PALOUSE BASIN AQUIFER committee

University of Idaho | PO BOX 443301
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208.885.6429
pbac@uidaho.edu | uidaho.edu/pbac

July 16th, 2020 Meeting Minutes

Moscow, UI Facilities Management, Jacks Creek Meeting Room (Video-Conference)

Attendance
X: In-person attendance
V: Video conference attendance

	UI: Alan Kolok, IWRRI, Director	V	WSU: Jeff Lannigan, Facilities Services
X	UI: Eugene Gussenhoven, Utilities & Engineering Director	V	WSU: Jason Sampson, Assistant Director, Environmental Services
V	Moscow: Tyler Palmer, Deputy Director Operations	V	Pullman: Cara Haley, City Engineer
	Moscow: Anne Zabala, City Council Member		Pullman: Kevin Gardes, Director of Public Works
V	Moscow: Mike Parker Water Utility Manager		Pullman: Eileen Macoll, City Council Member
V	Latah County: Paul Kimmell (Chair), Citizen/County Representative	V	Whitman County: Mark Storey, Public Works Director/County Engineer
V	Latah County: Tom Lamar, County Commissioner	V	Whitman County: Art Swannack, County Commissioner

Visitors and Others:
Chris Beard (V), Washington Department of Ecology; Colt Shelton (V), JUB Engineers; Robin Nimmer (V), Alta Science and Engineering; Zena Hartung (V), Citizen of Moscow; Adam Fredrick (V), Department of Water Resources; Gene Elliot, Citizen, PBAC; Korey Woodley (X), PBAC.

Action items indicated by: **
Action items where vote is required indicated by: ***

Call to Order:

Paul Kimmell called the meeting to order at 2:00 PM. Kimmell conducted introductions.

1) **Approval of June 18th, 2020 Meeting Minutes**

Tyler Palmer made a motion to approve June 18th, 2020 meeting minutes with suggested edits. The motion was second by Tom Lamar. ***June 2020 meeting minutes were approved by consensus.

2) **Public Comment for Items not on Agenda:** None.

3) **Presentations/Discussion:**

- **RFP Update:** Tyler Palmer reported that the RFP Review Subcommittee reviewed all four proposals. Palmer said that the subcommittee went into negotiations with Alta Science and Engineering. Palmer reported that Alta Science and Engineering presented a Scope of Work and Budget to the subcommittee that was approved. Palmer said that the next steps are to get funds transferred from PBAC through UI, and then a contract would be signed with the City of Moscow.
    - **Anchor QEA Project Update:** Korey Woodley shared a list of documents previously provided by Anchor QEA. She shared that they were put in an online document folder for a smooth transfer to Alta Science and Engineering. Woodley reported that Anchor QEA is also working on an additional document that will be added to the executive report and summary on the Palouse water alternatives. Woodley reported that the goal of the new document will be to provide an update on the progress of the Palouse Water Alternatives project since the original report was produced.
- **LEAP Update:** Woodley said that a final LEAP report should be available next month. Woodley asked a few committee members to participate in sending out a final request email to people who have not yet responded to the LEAP survey invitation.
- **Palouse Wastewater Plan, letter:** Paul Kimmell shared a letter written to the Washington Department of Ecology regarding the Palouse Wastewater Plan (attached below).

4) **Unfinished Business**

- **Subcommittee updates:**
    - **Research –** Woodley reported that the new graduate student on the project is working on the model scenarios and that she would follow up about the progress.
    - **Communications –** Paul Kimmell said that they would have a SEG contact list put together before the next meeting and that they will plan an alternative online launching event.
    - **Budget Committee –** Korey Woodley shared the Budget Report and asked committee members to send her any final recommendations for edits or content before the committee approves it at a later meeting.

5) **Budget – Korey Woodley:** Woodley presented the budget/account details from July 16th, 2020.

6) **Other Reports and Announcements as Time Allows –**

- **Next PBAC Meeting – Thursday, August 20th, 2020, 2:00 PM, Location TBD**

7) **Adjourn at 2:40 PM**

Korey Woodley, PBAC Executive Manager

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June 25, 2020

Brook Beeler
Eastern Region Director
Washington Department of Ecology
4601 N Monroe Street
Spokane, WA 99205

Re: City of Palouse Wastewater Facility Plan Groundwater Needs

Dear Ms. Beeler,

Greetings from the Palouse Basin Aquifer Committee (PBAC). First, we wanted to thank you and all the staff at the Washington Department of Ecology for protecting and managing Washington's water resources. Additionally, we continue to appreciate your agency's expertise and participation in our efforts to manage and stabilize our regional groundwater supplies here on the Palouse.

Recently, the City of Palouse Wastewater Facility Plan and proposed/recommended actions (March 2020) was brought to our attention, and given the potential use of regional groundwater supplies, we'd like to provide Ecology with comments about their proposal.

The Palouse Basin Ground Water Management Plan (GWMP) was adopted in 1992 in accordance with the interagency agreement between the Idaho Department of Water Resources and the Washington Department of Ecology to administer the groundwater within the Palouse Basin. PBAC adopted the plan and continues to operate within its framework. The primary objective of the 1992 Plan is "to ensure stable ground water levels in the aquifer system by limiting annual increases in ground water withdrawals." Please know that we and our respective entities continue to be committed to this goal. (Visit: www.palousebasin.org to view the GWMP and annual pumping data.)

Chapter 6 of the GWMP includes a set of goals. One goal is "to review and make recommendations on all water use or land use applications whose anticipated impact on the ground water system potentially lies outside the stated goals of the plan or policies adopted by the member entities." Another goal involves annual water use increases, "the committee adopts the standard that the two universities (WSU and UI) and two cities (Pullman and Moscow) shall attempt to limit their annual aquifer pumping increases to one percent (1%) of their pumping volume based on a five (5) year moving average starting with 1986."

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While the City of Palouse was not a signatory to the 1992 GWMP and at the time, the thought was that the City was outside the Basin boundaries, current evidence indicates that the City is likely within the Palouse Basin. Additionally, the City of Palouse has participated in and contributed funding for PBAC's efforts regularly since 2006. We do appreciate this support and their commitment to carefully managing their community's water resources.

