable to future water supply shortages and therefore may warrant more extensive study.

We recommend including a technical memorandum or report summarizing the approach, results, and key findings from this task. This technical memorandum/report may be included as an appendix in the final Douglas County Water Plan and be summarized in a chapter of the Plan.

Task 4: Groundwater Analysis (*This is called out as Task 3 in the RFI and also referred to as in-depth groundwater availability study*). Our proposed groundwater evaluation approach below is based on our recent experience developing a conceptual groundwater model for SMWSA coupled with our extensive expertise in developing regional water planning studies in areas that rely heavily on groundwater. For budgetary and efficiency purposes, our three-step process provides a broad overview of the Denver Basin and other aquifers underlying both Douglas County and surrounding counties (Step 1) and then narrows in on priority vulnerable areas for more in-depth technical analysis (Steps 2 and 3).

Step 1: Regional Overview. This step involves the collection and compilation of publicly available regional groundwater data and studies to provide an overview of the four Denver Basin aquifer systems, fractured bedrock aquifers, and alluvial aquifers underlying Douglas County. The data compilation process will include:

- General description of the four Denver Basin aquifer systems and other relevant aquifer systems
- Maps and cross sections of the aquifer systems underlying Douglas County
- Maps depicting wells in each of the aquifers
- Groundwater level contours and regional groundwater flow maps
- Groundwater quality conditions
- Known groundwater contaminants
- Historical groundwater levels

The RFI includes a demand and supply gap analysis in Task 2. Traditionally the “gap” in a demand and supply gap analysis is simply the difference between the available supply and existing/projected water demands, indicating a water shortage. Douglas County is more complex. Most of the water providers and well users in Douglas County are reliant on nonrenewable Denver Basin groundwater to meet all or a portion of their needs. The extent under which the Denver Basin can meet future water demands is an outstanding question many have asked and there is not a clear answer. We believe that this is a locally specific question where certain areas of the Denver Basin are more stressed than others. Our proposed Task 4 – Groundwater Analysis, focuses on addressing this question. Task 3 below, is a “precursor” to the Task 4 groundwater study to better characterize and visually depict through various mapping how reliant water providers and independent well users are on the Denver Basin.

- Hydrogeological characteristics

We have a comprehensive understanding of publicly available datasets available in Douglas County, having recently completed a comprehensive data search for the South Metro region. Data sources we may rely on include:

- CDSS data
- USGS maps, aquifer Reports, and Well Test and Level Data
- State Reports such as the Groundwater Atlas, Regional Water Level Reports, and the Groundwater Circulars
- USGS Denver Basin Model
- Additional Reports and Studies such as nearby ASR Feasibility Studies.
- Other relevant modeling studies.

This task is called out in the RFI as a task that could be contracted separately from the remainder of the project. Our Team is highly qualified and confident that we can provide you with a highly valued Douglas County Water Plan, yet we are open to alternative arrangements. In addition to the tasks above, we also bring a depth of experience and insight into regional groundwater studies, including groundwater studies in the South Metro area. We welcome the opportunity to work with you in whatever capacity is preferable for the DCWC.

Step 2: Identify Vulnerable Areas for Additional Study. Water

supply vulnerability of individual well owners and water providers depend on a variety of metrics including: natural conditions of the aquifer, amount of extractions in the local area, depth of wells in relation to groundwater levels, groundwater quality and presence of contaminants, financial resources of well owners and providers to address any issues, and etc. The objective of this step is to identify key geographic areas of concern that are exceptionally vulnerable to groundwater quality and/or quantity concerns. Key metrics that can be used to identify these vulnerable areas are provided in Table B.1 – 1 below. These metrics will be refined at the onset of the groundwater evaluation based on input from

stakeholders. One of the key findings of the SMWSA Regional ASR study directly applicable to the Douglas County planning effort is that groundwater conditions significantly vary not only among each of the four main aquifer systems (Dawson, Denver, Arapahoe, and Laramie-Fox Hills) in the Denver Basin but also there is significant heterogeneity within each aquifer system throughout the South Metro area. This is a function of spatial differences in aquifer properties as well as in the level of groundwater extractions geographically occurring throughout each aquifer system. For example, the

Item	Proposed Metric	Data source(s)
1	Nonrenewable groundwater reliance	Data generated via Task 3 above which includes current conditions and projected 2050 and buildout conditions
2	Areas of known significant pumping reductions and/or dry-up	Survey and follow up discussions
3	Areas of relatively high pumping	Available local pumping data
4	Long-term Groundwater level declines	Available local groundwater level data, regional reports and studies
5	Areas of water quality concern	Survey, State Data, etc.

Table 1Key Metrics

amount of groundwater available, and timing of well dry-up in Centennial Water and Sanitation District wellfield in the western portion of the Arapahoe Aquifer is different than the timing and amount of groundwater available to Castle Rock Water or East Cherry Creek Valley Water and Sanitation District.

Step 2 will entail gathering local data specific to metric items 2 through 5 above. This may be accomplished through the Task 1 survey provided to local water providers, data obtained through the SMWSA Regional ASR study, and follow up discussions with water providers and rural well user representatives. Following collection and synthesis of the local data, a comprehensive spatial evaluation will be conducted to identify areas within Douglas County that are currently or are projected to encounter one and/more of the metrics in Table 1above. These areas will be identified and presented using visual aids and maps. Mapping efforts will focus on identifying how geographic areas are vulnerable (e.g. contamination, wells are drying up, etc.), level of vulnerability relative to other geographic areas in the County, current conditions versus projected conditions, and etc. INTERA will show the vulnerability results at stakeholder meeting(s) and facilitate dialogue on how to best proceed. A set of identified priority areas will be carried into Step 3 for further analysis.



Step 3: Further Investigation of Priority Areas. This step will include local technical groundwater analyses to better understand the underlying issues associated with each of the selected priority areas along with an assessment of available local resources to address potential issues. Examples of questions that may be addressed include:

- What is/are the cause(s) of the current observed impacts (e.g. groundwater quality concerns, reduction in pumping rates)?
- Groundwater levels are declining, when should impacts to well production rates be anticipated assuming no growth or 10% growth by 2050? When could wells start to dry-up?
- What changes would be necessary to mitigate impacts?
- Is mitigation feasible and affordable with available local resources?

We recommend including a technical memorandum or report summarizing the approach, results, and key findings from the groundwater evaluation. This technical memorandum/report may be included as an appendix in the final Douglas County Water Plan and be summarized in a chapter of the Plan.

Regional ASR and Groundwater Numerical Modeling in the South Metro Area

INTERA is currently working with SMWSA on determining the level of SMWSA member support to continue with the ASR Regional study. Projected next steps involve an optimization study to better understand how renewable water may be stored via ASR in centralized locations, “Hubs,” in the South Metro area for physical withdrawal or exchange at a later period for those in need of supplies. The next phase is to identify water providers and potentially others in Douglas County that are limited on acquiring and/or storing renewable water supplies and would benefit from a regional ASR program.

In addition, the second phase of the study involves the development of a numerical groundwater model for the South Metro area. This model will serve as a tool to better understand the hydrogeological dynamics associated with ASR underlying each of the Hubs. This tool is to be developed in a manner where it could be modified and used by others to inform local and regional studies, such as local-specific studies identified in Task 5 below.

Task 5: Mitigation and Response to Vulnerabilities (This is a new task that is not called out in the RFI). This task focuses on identifying actions that may be taken to address the vulnerabilities identified in Tasks 3 and 4. Such actions could include:

- County sponsored programs and/or actions,
- Additional studies to further understand key vulnerabilities,
- Potential future key partnerships
- Policy recommendations and/or considerations
- Leveraging the South Metro Regional ASR project to enhance storage.

This is anticipated to be a stakeholder driven process where INTERA would provide the facilitation and support necessary to identify the actions and investigate/characterize supporting information specific to the implementation of such actions. Such information could include costs, preliminary review of what would be entailed to implement the actions, funding mechanisms that would support the actions, challenges and opportunities in implementing such actions, and potential partnerships and opportunities for collaboration.

We recommend including a technical memorandum or report summarizing the approach, results, and key findings from this task. This technical memorandum/report may be included as an appendix in the final Douglas County Water Plan and be summarized in a chapter of the Plan.

Phase 2: Land Use Policy Analysis

This phase will draw on land use planning work completed by Douglas County and local jurisdictions and will ultimately be used to inform the development or refinement of land use policies.

Task 1: Existing and Future Land Use Analysis. The first task will involve compiling land use information for Douglas County and jurisdictions, including:

- Existing Land Use
 - Leverage Douglas County property records to create a parcel-level map of generalized existing land use categories (e.g., residential, commercial, open space, etc.).
 - Coordinate with County and municipal staff to identify properties that are currently developed, undevelopable, undeveloped, and those with vested rights to develop.
- Future Land Use
 - Assemble a composite future land use map for Douglas County that includes all incorporated and unincorporated planning areas.
 - Synthesize and/or align future land use categories across jurisdictions where needed.

Key questions to be addressed in the Request for Proposals include:

- The quality and availability of GIS data related to development approvals.
- The existence of any aggregated future land use GIS layers across Douglas County.

Task 2: Land Use Buildout Analysis. After establishing foundational existing and future land use data across Douglas County, the process moves on to conducting a future land use buildout analysis. Components of the future land use buildout analysis process include:

- Developed Areas
 - Aggregating existing housing unit and building square footage data by existing land use category
- Approved Developments
 - Incorporating housing unit and building square footage data from approved development plans
- Future Development
 - Developing housing unit and building square footage assumptions for each future land use category

The data from this task will roll-up into a summary of the total housing units and building square footage if Douglas County and its municipalities develop according to their adopted future land use plans. To the extent possible, our Team will cross-check the buildout analysis with regional estimates from the State Demographer and will coordinate and/or leverage modeling performed for the SMWSA Master Plan and other Water District Plans.

Key questions to be addressed in the RFP include:

- The desired geographic level of buildout analysis (e.g., parcels, broader future land use areas, traffic analysis zones (to align with household and employment forecasts)
- The availability of economic forecasts to inform the housing and non-residential rates of development (e.g., what could be expected by 2050).
- Whether the County envisions the need for multiple buildout scenarios that are either consistent with or divergent from adopted future land use plans.
- The availability of SMWSA Master Plan modeling results/data.
- Does “full buildout conditions without a cap on expected population” mean buildout to the future land use plans, or is it implying development without any land use regulation?

Task 3: Constraints and Opportunities. Our Team will compare the results of the land use scenarios to the results from Phase 1, to identify areas that may face water-related constraints to development, as well as areas that present water-related opportunities for development. This task could also include exploration of land use policies to help mitigate or reduce water-related constraints. Some examples could include:

- Updating landscaping codes to comply with new State of Colorado regulations that prohibit installation of non-functional turf
- Adjusting development review processes to require additional reviews/approvals for water-intensive uses
- Adjusting future land use maps to focus growth in areas where adequate water supply is available and/or modifying densities for future land use categories
- Exploring incentives for reducing water demand or shifting it to alternative locations, such as transfer of development rights (TDR) programs to shift development away from water-scarce areas

We recommend including a technical memorandum or report summarizing the approach, results, and key findings from the land use policy analysis. This technical memorandum/report may be included as an appendix in the final Douglas County Water Plan and be summarized in a chapter of the Plan.

Phase 3: Development of the Douglas County Water Plan

Phase 3 in the RFI entails the development of the Douglas County Water Plan along with three public meetings. The RFI also provides the main sections of the report and details a variety of information to include in the Plan. The following bullet points provide additional items to consider with this task or with additional tasks to provide a congruent scope of work that corresponds with the items listed in the RFI.

- The County Plan will require multiple drafts and reviews before being finalized. It is helpful that this be specified for budgetary cost estimating purposes, particularly if there is a substantial number of reviewers with multiple sets of comments.
- The RFI lists 10 additional items that should be included in the County Plan. Each of these items require a degree of data collection and evaluation that for budgetary purposes is much easier to administer and manage through designated tasks. The Text Box, below shows how each of these 10 items may be organized into the tasks included in this proposal.

1. Current regional connections – Phase 1, Task 1
2. Assessment of water infrastructure and storage needs – Phase 1, Task 1
3. Identification of potential renewable water supply projects or system that could serve Douglas County – Phase 1, Task 1
4. Identification of reclamation and reuse opportunities and analysis requirements – Phase 1, Task 1
5. Integration of agricultural efficiencies, if applicable – Phase 1, Task 2
6. Conservation practices, including assessment of technologies, regulations, and incentives to extend water supply for all water user types – Phase 1, Task 2
7. Options for extending the life of the Denver Basin aquifers – Phase 1, Task 5
8. Identification of higher risk aquifer areas of reliability and quality, including the costs of replacing wells. – Phase 1, Task 4
9. Discussion of impacts on existing rural well users in County growth scenarios and mitigation - Phase 1, Task 4 (actions to mitigate problem would be Phase 1, Task 5)
10. Cost analysis to implement recommendations that may close the supply gap (if applicable) identified in Phase 1 – Water Supply and Demand Analysis – Phase 1, Task 5

- Add a project management task or phase. This project will require well executed coordination to ensure a comprehensive and cohesive plan. Budget and time will need to be set aside for coordination and administration purposes. This task/phase should also include the first three bullet points listed under the general project management expectations listed in the RFI.
- Add a new task for public meetings. Public meetings require dedicated time for preparation, organizing facility arrangements, facilitation, and post-meeting follow-up. The consultant time dedicated to this can vary significantly depending on the role the County plays in providing facility arrangements and conducting public outreach (e.g. advertising the meetings). Additional information on the consultants’ role for these meetings is helpful for cost-estimate purposes.

- Consider adding a task for stakeholder meetings. In our experience, well-designed stakeholder meetings that focus on obtaining targeted information prove to be an efficient means in obtaining valuable information and help to ensure that plans are sufficiently compatible with the “on-the ground” perspective of leadership and staff members responsible for carrying out the plan. We recommend identifying potential stakeholders for the County planning effort and including a task with a set number of stakeholder meetings. Such stakeholders may include relevant County staff, water providers, rural well user representatives (Rural Water Foundation of Douglas County).
- While the RFI, primarily focuses on water supply availability and land use planning, county water plans also offer an opportunity to touch on other county services that intersect with water. Examples of such intersections include: emergency preparedness and response with natural disasters such as drought, floods, and wildfire; environmental health; watershed health and parks and open space; public works stormwater and drainage; water conservation, etc. A scoping process could be included in the county plan development process to better understand these intersections and how these areas could be best incorporated into the Plan.

Timeline

We anticipate that a Douglas County Water Plan could be completed within a year to one and half years upon execution of the contract, assuming data is readily available, and that all public meeting and stakeholder meetings can be scheduled within the appropriate timeframe to complete the work. This does not include local-specific groundwater studies that may be identified in Step 3 of Task 4, the groundwater analysis. However, we are committed to working with Douglas County in scheduling a project timeline that sufficiently meets the County’s needs.

B.2 Firm Information

INTERA is teaming with Brendle Group (Brendle) to deliver water planning services to Douglas County. Detailed qualifications and specifics on the capabilities, followed by complete firm descriptions are provided below. Abridged resumes comprised of specific qualifications and training, and relevant experience, for our proposed staff are included in **Appendix B**.

Why the INTERA Team?

Our companies excel at integrating local and regional water resource knowledge, data analysis, modeling, communicating with stakeholders, and applying our understanding of water supply infrastructure and utility operations to find creative, sustainable solutions to challenging water management issues.

Our Team brings exceptional qualifications for developing Douglas County’s Water Plan. We bring over two decades of water resources planning experience in the South Metro including having just completed the first phase of a Regional ASR study with SMWSA. Additional information on our local experience is provided in Appendix A. The following elements highlight our water resources planning and land use planning expertise and groundwater capabilities.

- **Extensive expertise with regional and State planning processes.** Our Team brings hands-on experience with developing some of the basin implementation plans that inform the State Water Plan. This involved extensive stakeholder engagement among the basins, collecting and evaluating available State and local data, developing modeling tools, identifying basin-wide water supply gaps, identifying solutions and projects to meet the gaps, and developing comprehensive plans.
- **Well-versed in developing water demands and water resources planning.** Our Team brings high-end expertise in water sources planning for both regional/basin wide and utility-scale applications. This broad skill set includes our in-depth knowledge and experience with forecasting water demands, conservation and drought planning, water supply planning, Colorado water rights for various planning and litigation applications, land use planning, and a diverse portfolio of stakeholder and public engagement around water.
- **Cutting-edge expertise in land use planning and the integration of water.** Brendle Group has been at the forefront of integrating water and land use planning in Colorado. Several Brendle Group team members are certified by the American Institute of Certified Planners and bring significant experience as staff planners for municipal and metropolitan planning organizations, as well as consultants who have led and supported various comprehensive

plans, future land use maps, and land use regulations. Furthermore, the Brendle Group team actively participates in the Colorado Water and Land Use Planning Alliance – a voluntary network of professionals working to expand resources, grow technical knowledge, and advance best practices to advance coordination across water and land use planning professions. Examples of Brendle Group thought leadership in this space, include development of the Growing Water Smart Metrics Guidebook, published by Sonoran Institute in 2020.

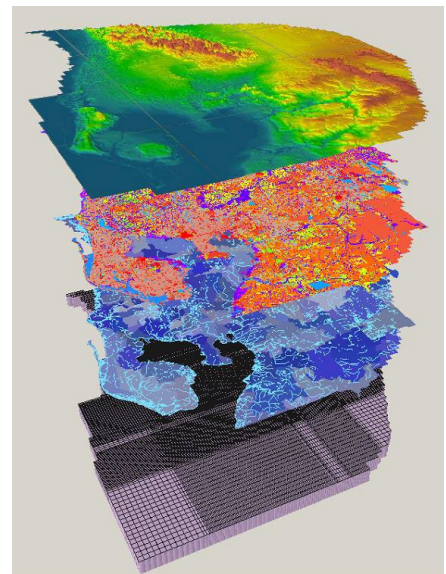
- **National expertise in developing county and regional water plans heavily focused on groundwater supplies.** In addition to our experience in Colorado, members of our Team are deeply involved in developing basin-wide groundwater plans in California under the Sustainable Groundwater Management Act (SGMA), Texas, New Mexico and Indiana. These plans are local stakeholder-driven plans that encompass in-depth investigations and numerical modeling of groundwater basins to determine water availability and long-term sustainable thresholds involving groundwater levels, water quality, groundwater-surface water interaction, dashboards, and etc. along with an implementation plan that basin stakeholders and water users must adhere to maintain the thresholds.

Firm Descriptions



INTERA is a geosciences and engineering employee owned consulting firm with nearly 50 years of experience in providing solutions to water resource, environmental, and waste isolation management challenges. While our initial services focused on the development and application of hydrogeologic models and other quantitative tools to support environmental and waste isolation issues, starting in the late 1990s, we expanded our services to include hydrologic, hydraulic, hydrodynamic, and water quality modeling, GIS, and remote sensing to address water resource development and management. INTERA’s primary water resources services include water resource planning, groundwater availability assessments, hydrographic data collection and analyses, surface water availability and water rights assessments, 3-dimensional geologic and hydrogeologic visualizations, GIS and database applications, and remote sensing. Since our inception, we have earned a reputation for developing best-in-class solutions to challenging problems facing utilities, governmental agencies, and industry. In support of water resource planning and management, INTERA’s core competencies include:

- Predicting future hydrologic-system states including groundwater availability, optimal water-resource management, and water-demand forecasting through the use of numerical models, statistics, and remote sensing technology
- Developing and applying hydrologic, hydraulic, hydrodynamic, and water quality models as decision support tools for identifying optimal solutions to water resource planning and management problems with multiple and occasionally competing objectives
- Modeling surface/groundwater interaction and developing integrated surface water and groundwater modeling tools
- Developing custom GIS and database software designed to manage, maintain, and analyze site-specific water resources data under a variety of software platforms
- Developing visualization and statistical techniques to assess model calibration metrics and model performance both spatially and temporally
- Analyzing agricultural water use and land-use change using GIS and remote-sensing techniques



INTERA developed an integrated surface water – groundwater model that simulates the full hydrologic cycle to serve as a tool for optimizing the operation of 11 wellfields.