As PBAC understands it, the preferred alternative for meeting a 2013 temperature TMDL requirement in the City of Palouse Wastewater Facility Plan (Plan) would result in a greater than 1% increase in pumping. Therefore, PBAC members agreed that it was important to comment to Ecology on this matter.

According to the Plan, the preferred alternative involves blending domestic groundwater with effluent. It states that the blending will require 22.4 GPM for the months of July, August, and September. This is approximately 2.94 million gallons annually. For the period from 2015 to 2019, the five-year-trailing-average water use for the City of Palouse has been 51.45 million gallons. The proposed blending water is equivalent to a roughly 5.7% increase to the City's annual water use.

The City's blending proposal is required by a temperature TMDL that indicates a maximum effluent temperature of 21.5º C, or 21.6º C, which is lower than the actual river temperature at the Potlatch Gauging Station during the summer season. It appears that in the Wastewater Facility Plan, the highest effluent temperature is 26º C and the highest river temperate is 28.9º C. If this is correct, the unblended effluent would cool the river rather than warm the river.

Since the currently favored nitrogen reduction plan involves seasonally storing effluent and not releasing it into the river, the blending proposal, if it begins in 2024, will at best provide river cooling for 7 years (2024 – 2030), at which point it will no longer be needed. The expenses related to designing, constructing, and maintaining such a short-term solution, as well as the harm done to the currently unsustainable groundwater system should be considered before selecting an alternative.

In terms of groundwater availability, Ecology has in the past indicated that little or no water is available in the Palouse Basin (WRIA 34) for new water uses. This is consistent with extensive evidence that even though water demand on the Palouse has decreased over the past 20 years, groundwater levels have continued to decline. The Plan indicates that, although the amount of water proposed to be withdrawn by the blending project falls within existing City water rights, the instantaneous withdrawal amount may exceed existing water rights unless additional storage/management is provided. This would result in either additional expenses incurred to

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provide additional storage/management, or a violation of existing water rights and the need for a new right(s) to accommodate the increased withdrawals.

Taken together, the effluent blending proposal simply provides a partial, temporary solution to river temperature concerns. In addition, it harms our Region's fragile, unsustainable groundwater resources. It represents a solution aimed specifically at improving a single component of the environment (surface water temperature), but at the same time has the potential to harm other components (air, ground water supply, and human). While PBAC certainly does not profess to be experts in these kinds of matters, we do pay attention to our regional water supplies and how they may be impacted in the future.

Therefore, we respectfully request that the Washington Department of Ecology reconsider this proposal from a broader perspective. Within the Plan it was implied that at some point a water quality variance might be a possible alternative. It might be worthwhile taking a second look at whether the right time is now.

We applaud the City of Palouse and their continued commitment to carefully manage their water and waste water systems and this letter is not intended to criticize the great work they are doing. Our interests and motivation for this letter are strictly concerned about our region's groundwater supplies. We look forward to our strong collaborative partnership with Ecology as we continue to pursue additional water supplies as well as stabilize our existing Palouse Basin groundwater resources in the years ahead. Please contact us if you have any questions.

Sincerely,

Paul Kimmell
Chair, Palouse Basin Aquifer Committee

CC (electronic)
Jeff Lannigan, Vice-Chair, PBAC
Patrick Cabbage, Ex-officio WDOE for PBAC
Kyle Dixon, Clerk, City of Palouse

PALOUSE GROUNDWATER BASIN ALTERNATIVE WATER SUPPLY PROJECT: PROJECT MANAGEMENT SERVICES

Submitted to:

City of Moscow
Attn: Tyler Palmer, Deputy City Supervisor
PO Box 9203
Moscow, Idaho 83843

Alta
Science & Engineering, Inc.

May 29, 2020

Tyler Palmer, Deputy City Supervisor
City of Moscow
PO Box 9203
Moscow, Idaho 83843

Subject: Palouse Groundwater Basin Alternative Water Supply Project: Project Management Services

Dear Mr. Palmer and Members of the Palouse Basin Aquifer Committee (PBAC):

PBAC and its respective partners have worked hard for years advancing the understanding of our regional aquifers and continuing progress towards a long-term solution to the Palouse Basin's water supply needs. Knowing that water on the Palouse is *essential*, PBAC recently developed four viable water supply alternatives via the Palouse Groundwater Basin Water Supply Alternatives Analysis Project. It is time to convert this valuable body of work into a solution for our region.

The aim of the Project Management Services contract is to confidently refine the alternatives into a viable, equitable, affordable, and resilient water supply project that our community and funding partners support. To fully serve the project goals for you, Alta Science and Engineering (Alta) is partnering with a national water resource leader, Jacobs, and two water rights experts. Alta's team provides tremendous depth and breadth of technical resources and is led by local project management.

With a mindset to deliver an actionable alternative(s) on schedule and on budget, our team provides you with five essential benefits:

1. An experienced, local project manager familiar with PBAC, your goals, the basin, and water issues, ready to focus on your project needs to **meet the December 2021 schedule without undue time demands on PBAC members.**
2. A full-service team offering over 10 years of relevant service in this basin, providing you **technically sound, implementable water supply solutions.**
3. Creative sequencing of interim water supply alternative projects offering **options and the best value.**
4. Effective stakeholder engagement, implementing an open, transparent process that **cultivates a coalition of support for the selected alternative(s).**
5. Valuable relationships with state agencies and experience securing funding, **providing you with a funding strategy that is aligned to the funding capacity and requirements.**

I, too, want to be completely confident in the path we choose because our water future is linked to the outcomes of these decisions. As the proposed Project Manager, I commit to keeping you fully in control of your project while also driving the project forward to get through big decisions that will shape the future of our region's water supply. Our team will provide very credible, data-driven information to you for confident decisions.

In Section A of our proposal we describe the team, qualifications, and experience that directly contribute to this project's success. In Section B, we present a thorough yet manageable approach that addresses the major challenges we have discussed over the last few years. We understand that stakeholders have unique needs and expectations. The process we propose ensures that all concerns are considered and addressed in a transparent and equitable manner. This approach can be completed within the time frame (as illustrated in Section C) using the proactive management program (described in Section E), and presented in a quality deliverable following our quality control procedures (described in Section F).

I have seen first-hand your dedication and passion toward securing a water supply that will extend into the distant future – and doing it the right way. The Palouse water supply is a local problem, and we are committed to serving as part of the local solution. Our team brings a broad suite of water resource capabilities including water rights, funding, hydrogeology, and even alternative modification capabilities, if needed.

We are proud to have worked with you in the Palouse Basin for over 10 years. We bring a solid understanding and respect for PBAC's goals and unique regional challenges, and we meet your project management needs with local leaders. As a local firm, we value the relationship we have developed with you and are personally invested in seeing this project though to a successful completion.

Please contact me with any questions or concerns at 208-301-2078 or *Robin.Nimmer@alta-se.com.*

Sincerely,

Robin Nimmer, Ph.D., PG, LG, Project Manager
Alta Science and Engineering, Inc.

A. DESCRIPTION OF FIRM

Our goal is to provide PBAC with confidence in a viable water supply solution and a coalition of support to present to the Idaho Water Resource Board. It is time to take action, and we are ready.

To move the water supply alternatives described in March 2017 *Palouse Groundwater Basin Water Supply Alternatives Analysis Report* (WSAA report) to an action stage, the Palouse Basin Aquifer Committee (PBAC) needs a team with the project management skills to push forward complex technical issues, provide outreach assistance to gather community support, leverage technical expertise to develop interim projects and fill outstanding data gaps, and develop a funding strategy.

Our team is 100% locally managed from Moscow, leveraging the strength and resources of a global water resource leader and two trusted specialty partners.

We provide a strong local Project Manager who is fun to work with and committed to guiding this project through a very critical decision-making process. Our teaming partners come with world-class water resources credentials and the experience from people who have planned, designed, built, and operated major water supply projects. Our water-rights specialists are here to navigate fatal-flaws and the complexities of interstate water agreements to keep making progress on this issue. This team is capable of not only accomplishing the scope of work in the Project Management contract, but we provide the resources to help guide the project towards funding and implementation of a water supply solution for our region.

FIRM PROFILES

Local Roots, Industry Experts

- ✓ *History on Similar Projects*
- ✓ *Palouse Basin Hydrogeologic/Water-Related Engineering Experience*
- ✓ *Columbia Plateau Hydrogeologic/Water-Related Engineering Experience*
- ✓ *Large-Scale Water Supply Project Experience*
- ✓ *Idaho & Washington Water Resources Experience*

Alta Science and Engineering, Inc. (Alta) will be the Prime consultant and lead the team. Alta is a multi-discipline science and engineering firm that was founded with a passion for providing intelligent project solutions. Locally committed since 1984, Alta was formed in 2017 through a corporate reorganization and split off that retained a 33-year history of providing quality consulting solutions to local, state, federal, tribal, and private clients. Now with three primary offices, four satellite offices, and 45 employees, Alta works in five states on hundreds of contracts with the proven infrastructure to support this contract.

We are proud of our commitment to the Palouse by providing jobs, giving back charitably, and always doing what's right for the long-term benefit of the community. Being local with an intimate knowledge of the regional water supply challenges on the Palouse is a bonus. We are teamed with Jacobs for their technical and funding expertise with PBAC's long-term success in mind. We can provide PBAC with a seamless transition from project management to funding package to the design/construction phases (and beyond, with operation and maintenance [O&M] strategy development if desired).

Jacobs. Jacobs brings water supply project and funding expertise to the team, along with a rich history of planning and delivering water supply projects through traditional design-bid-build, design-build-operate, GC/CM, and similar alternate delivery means. Jacobs offers the expertise and depth of staff on large-scale water supply and water related engineering projects—spanning a 65-year history completing planning, environmental, and design projects in the Columbia River Basin. With offices in the northwest United States and across the globe, Jacobs brings the relevant experience and skills necessary to provide a wide range of services and can use resources as necessary to accomplish projects of any size.

McCormick Water Strategies (McCormick). McCormick is our team's Washington water rights expert. McCormick is a Central Washington-based natural resources consulting firm with a strong understanding and working knowledge of water law, case law, water resource policy, and environmental regulations from over a decade of experience in water resources across Washington State in the public, private, and non-profit sectors.

SPF Water Engineering (SPF). SPF is our team's Idaho water rights expert. SPF is a full-service water, wastewater, and hydrogeologic consulting firm based in Idaho with a history of supporting the Palouse Basin. SPF and Alta's personnel have partnered for more than a decade. SPF's core competencies include water right research and consulting; groundwater exploration, supply development, and monitoring; well and pump system construction; public water system design and regulatory

compliance; grant applications and project funding; water treatment; wastewater treatment, design, and reuse; site civil engineering; and construction services.

RELEVANT PROJECT EXPERIENCE

The following three projects demonstrate relevant local experience, experience with large-scale water supply projects, and experience with multi-state water resource issues. The matrix following the three projects highlights these and eight additional water resource and supply projects our team has successfully completed:

CITY OF MOSCOW, SURFACE WATER RESERVOIR FEASIBILITY STUDY, ID

Project Dates: 2010-2014
Contact: Gary Riedner, City Supervisor, 208-883-7000, *griedner@ci.moscow.id.us*

This project demonstrates prior involvement with regional water supply planning for the Palouse. Alta served as Project Manager for experts including professionals in water rights, hydropower, pipelines, environmental, and water supply from both academia and industry. The study informed decision makers about the greater benefits that a larger, regional-scale supply alternative could have for the communities currently demanding approximately 7,400 acre-feet of water per year.

- *Compiled and reviewed water-demand projections for the cities of Moscow and Pullman for comparison with regional surface-water supply alternatives.*
- *Identified and evaluated potential aquifer storage and recovery (ASR) strategies and compared surface water reservoir options against river diversions or reuse.*
- *Managed the consultant team (SPF), providing complete deliverables on-time and on-budget.*

WALLA WALLA WATERSHED MANAGEMENT PARTNERSHIP, FLOW STUDY, WA & OR

Project Dates: 2018-2019
Contact: Chris Hyland, Executive Director, 509-524-5217, *chris.hyland@wwcc.edu*

This project demonstrates experience with a large-scale, multi-state water resources project. Jacobs was selected to help support the client's goal to improve flows in the mainstem Walla Walla River for native fish species while maintaining the long-term viability and water availability for irrigated agriculture, residential, and urban use. This phase of the Flow Study builds on nearly 20 years of planning and study by numerous entities in the Walla Walla Basin and includes detailed investigation of the feasibility of selected alternatives, identifying and filling data gaps, identifying and refining the focus of preferred alternatives, and initiating the environmental review process to identify one Preferred Alternative. Jacobs' work emphasized support for a new reservoir or pump exchange anchor project complemented by conservation, managed aquifer recharge, and aquifer storage-recovery.