The development and application of conceptual and numerical models and other quantitative decision support tools have been core competencies of INTERA for nearly 50 years. Our water resource professionals specialize in the application of proven hydrologic, hydraulic, hydrogeologic, hydrodynamic, and water quality models to provide scientifically sound and defensible solutions. With expertise in a wide array of modeling tools and

analysis techniques, we determine the most appropriate approach to achieving the goals and objectives of each project. We also bring the skills needed to develop customized software codes to meet specific project needs.

In Colorado, INTERA staff have been meeting water resource planning and water rights engineering needs since 2004. Our experience includes the Arkansas, Colorado, White, Yampa, South Platte, San Juan, and Gunnison River basins where work has ranged from supporting applications for water rights and substitute water supply plans, conducting basin-wide and ditch-wide water planning studies, analyzing demand and supply, water conservation, drought planning, and modeling of surface and groundwater systems. We have worked for/with local entities such as Soth Metro Water Supply Authority, Centennial Water and Sanitation District, Denver Water, Aurora Water, Town of Erie, City of Thornton, Dominion Water and Sanitation District, East Cherry Creek Valley Water District, and Mount Werner Water and Sanitation District, Basin Roundtables, energy development companies, water management districts, nonprofit organizations, environmental groups, and state and local agencies. Having worked with a wide range of clients both on the east and west slopes, we have gained an institutional knowledge of the key players and their interests, the challenges facing the state and municipalities, and the planning efforts that are currently being conducted in Colorado and the key organizations that are involved in these planning efforts.

The following assets and experience will enable INTERA to effectively support the County’s current and future water resource challenges:

- Our primary key personnel live in the Denver-metro area and can quickly respond to the City’s requests, in person when needed.
- We have successfully supported similar agencies with their water resource challenges, including those agencies listed to the right, and others described in the project examples in this proposal.
- Our staff are technical experts in the field of water resources planning and management and they genuinely care about the future of water supplies in Colorado.
- Our client satisfaction is exemplified by our high-level of repeat customer business of over 90% and by the willingness of our clients to provide positive references for our past work.

From a few thousand to millions of customers, INTERA staff have worked on water resources issues with utilities and municipalities of all sizes —

16,000	Town of Frederick,
116,000	City of Boulder, CO
375,000	City of Aurora, CO
500,000	Suez Water, NY
630,000	California American Water, CA
700,000	Albuquerque Bernalillo County Water Utility
800,000	Citizens Energy, IN
1.4 million	Denver Water, CO
2.0 million	Tarrant Regional Water District, TX
2.2 million	City of San Diego Public Utilities, CA
2.4 million	Tampa Bay Water, FL
4.0 million	Water Replenishment District of Southern CA



Brendle Group is nationally recognized for their work on integrated water and land use issues and water smart metrics. As a full-service sustainability firm, they are well qualified to ensure that Douglas County is fully supported on best practices in water resource planning and management as well as climate change, population growth, and stakeholder engagement.

Brendle Group is a woman-owned engineering, planning, analytics, engagement, and communications firm with extensive project experience in water, energy, and climate solutions for local and state governments. Since their founding in 1996, their success has come from our ability to anticipate the sustainability challenges ahead. Brendle thrives in sifting through the sea of possibilities to focus on the opportunities that accelerate equitable solutions to the climate crisis.

Accounts of Similar Scope

Details on several contracts/projects similar in scope to the services being requested by the County are provided below.

■ Optimization of Regional ASR System in the South Metro Region, Denver, CO

Client: South Metro Water Supply Authority

This multi-phase project entails development of a mathematical optimization model of ASR operations (infrastructure, pumping/extraction, surface water storage, water availability, WISE subscriptions and deliveries, water demand, aquifer behavior in response to injection and extraction, dominion and control of injected water, groundwater mound migration, interaction between ASR wells, physical deliveries of water between entities, paper exchanges, permitting constraints, etc.) in the South Metro region. INTERA is currently concluding Phase I, which involves developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Town of Castle Rock, (2) Centennial Water and Sanitation District and (3) East Cherry Creek Water and Sanitation District (ECCV). A conceptual groundwater model (part of the overall optimization model) was developed to allow for simulating aquifer behavior in response to the various injection and extraction scenarios and thus allow for optimization of the overall operations. The project includes a large stakeholder group including Aurora Water, Denver Water, CDPHE, State Engineer, EPA Region 8, Parker Water and Sanitation District and other South Metro entities. Other South Metro entities have expressed their interest in being hubs as well such as Dominion Water and Sanitation District and Meridian Metropolitan District. This regional project is built upon collaboration between entities that are either currently pursuing ASR or potentially may pursue ASR to maximize use and storage of surplus water to meet demands during high water demand /low water supply periods.

■ Water Rights Litigation Support and Raw Water Supply Modeling, Denver, CO

Client: Denver Water

INTERA has conducted a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system.

INTERA also completed an investigation of groundwater availability for irrigated parcels that receive surface water from the High Line Canal. We evaluated the availability of groundwater to fully supply the demand for each parcel. Our efforts included aquifer supply determination and developing cost estimates for the construction of wells and the associated water supply infrastructure needed to deliver water from each designated aquifer. Our work included assessment of water quantity and quality, hydrology, water supply, water demand, and modeling.

■ Water Planning Services for Dominion Water and Sanitation District, CO

Client: Dominion Water and Sanitation District

INTERA is working with wholesale water provider, Dominion Water and Sanitation District in developing a water conservation plan and recently completed developing a set of drought Rules and Regulations to define the foundational roles and responsibilities of Dominion and its retail water providers both during and prior to a drought. In addition, INTERA led development of a Drought and Water Shortage Plan that includes the following foundational components: drought mitigation, monitoring and triggers, stages, response, declaration protocol, implementation, and enforcement. This planning effort addressed the following questions which many M&I water providers will be facing in the future as they become more water efficient.

- What is the appropriate balance between regulatory measures to enforce water demand reductions and incentives?
- How can a drought response framework be developed to incentivize water efficiency with both existing development and planned new development?

- How can drought response be implemented in a fair and equitable manner among Dominion’s retail providers that range from using less efficient traditional practices to providers with sophisticated cutting-edge conservation practices?
- What is an appropriate level of drought response in communities that are highly water efficient, where relatively little additional water savings can be achieved without extreme measures?

■ Groundwater Model of Aquifer Storage and Recovery (ASR), East Cherry Creek Water and Sanitation District, CO

Client: East Cherry Creek Valley Water and Sanitation District

INTERA developed a MODFLOW groundwater model of the confined aquifers under ECCV service area. The calibrated model is used to simulate impacts from future injection and extraction and optimize operations. INTERA’s efforts includes data collection, developing a conceptual model to serve as the basis for the numerical model, refining a portion of the USGS Denver Basin Simulation Model to produce a local model capable of simulating the existing wellfields and potential ASR wells in the service area, calibrating the local-scale numerical model, and applying the model to make predictions of aquifer behavior and mound migration and optimize operations.

■ South Platte Basin and Yampa/White/Green (YMG) Basin Implementation Plans, CO

Client: Colorado Water Conservation Board

The objective of these plans was to investigate and analyze each basin’s water supply and demand through the year 2050, identify amount and location of water supply shortage, and show how future municipal, industrial, agricultural, recreational, and environmental needs can be met by both existing and proposed water projects. INTERA’s Shaden Musleh led the technical team that developed the YWG Basin Implementation Plan along with Courtney Black of INTERA. Shaden Musleh and Courtney Black also participated in the development of the South Platte Basin Implementation Plan. These projects involved numerous parties such as local and state government agencies, water management districts, local agencies, non-profit organizations, environmentalists and concerned citizens. The work encompassed researching previous studies, survey, education and outreach efforts, workshops, data collection, analysis of water supply and demand, modeling of water supply and demand under various hydrologic conditions and projected growth and operational scenarios using the State’s modeling tools and data. Shaden Musleh, vice chair of the Metro Basin Roundtable also served on the committee that oversaw the most recent update to the South Platte Basin Implementation Plan in 2022/2023.

■ Albuquerque Bernalillo County Water Utility Authority (ABCWUA), Water 2120 Plan Development, NM

Client: Albuquerque Bernalillo County Water Utility Authority

INTERA led the development of this comprehensive water plan that articulates the Water ABCWUA’s water planning for the next 100 years including surface- and groundwater management, as well as potential new supplies. Water 2120 looked at the current water situation in Albuquerque and projects the community’s needs based on various scenarios of climate variability and population growth. The Plan builds on the Water Authority’s past planning successes with conservation and the addition of surface water to the supply portfolio, both of which have allowed significant recovery of the aquifer that was previously the sole source of supply. The Plan was based on making prudent future investments in conservation, ASR, stormwater capture, watershed restoration, and wastewater reuse. In so doing, it provides for a sustainable and resilient water supply in the face of an uncertain future, while assuring groundwater sustainability. Our staff served as the public face of Water 2120 via involvement through presentations to ABCWUA’s Technical Advisory Committee and Board of Directors, as well as public meetings and outreach. INTERA developed a dynamic system simulation model for short-term surface and groundwater accounting, as well as long-term supply and demand planning and evaluation. The model serves as a management tool includes functionality to evaluate uncertainty in supply and demand as a result of forcing functions such as climate change and population dynamics. The tool also enables evaluation of ABCWUA’s existing water supply portfolio and determine at what period(s) in the future it may be necessary to expand the portfolio to meet growing demands. The model was used to evaluate and rank various water supply alternatives, aggregate the alternatives into water supply portfolios, and evaluate potential supply gaps in the future. Our team also developed a full groundwater reserve management plan to allow for prudent management of existing groundwater reserves. Other services included development of a conceptual reuse plan to evaluate potential supply and demand for non-potable reuse water for turf irrigation.

■ Regional Groundwater Sustainability Plans (GSPs), CA

Client: Various Water Agencies in California

The Sustainable Groundwater Management Act (SGMA) requires local Groundwater Sustainability Agencies (GSAs) in the state's high and medium priority basins to develop and implement Groundwater Sustainability Plans (GSPs). These GSPs provide roadmaps for how groundwater basins will reach long-term sustainability and consider the following indicators: groundwater declines, groundwater storage reductions, interconnected surface water-groundwater depletions, water quality degradation, land subsidence and salt-water intrusion. To date, INTERA experts led and/or supported 20+ GSAs and a total of 9 GSPs across the state of California. INTERA has successfully submitted the GSPs, annual reports, and accompanying datasets/appendices within the regulatory deadlines for all SGMA projects.

For four of the GSPs in southern California, INTERA developed basin-scale numerical groundwater models and worked on the technical and modeling analyses for the historical, current, and projected water budgets. In addition, INTERA has evaluated numerical groundwater models developed by other consultants and agencies with respect to the documentation of the water budgets.

As part of the SGMA planning efforts, INTERA integrated DWR datasets for future climate-change-impacted temperature, precipitation, and hydrology into the predictive modeling framework. Predictive modeling was performed using several scenarios with varying hydrologic conditions and groundwater management alternatives to capture the range of uncertainty in future conditions. The predictive models were used to assess the sustainable yield for the Basin and evaluate potential future management alternatives for groundwater sustainability planning under SGMA. INTERA's role on the project combined technical and modeling expertise with comprehensive stakeholder outreach and trust-building.

■ Groundwater Availability Models (GAMs), TX

Client: Texas Water Development Board

Given the complexity of hydrogeologic systems, computer models are great tools for simulating aquifers and assessing the effect of pumping and droughts on groundwater availability and thus can be used to estimate future groundwater availability in response to changes in demands and pumping patterns.

INTERA has developed, or is developing, 16 GAMs that include both conceptual and numerical models (12 directly for Texas Water Development Board (TWDB), one for a group of Groundwater Conservation Districts (GCDs) and accepted by TWDB as the "official" aquifer model, and another updated version of the GAM for this same group of GCDs). Through our work with GCDs and Groundwater Management Areas (GMAs) across Texas, we have applied GAMs to support developing desired future conditions (DFCs) and determining modeled available groundwater (MAG). Over the last 15 years, we have supported the efforts of over 30 GCDs and eight GMAs in Texas where our experience includes preparing management plans, groundwater rules, and guidance documents; designing monitoring well networks; providing GCD representation during GMA meetings; reviewing application permits; developing groundwater databases; organizing and conducting public meetings; directing and implementing field studies/well construction; evaluating alternative DFCs; responding to DFC petitions; and conducting technical and public workshops.

■ Hamilton County Water Plan, IN

Client: Hamilton County

INTERA has developed a water plan to determine water availability and accessibility for Hamilton County, Indiana. For most of the last 20 years, Hamilton County has been one of the fastest growing counties in the country and that growth depends on adequate, high-quality water being available. Over those same 20 years local utilities have kept up by making increasing investments in innovative infrastructure so they can deliver safe and reliable water to the community. The project goal is to answer important questions such as, how do the timing of withdrawals, discharges and the seasonal precipitation affect the regional supply and each other? When is it better to pump near a river to pull water into the aquifer, and when is it wise to pump older groundwater or even build a reservoir? The only way to answer these questions is to collect data to measure water availability. The project uses real-time sensors to collect data from 40 – 50 groundwater wells and deliver this new data to a web-based interpretive data dashboard. Installation sensors aids in the understanding of the groundwater system that supplies the County with drinking water and has been used to update the groundwater model. This information, along

with local groundwater quality, are shared with public, the utilities and other water users in the County. The project helps fill in the gaps of understanding of the aquifers in the County through real-time monitoring, supplemented by groundwater modeling, and a feasibility evaluation of a potential infiltration system. The analysis of the data collected in this project will help water users and the public learn how the aquifer system works and how to work together to ensure that all will have adequate water supply with continued growth.

■ Water Master Plan, CO

Client: City of Brighton, Colorado

INTERA staff worked with the City of Brighton alongside JVA Consulting Engineers Inc., to develop the City's Water Supply Master Plan (2015). In addition, he worked on developing a database of water well and hydrogeologic data used to determine potential locations for high-yield, shallow, alluvial water wells. He oversaw test-hole drilling programs to verify feasible locations for high-yield alluvial water wells. Data collected were used to develop a groundwater model for a potential horizontal collector well (HCW) along the South Platte River. In addition, he oversaw test-hole drilling program to determine the hydrogeology of the Beebe Draw alluvial aquifer. Data collected were used to inform a groundwater model to determine the potential maximum withdrawal rate for the City's wellfield in Beebe Draw. Lastly, Mr. Polmanteer oversaw aquifer testing and groundwater quality sampling and analysis for City's wells.

■ Water Adequacy Evaluations, CO

Client: Town of Elizabeth, Colorado

INTERA staff worked with the Town of Elizabeth alongside JVA Consulting Engineers Inc., to develop the Town's Water and Sewer System Master Plan (2020). In addition, he reviewed planned unit developments (PUDs) to determine adequacy of water supply reports. These reports estimate the required water supply for each PUD and the available groundwater rights below the to-be-developed land. Mr. Polmanteer also evaluated the Town's available groundwater supplies (Denver Basin water wells), projected growth, and timing for additional wells. Lastly, he managed the design, permitting, drilling, construction, testing, and analysis for Denver Basin groundwater wells for the Town.

■ Model Creation, Englewood, CO

Client: Cottonwood Water and Sanitation District

INTERA staff performed hydrogeologic analysis for siting alluvial and Denver Basin groundwater wells. He oversaw permitting, test hole drilling, production well drilling, well design, construction oversight, and aquifer testing and analysis. In addition, he performed water quality sampling analysis and CDPHE new groundwater source permitting. Lastly, he performed well-field modeling and analysis of available sustainable supply for the District's Cherry Creek alluvial well field.

■ Cherry Creek Hydrogeology Study, Englewood, CO

Client: Cherry Creek Project Water Authority

INTERA staff performed test hole drilling oversight, hydrogeologic analysis, design, permitting, construction oversight, and testing and analysis for alluvial groundwater wells as supply for Walker Reservoir. He oversaw permitting, hydrogeologic analysis, and water well design for Denver Basin aquifer groundwater wells for supply for Walker Reservoir. In addition, he reviewed water rights and hydrogeology of the Denver Basin aquifers for additional water wells.

■ Water and Landuse Planning, CO

Client: Colorado Water Conservation Board

The Brendle Group is at the forefront of the integration of water and land use planning, having developed the [Growing Water Smart Metrics Guidebook](#), published by Sonoran Institute in 2020. In addition, following the development of the guidebook, the Sonoran Institute and Brendle Group developed a program to support communities in testing the real-world application of the metrics identified. The program has now grown to assist four communities across Colorado, including the City of Fort Collins, the City of Evans, the City of Fort Lupton, and the Town of Bayfield. These communities received specialized training and assistance, including guidance in forming a stakeholder group, goal-setting, selecting metrics, gathering and analyzing water and land use data, and applying the findings.

■ Stakeholder Engagement for Water Planning Projects, NM

Company: State of New Mexico Interstate Stream Commission

Brendle Group draws on its multidisciplinary team of planners, engineers, analysts, and marketing specialists to design and implement community engagement processes around water and land use topics. For example, Brendle Group is collaborating with the State of New Mexico Interstate Stream Commission to support the development and promulgation of new rules and guidelines for the recently adopted Water Security Planning Act. Brendle Group’s approach involves facilitating a series of 16 open houses and an online open house, complemented by GIS mapping. The open houses are thoughtfully designed to provide attendees with the opportunity to contribute to water planning processes through a series of five interactive stations in both English and Spanish. Similarly, an online open house mirrors the in-person experience, allowing respondents to provide input at their convenience. The online open house includes a StoryMap that was developed to explain each map concept and enable users to explore their merits and drawbacks.

B.3 Understanding of Scope

Through our work on water resources planning projects in the South Metro Region, combined with experience completing water supply gap studies, basin implementation plans, county water plans, regional ASR studies, drought planning, and groundwater studies, the INTERA Team understands the scope of services and all conditions or requirements contained in the RFI. Our understanding of the key project goals, approach to accomplishing and managing the project, and the key project challenges we anticipate encountering are provided in Section B.1.

B.4 Mission Statement and Standard of Quality

INTERA’s purpose, promise, and core values, shown in the box to the right, serve as the foundation of our client service support philosophy. At INTERA, we pride ourselves on addressing our clients’ needs as if they were our own. We bring to all projects the insights and expertise we have gained from our work on thousands of projects—and a promise to do our best work on each client’s behalf. Our service philosophy is based on working with clients, rather than just for clients, and to always:

- Keep the client’s interests in mind
- Ask for the client’s input
- Keep our word
- Make our client’s life easier
- Provide honest, technically sound, and timely answers

While clients retain our services for a variety of reasons (e.g., to supplement in-house resources during periods of heightened workloads, to provide expertise not available through in-house resources, etc.), INTERA’s approach to providing consulting services is based on our client having the final authority. Based on our expertise and experience, we will provide information, options, alternatives, and recommendations with the understanding that the County makes final project decisions. INTERA excels at providing sound technical solutions to project challenges and we work closely with clients to implement these solutions.