KITTITAS RECLAMATION DISTRICT (KRD), YAKIMA BASIN AQUIFER RECHARGE ASSESSMENT GRANT APPLICATION, WA

Project Dates: 2018-2019
Contact: Urban Eberhart, Secretary/Manager, 509-925-6158, *urban@krdistrict.org*

This project demonstrates recent State of Washington groundwater recharge, funding support, and large-scale conservation experience. Jacobs prepared the grant application package for State funding assistance through the Washington Department of Ecology Grants 2018-2019 Funding Opportunity Agreement. KRD applied for and received $389,100 in State funding assistance. The KRD project involves conserving approximately 123,000 acre-feet (ac ft) of water annually. KRD is investigating the potential for managed aquifer recharge opportunities throughout the Yakima Basin to identify cost-effective alternatives that can be incorporated into the overall conservation, habitat, and water management program.

CLIENT *(State)*	PROJECT *(Firm)*	DATES	On-Schedule	Water Resource Planning	Funding Support	Stakeholder Management	Palouse Basin/ Columbia Plateau	PROJECT HIGHLIGHTS
PBAC *(ID, WA)*	Framework Study and Follow-on Projects *(Alta)*	2009-2012	✓	✓		✓	✓	▪ *Project management, multiple interrelated water resource projects*
Elmore County *(ID)*	Water Supply Alternatives Study/WR *(SPF)*	2009-2014	✓	✓		✓		▪ *Developed alternative supply sources for Mountain Home Management area.* ▪ *Conceptual design of recharge, conveyance* ▪ *Led water right acquisition and permitting*
City of Moscow *(ID)*	Surface Water Reservoir Feasibility Study *(Alta, SPF)*	2010-2014	✓	✓		✓	✓	▪ *Project management* ▪ *Considered range of surface water options, stream diversions, ASR, water quality*
City of Moscow *(ID)*	Brownfield Project, Phase I and II Environmental Site Assessments *(Alta)*	2011-2013	✓			✓	✓	▪ *Project management; community, city, and state involvement; environmental site investigations*
Twin Falls Canal Company *(ID)*	Kinyon Pond Re-regulation Reservoir WaterSMART Grant Application *(Jacobs)*	2012-2013	✓	✓	✓	✓		▪ *Successful grant brought $295,000 in Federal funding* ▪ *Project consisted of new re-regulating reservoir and appurtenant structures to meet variable water demands*
Yakima-Tieton Irrigation District *(WA)*	N. Fork Cowiche Creek Reservoir Study *(Jacobs)*	2013-present	✓	✓		✓	✓	▪ *35,000 ac.ft reservoir planning modeling, concept design, financial analysis*
Ralston Hydrologic Services, IDWR *(ID)*	Lewiston Plateau Hydrogeology Study *(Alta)*	2016-2017	✓	✓		✓	✓	▪ *Hydrogeologic investigation; community, entity, and state involvement* ▪ *IWRB Funding*
Yakama Nation *(WA)*	Melvin R. Sampson Coho Facility *(McCormick)*	2016-2018	✓	✓			✓	▪ *Conjunctive use groundwater and surface water rights*
City of Moscow *(ID)*	Water Rights Consulting Project *(SPF)*	2017-2019	✓	✓		✓	✓	▪ *Successfully integrating the City's municipal water rights* ▪ *Confirmed City's current water rights portfolio sufficient to meet current and 50-yr future water*
Kittitas Reclamation District *(WA)*	Yakima Basin Focused Managed Aquifer Recharge Assessment Grant Application *(Jacobs)*	2018-2019	✓	✓	✓	✓	✓	▪ *Managed extensive stakeholder involvement* ▪ *Prepared grant application package for funding assistance through the Washington Department of Ecology*
Walla Walla Watershed Management Partnership *(WA, OR)*	Flow Study *(Jacobs)*	2018-2019	✓	✓		✓	✓	▪ *Reservoir evaluation, modeling concept design, and cost estimating*

B. PROJECT APPROACH

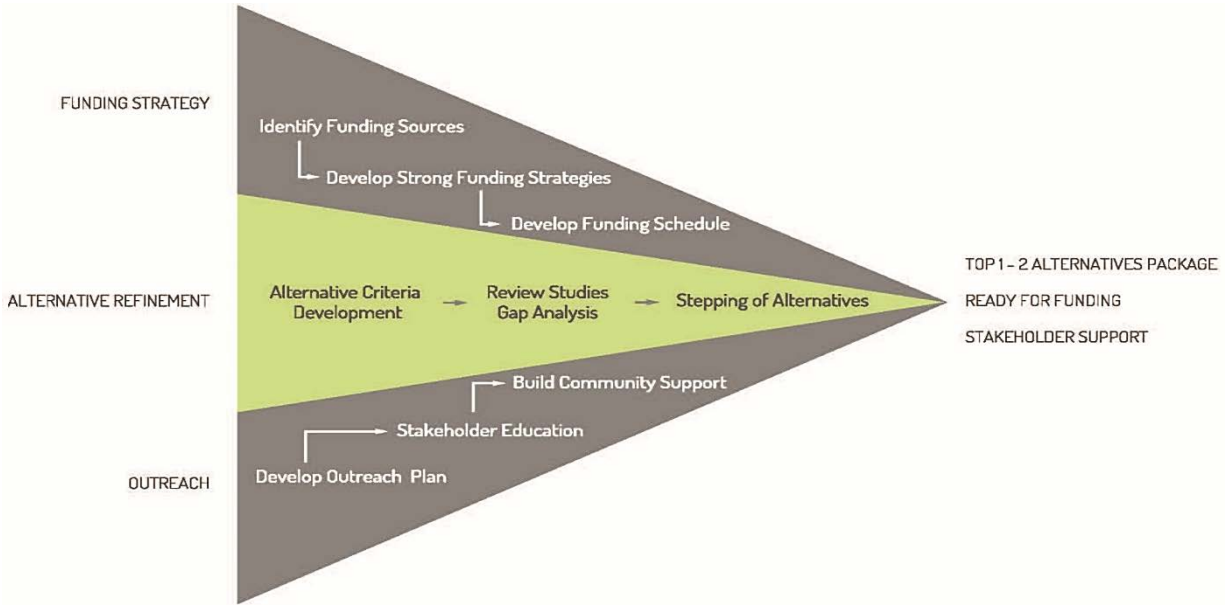
From contract management to preferred supply alternative(s), our approach keeps agency fundability at the forefront of this project.