Purpose

Innovation and stewardship for a sustainable tomorrow

Promise

We apply insight, creative thinking, and scientific rationale to spur environmental innovation and stewardship

Core Values

- | | |
|---|---|
|  Stewardship |  Safety |
|  Innovation |  Quality |
|  Accountability |  Integrity |
|  Diversity, Equity, and Inclusion |  Teamwork |

A Focus on Quality and Efficiency. Providing our clients with the highest quality services and work products is of paramount importance to INTERA. To us, quality includes not only the ability to provide a technically accurate and superior work product, but also the ability to complete work safely, on schedule, and at the agreed-upon price. To ensure that our work is of the highest quality, we maintain a corporate Quality Assurance Plan (QAP). Project activities that affect quality are conducted in accordance with documented procedures that specify the actions to be taken, organizational responsibilities for such actions, and established criteria for determining when the actions are satisfactorily completed.

Our major Quality Assurance (QA) objectives are to:

- Deliver products that meet INTERA’s and our clients’ expectations for technical excellence in clarity, content, style, and organization
- Execute a committed and comprehensive review plan designed to eliminate mistakes
- Actively observe and manage project costs to complete tasks on schedule and within budget
- Engage experienced experts while executing the project

Several concepts drive our QA program. These include having the appropriate leadership and organizational structures in place, performing detailed reviews of our own work, and establishing a quality control (QC) plan and data collection plan to guide our efforts under each project. In his role as Project Manager, Shaden Musleh will ensure quality control of all reports and deliverables to the County.

A Focus on Health and Safety. INTERA’s number one core value is SAFETY—*we execute our mission with the highest regard for the safety and health of our personnel, contractors, and the public.* In executing our work, all INTERA staff are committed to working safely and to delivering work products of the highest technical quality. In the conduct of all INTERA operations, the health and safety of employees, contractors, and the public, and the protection of the environment are of paramount importance. INTERA has made a commitment to our clients and employees to provide safe working conditions. To ensure this commitment, we implement a corporate Health and Safety Program that complies with the specific requirements under OSHA 29 CFR 1910.120 regulations and other applicable Federal, State, County, and City regulations. If field work is required to complete City tasks, INTERA will develop a project-specific Health and Safety Plan (HASP) that will include requirements to eliminate or reduce the potential spread of or exposure to COVID, as well as procedures to ensure that field tasks are performed safely and thoroughly.

B.5 Disclosure of Conflicts of Interest

The INTERA Team does not have any conflicts of interest that may impact our ability to support Douglas County, and we offer an exceptionally qualified team of experienced staff with a very low potential for conflict of interest in the South Metro area.



The whole process ran so smooth...thanks Courtney for your professionalism! We love working with you and appreciate the top-quality product that you delivered!”

KELLY ROMERO-HEANEY
Water Resources Manager



Shaden Musleh has recently completed work for Denver Water’s Water Resource Strategy group as a consultant on South Platte River issues. His extensive knowledge of Colorado water resources and rights were a great asset to Denver Water. It should be noted that these projects were completed exhibiting excellence in communication, management, and attention to detail...”

RUSSELL SLADE
Lead Planner



C. Company References

The names and phone numbers of five clients who may be contacted to confirm INTERA's track record of proven project performance are provided below. Each of the five references shown below are clients for which we have provided services during the preceding year.

Reference #1: Rick McCloud, Centennial Water and Sanitation District, Water Resources Manager, 720-240-4915, rmcloud@highlandsranch.org

Reference #2: Lisa Darling, Executive Director, South Metro Water Supply Authority, lisdarling@southmetrowater.org, (720) 427-6033

Reference #3: Michelle Probasco, PE, East Cherry Creek Water and Sanitation District, Project Manager, mprobasco@eccv.org, 303.901.2547

Reference #4: Daniel J. Arnold, Denver Water, Attorney, Office of General Counsel, 303-628-6469, daniel.arnold@denverwater.org

Reference #5: Andrea Cole, Dominion Water and Sanitation District, General Manager, 720-531-4210, andrea.cole@dominionwsd.com

Appendix A – Qualifications

Familiarity with Douglas County and County Water Issues

Our Team brings over two decades of water resources planning experience in the South Metro Area and are well versed in Douglas County and water-related issues. Our Team members have participated in water resources planning, conservation and drought planning, and groundwater studies for SMWSA, Castle Pines North Metropolitan District, Dominion Water and Sanitation District, Centennial Water and Sanitation District, Castle Rock Water, Parker Water and Sanitation District, Cottonwood/Inverness, Cherry Creek Water Authority, Pinery and others.

This includes our recent experience with SMWSA’s ASR Regional study, which we are in the process of finalizing Phase 1. Phase 1 focused on development of a conceptual framework of a collaborative approach to ASR where surplus renewable supplies during wetter years (e.g. WISE) may be stored via ASR in three centralized areas (Hubs) for later withdrawal to other water users participating in the program. If the SMWSA Board decides to pursue a second phase, it will initiate an optimization study, identifying others in the region needing storage and supplies along with developing a regional numerical groundwater model. This study can inform the County’s water plan and provide a tool to investigate groundwater availability in Douglas County currently and in the future.

We also bring a broad portfolio of expertise in water supply planning and water availability studies. These are discussed in Section B.2. We welcome the opportunity to speak with further about our water resources and land use planning expertise including local projects in the South Metro area.

Demonstrated Expertise in Water Supply Planning and Water Availability Studies

Our response shows the qualifications of five of our key local staff that encompass the required technical experience for the development of the Douglas County Water Plan. Their resumes and Bios are provided in Appendix B.

Firm’s Ability to Support the Project with Appropriate Resources and Complete the Project in a Timely Manner

The INTERA Team fully understands the importance of completing all of the task orders under this contract on schedule, including any required to be performed on an accelerated basis. We offer the full commitment of INTERA and all of our proposed personnel, supported by our proposed Project Manager, Shaden Musleh, to providing the resources needed to meet the County’s time and budget requirements. Our ability to meet critical schedules and budgets is demonstrated and supported by:

- INTERA’s past performance on similar contracts and assignments for other water providers and local government agencies
- The depth of staff in the disciplines necessary to provide water resources planning services
- Our high level of technical expertise that enables us to conduct work cost-effectively and in a timely manner
- The high level of commitment and availability of our project team
- The use of proven project management and scheduling systems

INTERA develops task schedules integrating all activities that can affect our performance of the scope of work (SOW). Achieving success requires the integration of scope, schedule, and budget. The task schedules we prepare reflect an integration of SOW elements and all known factors affecting project completion within the defined timeframe. Our initial planning efforts focus on:

- Organizing all SOW elements into a detailed task plan
- Establishing a logic network of successor and predecessor relationships for all SOW activities
- Defining resources required to perform each task
- Evaluating durations required to perform tasks

These planning activities are incorporated into a resource-loaded schedule. Our Project Manager regularly reviews the schedule to ensure that critical path activities are receiving the necessary management attention and resources, and that responsible Technical Leads are being held accountable for progress on work they are managing.

To ensure that our work products are consistent with project scopes and completed within funding constraints, INTERA works closely with the client to clearly define project goals and objectives and develop a detailed task plan for meeting these goals. The anticipated work requirements are explicitly stated in the form of baseline projections of budget and labor requirements over the course of each project task. These projections are used to assess task performance at scheduled intervals during task execution. We manage and monitor task activities using a system that focuses on an appropriate task-level organization and the use of procedures designed to assure quality and efficiency of task performance. We use a proven computerized management reporting system for project control. Our Project/Contract Manager prepares a report that establishes the budget for each task and assigns each element of work an appropriate task code designation. The Project/Contract Manager will monitor the performance of each work element and prepare periodic progress reports. These reports will provide various levels of information for each task, as well as for the entire project. This includes personnel hours and direct costs charged to date, current estimates to complete the project, and a comparison of the current estimated total with the previously established budget.

Identification of Key Subcontractors or Other Experts to Engage to Complete the Project

INTERA is teaming with Brendle to provide water planning services to Douglas County. INTERA will serve as the prime contractor to the County and will provide program and project management and lead the technical aspects for all assigned work. Brendle will provide technical consulting services related to land use scenario planning. INTERA has established an excellent working relationship with Brendle through the recent update of the *Guidebook of Best Practices for Municipal Water Conservation in Colorado*. The INTERA-Brendle team, along with others, collaborated on Colorado's reference guide to update the best practices for municipal water conservation in the State incorporating the latest information and stakeholder input on the latest techniques, trends, benefits, challenges, water savings estimates, case studies, other resources on the best practice, etc.

Appendix B
Abridged Resumes
(presented in alphabetical order by last name)



Courtney Black, PE Senior Water Resources Engineer



Years of Experience: 23

Education:

- MS, 2001, Environmental Engineering, University of Florida
- BS, 1999, Civil and Environmental Engineering, Lehigh University

Professional Registrations/Affiliations:

- Registered Professional Engineer, CA, 2004, No. 67976; CO, 2005, No. 40429
- Director-at-Large, Chair of Education Committee, 2010-2013, American Water Resources Association
- Board of Directors, 2019 – Present, Colorado WaterWise

Professional History:

- 2019 – Present Senior Water Resources Engineer – INTERA Incorporated, Boulder, CO
- 2017 – 2019 Senior Water Resources Engineer – Headwaters Corporation, Lakewood, CO
- 2015 – 2016 Regional Drought Information Coordinator – National Integrated Drought Information System (NIDIS), NOAA, Boulder, CO
- 2008 – 2014 Senior Water Resources Engineer – AMEC Foster Wheeler
- 2005 – 2008 Water Resources Engineer and Planner – CDM Smith Consulting, Denver, CO
- 2003 – 2005 Project Engineer – Ducks Unlimited, Inc., Sacramento, CA
- 2001 – 2003 Water Resources Engineer in Training – CDM Smith Consulting, Sacramento, CA

Training:

- Water Leaders Course – Water Education Colorado, 2012
- 40-hr Conflict Resolution Course, 2016

Courtney Black has over two decades of experience in municipal and basin-wide water resources planning, water rights engineering, stakeholder engagement and coordination, environmental impact study (EIS) planning documents and wetland design. She has extensive experience in focused in water demand analyses and forecasting, water conservation, drought management, water supply planning, Colorado water rights engineering support, demand and supply modeling, climate change analyses and stakeholder engagement. She has led water resources projects in Colorado and throughout the U.S. involving the complex economic, legal, social, and technical issues surrounding limited water supplies and increasing demands. Ms. Black has experience collaborating with federal, state and local agencies, academic institutions, municipalities, water rights lawyers, contractors and wildlife refuges. She has management experience with the entire civil engineering project life cycle including the initial survey, design, bidding, construction management and project closure.

Relevant Experience

Optimization of Regional Aquifer Storage and Recovery (ASR) in the South Metro Region, South Metro Water Supply Authority, Denver, CO. 2023 – Present. PM.

A multi-phase project that entails development of optimization model of ASR operations (infrastructure, water storage, water availability, supply/demand, aquifer behavior, physical deliveries between entities, paper exchanges, etc.) in the South Metro region. Currently developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Castle Rock, (2) Centennial Water and Sanitation District and (3) East Cherry Creek Water and Sanitation District. A conceptual groundwater model (part of the overall optimization model) was developed to allow for simulating aquifer behavior in response to the various injection and extraction scenarios and thus allow for optimization of the overall operations.

Water Supply Gap Analysis, Denver Water, CO. 2020 – Present. Sr Eng.

Supported a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system.

South Metro Regional Water Supply Plan, South Metro Water Supply Authority, Greenwood Village, CO. 2007. Engineer.

Served as the primary project engineer for development of the SMWSA Regional Water Master Plan addressing how SMWSA providers could secure renewable water supplies. This involved evaluation of water demands and development of delivery, treatment, and storage alternatives, cost estimates & a phased implementation plan.

Drought Planning, Dominion Water and Sanitation District, CO. 2022 – 2023. Project Manager. Developed Drought Management Plan and Rules and Promulgations for the management of drought and water shortages for a wholesale water provider. This planning effort sets the stage for a new water wholesale water provider defining its relationship with retail water providers along with addressing pivotal questions concerning drought response among a water efficient community where additional water savings in periods of drought is limited.

Model Demand Model Update, City of Fort Collins, CO. 2023 – Present. PM. Developing a water demand forecast model to incorporate water conservation and demand management strategies to inform water supply planning.

Integrated Water Resource Plans, Castle Pines North Metropolitan District/City of Northglenn, CO. 2006 – 2008. Engineer. Developed Integrated Water Resources Plans for Castle Pines North Metropolitan District and the City of Northglenn. Evaluated historical demands and conservation efforts, forecasted future demands, assisted in the development of future water supply alternatives, developed cost estimates, and evaluated these alternatives.

Water Efficiency Plan, Town of Parker, CO. 2024 – Present. Project Manager. Updating Parker's Water Efficiency Plan according to State water conservation guidelines. This includes an assessment of Parker's water efficiency program and demands and working with Parker in the selection of new measures, integrating the latest information available in the water conservation field.

Water Supply Master Plan Update, City of Steamboat Springs/Mount Werner Water and Sanitation District, CO. 2018 – 2019. Sr. Eng. Evaluated historical water demand trends to identify how historical demands have been influenced by population growth, climate factors, drought restrictions, water rates, advances in new water saving technologies and water conservation activities. Evaluated performance of meeting established water conservation targets.

Update to the Colorado Guidebook of Best Practices for Municipal Water Conservation, Colorado WaterWise. 2022 – 2024. Senior Engineer. Updating Updated Colorado's reference guide on the best practices for municipal water conservation in the State incorporating the latest information and stakeholder input on the latest information.

South Platte and Yampa/White/Green (YWG) Implementation Plans (BIPs), Various Clients, CO. 2014 – 2015. Sr Eng. Provided technical support and managed components of the BIPs for the South Platte and YWG basins.

Development of the Groundwater Sustainability Plan (GSP) for the Arroyo Santa Rosa Basin, Camrosa Water District and Arroyo Santa Rosa Groundwater Sustainability Agency, CA. 2021 – 2022. Sr. Eng. Supported development of the GSP.

Update to Water Supply and Demand Management Policy, City of Fort Collins, CO. 2012. PM. Stakeholder facilitation support & thorough review of the city's policy & conservation plan; development of a new per capita water demand for decision making incorporating climate change; a survey of twelve Front Range providers' water demands and water supply planning approaches; and development of recommendations for the policy update.

Development of the Groundwater Sustainability Plan for the Upper Ventura River Basin, Upper Ventura River Groundwater Agency, CA. 2020 – 2021. Senior Engineer. Supported development of the GSP of the Upper Ventura River Basin.

Groundwater Model of Aquifer Storage and Recovery System, East Cherry Creek Valley WSD, CO. 2021 – 2023. Sr. Eng. Supported the development of a regional MODFLOW model of Denver Basin aquifers under ECCV service area.

Groundwater Model of Aquifer Storage and Recovery System, East Cherry Creek Valley WSD, CO. 2021 – 2023. Sr. Eng. Supported the development of a regional MODFLOW model of Denver Basin aquifers under ECCV service area.

Water Conservation Plans, Castle Pines North Metropolitan District and Town of Erie, CO. 2006 – 2014. Senior Engineer. Developed the first state approved Water Conservation Plan for Castle Pines North Metropolitan District and authored the 2008 and 2014 conservation plans for Erie.

Water Supply Cost Allocation Tool, South Metro Water Supply Authority, Greenwood Village, CO. 2008. Engineer. Managed development of a cost allocation tool that SMWSA's thirteen providers could use to allocate the renewable water supply development costs among each provider.



Steven Humphrey, PG Senior Hydrogeologist



Years of Experience: 19

Education:

- MS, 2008, Hydrogeology, University of Nevada
- BS, 2002, Geology, California State University

Professional Registrations/Affiliations:

- Professional Geologist, 2021, CA (GEO 10024)
- Professional Geologist, 2017, IN (IN2559)
- Member, National Ground Water Association
- Member, Colorado Environmental Management Society

Professional History:

2021 – Present	Senior Hydrogeologist – INTERA Incorporated, Boulder, CO
2011 – 2021	Hydrogeologist/Groundwater Modeler – Geomega Inc., Boulder, CO
2008 – 2010	Staff Hydrogeologist – Golder Associates, Portland, OR
2007 – 2008	Hydrogeologist – Aqua Hydrogeologic Inc, Reno, NV
2007 – 2008	Research Assistant – Desert Research Institute, Reno, NV
2005 – 2007	Research Assistant – Sierra Army Depot, Herlong, CA
2000 – 2005	Surveyor and Technician, Hydmet Inc., Redding, CA

Training:

- FEFLOW, MODFLOW (2000/NWT/SURFACT/USG/6), Leapfrog, MS Office, PEST, MT3D, AQTESTOLV, Aquifer Test Pro, QGIS, Surfer, ArcGIS, SQL, Scilab, Python, MATLAB, Fortran.

Mr. Humphrey is a senior hydrogeologist with expertise in numerical groundwater modeling. For almost two decades he has provided technical support in a variety of disciplines in the hydrologic sciences for environmental consulting firms. He has supported and managed regulatory and litigation-based projects involving water resource management and sustainability planning, groundwater flow and mass transport modeling, hydrogeologic characterizations, conceptualizations, remediation support, feasibility studies, water quality assessments, environmental forensics, and aquifer storage and recovery (ASR) programs. Mr. Humphrey has recently been supporting several California Groundwater Sustainability Agencies successfully develop and implement Groundwater Sustainability Plans. His unique skill sets with data management, interpretation, analyses, visualization, and simulation complement his project experience with geophysical and chemical data interpretation.

Representative Project Experience

Hydrogeologic Technical Services, Eastern Municipal Water District, Perris, CA. 2023 – Present. *Senior Hydrogeologist/Project Manager.* Provided as needed hydrogeologic services in coordination with a technical team. Managed the compilation and review of geologic, groundwater, and geophysical data to develop a 3D visual Leapfrog model for the San Jacinto Basin to aid water resource management decisions. Reviewed the numerical groundwater flow and transport model to assess potential updates and revisions.

Water Resources Planning Support, Camrosa Water District, Camarillo, CA. 2023 – Present. *Senior Hydrogeologist.* Expanded a 3D visual model (Leapfrog) of the aquifer system to incorporate lithologic, geophysical, and numerical modeling data. Reviewed and tested an existing numerical groundwater flow model (MODFLOW) to assess hydraulic response, availability of groundwater resources, and structural control on groundwater flow. Analyzed groundwater levels and chemistry to assess potential revisions to the hydrogeologic conceptual model.

Groundwater Sustainability Plan Updates, East Kaweah Groundwater Sustainability Agency, Tulare County, CA. 2023 – Present. *Senior Hydrogeologist.* Provided technical support to the East Kaweah Groundwater Sustainability Agency (GSA) to assist the revision of sustainable management criteria and developed methods to evaluate potential impacts to beneficial uses and users. Assisted the coordination of GSAs, technical staff, stakeholders, and communication with the State Water Resources Control Board and community assistance programs. Enhanced 3D visualization with Leapfrog and reviewed groundwater modeling inputs and subsidence modeling applications.

Groundwater Sustainability Plan Updates and Implementation, Best Best & Krieger/Delano-Earlimart Irrigation District Groundwater Sustainability Agency, Delano, CA. 2021 – Present. *Senior Hydrogeologist.* Provided technical and strategic support to the Delano-Earlimart Irrigation District (DEID) GSA to update their Groundwater Sustainability Plan (GSP) in response to comments from the California Department of Water Resources

(DWR). Developed revised sustainable management criteria (SMC) for groundwater levels and land subsidence. Reviewed and analyzed groundwater levels, well lithologic and pumping data, subsidence data, and numerical model results with respect to impacts to beneficial uses and users. Collaborated with a team of technical experts, lawyers, water supply districts, and GSA board members to develop and approve strategies for the revised GSP.

Arroyo Santa Rosa Groundwater Sustainability Plan, Arroyo Santa Rosa Groundwater Sustainability Agency, Camarillo, CA. 2021 – Present. *Senior Hydrogeologist/Project Manager.* Development of the Hydrogeologic Conceptual Model and numerical groundwater model in support of the water budget calculation for the Groundwater Sustainability Plan. Compiled, managed, and submitted the Groundwater Sustainability Plan document in July 2023 and coordinated with Groundwater Sustainability Agency Executive Director and Board of Directors. Developed sustainable management criteria for chronic lowering of groundwater levels, reduction of groundwater storage, degraded water quality, and depletion of interconnected surface water sustainability indicators.

Upper Ventura River Groundwater Sustainability Plan and Annual Report, Upper Ventura Groundwater Sustainability Agency, Casitas Springs, CA. 2021– Present. *Senior Hydrogeologist/Project Manager.* Compiled, managed, and submitted the Groundwater Sustainability Plan (approved in 2023) and Annual Reports in accordance with the California Groundwater Sustainability Act regulations. Reviewed Code of Regulations and Best Management Practices and QA/QC of document content and model simulation results. Supported technical documentation of Groundwater Sustainability Plan elements and coordinated with Groundwater Sustainability Agency Executive Director. Assisted the development of sustainable management criteria for chronic lowering of groundwater levels, reduction of groundwater storage, degraded water quality, and depletion of interconnected surface water sustainability indicators. Reviewed groundwater dependent ecosystems and assessed streamflow depletion using an integrated groundwater flow model. Coordinated with team of professionals on comment responses and document updates and revisions.

Mound Basin Groundwater Sustainability Plan and Annual Report, Mound Basin Groundwater Sustainability Agency, Ventura, CA. 2021– Present. *Senior Hydrogeologist/Project Manager.* Compiled, managed, and submitted the Groundwater Sustainability Plan (approved in 2023) and Annual Reports in accordance with the California Groundwater Sustainability Act regulations. Reviewed Code of Regulations and Best Management Practices and QA/QC of document content. Supported technical documentation of Groundwater Sustainability Plan elements and coordinated with Groundwater Sustainability Agency Executive Director. Assisted the development of sustainable management criteria for chronic lowering of groundwater levels, reduction of groundwater storage, degraded water quality, seawater intrusion, and land subsidence sustainability indicators. Coordinated with team of professionals on comment responses and document updates and revisions.

Ranegras Basin Groundwater Resources Exploration and Feasibility Study, Heliogen SR2 LLC, Brenda, AZ. 2022 – Present. *Senior Hydrogeologist.* Reviewed and documented background data, reporting, and numerical groundwater modeling of an arid hydrographic basin in western Arizona. Assisted the planning and interpretation of geophysical data collected to confirm the basin structure and provide supporting information for the siting of pilot test wells for groundwater exploration. Developed a 3D visual model using Leapfrog to analyze data and revise and update the hydrogeologic conceptual model for the basin. Co-authored a Groundwater Availability Report to aid communication with the Bureau of Land Management.

Conceptual Model Development, Town of Frederick, CO. 2022. *Senior Hydrogeologist.* Reviewed background data, reporting, geologic, and GIS information to develop a conceptual model to assist in decision-making for future data collection and groundwater modeling to characterize a flooding shallow aquifer system.

Mass Transport Modeling and Remediation Support, Suncor Energy, Commerce City, CO. 2014 – 2021. *Groundwater Modeler/Project Manager.* Provided litigation support for a groundwater contaminated site, and subsequently provided environmental consulting and regulatory support. Organized and evaluated information, databases, and updated and calibrated a groundwater flow and transport model using MODFLOW-USG, MT3D, and PEST. Reviewed groundwater and soil remediation efficacy. Modeled and presented results for several remediation scenarios to assist decision making. Developed and supervised a field sampling and analysis program (soil gas, soil, groundwater, LIF [UVOST], slug testing) in support of site characterization, modeling, and environmental forensics. Reviewed and analyzed gas chromatograms and LIF data to interpret subsurface petroleum product extent, identification of types, locate source areas and document contamination history. Contributed to expert report documentation and supported legal team during arbitration, which resulted in an amicable settlement in 2017.



Shaden Musleh, PE
Principal Water Resources Engineer /
Director of Colorado Water Resources Services



Years of Experience: 29

Education:

- MS, 2001, Water Resources/Irrigation Engineering (Emphasis on effect of grid size and digital simulation of groundwater flow), Utah State University
- BS, 1994, Agricultural Engineering, Soil and Irrigation, University of Jordan

Professional Registrations/Affiliations:

- Metro Basin Roundtable, Vice-Chair, At-Large Member
- Certified Project Manager, 2008
- Professional Engineer, CO, 2008 (#42368), NM, 2007 (#18110)
- Member, Colorado River Water Users Association
- Member, Colorado Water Congress
- Member, Colorado Groundwater Association
- Member, American Water Resources Association, CO Section
- Member, International Association of Hydrological Sciences

Professional History:

2018 – Present	Principal Water Resources Engineer – INTERA Incorporated, Boulder, CO
2016 – 2018	Principal Water Resources Engineer – Summit Water Consulting, Broomfield, CO
2015 – 2016	Senior Project Manager – Hydros Consulting, Boulder, CO
2004 – 2015	Group Manager & Senior Project Manager – Hydrosphere Resource Consultants, acquired by AMEC Foster Wheeler (now WSP USA), Boulder, CO
2002 – 2004	Geohydrologist – URS Corporation (now AECOM), Denver, CO
2001 – 2002	Project Engineer – Waterstone Environmental Hydrology and Engineering, Boulder, CO
1996 – 2001	Graduate Assistant, Systems Simulation/ Optimization Lab – Irrigation Engineering Department, Utah State University, Logan, UT

Training:

- Western Water Rights and Water Engineering, University of Colorado at Denver, 2005
- MODFLOW (multiple versions), IDSCU, IDS-AWAS, StateMod model (South Platte, Colorado, White, Yampa), ArcGIS, MS-Office, RiverWare, MT3D, MODPATH, GWVistas, GMS, Visual MODFLOW, PMWIN, FORTRAN, Visual Basic, CRAM, StateCU, StateDMI, StateView, TSTool, CDSS

Shaden Musleh is a licensed professional engineer, a project manager and a leader with extensive and broad professional experience in water resources engineering, planning, and management. He has developed cooperative solutions to water resources problems in multi-party settings and has led and managed numerous large-scale projects that involved providing management solutions to complex water resources problems. He has led multiple large-scale water planning studies in Colorado for which he estimated gap in supply and modeled projects to meet these gaps. He is well versed in surface and groundwater modeling, water supply/demand modeling under Colorado water law, state water planning, water allocation, water conservation, groundwater availability, water rights and conjunctive management of surface water and groundwater.

Representative Project Experience

Optimization of Regional Aquifer Storage and Recovery (ASR) in the South Metro Region, South Metro Water Supply Authority, Denver, CO. 2023 – Present. Project Principal.

A multi-phase project that entails development of optimization model of ASR operations (infrastructure, water storage, water availability, supply/demand, aquifer behavior, physical deliveries between entities, paper exchanges, etc.) in the South Metro region. Currently developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Castle Rock, (2) Centennial Water and Sanitation District and (3) East Cherry Creek Water and Sanitation District. A conceptual groundwater model (part of the optimization model) was developed to allow for simulating aquifer behavior in response to the injection and extraction scenarios and allows for optimization of the operations.

Water Supply Gap Analysis , Denver Water, CO. 2020 – Present. Project Manager.

Leads the INTERA TEAM that conducted a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system.

South Platte Implementation Plan/State Water Plan, Colorado Water Conservation Board, CO. 2022 – 2023. *Metro/South Platte Basin Implementation Plan Committee Member.* Oversaw the most recent update to the South Platte Implementation Plan. Reviewed drafts, provided comments and participated in discussions throughout the process.

South Platte Allocation Model, Colorado Decision Support System, Colorado Water Conservation Board, CO. 2015 – 2016. *Project Manager/Modeling Lead.* Lead the development of historical water allocation (water supply/demand) model for the Boulder Creek Basin. This model is used as a planning tool to develop basin wide and statewide policies for the South Platte Basin. The model simulates all types of demands (municipal, industrial, ag, augmentation, etc), river supplies and complex operations (e.g. complex exchanges) in Boulder Creek from 1950-2016.

South Platte Basin Implementation Plan, CO. 2014 – 2015. *Hydrologic Modeling and Agriculture Task Leader.* Assisted in various tasks that included hydrologic modeling and analysis and agricultural analysis using geographic information systems (GIS) and other modeling tools

Water Master Plan for the Upper Yampa River Basin, Upper Yampa Water Conservancy District, CO. 2012 – 2014. *Project Manager/ Modeling Lead.* The project included development of complex water allocation (water supply/demand) model to simulate several potential new storage projects, environmental mitigation projects, and water transfers. Included simulating demand/supply under climate change using Tree Ring construction that dates back to year 1000 to optimize system performance under a variety of hydrological conditions.

Groundwater Model of ASR System, East Cherry Creek Water and Sanitation District, CO. 2021 – 2023. *Project Manager.* Led the technical team for development of a regional MODFLOW model of the confined aquifers under ECCV service area. The calibrated model will be used to simulate impacts from future injection and extraction and optimize operations.

Groundwater Investigation, Denver Water, CO. 2018 – 2019. *Project Manager.* Led the technical team that investigated supply/demand for various locations in the Denver Metro Area using models and data analysis.

Yampa/White/Green Basin Implementation Plan, Colorado State Water Plan, Yampa/White Basin Roundtable, CO. 2015 – 2016. *Project Manager/Modeling Lead.* Led the technical team, performed modeling, managed stakeholders and facilitated stakeholder meetings. The objective of the plan was to investigate and analyze the state's water supply and demand through the year 2050 and show how the future municipal, industrial, agricultural, recreational, and environmental needs can be met by both existing and proposed water projects under various operational scenarios. Included complex modeling of future gap under various hydrological and operational scenarios and investigated meeting the gap by simulating various proposed projects.

Groundwater Availability, Confidential Client, CO. 2018 – 2019. *Technical Lead.* Participated in investigating groundwater availability and reliability in the South Platte River Basin for a future development. This task included looking into tributary and non-tributary sources.

Recharge and Groundwater Storage, East Cheery Creek District, United Water and Sanitation District, Farmers Reservoir and Irrigation Company, Sand Hills Metropolitan District, City of Boulder, CO. 2012 – 2013. *Project Lead.* Analyzed a MODFLOW groundwater model to evaluate recharge operations including aquifer storage capacity, rise in water table, and estimate accretions to the South Platte River from recharge operations in the South Platte River basin. Provided expert opinions regarding findings and potential injury to Boulder's water rights.

Development of Groundwater Sustainability Plan for Mound Basin, Mound Basin Groundwater Sustainability Agency, Ventura, CA. 2020 – 2021. *Task Manager.* Participated in the development of the plan report. Managed the effort by the various parties responsible for model MODFLOW model development and writing pieces of the plan report.

Years of Experience: **15**

Education:

- MS, 2013, Hydrogeology, University of Strathclyde
- Graduate Studies, 2006 – 2008, Hydrogeochemistry, University of New York at Buffalo
- BS, 2006, Geological Sciences, State University of New York at Genesco

Professional Registrations/Affiliations:

- Professional Geologist, WY, PG-4105
- Member, Rural Water Supply Network
- Secretary of the Board, Colorado Groundwater Association

Professional History:

2023 – Present	Senior Hydrogeologist – INTERA Incorporated, Albuquerque, NM
2014 – 2023	Hydrogeologist – HRS Water Consultants, Lakewood, CO
2012 – 2013	Hydrogeologist – University of Strathclyde/Water for People, Blantyre, Malawi
2010 – 2012	Mudlogging Geologist – TM Mcoy & Co, Wilson, WY
2009 – 2010	Environmental Geologist – GEI Consultants, Montclair, NJ

Mr. Polmanteer has 15 years of experience in hydrogeology, geology, and water resources. Mr. Polmanteer has designed field program studies; performed lithologic analyses and logging; water supply and monitoring well design; aquifer test design, oversight, and data analysis; water quality sampling; stream depletion analysis; and water rights representation including expert witness testimony and expert report writing. He has been the lead geologist for numerous Denver Basin Well projects. He has worked extensively throughout Colorado on a variety of projects and also in New York, New Jersey, Montana, New Mexico, Utah, and Malawi, Africa.

Project Experience – Water Resources

Field Manager, City of Brighton, CO. 2015 – 2023. Hydrogeologist. Worked with team to write Water Master Plans for the City. He oversaw drilling for high water table review and analysis in a subdivision of the City. Oversaw test hole drilling and lithologic analysis to support conceptual modeling for additional water wells along the South Platte River. Oversaw test hole drilling and lithologic analysis to support sustainability modeling for additional water wells Beebe Draw. Also oversaw aquifer testing and water quality analysis for existing wells in the client system.

Project Manager, Cherry Creek Project Water Authority, Franktown, CO. 2021 – 2023. Hydrogeologist. Performed Alluvium and Denver Basin Aquifer water well designs including test hole drilling, siting, permitting, and construction and testing oversight. He also provided a review of area Denver Aquifer well yields for future design; and provided a review of regional water rights.

Desktop Aquifer Evaluation, Basin Lands, LLC., CO. 2021 – 2023. Hydrogeologist. Performed desktop evaluation of Dakota Group Aquifer to determine likely tributary status of the aquifer at Johnston Ranch. This included regional aquifer analysis, regional well review, and stream depletion analysis. Also provided hydrogeologic conceptual modeling at HTW Ranch in support of a non-tributary determination of the Upper Laramie and Upper Pierre aquifers.

Borehole Log Database Creation, Arkansas River Decision Support System, CO. 2017 – 2020. Hydrogeologist. In support of developing the Arkansas River Decision Support System (ARKDSS) model, created a borehole log database and provided geologic interpretation for layering in ROCKWORKS 3D software. Divided model by tributary reach to visualize hydrogeology. Compared STATSGO2 and SSURGO for appropriate soil analysis and provided representative aquifer parameters to calculate URFs for each tributary division.

Cherry Creek Hydrogeology Study, Cottonwood Water & Sanitation District, CO. 2016 – 2021. Field Manager. Evaluated the current monitoring well field and sited additional monitoring wells. Oversaw monitoring well design, drilling, and construction. He oversaw municipal well testing to determine wellfield impacts to Cherry Creek.

Model Creation, Cottonwood Water & Sanitation District, CO. 2015 – 2023. Project Manager. Created a model to determine well-to-well impact,

sustainable yield of the aquifer, and to site additional water wells in Cherry Creek Alluvium. Oversaw design, permitting, bid process, drilling and construction, and testing of alluvial aquifer well DD3R. He oversaw design, permitting, bid process, drilling and construction, and testing of Denver Basin well D1RR. Oversaw aquifer testing and analysis of multiple municipal wells. He provided analysis of water quality sampling and testing in support of new wells for CDPHE permitting.

Crystal River Hatchery, Colorado Parks & Wildlife, Carbondale, CO. 2023. Field Manager. Oversaw test hole drilling program at Hatchery in effort to site a new water well to replace yield-loss from shut-down of a branch of their spring collection system.

Water Adequacy Evaluations, Town of Elizabeth, CO. 2017 – 2023. Project Manager. Reviewed design plans provided by developers to determine the water adequacy of each project before annexation by the Town. Evaluated town water supply and timing needs for additional wells based on development plans. Oversaw the design, permitting, bid process, drilling, well construction, pump testing, and water quality sampling for multiple Denver Basin aquifer municipal wells. Assisted in writing the Water Master Plan for the Town.

Grant Funding Report, Town of Empire, CO. 2021 – 2023. Project Manager. Assisted JVA with the Basis of Design Report and Project Needs Report to obtain grant funding for a new well and water treatment plan for the Town. Designed a new alluvial, groundwater well and oversaw drilling, construction, testing, and water quality sampling of the new well.

Salida Fish Hatchery, Colorado Parks & Wildlife – Salida, CO. 2019 – 2022. Field Manager. In an effort to provide hatchery with a new water source free of whirling disease, he provided a review of the area hydrogeology, well construction logs, the hatchery spring collection system, and tested the Eggleston water well and analyzed the pumping results. Assisted with writing additional scopes of work for additional well drilling, a geophysics survey for additional water supplies, and analysis of Harrington Ditch leakage rages and the impact to groundwater supply for area wells.

Aquifer Analysis Report, City of Golden, CO. 2021. Hydrogeologist. Provided a written report, Hydrogeologic Analysis of Feasibility of Bedrock Aquifer Water Wells for Future Water Supply for City of Golden. The report included an analysis of the underlying aquifers, review of well construction records, Denver Basin aquifer map review, creation and analysis of geologic cross-sections.

Well Oversight, Indian Hills Water District, CO. 2015 – 2023. Project Manager. Designed, obtained permits, oversaw drilling, construction and testing, and water quality sampling, and completion of CDPHE Basis of Design Report of Well 11-R granite bedrock well. Oversaw a well system inventory and review for new management and board. Designed a testing program for siting re-drill of Well 9.

Hydrogeologic Support, Rio Grande Decision Support System, San Luis Valley, CO, 2015 – 2023. Hydrogeologist. Provided hydrogeologic support for phased improvements to the Rio Grande Decision Support System (RGDSS) model including: cross-section construction near Alamosa and La Jara to identify faults; oversight and lithologic analysis of test hole drilling near historic Diamond Springs to determine original source of water to spring and possible explanations for loss of flow; cross-section and fault interpretation near McIntire and Manassa Fault systems; created geodatabase and cross-sections in Rockworks to help determine hydrogeologic reasons for problematic areas of model.

Consulting Services, Board of Water Supply Hawaii, Honolulu, Oahu, HI. 2023 – Present. Field Hydrogeologist. Provided on-site consulting services for drilling and monitoring well installation including: lithologic logging of basalt cores; contaminant screening of cores using PID; and implementation of permit requirements. He also assisted in writing technical specifications and bid designs for planned monitoring wells.

Consulting Services, Ivanhoe Electric Santa Cruz Mine, Casa Grande, AZ. 2023 – Present. Field Hydrogeologist. Provided on-site consulting services for drilling and monitoring well installation including: lithologic logging of alluvium, conglomerate, and igneous rock formations; installation of monitoring wells; water quality testing for well developing; and oversight and data collection for pneumatic slug testing of open boreholes. He also assisted in writing the technical specifications and monitoring well design.

Technical Support Services, California American Water, Monterrey, CA. 2023 – Present. Hydrogeologist. Assisted in writing technical specifications, water well design, and rehabilitation programs for the Ambler Water System and the Rancho Cañada Water System.



Travis Zielke, CGWP
Senior Hydrogeologist



Years of Experience: 21

Education:

- BS, 1998, Environmental Geology, Colorado State University

Professional Registrations/Affiliations:

- Certified Groundwater Professional, National Groundwater Association

Professional History:

- 2021 – Present Senior Hydrogeologist – INTERA Incorporated, Boulder, CO
- 2010 – 2021 Hydrogeologist and IT Support Professional – Lamp Rynearson, Lakewood, CO
- 2002 – 2010 Hydrogeologist – AMEC, Boulder, CO

Training:

- MODFLOW, Groundwater Vistas, ArcGIS, CDSS/SEO Tools, Visual Basic, Python, Excel Macro Programming, AQTESOLVE, IDS Tools, GFlow, General IT Support

Travis Zielke has been involved in water supply planning, water supply and demand analysis, water rights analysis, modeling of surface and subsurface water supply systems, and litigation support for more than twenty years. He has worked with a number of municipal clients such as Denver Water, Thornton, Lafayette, Castle Rock, Centennial Water and Santitaitn District, Northglenn, Berthoud, and many smaller metropolitan districts. His work has included on-site well construction, geologic logging, and pump service work, in addition to groundwater modeling and water rights projects.