The timeline is tight and the project complex. As members of PBAC, you have hard decisions to make that will influence the resiliency of our region's water supply for this generation and the next. Our approach supports an aggressive pivot from planning and research to action. Our goal for the outcome of this project is for you to confidently present the IWRB with a project that is practically and technically solid. This section describes our approach to get you there.

The Palouse Groundwater Basin has supplied water to generations of people and spans across state lines. Unfortunately, this water supply has been declining for over a decade. PBAC has taken on the mission of ensuring a long-term, quality water supply for the Palouse Basin region. In 2015, PBAC took action and contracted with a team to evaluate and update previously studied water supply alternatives where four options were selected as the most promising.

We need to refine the four water supply alternatives into one or two viable alternatives to help meet future water demands, while meeting the respective objectives of PBAC member organizations, gaining a coalition of support, and ultimately be successfully permitted, funded, and constructed. The specific objectives for this project as we understand them are:

- Support PBAC in its outreach efforts to garner a coalition of community support of the proposed alternative(s).
- Support PBAC in its technical efforts by refining the water supply alternatives into interim steps and supporting PBAC-funded research and data gap work, incorporating into the alternative refinement.
- Investigate potential funding sources.
- Select one to two top alternatives and prepare a general package ready for submittal to the appropriate funding agencies, particularly the IWRB.



PROJECT TASK OUTLINE

TASK 1 CONTRACT MANAGEMENT AND ADMINISTRATION
TASK 2 OUTREACH AND FEEDBACK ASSIMILATION
TASK 3 ALTERNATIVES REFINEMENT
TASK 4 FUNDING STRATEGY DEVELOPMENT
TASK 5 WATER SUPPLY ALTERNATIVE REPORT FOR FUNDING SOLICITATION

Based on the RFP Scope of Work, we present our proposed approach by tasks and subtasks. The sections detailed below further communicate our team's project approach. For Tasks 2–5, this includes the task objectives, overall approach, activities/work elements, and deliverables. The actual project approach will be determined collaboratively with PBAC. For each of the Tasks, Alta will:

- Evaluate and determine unknown work/tasks and recommend to PBAC
- Facilitate meetings with PBAC's Executive Manager (EM) and PBAC subcommittee as needed
- Advise PBAC on recommended actions/steps

TASK 1 CONTRACT MANAGEMENT AND ADMINISTRATION

Achieve project outcomes through mindful contract management

Contract management and administration ensures adherence to the project scope of work, schedule, and budget. We deliberately call out this task to demonstrate our approach for efficiently running the project. Our objective is to support our Project Manager with hyper-efficient tools and resources so that she spends her time leading our team and focusing on the project needs.

As the Project Manager, Robin Nimmer will provide status reports, timely and accurate invoices, and will ensure adherence to the overall scope, schedule, and budget. She will lead the project kickoff meeting, provide monthly and quarterly reports, actively participate in PBAC meetings, and lead the consultant team. Robin will provide monthly updates to the EM in preparation for the monthly PBAC meetings.

To support Robin's focus on the overall project, Alta is committing administrative support time to assist her with the minutiae of invoicing, sub-consultant contracting, scheduling, preparing meeting notes, and related tasks. The administrative assistant will maintain a secured online portal accessible only to PBAC members with all project records, working documents, and deliverables. Our team's deputy Project Manager will stay abreast of the project from start to finish and ensure the technical resources of our team are committed when needed. The deputy Project Manager will implement our Quality Assurance/Quality Control (QAQC) Program.

You, as PBAC members, have major demands on your time with full-time jobs. We respect that. Keeping the project on schedule with continual and proactive management is key. Alta recommends weekly email updates to PBAC's subcommittee and EM, and a minimum of twice monthly "action meetings" with the EM. In Section E, Project Management Procedures approach, we describe our process for facilitating and supporting key critical decisions that will be needed. Proactive and diligent management of the scope, schedule, and budget are needed, and real-time transparent status and cost information are essential to avoid project surprises.

Deliverable(s):

- *Project Management Plan with secure hyperlinks to the baseline project schedule, final scope, and budget reports*
- *Project Kickoff Meeting agenda, notes, action items*
- *Short "Executive Format" weekly email updates with work completed, work anticipated, and PBAC input needs*
- *Monthly and quarterly accomplishments reports including a decision log, budget and schedule status, and foreseen changes or concerns*
- *Decision Support memoranda in preparation for key decisions (see Section E)*

TASK 2 OUTREACH AND FEEDBACK ASSIMILATION

Build a coalition of support

In the late 1970s, the US Army Corps of Engineers proposed diverting Snake River water as a water supply alternative for the Palouse Basin. The project met with significant resistance from a group of stakeholders and lost traction. Steam-rolling a technically viable alternative was unsuccessful because the project lacked outreach and community support. The problem of not having a sustainable water supply remained and our regional aquifer continued to decline.

Since then PBAC has worked tirelessly and successfully changed the tone over time through rigorous data-driven outreach, education, and engagement. Our goal is to help you accelerate your outreach momentum. We will assimilate the highly visible and successful outreach efforts you have built into a focused, project-specific outreach strategy.

Community support is a key requirement for the IWRB. Although it is unlikely there will be a unanimous consensus for a single alternative, PBAC's goal is to gain informed consent among the stakeholders. Outreach will present the background (education

about the Basin), the problem (water level decline), and the solution (four alternatives and the criteria for selecting one or two alternatives). There will be ample opportunity for feedback, and PBAC will be able to demonstrate how community input has been incorporated.

Task Objective: To build a coalition of support for a selected alternative(s) through PBAC's outreach activities.