Representative Project Experience

Water Supply Gap Analysis, Denver Water, CO. 2020 – Present. Tech Lead. Supported a water supply needs analysis for Denver Water which involved both east and west slope water supplies. The analysis included the development of water demand and water supply models that collectively simulate the gap in water supply under 2070 future growth and warming climate scenarios. Various warming climatic scenarios were modeled utilizing tree ring chronologies and output from downscaled climate models. The water supply model incorporated daily operations of the Denver Water collection system

Optimization of Regional Aquifer Storage and Recovery (ASR) in the South Metro Region, South Metro Water Supply Authority, Denver, CO. 2023 – Present. Modeler/Tech Support. Provided various technical support for this multi-phase project that entails development of optimization model of ASR operations (infrastructure, water storage, water availability, supply/demand, aquifer behavior, physical deliveries between entities, paper exchanges, etc.) in the South Metro region. Currently developing a conceptual framework for an integrative approach to ASR where three local areas could serve as storage “hubs” for multiple water providers to store renewable surface water supplies in the subsurface for later use during dry periods. The three hubs are (1) Castle Rock, (2) Centennial Water and Sanitation District and (3) East Cherry Creek Water and Sanitation District. A conceptual groundwater model (part of the overall optimization model) was developed to allow for simulating aquifer behavior in response to the various injection and extraction scenarios and thus allow for optimization the overall operations.

Various Services, City of Lafayette, CO. 2010-2021. Water Right Expert. Firm Yield modeling to evaluate a number of water supply improvements under consideration by the city. Firm Yield modeling for water supply calculations used in the Gross Reservoir Environmental Pool application. Decree and Augmentation Plan review for opposition expert reports such as

in the Erie and Firestone cases. Evaluation of water supply project proposals, such as those posed periodically by Jon File. Writing, technical support, and editorial review of the 2021 update to the Water Rights manual for the City. Accounting audits in support of Ted Zorich's daily accounting submittals.

Groundwater Modeling, East Cherry Creek Valley Water, Aurora, CO. 2021 - Present. *Modeler/Hydrogeologist.* Created a groundwater model from the USGS regional Denver basin groundwater model to examine effects from Artificial Storage of water using the district's existing wells. Work involved a geologic review of the aquifers in the project area, calibration of the reduced size model, and scenario analysis for various storage and extraction plans.

Water Rights Engineering and Litigation, City of Thornton, CO. 2021 - Present. *Water Rights Expert.* Provides Water Rights Engineering and modeling support for Thornton's applications in water right cases as well Thornton's role as an objector in others' water right cases in the South Platte River Basin. Created a daily accounting form for a batch of changed shares for use in conjunction with the town's other water supplies.

Hydrogeologic Study, Town of Frederick, CO. 2023 - Present. *Hydrogeologist.* Prepared groundwater level study, located test borings for installation, assisted in setup of monitoring program for water levels, and creation and maintenance of a groundwater model to simulate subsurface conditions under the downtown. Scenario modeling to inform various mitigation scenarios for cost/benefit analysis.

Change of Water Right for Farmers Reservoir and Irrigation Company, Church Ditch, and Lawn Irrigation Return Flows Update, City of Northglenn, CO. 2015 - 2020. *Hydrogeologist.* Prepared historical use analysis and creation of a ditch wide groundwater model for use in a change of water right on the Farmers Reservoir and Irrigation Company ditch and the Church Ditch. Groundwater modeling and historic irrigation analysis for update to lawn irrigation return flows right.

Regional Augmentation Plan, Huerfano County Water Conservancy District, CO. 2017 - 2020. *Hydrogeologist.* Geological research and aquifer analysis for the creation of a county wide augmentation plan for use in business development throughout Huerfano County.

Water Court Application Support and Protection of Existing Water Rights, Bijou Irrigation Company, CO. 2010 - 2021. *Hydrogeologist.* Reviewed numerous water court applications to identify potential injury to client's water rights and assisted negotiations to resolve those issues. Conducted a variety of groundwater analysis in support of recharge program applications for the client and completed work on rebuttal analysis and reports to further negotiations with opposers.

Protection of Existing Water Rights, City of Boulder, CO. 2002 - 2010. *Water Rights Expert.* Work included consumptive use analysis, water rights administration, assessment of water projects, analysis of groundwater pumping impact on streams, analysis of groundwater availability, evaluation of water demand and supply and analysis of the various practices (construction, agricultural, industrial, municipal, etc.) associated with the different aspects of water rights applications.

Reservoir Accounting, Hunter's Overlook Reservoir, Windsor, CO. 2017 - Present. *Hydrogeologist.* Design and installation of a tracking system for precipitation, reservoir water levels, evaporation, and groundwater seepage. Creation and maintenance of the daily accounting form.

Weekly and Monthly Water Right Accounting, Spring Valley, Boulder, CO. 2010 - Present. *Water Right Expert.* Creation of monthly depletion accounting for residential well usage. Lagged depletion calculations for new well installations, and weekly accounting for adjacent water users.

Monthly Water Right Accounting, Columbine Ranches Homeowner's Association, Commerce City, CO. 2010 - Present. *Water Right Expert.* Creation of monthly depletion accounting for residential well usage. Coordination with nearby water users for annual lease of excess credits.



INTERA Incorporated
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Boulder, CO 80302
720.318.4725



Innovation and stewardship for a sustainable tomorrow

DOUGLAS COUNTY GOVERNMENT

Department of Community Development

100 Third Street

Castle Rock, Colorado 80104

Telephone: 303-660-7460

www.douglas.co.us

REQUEST FOR INFORMATION (RFI)

NO. 000-00

PROJECT TITLE

**YOUR RESPONSE MUST BE RECEIVED NO LATER THAN
MONTH, DAY, 20XX @ 4:00 P.M.**

RFI CERTIFICATION

We offer to furnish to Douglas County the information requested in accordance with the specifications and subject to the terms and conditions described herein:

NAME: Martin and Wood Water Consultants, INC.

ADDRESS: 538 Commons Dr.

CITY: Golden STATE: CO ZIP: 80401

TELEPHONE NUMBER: 720-836-6569 FAX NUMBER: 303-526-2624

E-MAIL ADDRESS: BY: mjohnson@martinandwood.com

Michelle Johnson

(Printed or Typed Name)

Michelle Johnson
(Written Signature)

TAXPAYER I.D. NUMBER: 84-1162645

Signature constitutes acceptance of all terms and conditions listed on this form and all documents attached.

Douglas County Government reserves the right to reject any or all responses, to waive formalities, informalities, or irregularities contained in a said response and furthermore to potentially award a contract for items herein, either in whole or in part, if it is deemed to be in the best interest of the County to do so. Additionally, we reserve the right to negotiate optional items and/or services with the successful firm.

SECTION ONE ~ GENERAL AND DETAILED PROJECT INFORMATION:

A. Scope of Services:

Through this Request for Information (RFI), the Douglas County Government, hereinafter referred to as the County, respectfully requests information from responsible, qualified firms for the provision of a Douglas County 2050 Comprehensive Water Plan (Water Plan), as specified. It is the intention of the County to review all RFI responses, short-list those responses, and post an actual Request for Proposal (RFP). Only those companies, who have submitted a potentially acceptable response to this RFI will be allowed to submit a response during the formal RFP process.

This RFI process should be considered "Step One" of a multi-step solicitation process.



June 27, 2024

Douglas County Government
Department of Community Development
100 Third Street
Castle Rock, Colorado 80104
www.douglas.co.us

Delivered via electronic submittal

Re: Letter of Interest for Douglas County 2050 Comprehensive Water Plan;
RFI-0000000001

To Douglas County Government Representative:

Martin and Wood Water Consultants, Inc. (Martin and Wood) is pleased to submit this letter to express our interest in supporting Douglas County (the County) and the Douglas County Water Commission (DCWC) in the development of the Douglas County 2050 Comprehensive Water Plan (Water Plan).

We understand that the County is seeking a qualified consultant to collaborate with and support the County in the development of the Water Plan, including a water supply and demand analysis, land use scenario planning, groundwater analyses, and development of a comprehensive working plan. Martin and Wood is uniquely qualified to support the County with our team of licensed engineers and hydrogeologists located in Golden, Colorado and because of our experience providing water resources, water planning, and water rights services in Colorado for over 30 years. Martin and Wood's engineers and hydrogeologists are qualified to perform all phases of the County Water Plan, including the hydrogeological study.

We are the primary water resources and water rights consultant for a number of Colorado municipalities (including the City of Englewood, the City of Greeley, the City of Boulder, Canon City, the City of Florence, and Town of Minturn), and we understand the water resource needs and goals of Front Range municipalities. We also work for several Counties including Pitkin County, Elbert County, and Montrose County. We frequently collaborate with municipal water resources' staff and attorneys, as well as other consultants, to manage and protect water resources and find effective solutions to water challenges. We are also proactive in exploring new ideas and approaches to water resources planning and have an interest in finding creative ways for the County to plan for the future while protecting and sustaining Colorado's water resources and the environment. It is of the utmost importance to us that we provide high quality services

to our clients in a timely and efficient manner. We have great pride in our team of experienced engineering and hydrogeology professionals who strive to deliver reliable support and valuable deliverables to our clients. Our proposed approach is to assign a Project Manager who will be the primary contact during the entirety of the project working with a project team of our experts to be integrally involved in the project for you from start to finish. Team members will be designated roles and responsibilities and will work collaboratively both internally and with the County, DCWC, and other stakeholders. We have a long history of working closely with our clients as an extension of staff and delivering high quality work products within the communicated timelines and schedules.

Our team of engineers and hydrogeologists have extensive experience and knowledge of the surface water resources, groundwater resources, and major water users and water providers in Water Division 1 (South Platte River basin). Attached is a list of five client references. Some of our relevant experience with these clients includes the following:

- municipal water supply planning such as supply-demand analyses, estimates of firm yield of water supplies, evaluation and prioritization of potential projects, and impact evaluation of potential water rights administrative changes,
- hydrologic modeling, including streamflow synthesis and comparisons to support the use of multi-year and multi-decade datasets,
- drought planning and assessment of water demand changes for various uses both with and without conservation and demand reduction strategies,
- technical support to advance municipal code updates and land use standards,
- leading public engagement meetings and preparing outreach materials including developing and synthesizing public surveys,
- mapping in Arc GIS in support of planning efforts and water rights technical analyses,
- conservation planning and implementation of water efficiency programs,
- nontributary groundwater analyses, and
- providing technical support for and preparing integrated water resources planning documents.

Martin and Wood represents and has worked closely with municipal water providers across the Front Range, including those within and adjacent to Douglas County. Martin and Wood has also worked with Bell Mountain Ranch, Cherokee Ranch, Sandstone Ranch, Englewood, and industrial entities on evaluating and utilizing Denver Basin groundwater resources.

Our Project Manager, Logan Burba, worked as a staff member of the South Metro Water Supply Authority (SMWSA) from 2014 through 2017, representing the then 13 water providers, most of which were located within Douglas County. During her time there, Logan managed the consultant team that prepared the 2016 Regional Master Plan Update, developed the Conservation Subcommittee, led discussions to evaluate the

land use and water use nexus within the membership, developed the Model Regional Landscape and Irrigation Ordinances, and helped select the QWEL program as the regional professional landscape and irrigation specialist certification program. In this role, Logan also represented the WISE Authority, made up of 10 SMWSA members to partner with the City of Aurora and Denver Water to build infrastructure and operate agreements to deliver excess renewable water from Aurora and Denver to the WISE partners. Following her time with SMWSA, Logan was part of the consulting team that worked for the Colorado Water Conservation Board to prepare the Technical Update to the Colorado Water Plan in 2019. She was the primary modeler responsible for the development of the municipal demand projections encompassing estimates of all municipal demands by county within Colorado, for current and multiple future conditions. This involved extensive analyses of current water use by customer type and by indoor and outdoor uses for all counties, river basins, and statewide based on available water provider data. Our project team will include water resources experts with extensive experience in supply and demand modeling as well as hydrogeologists that have extensive experience evaluating well yields, hydrogeologic conditions, and aquifer system modeling.

Although we have several municipal clients in Water Division 1, we do not believe we have any existing conflicts that would prevent us from serving as Douglas County's water resources consultant for this project.

We have reviewed the draft scope of work provided with the RFI for the Water Plan project and affirm that we understand the scope of services requested and all conditions and requirements included in the RFI. We appreciate the thought that the County has put into the development of this phased approach. We generally agree with the presented phases and defined tasks and have provided detail on potential efforts that would provide value to the project. Attached, please find additional comments and considerations for each of these phases. This reflects Martin and Wood's high-level proposed approach to support the County in this planning effort.

We very much appreciate this opportunity to express our interest in serving the County under this Request for Information. If you have any questions or wish to further discuss, please contact Logan Burba at lburba@martinandwood.com or Michelle Johnson at mjohnson@martinandwood.com, or by calling (303)-526-2600. Please note that our Project Manager will be unavailable should a presentation be requested on July 22, 2024 due to previously scheduled international travel that cannot be adjusted. If the presentation date cannot be rescheduled due to conflicts with the DCWC, we are happy to facilitate a presentation from another key team member from Martin and Wood.

My signature below certifies that the information and data submitted with this response are true and complete to the best of my knowledge.

We would be pleased to work for Douglas County and assist you in planning for the future.

Sincerely,
**MARTIN AND WOOD
WATER CONSULTANTS, INC.**



Michelle C. Johnson, P.E.
President

Enclosed:

1. Proposed Scope and Approach
2. About Martin and Wood and Mission Statement
3. Martin and Wood Standard of Quality Statement
4. Martin and Wood References



Martin and Wood Proposed Approach for Douglas County Water Plan

Project Management Approach

We have found that water resources projects are best performed by selecting a team of staff who are extremely knowledgeable of the client's planning goals, water supplies, and regional issues. Our Project Manager for this project would be Logan Burba, P.E., based on her extensive experience with water planning and communities in the South Metro area. Ms. Burba has nearly 20 years of experience evaluating, supporting, and managing water projects in and near Douglas County. Following the release of the final Request for Proposals (RFP), Martin and Wood will build the best team from its staff to provide excellent service, support, and work products for Douglas County (County) and the Douglas County Water Commission (DCWC). As a small company, we are able to select the best staff team for each client and assure quality through our internal quality controls. All staff are based out of Martin and Wood's sole office located in Golden, Colorado and are familiar with Front Ranch water challenges. Martin and Wood anticipates completing this project without the use of subconsultants.

Communication. While the Project Manager will be the primary contact point for the project, we see great benefit to including direct coordination between the client and our team members. We find that this can lead to improved efficiency and better work products. Monthly progress reports will be provided to the County and will include status of milestones, budget and schedule tracking, and any adjustments to those as needed. We will work with the County to define presentations required through the duration of the project and will support with public notice, as requested.

Project Timeline. We anticipate that the majority of Phases 1 and 2 can be completed within 18 to 24 months of the project kickoff; however, these Phases plus Phase 3 cannot be completed until Phase 3 Task 3 involving the groundwater analysis is completed. The provided Request for Information (RFI) notes that this groundwater task is expected to take three years to complete. All tasks will be completed in a timely and efficient manner, understanding that many of the tasks will involve close coordination with the County and with local water providers and stakeholders and may be contingent on the completion of all defined Phases.

Comments on Proposed Draft Scope and Approach

We have reviewed the draft scope of work provided in the draft RFP (Draft Scope of Work) and agree that the proposed phased approach would work well for this project. The Draft Scope of Work as drafted by the County includes three Phases and includes a list of specific components for inclusion in the analyses and reporting, as applicable. We agree that these

additional components should be considered under the defined Phases below and integrated in analyses as appropriate. We acknowledge that the Draft Scope of Work will be further defined following the RFI process and additional details will be incorporated by the County and by proposing entities at that time.

The following are considerations and comments prepared by Martin and Wood relating to the proposed Draft Scope of Work and include some details on our project approach.

Phase 1: Water Supply and Demand Analysis

- Task 0: Project Kickoff – This Phase represents the initiation of the Water Plan project, development of the Work Plan, and a full project team kickoff meeting. This meeting would include introductions of key personnel from Martin and Wood and the DCWC and discussion of preferred communication, meeting approach and frequency, key milestones, any further scope revisions, and any other project housekeeping.
- Task 1: Water Supply Information Collection – This task as presented in the Draft Scope of Work is well thought out, and we agree includes critical steps to develop the supply profile for water users within the County. We anticipate that this task will also involve review of water provider planning documents and potentially decrees and water agreements. We may consider evaluation of individual wells here as well as in Task 2. This task may also consider planned water supply projects and anticipated infrastructure including system interconnections. We anticipate that this will require direct coordination with water providers within the County.

We will work with water providers to prepare robust mapping and figures using ArcGIS to effectively illustrate water supplies and well locations and where water provider service areas are located in relation to supplies and key infrastructure including storage and interconnects. These maps will likely be influenced by subsequent tasks and finalized in Phase 3. All ArcGIS shapefiles will be provided to the DCWC in an organized and usable format.

- Task 2: Water Demand Projection Analysis – For this task, we agree that preparing a current “baseline” water use for all water providers within the County is the initial effort. We recommend considering recent planning efforts for those water providers and utilizing water use data submitted under House Bill 1051 for those providers preparing annual submittals. This would help to standardize the customer use categories to the extent water providers are reporting via the H.B. 1051 Web Portal. These are publicly available data and would help to maintain consistency with other planning and reporting efforts for the water providers. Based on our review of the draft Exhibit A - Example Water Supplier Survey, we recommend that a section be added to address non-revenue water and water loss, tying the request to AWWA M36 water loss audit reporting to the extent possible. This will involve direct coordination with water providers both via the facilitation of the Water Supplier Survey, but also in follow up to ensure local water use is being appropriately represented in the baseline water use.

Projected water demands will be prepared based on baseline water use for 2050 and full buildout. We recommend the DCWC consider preparing demand scenarios that would present different planning futures within the County, similar to the Technical Update to the Colorado Water Plan (Technical Update). The scenarios would utilize planning “drivers” that may include reductions from conservation efforts, impacts to outdoor use from hotter and drier future conditions, or changes in future non-revenue water levels. These impacts under two different climate futures were prepared in the Technical Update for each County within the state based on local weather, crop consumptive use, and climate modeling. We anticipate that direct coordination with water providers will be necessary to capture planned development, expected water use reduction through conservation programs, and to inform other scenario drivers.

We envision that the supply-demand analysis will lead to the development of a spreadsheet model that considers demands and supplies under various scenarios. The analysis will also utilize geospatial relationships, where possible, and may show more localized water supply gaps within the County under certain conditions. We understand that showing a supply gap for a specific water provider should be treated with sensitivity, so we will work closely with the DCWC, and local water providers to determine the best way to present this analysis. We anticipate that the gap analysis will be completed after all other efforts within this Phase have been completed.

- **Task 3: Groundwater Analysis** – In this task, production wells within Douglas County will be catalogued as described in the Draft Scope of Work. Our hydrogeologists have knowledge and experience with the Denver Basin Aquifers and will utilize available data to determine existing and anticipated consumption and yield from wells through 2050 and at buildout. We will work with the DCWC to determine whether it would be beneficial to prepare different supply scenarios that would show varying levels of water providers’ reliance on the Denver Basin Aquifer wells in the future.

We will conduct a thorough review of local and regional aquifer water levels and water quality within each Denver Basin aquifer formation and supply availability based on publicly available information from the US Geological Survey (USGS), Colorado Department of Water Resources (CDWR), Douglas County, Water Districts, well users, and will consider other relevant and available data. This will include a review of non-tributary groundwater located within the Denver Basin Aquifers. Well pumping records will be reviewed to support evaluations of the health and anticipated life of the non-tributary groundwater within Douglas County. Both estimated baseline and potential future groundwater availability conditions at 2050 within the County’s Denver Basin Aquifer Systems will be prepared at 10-year increments, considering pumping continues at current levels. We may consider alternative pumping scenarios based on findings in Task 2 of this Phase and in coordination with the DCWC. This analysis may depend on the Supreme Court ruling that is pending in 2023SA141 regarding the State Engineer’s imposition of a total allowed withdrawal limit from Denver Basin aquifers pursuant to well permit issued under 37-90-137 (C.R.S).

We will prepare a report of our findings and analyses with a presentation to DCWC and Douglas County. We recommend that the development of an ArcGIS geodatabase and/or ArcGIS StoryMap may be useful tools for presenting the information.

Phase 2: Land Use Scenario Planning and Public Engagement

Martin and Wood suggests that the following tasks be added within Phase 2.

- Proposed Task 1: Literature Review and Documentation – This proposed task would include the review and documentation of other local County-level land use codes, local land use planning efforts for water providers currently serving within the County, and other land use planning and water use nexus evaluations. We have found in our past evaluations that memoranda that provide additional detail on certain topics can be helpful deliverables. For this task, this may be useful in documenting findings through this review and providing recommendations for County consideration. This task could include meeting with local water providers to discuss specific land use regulations and ordinances that are in place or are planned for their communities. This task would help to inform demand projections under Phase 1 Task 2.
- Proposed Task 2: Douglas County Land Use Guidance – This proposed task would include close coordination with the DCWC and the County Community Development Department to consider opportunities for water utilities and land use authorities to partner. A 2015 study completed by the South Metro Water Supply Authority (SMWSA) facilitated initial discussions between land use authorities and water providers in the area that resulted in the development of a Regional Model Landscape and Irrigation Ordinance¹ and implementation of the Qualified Water Efficient Landscaper (QWEL) Program,² the development of both integrally involved our Project Manager. We also recommend consideration of other Colorado-based efforts and guidelines relating to land and water planning in Colorado. This task would utilize information from Phase 2 Task 2.
- Proposed Task 3: Public Engagement – This proposed task would include the development of a public engagement program. We would provide any support in preparing materials to facilitate stakeholder and public engagement, participating in up to three public engagement meetings based on County preference, and preparing any follow-up notes and documentation based on stakeholder and public feedback.

¹https://southmetrowater.org/application/files/1915/7894/2140/FINAL_SMWSA_ModelLandscapeOrdinance_2017-1.pdf

²<https://southmetrowater.org/education/qwel-professional-certification>

Phase 3: Development of the Plan

Martin and Wood suggests that the following tasks be added within Phase 3.

- Proposed Task 1: Draft Plan Development – This proposed task would include the preparation of a draft Water Plan, developed through the duration of work under Phases 1 and 2, and completed following completion of those Phases. We anticipate up to two rounds of review by the DCWC during this task. Depending on client preference, we may provide draft report sections separately throughout other work Phases. The Draft Plan will include all components defined in the Draft Scope of Work and will document any additional tasks identified in the final scope of work.
- Proposed Task 2: Finalize Deliverables – This proposed task would focus on finalizing and submitting all Water Plan documents, attachments, and deliverables on an ongoing basis as they are completed. As described above, we recommend the DCWC consider a demand and supply scenario model as part of the project package that would accompany the final Water Plan and allow the DCWC to refine projections as new information becomes available in the interim between the development of this Water Plan and future updates.
- Proposed Task 3: Team Coordination – This proposed task would involve a series of formal and/or informal meetings with the DCWC throughout the duration of the project. We have found great success coordinating closely and regularly with our existing long-term clients and believe it results in a more robust and beneficial work product. The structure and frequency of these meetings would be at the discretion of the DCWC project team. Additionally, we will prepare for and participate in more formal presentations to County staff, the DCWC, and other stakeholders at key project points, as defined by County staff. Monthly progress reports will be provided to the County and will include status of milestones, budget and schedule tracking, and any adjustments to those as needed.

About the Firm



Martin and Wood was founded in 1991 by two individuals passionate about water resources. Now in our third decade, Martin and Wood has completed assignments in the Western United States ranging in scope from seven days to seventeen years. Our staff is trained in disciplines ranging from water rights, to surface and groundwater resources, water well design, water quality evaluations, and more.

Martin and Wood's strength lies in the depth of our experience and the diversity of our skills. We deliver thoughtful, enduring, high-quality solutions to complex water problems.

Our mission is to provide thoughtful, enduring, high-quality solutions to complex water problems.

Throughout our 30-year history, Martin and Wood has acquired extensive knowledge of the river basins in Colorado, has helped to set water policies, and has developed relationships with irrigators, municipalities, and other stakeholders.

Because we're an employee-owned technical resources company, we're responsive and responsible. We attract and retain top talent, and insist on a high quality of work. Our team of approachable, knowledgeable, energetic employees includes professional geologists and engineers with multi-disciplinary expertise. You'll have a one-on-one relationship with a lead water expert, as well as



access to a full, diverse team, hand-picked to meet your needs.

We specialize in water supply planning and complicated or controversial water rights issues and have the ability — and persistence — to stay with you for the long haul. This is evident by the number of Martin and Wood's long-term clients. Our culture is based on innovation and education. And the combination of our technical know-how, and ability to leverage best-in-class expertise in a variety of specialties, means you have all the water resources you need under one roof.

History.

Education.

Unwavering Commitment to Quality.

THAT'S THE MARTIN AND WOOD EXPERIENCE.

Statement of Quality



We continuously strive to provide our customers with **outstanding quality** on our technical services and customer support. To achieve this, we

- create a collaborative and respectful working environment,
- encourage professional growth and training to maintain high-quality staff members, and
- utilize internal quality controls on calculations and reports prior to submittal.

References



CITY OF GREELEY

Water Resources Engineering, Water Supply
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Master plan for integrated management of water resources in Douglas County

Submitted by Mekorot, Israel's National Water Company

November 2024

RFI – Mekorot Response

1. GENERAL BACKGROUND

Douglas County, Colorado, is at a critical juncture in managing its water resources. With its population growing rapidly and urban development accelerating, the county faces significant challenges in ensuring a sustainable water supply for the future. Recognizing these challenges, the Douglas County Water Commission (DCWC) was established in 2023 with a mandate to develop a comprehensive water management plan through 2050.

Background and Context:

Douglas County spans 844 square miles, encompassing urban areas, rural communities, and diverse water needs, including residential, agricultural, industrial, and ecological demands. The region relies on a combination of surface water, groundwater from the Denver Basin aquifers, and intergovernmental agreements with neighboring counties and water districts. However, the pressures of growth, coupled with the inherent limitations of these water sources, necessitate a reevaluation of current practices.

Key Drivers for the Efficiency Plan:

1. Anticipated Supply and Demand Imbalance:

- Projections indicate a significant gap between water supply and demand by 2050. Urban growth, particularly in municipalities such as Castle Rock, Parker, and Lone Tree, is expected to increase demand beyond what existing sources can support.
- Current reliance on finite groundwater reserves, particularly from the Denver Basin aquifers, poses risks of over-extraction, declining water tables, and eventual depletion.

2. Groundwater Depletion and Quality Concerns:

- Groundwater from the Denver Basin has been a primary resource for many areas in Douglas County. However, unsustainable pumping rates have already resulted in measurable declines in aquifer levels.
- Emerging concerns over water quality, such as radium contamination in certain areas, add complexity to the management of groundwater resources.

3. Changing Land Use Patterns:

- Rapid suburban expansion and the corresponding changes in land use are straining existing water infrastructure.

- Development in previously rural areas, where individual wells are common, may exacerbate aquifer depletion and introduce new management challenges.

4. **Infrastructure Limitations and Investment Needs:**

- Existing infrastructure, including storage, pipelines, and water treatment facilities, is insufficient to meet future demands.
- Opportunities for renewable water supply projects, such as expanded use of reclaimed water and aquifer storage and recovery (ASR), require significant planning and investment.

5. **Environmental and Sustainability Considerations:**

- Long-term water management must account for environmental conservation, including maintaining healthy ecosystems and minimizing impacts on the county's natural resources.
- Conservation practices, such as incentivizing efficient water use and promoting drought-tolerant landscaping, are crucial to extending the life of available supplies.

6. **Public Engagement and Awareness:**

- Addressing water resource challenges requires robust public support and participation. Educating residents on conservation practices and engaging stakeholders in planning efforts are essential for the success of the plan.

Objectives of the 2050 Comprehensive Water Plan:

The Douglas County Water Plan aims to:

- **Quantify and assess water supply and demand:** Conduct a comprehensive analysis of current and projected water use, including the development of a gap analysis to identify critical shortages.
- **Develop land use policies aligned with water availability:** Integrate water resource planning into land-use decisions to ensure sustainable growth.
- **Improve infrastructure and storage:** Expand and modernize water infrastructure, including the exploration of new storage and renewable supply options.
- **Preserve groundwater resources:** Implement strategies to extend the life of the Denver Basin aquifers and address areas of high aquifer stress.

- **Promote conservation and efficiency:** Encourage practices and technologies to reduce water consumption and enhance resource efficiency.
- **Engage the community:** Foster a collaborative approach by involving municipalities, water providers, and residents in decision-making processes.

Importance of a Strategic Approach:

The challenges faced by Douglas County are complex, requiring a coordinated and phased approach to water management. The 2050 Comprehensive Water Plan represents a proactive effort to balance economic growth, environmental stewardship, and resource sustainability. Through this plan, the county seeks to secure its water future while maintaining its commitment to the well-being of its residents and ecosystems.

2. COMPANY PROFILE

Mekorot, the national company of water of Israel began operations in 1937 as the "impossible dream" of the leading pioneers of Israel, a decade before the establishment of the State.

Today, Mekorot is one of the most advanced water companies in the world, a leader in management of water resources, desalination, wastewater treatment and reuse of effluents, rainfall enhancement, water quality, drinking water and engineering of water projects.

Through constant research, experimentation and implementation of innovations, the company provides solutions for reliable supply of high-quality water to a population that is growing, despite the limited resources of freshwater, the arid climate and the difficult geographic and geopolitical reality of the region.

Mekorot supplies 80% of the drinking water in Israel and 70% of the total water supply, operating 3,000 facilities and plants across the country.

The uniqueness of Mekorot resides in its unmatched experience, knowledge, technologies and innovative processes for the management, operation, and treatment of all types of water resources: surface water, ground water, brackish water, seawater and effluents.

The supply of adequate quantities of high-quality water has become a huge challenge in many regions of the world, a situation that unfortunately is expected to be intensified. The skills, technologies, and knowledge that Mekorot has accumulated over the decades have provided the company deep knowledge about successful approaches to the challenges of the water sector.

Based on their experience and abilities Mekorot, as well as the main international institutions specialized in this area, it is considered that it is possible to convert the global shortage of water into an engine of economic growth.

Management of water resources: the knowledge accumulated by Mekorot derive from decades of innovation dealing with great challenges. Mekorot has overcome these challenges through the development of leading-edge processes that have managed to maximize the utilization of the water resources of Israel, automate the water treatment and supply to domestic, industrial, and agricultural users.

Water supply: over a period of more than 80 years, Mekorot has implemented a series of new systems and methods to supply water with high reliability and safety.

Mekorot supplies water to approximately 5,000 intermediaries' suppliers, including municipalities, regional associations, industrial consumers and agricultural settlements.

Quality and safety of water: Mekorot has established a network of laboratories for water quality analysis and sophisticated programs of monitoring at a national level.

Desalination: One of the pioneers of the world in desalination, Mekorot operates today 31 desalination plants treating every day more than 1 million cubic meters of sea water and brackish water.

Its advanced capability of research and development, as well as its experience and knowledge have resulted in desalination plants with an impressive level of automation and economy, reducing energy consumption and the use of membranes.

These efficiencies have enabled Mekorot achieve the lowest desalination costs in the world. The Mekorot's desalination expertise range from the plant design, construction, and project management, to operation, training and maintenance.

Treatment of wastewater and recovery: the systems established by Mekorot have given Israel the highest water recovery rate in the world.

Purification of water from the company's eight plants treat 40% of the effluents from all over Israel, and its nine reclamation plants allow that 70% of the effluent can be reused for agriculture, releasing water for domestic and industrial use.

Floods harvesting: Mekorot has developed innovative technologies for the harvesting of the floods in the desert regions.

Rainfall enhancement: Mekorot technologies for clouds seeding and the implemented programs have managed to increase precipitation of Israel in about 13-18% a year.

Operational planning based on models: Mekorot has developed sophisticated mathematical models and SCADA control systems (Supervision, Control and Data acquisition) to optimize the full range of their operations and planning activities.

The professional staff is available to adapt and implement these tools for clients.

Advanced Engineering and Infrastructure capabilities: the engineering subsidiary company of Mekorot, Electro-Mechanical Services (EMS), has experience in carrying out large-scale infrastructure projects such as the project logo of Israel the "National Water Supply System" and the "Fifth Line to Jerusalem".

To share the experience with companies from around the world, Mekorot has established a framework of professional services under which provides outsourced consulting technology, planning, engineering, operation, maintenance, management and implementation of projects.

Entrepreneurship: To extend its technological leadership and continuously improve the quality of the water provided, Mekorot actively promotes the development of new technologies of water.

Through its Department of Initiative and Innovation, Mekorot provides to entrepreneurs in all areas of business related to water, platforms for beta testing and commercial tests, and supports them with a wide range of technological services of analysis and consultation.

It also helps them in their efforts to reach global markets, strategic partners, and the required capital.

In conclusion, it can be said that Mekorot's advantage in sustainable planning lies in its combination of extensive experience, technological innovation, long-term strategic vision, and dedication to environmental stewardship. This approach ensures the availability of water resources for future generations while positioning Israel as a global leader in sustainable water management.

The primary challenge in Douglas County's water management lies in its heavy reliance on the depleting groundwater resources of the Denver Basin aquifers. These non-renewable sources are being overexploited to meet rising demands driven by population growth and urban expansion, resulting in significant depletion rates and recovery periods spanning decades or centuries. This depletion is compounded by deteriorating water quality, including increased salinity and contamination risks, which elevate treatment costs and complicate resource management.

Furthermore, the absence of readily available sustainable alternatives and the increasing dependency on these finite resources amplify the risks, posing a critical threat to the county's long-term water security and economic resilience.

Mekorot's extensive experience in sustainable groundwater management positions it as a valuable partner in addressing the groundwater challenges of Douglas County. With decades of expertise in optimizing aquifer usage and implementing advanced monitoring technologies, Mekorot has successfully balanced water supply needs with resource preservation. Its methods, such as controlled water extraction and the development of predictive models for resource management, can be adapted to various conditions. By applying these approaches, Douglas County can enhance its water resource management and maintain their quality over the long term.

A project that might be worth mentioning is the 'Eastern Drain' project.

Mekorot is leading the "Eastern Drain" project as part of a comprehensive plan to rehabilitate the Coastal Aquifer, which constitutes approximately 30% of Israel's natural water resources. Over the years, the aquifer has suffered from over-extraction and contamination, resulting in lowered water tables, increased salinity, and reduced water quality.

The project area spans from Ashdod in the north to Nir Am in the south, and from the coastline in the west to Bnei Ayish in the east. Key components of the project include:

- **New drilling operations:** 20 new boreholes were drilled to depths of approximately 150 meters to extract brackish water.
- **Laying water pipelines:** About 40 kilometers of new water pipelines were installed to transport raw water to desalination facilities.
- **Expanding desalination facilities:** The capacity of two desalination plants, including the "Granot" facility and the Zion Cohen ("Lahat") plant, was doubled to treat brackish water and return it to the national water supply system.

The primary goals of the project are to stabilize groundwater levels, reduce chloride concentrations in the aquifer, improve drinking water quality, and decrease the salt load entering the aquifer from irrigation. The project's estimated cost is approximately NIS 265 million.

3. A PROPOSED APPROACH TO PROJECT EXECUTION

Drawing on Mekorot's extensive experience in developing master plans for Israel, as well as for regions in India (Punjab, Maharashtra), Argentina (various provinces), Azerbaijan, and Kazakhstan (Almaty), the following structured approach is recommended:

Phase 1: Water Supply and Demand Analysis

Step 1: Data Collection and Assessment of Current Conditions

Objectives:

- Assess the present state of water resources.
- Analyze water accessibility and usage across various sectors.
- Identify information gaps and challenges within the existing system.

Tasks:

- Analyze historical hydrological and water resource data.
- Review reservoir data, including storage capacities and operational history.
- Assess water quality and the use of treated water.
- Examine current regulations and the balance of available resources.

Step 2: Projections of Water Resource Availability

Objectives:

- Evaluate the availability of water resources for 2030, 2040, and 2050.
- Identify vulnerable areas and propose sustainable solutions.

Tasks:

- Project rainfall, surface water, and groundwater availability.
- Develop comprehensive water availability forecasts.

Step 3: Water Demand Projections

Objectives:

- Provide accurate water demand forecasts for various timeframes.

- Ensure a reliable water supply tailored to sectoral needs.

Tasks:

- Generate decadal water demand projections by sector (e.g., agriculture, industry, urban).
- Map demand by region and sector.

Step 4: Regulations for a Water-Based Economy

Objectives:

- Establish a sustainable framework for water resource management.
- Define pricing mechanisms and usage regulations.

Tasks:

- Implement water economy concepts.
- Develop regulations for the use of groundwater and surface water.
- Create quantitative tools and pricing models for efficient resource management.

Step 5: Water Balance

Objectives:

- Present water balance projections by region and sector.
- Identify potential areas of water stress and develop mitigation strategies.

Tasks:

- Conduct annual water balance calculations.
- Map stress-prone areas and design intervention strategies.

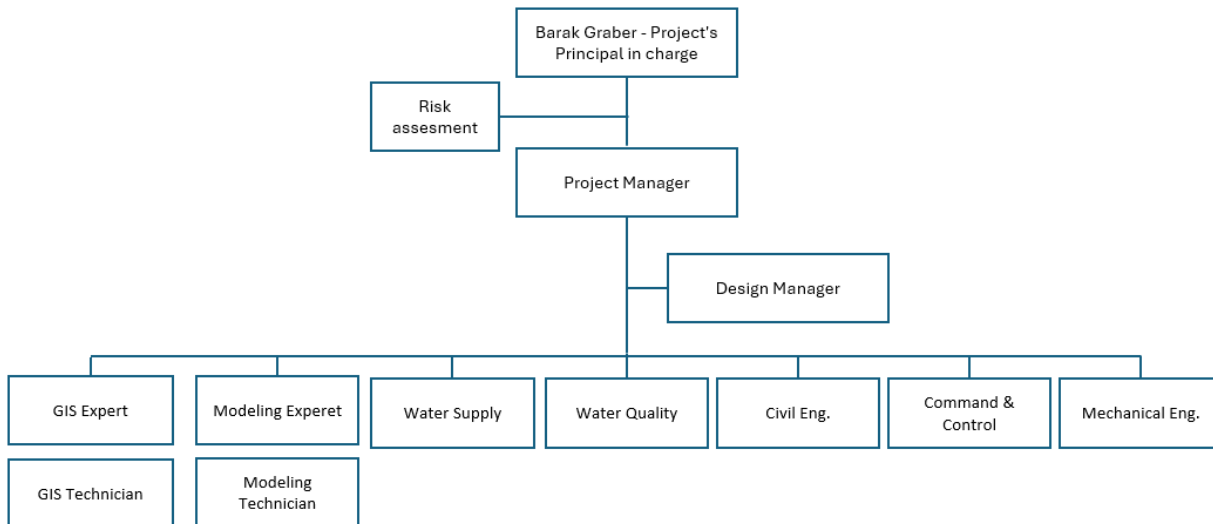
Phase 2: Land Use Scenario Planning and Phase 3: Plan Development have not yet been fully defined, which is understandable. Ideally, the land use scenarios should be developed during the Phase 1 preparation, when deficits become evident following the establishment of the actual and projected water balance. These scenarios will serve as alternatives for mitigating the identified deficit.