Approach: PBAC will be the front line for the outreach effort. Our team will support you with solid technical information and a refined project-specific outreach strategy by leveraging our own local ambassadorship. We will adjust and optimize our support as the outreach progresses through close communication via twice-monthly meetings with the EM, and weekly email updates.

As experienced by the Legislative Executive Administrative Public (LEAP) Analysis, it can be difficult to reach people and meet with them for this outreach task. Scheduling can be a challenge in the best of times, and COVID-19 may make communication with groups more difficult. Not every stakeholder, as an individual or group, can be contacted. However, Alta will work with PBAC to overcome these challenges using the activities described below.

Activities/ Work Elements:

- Support PBAC in refining an outreach and engagement strategy that links with the project milestones. The strategy will include goals, success factors, schedule, participants, format, communication methods, content, metrics used for informed consent, and how feedback will be incorporated.
- Actively participate in outreach and engagement components as established in the project-specific outreach strategy. These may include updating technical content of presentation materials to incorporate new information, support at outreach meetings, facilitating meetings, providing meeting documentation (agenda/notes), keeping detailed records, and management of the outreach task to meet the project schedule.
- Assess the status of the outreach plan activities during twice-monthly meetings with the EM: Review and update schedule, milestone and decision point dates, outreach content provided for stakeholders, meeting agendas, roles and assignments for providing the outreach, and planned follow-up and documentation after the initial touch-point.
- Assimilate the LEAP analysis findings (when complete) with the outreach plan and tie in with the funding strategy by developing and strengthening key ties and relationships.
- Assist PBAC with the Stakeholder Engagement Group (SEG), which may include attending or presenting at SEG meetings, engagement, and updating outreach content.
- Identify and address areas of stakeholder concerns/conflict/impasse to get to a preliminary selected alternative(s).

Deliverable(s):

- *A project-specific outreach plan that integrates:*
  - *Outreach and engagement objectives*
  - *Content for PBAC presentations to stakeholders and schedule*
  - *GovFriend LEAP analysis for identifying, informing, and engaging all stakeholders*
  - *SEG engagement*
  - *University of Idaho (UI) survey by Dr. Maas of 420 Palouse residents to determine what is important to them regarding water*
- *Meeting agenda/minutes*
- *Report detailing the outreach activities conducted to demonstrate community support and PBAC's efforts*

TASK 3 ALTERNATIVES REFINEMENT

Pivot from research to action

The 2017 WSAA report presents the alternatives, highlights the top four, and identifies and prioritizes data gaps for each of them. Some of the data gaps identified have since been filled, some are ongoing, and some have yet to be started. Each of the four supplemental water supply alternatives consists of multiple project elements that could be isolated into smaller, discrete projects that would allow project funding, design, and construction to occur in a phased approach.

To refine project alternatives, specific data gaps must be filled to help PBAC and partners focus their efforts and investments on the best alternatives. Specific examples include availability of water rights and the potential for obtaining them. A recent change occurred when the Nez Perce Tribe filed for water rights, which may impact some alternatives. Alta therefore recommends a robust water right investigation as described as a recommended subtask herein.

Subtask 3.1 Support and Integrate Ongoing Work

Objective: To incorporate the most recent data into the alternative selection process and support PBAC and their contracted consultants with recent and currently funded work.

Approach: Alta will work collaboratively with PBAC and other contracted consultants to support related and ongoing research, including water supply alternatives data gap assignments. We will characterize the criticality of remaining data gaps to use in an alternatives evaluation matrices for sub-task 5.1.

Activities/Work Elements:

- Integrate the subsequent work into the project data set included in the development of the selected alternative(s) (Task 5.1) and outreach (Task 2). Subsequent work includes results of filling data gaps, recent related or relevant research funded by PBAC (e.g., Washington State University [WSU] updated groundwater model and UI groundwater recharge investigation), and other follow-on work conducted by PBAC's consultant team. For example, model results may allow for refinement of estimations on the amount of water needed to augment the supply in order to reach aquifer stabilization.
- Evaluate and characterize the relative significance of the data gaps and needs.

Deliverable(s):

- *None. We will incorporate and document the outcomes of the studies into the appropriate project task deliverables (e.g., LEAP Analysis – Task 2, WSU Model – Task 3.3)*

Subtask 3.2 Fill Water Right Data Gaps (recommended task)

Objective: To determine if water rights are available from the identified sources in the quantities required to meet project demands, and to ensure there is a clear linkage between existing water rights, the alternative, and the ability to maintain water rights while interim pieces of the alternative are implemented.

Approach: The project team will identify opportunities and obstructions to developing new water right appropriations from the identified sources in the required quantities and times of availability. Existing water rights will be examined to identify potentially concerned parties and competing interests. Identified existing water rights may also provide opportunities for water right acquisition if new appropriations are unavailable or insufficient to meet project demands. Consideration of one or more alternatives may be halted if new water rights are unavailable or if acquiring existing water rights is cost-prohibitive.

Activities/Work Elements:

- In the context of scaling the four alternatives, our water rights experts will examine the most recent restrictions that prevent or limit new water right development, acquisition and transfer of existing water rights, and conveying water for use across state boundaries.
- Identify existing water rights utilizing the same source and tributary source (as appropriate).
- Determine potential for existing water rights to conflict with new appropriations. This may entail reviewing watermaster or other delivery records and interviewing knowledgeable parties such as the watermaster, Idaho Department of Water Resources or Washington Department of Ecology (Ecology) staff, and/or local water users.
- Identify conflict between the project goals and the potential for claims filed by the Nez Perce Tribe in the Palouse Basin Adjudication to conflict with new water right appropriations.
- If new water right development is unavailable from the desired source at the quantities required, identify existing water rights that may be available for acquisition and transfer.

Deliverable(s):

- *A water rights investigation report for both Idaho and Washington*

Subtask 3.3 Development of Water Supply Alternatives Interim Steps

Objective: To explore strategies for phasing each supplemental water supply alternative such that each large overall project may be accomplished in a series of smaller incremental projects, perhaps in a pay-as-you-go approach.

Approach: Our team will evaluate each of the four alternatives with the intent to divide them into smaller, strategically-sequenced project phases that can be implemented to ultimately achieve supplemental water supply goals. We will present the strategically-sequenced phases to you in a workshop for discussion and evaluation. For example, for Alternative 1, we envision breaking the project down into the following two phases:

- Phase 1: Construct the regional Snake River intake, pipeline to the treatment plant, the treatment plant, effluent pipeline to the City of Pullman and WSU.
- Phase 2: Construct the effluent pipeline to the City of Moscow and UI.