Phase 3: Plan Development should be scheduled upon the completion of Phases 1 and 2 to ensure the plan is data-driven and well-informed.

We estimate that the project duration will be 30 months (refer to the proposed schedule for completion).

Month	phase 1						phase 2					phase3
	Data Collection and Assessment of Current Conditions	Projections of Water Resource Availability	Water Demand Projections	Regulations for a Water-Based Economy	Water Balance	Phase 1 report	DATA collection and calibration	scenario a	scenario b	scenario c	Phase 2 report	Development of the Douglas County Water Plan
1	1	2	3	4	5	6	1	2	3	4	5	1
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Mekorot's Professional Team



Engagement of External Consultants

To ensure the project's success and maximize professional capabilities and expertise, Mekorot will engage external consultants as needed. The primary consultant for this project will be:

- **Amir Givati** – An expert in forecasting water resource availability, providing advanced predictive models and insights to optimize water management strategies.

We hereby confirm our understanding of the scope of work outlined in the RFI.

4. CONFLICT OF INTEREST

As far as we know, we have no conflict of interest regarding this project, as soon as one is created, we will update as soon as possible

5. COMPANY REFERENCES

Reference # 1

Country: India, Punjab

Project: “*Water Conservation and Management Master Plan*” (2019 – 2022)

Client: Punjab Water Resources Management and Development corporation

Reference # 2

Country: Azerbaijan

Project: “*Increasing Water Use Efficiency for the State of Azerbaijan*” (2022 – 2024)

Client: Azerbaijan Amelioration and Water Farm OJSC

Reference # 3

Country: Argentina, Mendoza

Project: “*Master Plan for The Water Sector of The Province of Mendoza*” (2022 – 2025)

Client: Consejo Federal De Inversiones (CFI)

Reference # 4

Country: Argentina, San Juan

Project: *“Master Plan for The Water Sector of The Province of San Juan”* (2022 – 2025)

Client: Consejo Federal De Inversiones (CFI)

Reference # 5

Country: Argentina, Rio Negro

Project: *“Master Plan for The Water Sector of The Province of Rio Negro”* (2023 – 2026)

Client: Consejo Federal De Inversiones (CFI)

Contact Person for all references:

Mr. Barak Graber

Director of Business Development, Mekorot.

6. APENDIX - MEKOROT ETHICAL CODE

Mekorot Water Company Ltd.

The Ethical Code

Introduction:

Water is a strategic asset for the State of Israel, economically, politically, and socially. Employees of Mekorot view their role in water resource management as a mission. The company is responsible for ensuring the availability and quality of the water it supplies, given that water is a scarce resource.

National Responsibility and Mission

Mekorot operates responsibly to ensure the stability and quality of Israel's water sector. The company handles water crises and shortages through proper preparedness and planning. It emphasizes water quality, safety, operational efficiency, and sustainable development.

The company supplies water nationwide across all sectors, adhering to high standards and defined criteria. Mekorot collaborates with government bodies and statutory authorities to optimize efficiency and ensure long-term sustainability for future generations.

The company encourages its employees to act transparently with government authorities and foster cooperation with the public sector to maximize benefits and reduce costs in joint areas of interest. Mekorot aims to enhance the water supply, develop solutions, and implement innovative technologies to address water resource management challenges.

Supplying High-Quality Water

Mekorot is committed to providing consumers with high-quality water, treated professionally and monitored continuously. The company ensures compliance with all relevant standards and regulations, adhering to stringent protocols to guarantee water quality and availability.

- **Key Commitments:**

- 1. Standards Compliance:**

The company strictly adheres to voluntary and mandatory regulations in all its operations.

- 2. Quality Control:**

Mekorot emphasizes water quality and security through risk assessments, scenario planning, team training, and routine inspections. It maintains certifications like ISO standards to align with national and international benchmarks.

- 3. Transparent Reporting:**

Employees must ensure reliable and accurate reporting regarding water quality. Transparency is prioritized in communications with all stakeholders.

4. Continuous Monitoring:

Teams conduct ongoing professional checks to maintain high-quality water standards, addressing all risks effectively.

Professionalism and Reliability

At Mekorot, professionalism means providing various types of high-quality water reliably, safely, and efficiently. The company focuses on technological leadership and operational excellence to maintain its competitive edge and deliver value to stakeholders.

- **Core Principles:**

- 1. Commitment to Excellence:**

Employees are expected to uphold high professional standards and ensure reliability in all tasks.

- 2. Risk Management:**

Employees bear full responsibility for their actions and are expected to manage risks diligently. Mekorot integrates a culture of risk management into all major activities to minimize threats and capitalize on opportunities.

- 3. Transparency and Accountability:**

Employees are required to report issues or challenges immediately and act responsibly in managing resources effectively.

- 4. Continuous Improvement:**

Mekorot values the continuous enhancement of management quality and operational processes to meet its commitments and adapt to evolving conditions.

Representation of the Company

Mekorot employees are the company's ambassadors and are expected to conduct themselves professionally and respectfully in all interactions, both within and outside the organization.

- **Key Guidelines for Representation:**

- 1. Professional Conduct:**

Employees must maintain a professional demeanor in appearance, written communication, and verbal interactions. Their behavior should reflect the values and reputation of Mekorot.

- 2. Public Communications:**

Employees must exercise caution when expressing opinions, particularly in public

forums or digital platforms, and refrain from making statements that could be perceived as representing the company's official stance.

3. Respect for Company Assets:

Employees are responsible for the proper use of company resources, including vehicles, equipment, and digital tools. These assets must be used only for authorized purposes.

4. Technological Leadership:

Mekorot promotes innovation and professionalism by investing in employee training and technological advancement to maintain its leadership in Israel's water sector.

Information Security and Confidentiality

Mekorot places a high priority on information security and protecting the confidentiality of its operations, data, and intellectual property. Employees must adhere to strict protocols to safeguard company assets and prevent unauthorized access to sensitive information.

• **Key Policies:**

1. Data Confidentiality:

Employees are prohibited from disclosing sensitive company information, including intellectual property, trade secrets, or proprietary data, without proper authorization.

2. Prohibition of Insider Trading:

The use of non-public information for personal gain or trading securities is strictly forbidden. Employees must not share confidential information with third parties unless it has been publicly disclosed.

3. Use of IT Systems:

Employees must use the company's IT systems responsibly and in accordance with established guidelines to prevent cyber threats and unauthorized data breaches.

4. Training and Awareness:

Mekorot conducts regular training sessions to raise awareness of cybersecurity risks and enforce compliance with information security policies.

5. Reporting Security Breaches:

Employees are required to report any security lapses, suspicious activities, or risks immediately to the relevant authorities within the company.

Relations with Investors

Mekorot, as a government company with publicly traded securities, emphasizes transparency, accuracy, and reliability in its communications with investors and stakeholders.

- **Key Principles:**

- 1. Transparency:**

Mekorot is committed to honest and clear communication with investors, adhering to all regulatory requirements and providing timely updates.

- 2. Prevention of Conflicts of Interest:**

Employees and managers must avoid any actions that could create a conflict of interest or appear to compromise the integrity of the company's financial reporting.

- 3. Integrity in Reporting:**

All financial and operational data must be accurate and comply with legal and regulatory standards.

Cooperation and Mutual Respect

Mekorot fosters a work environment based on cooperation, respect, and shared responsibility among employees, management, and external partners.

- **Key Guidelines:**

- 1. Respectful Communication:**

Employees are expected to treat colleagues, customers, and partners with respect and professionalism.

- 2. Equal Opportunity:**

Mekorot ensures fair and unbiased treatment in recruitment, promotion, and professional development, regardless of gender, ethnicity, religion, or other characteristics.

- 3. Workplace Ethics:**

The company prohibits any form of harassment, discrimination, or abuse within the workplace.

Privacy Protection

Mekorot prioritizes the privacy of its employees and stakeholders, ensuring compliance with all relevant regulations.

- **Key Actions:**

- 1. Protection of Personal Data:**

Employees must handle personal information with care, ensuring confidentiality and adherence to data protection laws.

2. Reporting Violations:

Any breach of privacy or misuse of personal data must be reported immediately to the relevant department.

Public Engagement and Sustainability

Mekorot is dedicated to sustainability and environmental responsibility, focusing on actions that benefit both the community and future generations.

- **Sustainability Commitments:**

- 1. Environmental Protection:**

Mekorot strives to minimize its ecological footprint by adopting energy-efficient practices and promoting clean water technologies.

- 2. Community Engagement:**

The company fosters relationships with the public and supports community initiatives to raise awareness of environmental issues.

- 3. Transparency in Environmental Reporting:**

Mekorot reports on its environmental impact openly and in compliance with legal and ethical standards.

Supplier and Contractor Relations

Mekorot values fair and transparent relationships with its suppliers and contractors, ensuring they align with its ethical principles.

- **Expectations from Suppliers and Contractors:**

- 1. Adherence to Ethical Standards:**

Suppliers and contractors must comply with Mekorot's ethical code and all relevant laws and regulations.

- 2. Transparency in Operations:**

Accurate and honest reporting is required in all dealings with Mekorot.

- 3. Avoidance of Conflicts of Interest:**

Suppliers and contractors must disclose any potential conflicts of interest and act responsibly in their engagements with the company.

Ethical Dilemmas and Reporting

Mekorot recognizes that employees may encounter ethical dilemmas in their work and provides clear guidelines for addressing them.

- **Steps for Handling Ethical Dilemmas:**

- 1. Evaluate the Situation:**

Determine if the issue involves a conflict between ethical principles and established policies.

- 2. Consult the Ethical Code:**

Refer to Mekorot's ethical code for guidance.

- 3. Seek Advice:**

Consult the Ethics Officer or relevant managers for clarification or support.

- **Reporting Mechanisms:**

- Mekorot encourages employees to report unethical behavior or policy violations via designated channels, ensuring confidentiality and protection from retaliation.

Leadership Responsibilities

Mekorot expects its managers to lead by example, promoting ethical behavior and maintaining high professional standards.

- **Managerial Duties:**

- 1. Model Ethical Conduct:**

Managers must demonstrate integrity in decision-making and interactions with employees.

- 2. Encourage Transparency:**

Create an environment where employees feel comfortable raising ethical concerns.


- 3. Promote Professional Development:**

Support employees in their professional growth and ethical awareness.

Glossary of Terms:

- **Ethics:** The study of moral principles, determining right from wrong.
- **Sustainability:** Meeting the needs of the present without compromising the ability of future generations to meet their needs.
- **Stakeholders:** Individuals or groups affected by or affecting the company's operations, such as employees, customers, suppliers, and government entities.
- **Ethical Dilemma:** A situation involving conflicting values or principles requiring a thoughtful resolution.

Agenda Item

DATE: DECEMBER 17, 2024
TO: DOUGLAS COUNTY BOARD OF COUNTY COMMISSIONERS
THROUGH: DOUGLAS J. DEBORD, COUNTY MANAGER
FROM: TERENCE T. QUINN, AICP, DIRECTOR OF COMMUNITY DEVELOPMENT 
CC: MARCCO HIGHAM, PLANNER
LAUREN PULVER, PLANNING SUPERVISOR
MICHAEL CAIRY, ZONING COMPLIANCE MANAGER
KATI CARTER, AICP, ASSISTANT DIRECTOR OF PLANNING RESOURCES
STEVEN E. KOSTER, AICP, ASSISTANT DIRECTOR OF PLANNING SERVICES
SUBJECT: NATURAL MEDICINE BUSINESSES – PROPOSED REGULATIONS

SUMMARY

At a Board of County Commissioners (Board) work session on October 28, 2024, staff reviewed information pertaining to Natural Medicine businesses as requested by the Board. This included several mapping scenarios and input solicited from the Douglas County Board of Health and emergency service providers.

The Board directed staff to draft regulations to establish a 1,500-foot separation requirement for Natural Medicine businesses from a residential zone district, dwellings, schools, childcare facilities, libraries, churches, parks, and municipal boundaries as well as incorporate recommendations from the Board of Health.

The attached draft amendments to the Douglas County Zoning Resolution (DCZR) would allow Natural Medicine businesses with a Use by Special Review (USR) in specified zone districts, would limit days and hours of operation, and would establish noticing requirements to the Douglas County Health Department (DCHD), the Douglas County Sheriff's Office (DCSO), and emergency medical facilities within 5 miles of the approved Natural Medicine business.

DISCUSSION

Healing Centers (where natural medicines would be provided to clients by licensed facilitators) would be allowed in the Business, Commercial, Light Industrial (LI), and General Industrial (GI) zone districts with a USR. All other Natural Medicine businesses would be allowed in the LI and GI zone districts with a USR. Hours of operation for all

Natural Medicine facilities would be limited to 8:00 a.m. to 5:00 p.m., Monday through Friday.

The draft amendments would establish a 1,500-foot separation requirement for Natural Medicine businesses from a residential zone district, dwellings, schools, childcare facilities, libraries, churches, parks, and municipal boundaries. As part of a specific USR application, the Board may consider a reduced separation requirement.

The draft amendments would also require that a Healing Center be located no more than 5 miles from a hospital, emergency medical care center, urgent care center, or other such medical treatment facility, unless such services are available at the Healing Center. Additionally, the USR process would require notice to the DCHD, the DCSO, and emergency facilities within 5 miles of a Healing Center within 14 days of an approval.

During the referral process, staff intends to engage with representatives from medical treatment facilities and emergency service providers to seek feedback on the proposed requirements for Healing Centers

NEXT STEPS

Staff is prepared to discuss the proposed amendments to the DCZR for Natural Medicine businesses.

ATTACHMENTS

- Draft Revisions to Zoning Resolution Section 11
- Draft Revisions to Zoning Resolution Section 12
- Draft Revisions to Zoning Resolution Section 13
- Draft Revisions to Zoning Resolution Section 14
- Draft Revisions to Zoning Resolution Section 21

SECTION 11 B – BUSINESS DISTRICT

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1103 Accessory Use

The following shall be allowed only when a principal use has been established on the lot:

- 1103.01 Accessory uses and buildings *(Amended 5/27/14)*
- 1103.02 Satellite dish
- 1103.03 Single or multifamily residence for management or employees *(provided unit is incorporated into principal structure)*

1104 Uses Permitted by Special Review *(Amended 6/22/05)*

The following uses are permitted, upon approval by the Board, in accordance with Section 21, Use by Special Review, of this Resolution. *(Amended 3/26/24)*

1104.01 Heliport

1104.02 Natural Medicine Business: Healing Center, as defined in Colorado Regulated Natural Medicine Rules 1 CCR 213-1 and Colorado Revised Statutes. Natural Medicine businesses are not a permitted use in the PD – Planned Development District.

1104.0~~32~~ Residence

- Group home *(Amended 5/10/16)*
- Group home for registered sex offenders
- Group Residential Facility
- Multifamily – apartments, condominiums

1104.0~~43~~ Utility – major facility

1105 Minimum Lot Area: none

1106 Water and Sanitation Requirement

All uses shall be served by a central water and sanitation facility.

1107 Utilities

All public utility distribution lines shall be placed underground.

1108 Land Dedication

A portion of the gross site area shall be dedicated to Douglas County for public use, or cash-in-lieu of land as required by the Douglas County Subdivision Resolution.

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- 1202.06 Recreation facility – outdoor/community
- 1202.07 Retail/service business – including outdoor/wholesale activity
- 1202.08 Sexually oriented business – *Sexually oriented businesses are not permitted as a commercial use in the PD – Planned Development District and are not permitted in any zone district other than the C – Commercial District.*
- 1202.09 Theater – outdoor/indoor

1203 Accessory Uses

The following shall be allowed only when a principal use has been established on the lot:

- 1203.01 Accessory uses and buildings (*Amended 5/27/14*)
- 1203.02 Commercial storage area (*Amended 3/26/24*)
- 1203.03 Satellite dish
- 1203.04 Single or multifamily residence for management or employees

1204 Uses Permitted by Special Review (*Amended 6/22/05*)

The following uses are permitted, upon approval by the Board, in accordance with Section 21, Use by Special Review, of this Resolution. (*Amended 3/26/24*)

- 1204.01 Heliport
- 1204.02 Natural Medicine Business: Healing Center, as defined in Colorado Regulated Natural Medicine Rules 1 CCR 213-1 and Colorado Revised Statutes. Natural Medicine businesses are not a permitted use in the PD – Planned Development District.
- 1204.0~~23~~ Residence
- Group home (*Amended 5/10/16*)
 - Group home for registered sex offenders
 - Group Residential Facility
 - Multifamily – apartments, condominiums
- 1204.0~~34~~ Utility – major facility
- 1204.0~~45~~ Zoo

SECTION 13 LI – LIGHT INDUSTRIAL DISTRICT

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- 1302.24 Restaurant/fast food establishment
- 1302.25 Satellite earth station
- 1302.26 Seasonal use (*refer to Section 22A*)
- 1302.27 Telecommunication facility
- 1302.28 Utility service facility
- 1302.29 Veterinary clinic or hospital (*Amended 3/26/24*)
- 1302.30 Warehouse
- 1302.31 Wholesale business – sales/service

1303 Accessory Uses

The following shall be allowed only when a principal use has been established on the lot:

- 1303.01 Accessory uses and buildings (*Amended 5/27/14*)
- 1303.02 Day-care facility for children of employees
- 1303.03 Residence for management or employee
- 1303.04 Satellite dish

1304 Uses Permitted by Special Review (*Amended 6/22/05*)

The following uses are permitted, upon approval by the Board, in accordance with Section 21, Use by Special Review, of this Resolution. (*Amended 3/26/24*)

- 1304.01 Batch plant – concrete, mortar, or asphalt
- 1304.02 Heliport

1304.03 Natural Medicine Business: Healing Center, Cultivation Facility, Products Manufacturer, Testing Facility, or any other Natural Medicine Business licensed by the State Licensing Authority, as defined in Colorado Regulated Natural Medicine Rules 1 CCR 213-1 and Colorado Revised Statutes. Natural Medicine businesses are not a permitted use in the PD – Planned Development District.

- 1304.0~~4~~³ Recycle/trash transfer facility – indoor

1304.0~~54~~ Residence

- Group home (*Amended 5/10/16*)
- Group home for registered sex offenders
- Group Residential Facility
- Single-family attached or multifamily

1304.0~~65~~ Satellite earth station that exceeds the zone district height limitation or exceeds the minimum health standards.

1304.0~~76~~ Telecommunication equipment (*excluding whip type antennas*) that exceed the zone district height limitation or exceed minimum health standards.

1304.0~~87~~ Utility – major facility

1305 Minimum Lot Area: none

1306 Water and Sanitation Requirement

All uses shall be served by a central water and sanitation facility.

1307 Utilities

All public utility distribution lines shall be placed underground.

1308 Land Dedication

A portion of the gross site area shall be dedicated to Douglas County for public use, or cash-in-lieu of land as required by the Douglas County Subdivision Resolution.

1309 Street Standards

Construction of paved streets in accordance with the Douglas County Roadway Design and Construction Standards, Storm Drainage Design and Technical Criteria manual, and other applicable County regulations.

1310 Parking Standards

Parking shall be provided as shown on the approved USR Plan Exhibit or Site Improvement Plan prepared in accordance with Section 21, Use by Special Review, or Section 27, Site Improvement Plan; and Section 28, Parking Standards, of this Resolution. (*Amended 3/26/24*)

SECTION 14 GI – GENERAL INDUSTRIAL DISTRICT

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1404 Uses Permitted by Special Review (Amended 4/28/15)

The following uses are permitted, upon approval by the Board, in accordance with Section 21, Use by Special Review, of this Resolution. (Amended 3/26/24)

- 1404.01 Batch Plant – concrete, asphalt, or mortar (not including temporary batch plants; see Douglas County’s Grading, Erosion, and Sediment Control Manual, as amended, for processing details)
- 1404.02 Chemical and hazardous material storage/transfer/disposal facility
- 1404.03 Firing range – outdoor
- 1404.04 Heliport
- 1404.05 Jail/correctional facility
- 1404.06 Junk/scrap yard
- 1404.07 Landfill – private/public
- 1404.08 Mining, quarry, sand and gravel pit or similar extractive land use
- 1404.09 Natural Medicine Business: Healing Center, Cultivation Facility, Products Manufacturer, Testing Facility, or any other Natural Medicine Business licensed by the State Licensing Authority, as defined in Colorado Regulated Natural Medicine Rules 1 CCR 213-1 and Colorado Revised Statutes. Natural Medicine businesses are not a permitted use in the PD – Planned Development District.
- 1404.~~1009~~ Propane distribution/storage facility
- 1404.~~110~~ Recycle/trash transfer facility
- 1404.~~124~~ Satellite earth station that exceeds the zone district height limitation or exceeds minimum health standards
- 1404.~~132~~ Telecommunication equipment (*excluding whip type antennas*) that exceed the zone district height limitation or exceed minimum health standards.

1405 Minimum Lot Area: none

1406 Water and Sanitation Requirement

All uses shall be served by a central water and sanitation facility.

SECTION 21 USE BY SPECIAL REVIEW

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- (6) Wildlife impact areas as designated in the Douglas County Comprehensive Master Plan, as amended, and areas considered significant by the Colorado Division of Wildlife
- (7) Areas identified, through independent assessment, as having historic, archaeological, or paleontological resources
- (8) All Douglas County Comprehensive Master Plan designations

2107.32.5 An operational plan shall be submitted that at a minimum addresses the following:

- (1) Start and end dates and the hours of operation
- (2) A program for initial air-quality measurements and an ongoing monitoring program, including dust from equipment and stockpiles
- (3) A program for initial water quality and quantity measurements, including well tests in the area, and an ongoing water-quality monitoring program
- (4) Sources and quantities of water needed on site
- (5) A drainage and erosion control plan in compliance with the Douglas County Storm Drainage Design and Technical Criteria manual
- (6) A program for initial noise measurement, an ongoing noise monitoring program, and a noise abatement program
- (7) Proposed methods and timing of site restoration and their relationship to visual and air-quality impacts
- (8) A phasing plan that:
 - designates areas to be disturbed and the proposed timing or extraction for each area;
 - illustrates the timing of site restoration for each area including revegetation, contouring, and grading;
 - limits the total land area to be disturbed at any one time; and
 - links the availability of adequate transportation facilities to the scope of the operation, specifically identifies off-site infrastructural improvements required for the project, and specifies the time frame for construction in relation to phases of on-site operation.
- (49) A transportation plan that:
 - designates transportation routes (*existing or proposed*) that avoid residential areas and limit the use of local roads;
 - gives traffic counts and the projected level of service along haul routes, at bridges and culverts, and at key intersections both at the start and at peak operation;
 - specifies the hours when material will be transported off site;
 - lists the improvements necessary for the transportation system to accommodate expected traffic;

- addresses the construction of needed transportation improvements; and
 - lists the actions to be taken at the staging area to allow only safe, clean, and covered trucks onto the transportation system.
- (~~2~~10) A blasting plan that:
- Identifies noise and vibration-sensitive uses/structures/activities in the area;
 - includes a pre-blast inspection program for identified structures;
 - includes a program for initial seismic and noise monitoring during the first blast;
 - incorporates a method of reviewing data from the initial blast and provisions for amending the blasting program accordingly; and
 - specifies the times and the atmospheric conditions when blasting is permitted.
- (~~3~~11) An end-state, land-use plan that shows:
- areas to be returned to a natural state;
 - areas to be restored for wildlife habitat, *if applicable*;
 - areas that are appropriate for open space, trails, parks and recreational uses, and are identified on the County's open space and recreational plans;
 - the site's final topography;
 - proposed post-mining land uses, consistent with the zoning of the land; and
 - site restoration phases.
- (~~4~~12) A site evaluation including:
- wildlife impact analysis conducted in conjunction with the Colorado Division of Wildlife;
 - independent assessment of the historic, archaeological, or paleontological value of the site;
 - drainage studies as required by the Public Works Department, including an erosion and sedimentation control plan, a Phase I drainage report at initial submittal, and a Phase III drainage report prior to each phase;
 - a transportation study that identifies transportation routes, number of trips, critical intersections, traffic volumes, and transportation system improvements necessitated by the application;
 - a visual analysis that documents the visibility throughout the life of the operation; identifies visually sensitive areas and the expected impact at those locations; and lists visual impact mitigation measures; and

- a copy of all information submitted to the Division of Minerals and Geology, Colorado Department of Natural Resources.

2107.33 Motel: CMTY and D zone districts

2107.34 Motorsports Facility, Private: A-1 zone district *(Amended 4/26/16)*

2107.34.1 All components of the Private Motorsports Facility shall be located a minimum of 200 feet from all property lines. Additional setbacks may be required if necessary to mitigate noise impacts.

2107.34.2 Noise generated by the Private Motorsports Facility use shall comply with the limits established in Section 1703A of the Noise Overlay District (“noise standard”).

2107.34.3 A noise study shall be submitted demonstrating that the proposed facility can be designed and operated in such a manner as to ensure ongoing compliance with the noise standard.

2107.34.4 Maximum land area devegetated, including devegetation resulting from the Private Motorsports Facility, shall comply with the limits established in Section 24, Animals.

2107.34.5 In addition to the management plan components specified in Section 2112, operational limitations for the Private Motorsports Facility shall address the following:

- (1) Maximum number of concurrent motorsports vehicles in use
- (2) Hours and days of use
- (3) Specific mitigation measures to limit visual impacts of the Private Motorsports Facility from public roadways and abutting properties; and
- (4) Specific limitations or mitigation measures to ensure compliance with the noise standard and recommendations of the noise study.

2107.35 Natural Medicine Business. A Natural Medicine Business shall be located a minimum of 1,500 feet from any:

- A residential zone district (LRR, RR, ER, SR).
- Dwelling.
- Church, park, or library.
- State-licensed day-care facility.
- School or educational facility, serving persons age 18 or younger.
- Property within an incorporated area.

The distance between any Natural Medicine Business and any dwelling, church, park, library, day-care facility, school, residential zone district, or incorporated area shall be measured in a straight line, without regard to intervening structures or objects, from the nearest portion of the building or structure used as part of the premises where the Natural Medicine Business is conducted to the nearest lot line of the premises of the dwelling, church, park, library, day-care facility, or school or the nearest boundary of a residential zone district or incorporated area.

2107.35.1 Healing Center: B, C, LI, and GI zone districts.

• Additional Requirements:

- Hours of Operation: Between 8:00 a.m. and the next 5:00 p.m.
- Days of Operation: Monday through Friday
- A Healing Center shall be located no further than 5 miles from a hospital, emergency medical care center, urgent care center, or other such medical treatment facility, unless such services are available at the Healing Center.
- Within 14 days of the Director's execution of the approval certificate for a new Healing Center, staff shall provide written notice of the approval to the Douglas County Sheriff's Office, Douglas County Health Department, and any facility providing emergency medical care located within 5 miles of the Healing Center.

2107.35.2 Cultivation Facility: LI and GI zone districts.

• Additional Requirements:

- Hours of Operation: Between 8:00 a.m. and the next 5:00 p.m.
- Days of Operation: Monday through Friday.

2107.35.3 Products Manufacturer: LI and GI zone districts.

• Additional Requirements:

- Hours of Operation: Between 8:00 a.m. and the next 5:00 p.m.
- Days of Operation: Monday through Friday.

2107.35.4 Testing Facility: LI and GI zone districts.

- Hours of Operation: Between 8:00 a.m. and the next 5:00 p.m.
- Days of Operation: Monday through Friday.

2107.35.5 Any other Natural Medicine Business licensed by the State Licensing Authority: LI and GI zone districts.

• Additional Requirements:

- Hours of Operation: Between 8:00 a.m. and the next 5:00 p.m.
- Days of Operation: Monday through Friday.

2701.36 Oil or gas drilling operation: A-1 zone district provided such use is located a minimum of 100 feet from any lot line

2107.376 Propane distribution/storage: GI zone district

2107.387 Recreation facility – community: A-1, LRR, RR, ER, SR, MF, MH, CMTY, and D zone districts, provided all structures within A-1, LRR, RR, ER, SR, and MF zone districts are located at least 50' from all lot lines or the zone district minimum setback, whichever is greater

2107.398 Recreation facility – indoor: CMTY and D zone districts

2107.4039 Recreation facility – neighborhood: CMTY and D zone districts

2107.410 Recreation facility – outdoor: CMTY and D zone districts

2107.424 Recreation facility – private: CMTY and D zone districts

2107.432 Recycle/trash transfer facility: LI and GI zone district provided all recycling or trash transfer activities are conducted within an enclosed structure.

2107.443 Residence:

For new residential units in the B, C, LI, GI, or MI zone districts, school and park land dedications shall be provided in accordance with the Douglas County Subdivision Resolution, as amended.

- Caretaker – LRR zone district – 1 per lot
- Mobile home – 1 per parcel/lot in the A-1 zone district when a principal dwelling does not exist on the property
- Multifamily – B, C, and MI zone districts
- Single-family attached or multifamily – LI and MI zone district

2107.454 Religious retreat: A-1 zone district.

2107.465 Satellite earth station: A-1 zone district, and in LI and GI zone districts when the equipment exceeds the height limitation or the minimum health standards.

2107.465.1 In addition to the exhibit requirements contained in this Section and Section 27, a report describing the satellite earth station shall be included with the application. The report shall include the following:

- (1) Discussion of proposed number, height, and types of satellite dishes to be accommodated
- (2) Description of output frequency, number of channels and power output per channel for each proposed antenna (if applicable)

- (3) A letter from the applicant stating that an intermodulation study, if required, has been conducted and concludes that no interference problems are predicted
- (4) A five-year plan for the use and estimated life of the proposed telecommunication facility
- (5) A narrative from the applicant identifying technologically feasible locations (search ring or rings) for the proposed facility, and justifying the proposed location to the satisfaction of the County
- (6) A copy of the FCC license and a commitment statement from the applicant to maintain compliance with all FCC regulations, standards, and requirements regarding both radio frequency interference (RFI) and radio frequency radiation (RFR)
- (7) Statement that the proposed facility will be in compliance with all FAA regulations and applicable federal requirements including, but not limited to, those associated with the National Environmental Protection Act (NEPA) as amended, and the National Historic Preservation Act (NHPA) as amended

2107.4~~76~~ Sawmill – portable: A-1 and LRR zone districts, provided that such use is located at least 100 feet from all lot lines. A portable sawmill is permitted only as accessory to a principal use.

2107.4~~87~~ Septic waste and domestic sludge application: A-1 and LRR zone districts, with the approval of the Colorado Department of Health, when any of the following apply:

2107.4~~87~~.1 Liquid dewatered or semi-dewatered sludge, as defined by the Colorado Department of Health Domestic Sewage Sludge regulations, would be applied on the soil surface or would be incorporated into the soil at a depth which does not completely cover the sludge. Dried sludge is not subject to this provision.

2107.4~~87~~.2 More than 10 delivery vehicles would be transporting sludge to the site in any 24-hour period.

2107.4~~87~~.3 More than 50,000 gallons of liquid sludge, or 200 cubic yards of any sludge, not defined or transported as a liquid, would be applied to the site in any 24-hour period.

2107.4~~87~~.4 Permanent structures or facilities for further processing, treating or dewatering sludge would be constructed or associated with the site and the application of sludge material.

2107.4~~98~~ Telecommunication facility: A-1 zone district; and in LI and GI zone districts when the equipment exceeds the height limitation or the minimum health standards.

2107.4~~98~~.1 In addition to the exhibit requirements contained in this Section, a report describing the telecommunication facility shall be included with the application. The report shall include the following:

- (1) Description of the height, design and elevation of the proposed support tower with a cross section view and description, and a statement as to whether the tower will be structurally designed to accommodate future antennas
- (2) Description of height for all potential mounting positions for antennas. If the support tower is designed for collocation, the minimum separation distances should be shown and noted as possible future antenna locations
- (3) Discussion of proposed number, height, and types of antennas to be accommodated through this application
- (4) A letter from the applicant stating that an intermodulation study, if required, has been conducted and concludes that no interference problems are predicted
- (5) A description of the use and estimated life of the proposed telecommunication facility including additional development and coverage anticipated to meet projected service needs
- (6) A narrative from the applicant identifying and justifying technologically feasible locations (search ring or rings) for the proposed service, and demonstrating to the satisfaction of the County, that the proposed service cannot be accommodated on an existing or approved support tower located within a five mile radius
- (7) The results of the RF drive test, certified as currently in calibration and traceable to National Institute of Standards and Technology, if it was undertaken to verify technologically feasible locations
- (8) Copy of the FCC license and a commitment statement from the applicant to maintain compliance with all FCC regulations, standards, and requirements regarding both radio frequency interference (RFI) and radio frequency radiation (RFR)
- (9) Statement that the proposed facility will be in compliance with all FAA regulations as demonstrated by the response to the "Notice of Proposed Construction or Alteration" or equivalent, unless certified by a qualified, licensed engineer that FAA review and approval is not required
- (10) Statement that the proposed facility will be in compliance with applicable federal requirements including, but not limited to, those associated with the National Environmental Protection

Act (NEPA) as amended, and the National Historic Preservation Act (NHPA) as amended

- (11) When required, a letter of intent, in a form approved by the County, committing the support tower owner, its successors or assigns, to allow collocation of the facility under market terms, rates, and conditions
- (12) A Visual Impact Assessment (VIA) demonstrating that the proposed location is in compliance with the criteria contained in Subsection 2107.37.3
- (13) The County may require that an independent, outside consultant be retained, at the applicant's expense, to perform evaluations pertaining to compliance with regulations, standards and requirements stipulated
- (14) The Director may waive or modify one or more of the aforementioned information requirements based on design, size, or overall impact of the proposed facility

2107.498.2 A Visual Impact Assessment (VIA) shall be prepared in accordance with the VIA process contained in Appendix D of this Zoning Resolution.

2107.498.3 In addition to the approval standards stipulated in Subsection 2102, proposed telecommunication facilities shall be located and designed in accordance with the following criteria:

- (1) Proposed telecommunication antennas shall be located on existing support towers where feasible and where the visual impacts are minimal.
- (2) The facility shall be sited to minimize impact on the environment and wildlife in the region.
- (3) The facility shall be sited to fade into the predominant backdrop of the vicinity by complementing other features and forms in the backdrop landscape.
- (4) All elements of the facility shall be designed and constructed to result in minimal visual impact. Elements shall be constructed of non-reflective materials that are typical in style and color to area buildings, structures or the backdrop landscape.
- (5) All elements of the facility, including but not limited to the accessory equipment, shall be camouflaged or screened from viewer groups as identified in the VIA. Where proposed, fencing shall be designed to minimize visual impacts.
- (6) Access to the facility shall be designed to minimize land disturbance, (including cut and fill), and visual impacts.
- (7) The height of any tower or structure shall be no greater than the distance to the nearest lot line or lease area, except engineered

structures which shall be in compliance with the zone district setback.

2107.4~~98~~.4 The property owner shall be responsible for removing all elements of the telecommunication facility including, but not limited to, antennas, buildings, accessory equipment, driveways and fencing if the facility becomes technologically obsolete or ceases to perform its intended function for a period of 180 consecutive days. This removal shall be completed within 90 days of the end of such 180-day period. The site shall be restored to replicate the existing surrounding vegetation.

2107.5~~04~~9 Theater – indoor or outdoor: CMTY and D zone districts

2107.5~~10~~ Utility – Major Facility: In all zone districts, except GI, provided that the setback requirements of the zone district in which the facility is proposed to be located are met, or such additional setbacks or requirements as the Board determines necessary. Maximum heights and lot area shall be determined through the use by special review process specific to each site.

Final action by the Board must be rendered within 90 days after the submittal date for a Utility Major Facility of a public utility providing electric or natural gas service, unless the provider and the County reach agreement on an amended time period. [§29-20-108 C.R.S.]

Wastewater Facility: Site approval is required by the Colorado Department of Public Health and Environment.

Water Storage/Treatment Facility and/or Appurtenance(s), except for Major Reservoirs, located within the following areas are exempt from the requirement for a use by special review application:

- Municipal Planning Areas (MPAs) designated by Douglas County Comprehensive Master Plan;
- Separated Urban Areas (SUAs) designated by the Douglas County Comprehensive Master Plan;
- Primary Urban Area (PUA), designated by the Douglas County Comprehensive Master Plan;
- Potential Town Urban Service Area as depicted in the Castle Rock and Douglas County Intergovernmental Agreement;
- Urban Service Area as depicted in the Town of Parker and Douglas County Intergovernmental Agreement;
- Facilities approved as part of a special district's service plan, which are located and serve property within the boundaries of such special

district described in its service plan and any subsequent inclusion orders.

2107.5~~24~~ Veterinary clinic or hospital: A-1, LRR, and RR zone districts, provided that such uses are located 100 feet from all lot lines

2107.5~~32~~ Wind energy conversion systems up to 100 kilowatts: A-1, LRR, and RR zone districts as follows:

2107.5~~32~~.1 In addition to the plan exhibit required in Section 2112, herein, the plan exhibit shall include the following:

- Location of all above ground utility lines
- Location of trees or other vegetation on site, described by size and type

2107.5~~32~~.2 The maximum tower height shall be 120 feet. The minimum distance for any portion of the rotor or blades from the ground beneath the system shall be 30 feet.

2107.5~~32~~.3 The supporting tower shall be set back from all property lines and overhead utility lines at least the height of the tower, except engineered structures which shall be in compliance with the zone district setback.

2107.5~~32~~.4 Climbing access to the structure shall be limited either by means of a 6 foot high fence around the tower base with a locking gate, or by limiting tower climbing apparatus to no lower than 12 feet above the ground.

2107.5~~43~~ Zoo: C zone district

2108 Submittal Prerequisite

The applicant shall attend a presubmittal meeting with the Planning Services Division to discuss the request and the submittal process and requirements for a new use by special review or an amendment to an approved use by special review.

A proposed amendment to an approved use by special review may be considered in accordance with the procedures identified herein. An amendment to a use by special review shall be considered through an administrative process when the Director determines that the change does not represent a substantial increase in the intensity of the use or impacts to the neighborhood. This type of amendment shall be referred to as an administrative use by special review amendment.

If the Director determines that the proposed amendment to an approved use by special review does represent a substantial increase in the intensity of the use or impacts to the neighborhood, the proposed amendment shall be subject to the same submittal and