New and creative ideas will also be evaluated. An example is a further concept phase in Alternative 1 whereby a pumped storage, renewable power generation project could complement the supplemental water supply project; additional Washington project ideas are being investigated by WSU, City of Pullman, and Whitman County. As each sub-alternative project is identified and defined, conceptual layouts of the smaller projects would be developed, construction cost estimates prepared, and annual O&M costs estimated as budget allows for execution of this work. A project phasing schedule will be developed to inform project funding and cash flow requirements.

As an optional service, we can calculate social values using Jacobs' proprietary Total Value X tool. Doing so can 'monetize' the anticipated sustainability and resiliency benefits that result from the preferred alternative. These monetized benefits can then be leveraged to more strongly position your applications for state and federal funding.

Activities/Work Elements:

- Compile historical documents, data, and native files, including the WSAA report, consultant follow-on work, and initial project documents.
- Identify and define potential sub-alternative projects within each of the four primary alternatives.
- Present to stakeholders for endorsement / elimination at workshop with PBAC.
- Develop conceptual project layouts (high-level).
- Develop phasing plan to achieve the complete buildout of the four primary alternatives.
- Validate construction cost estimates for the four primary alternatives developed previously by others.
- Develop construction cost estimates for each phased project utilizing estimate data developed previously by others.
- Develop estimated annual O&M costs for each phased project.
- Compile the construction cost estimates and annual O&M cost estimates for each phased project to develop:
  - Project funding and cash flow requirements
  - Life cycle cost analysis to estimate the Net Present Value
- Present findings/results.

Deliverable(s):

- *Interim Steps Workshop - agenda and preparation materials*
- *Workshop notes and summary of decisions*
- *Draft and final report with sub-alternative project descriptions, conceptual project layouts, and construction and annual O&M cost estimates*

TASK 4 FUNDING STRATEGY DEVELOPMENT

To bring this project to fruition, a funding strategy needs to be in place

The RFP specifically mentions the IWRB, but because the aquifer is a bi-state aquifer, both Idaho and Washington will need to commit to financial support of the project. The goal of this task is to identify funding scenarios and provide PBAC with a road map to secure funding that aligns with projects as a whole or possible interim projects over time.

Task Objective: To investigate and uncover funding opportunities and assemble information needed for funding applications or steps to do so.

Approach: Using established relationships with various individuals/agencies/entities as well as funding source experts on our team, evaluate funding options. Work with PBAC to establish advocates. For each opportunity, determine the application process, requirements, and timeline. Keep informed on changing funding opportunities, including due to the COVID-19 pandemic. For example, Ecology has suspended providing funding for capital projects due to economic conditions.

Activities/Work Elements:

- IWRB: Members of PBAC and GovFriend have met with members of the IWRB. The Board has provided guidance for the report package they are seeking for considering potential funding (see RFP and GovFriend May 2019 memorandum).
- Ecology: Pursue dialogue beyond PBAC's initial conversations with Ecology and identify key personnel. Develop discussion points and facilitate meeting(s) with Ecology, our project team, and PBAC. Solidify information to present with the funding package to the IWRB per their requirement (Task 5.2).

- Other: Research grants beginning with known opportunities and established contacts with funding sources.

Deliverable(s):

- *Meeting agendas and summaries*
- *Draft and final report providing potential funding strategy opportunities, including those that align with possible interim projects of the four alternatives*

TASK 5 WATER SUPPLY ALTERNATIVE(S) REPORT FOR FUNDING SOLICITATION

Where the rubber hits the road. We will see this project through to the end.

Task Objective: To develop one to two preferred (recommended) water supply alternatives and develop a sound package for funding.

Subtask 5.1 Alternative(s) Selection

As with any complex, multi-objective water resources plan, selecting the alternative(s) that optimizes the various objectives and best satisfies the needs of the stakeholders is a critical and potentially challenging step. The chosen alternative(s) will need to be:

- Technically sound
- Implementable
- Permittable
- Fair and equitable with no one entity disproportionately burdened with the cost
- Has a coalition of support from the stakeholders
- Fundable (capital costs and O&M)

Approach: Our team will apply a process for developing the alternative selection; it starts with confirming your objectives and priorities, then working with you to develop a final set of selection criteria and the final decision process. We propose focused, facilitated working sessions with you to make informed decisions.

Work Elements/Activities:

- Develop draft evaluation criteria, weighting parameters, and a decision process in collaboration with PBAC. Seek input from PBAC if the evaluation criteria and weighting parameters in the WSAA report are sufficient or if modifications are desired.
- Lead a workshop with PBAC to solicit agreement on the evaluation criteria, weighting process, and decision processes. (Selection Workshop 1)
- Evaluate outstanding data gaps and the level of importance to fill them in order to select an alternative. Provide recommendations and define scope of any additional work to address the gaps
- Prepare early draft ranking, present at PBAC and SEG meetings
- Update evaluation criteria based on outreach feedback (Selection Workshop 2)
- Update ranking matrix using updated evaluation criteria based on input from data gap filling, funding, and interim steps
- Recommend one to two alternatives or provide steps to do
- Lead a workshop with PBAC to form a consensus on the selected alternatives (Selection Workshop 3)
- Present final alternative(s) selection to PBAC and the SEG, and document in a report

Developing criteria for an alternative selection may be constrained by the status and relative importance (weighting) of outstanding data gaps provided in the WRA report. To be able to adequately select an alternative(s), important data gaps should be filled or a plan to fill them should be prepared.

Deliverable(s):

- *Meeting agendas, supporting materials, and minutes*
- *Draft and final alternative selection plan documenting selection criteria, weighting factors and selection process, and critical data gaps, and suggested work to address the gaps*
- *Draft and final technical memoranda/reports presenting the process and recommended alternative(s)*

Subtask 5.2 Package for Funding

The package for funding incorporates products from the various other tasks. This package should have sufficient information and documentation for you to present to the IWRB and other potential funding sources that will satisfy requirements for consideration of funding.

Approach: This subtask starts at the beginning of the project to ensure the tasks and milestones meet the IWRB requirements, and continues to the end of the project when a deliverable package is provided to you for presentation to the IWRB. In addition, the package will have the necessary general and specific contents or a path to solicit funding from other sources as described in Task 4.

Work Elements/ Activities:

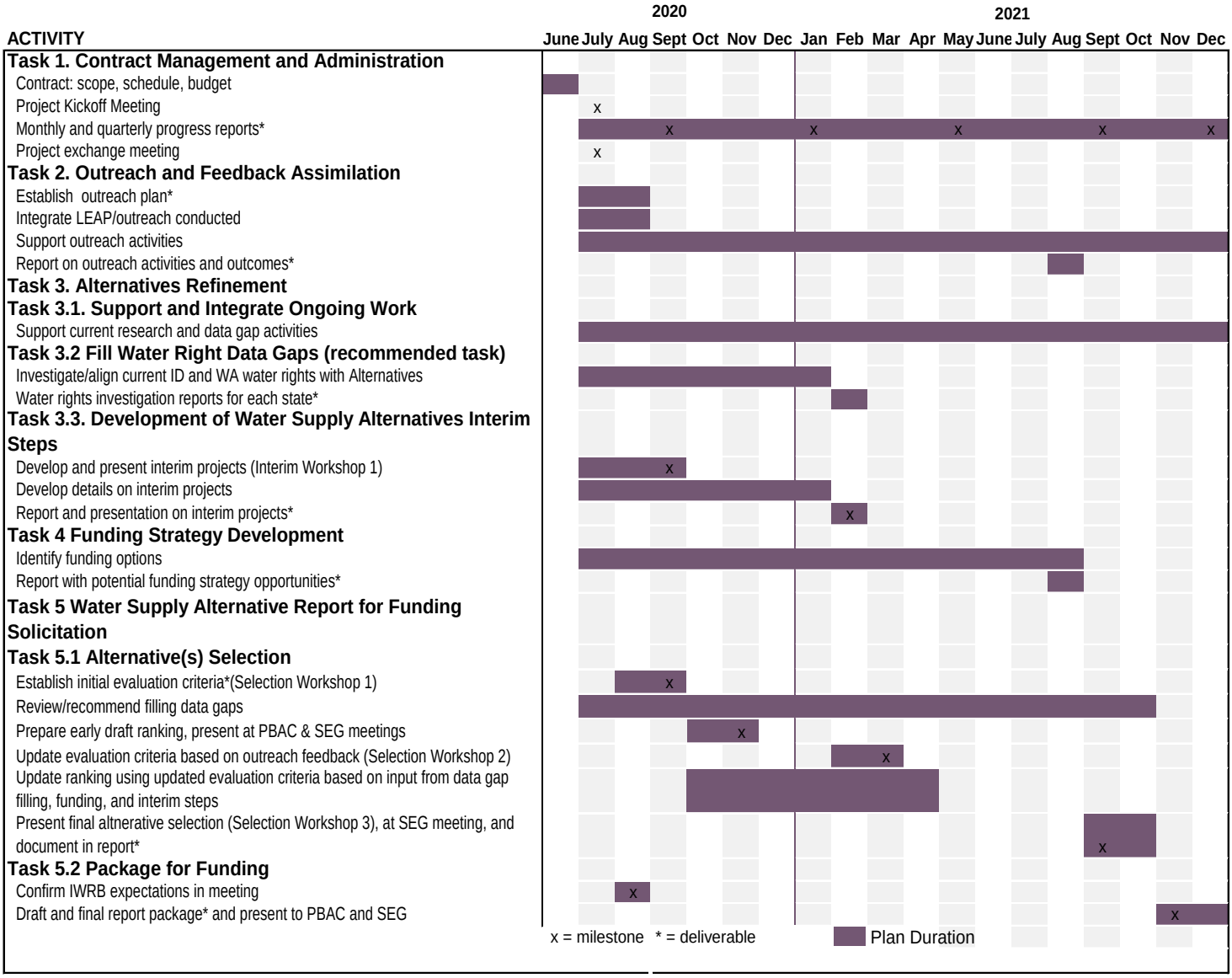
- Review meeting notes from previous meetings between PBAC, GovFriend, and members of the IWRB. Discuss the understanding of the Board's expectations.
- Meet with PBAC and the IWRB to ensure the understanding is complete.
- Assemble report package.

Deliverable(s):

- *Draft and final report that includes key deliverables from Tasks 2–5.1*

C. SCHEDULE

With thorough look-ahead planning and risk management, our team delivers your project on schedule.



D. KEY PERSONNEL

Our local, dedicated team is focused on your needs and ready to meet the 2021 schedule with optimum use of PBAC members' time.

In order to provide the strong management and technical support required for this project, the following team members and firms were selected according to skill and dedicated availability:

- Our assembled team is ready to provide the level of utilization needed to accomplish the proposed work scope tasks according the proposed schedule.
- The following organizational chart provides names, locations, and firms for the project management team, key personnel, optional services staff, and support staff.
- Resumes for these individuals are provided in the Appendix of this proposal. Each resume identifies skills related to this project along with details of education, experience, and relevant accomplishments.

PROJECT LEADERSHIP AND UTILIZATION

PROJECT MANAGER, Robin Nimmer, Ph.D., PG, LG

Est. Time Utilization – 50%

Dr. Nimmer is fully dedicated and available to supporting the time required for this project's success. Alta is also committed to shifting project needs as necessary to support her time on this important PBAC project.

Dr. Nimmer brings more than 15 years of experience in water resources and hydrogeology. A local resident, she is involved with water issues on the Palouse and is a board member of the Palouse Basin Water Summit. She has managed and worked on several projects for PBAC or in collaboration with PBAC.

Where collaboration between clients and other agencies is required, Dr. Nimmer has demonstrated effective project management skills, having managed over 120 projects for clients ranging from private individuals and companies to city, state, and tribal entities—with durations ranging from weeks to more than a decade. She is organized, personable, and an effective communicator, with good negotiation and leadership skills, and experience bringing parties together to resolve issues. She is the Water Resources Division leader for Alta.

PRINCIPAL/ DEPUTY PROJECT MANAGER/ QAQC, Derek Forseth, PE

Est. Time Utilization – 10%

Derek Forseth is committed to shifting project needs as necessary to support this important PBAC project.

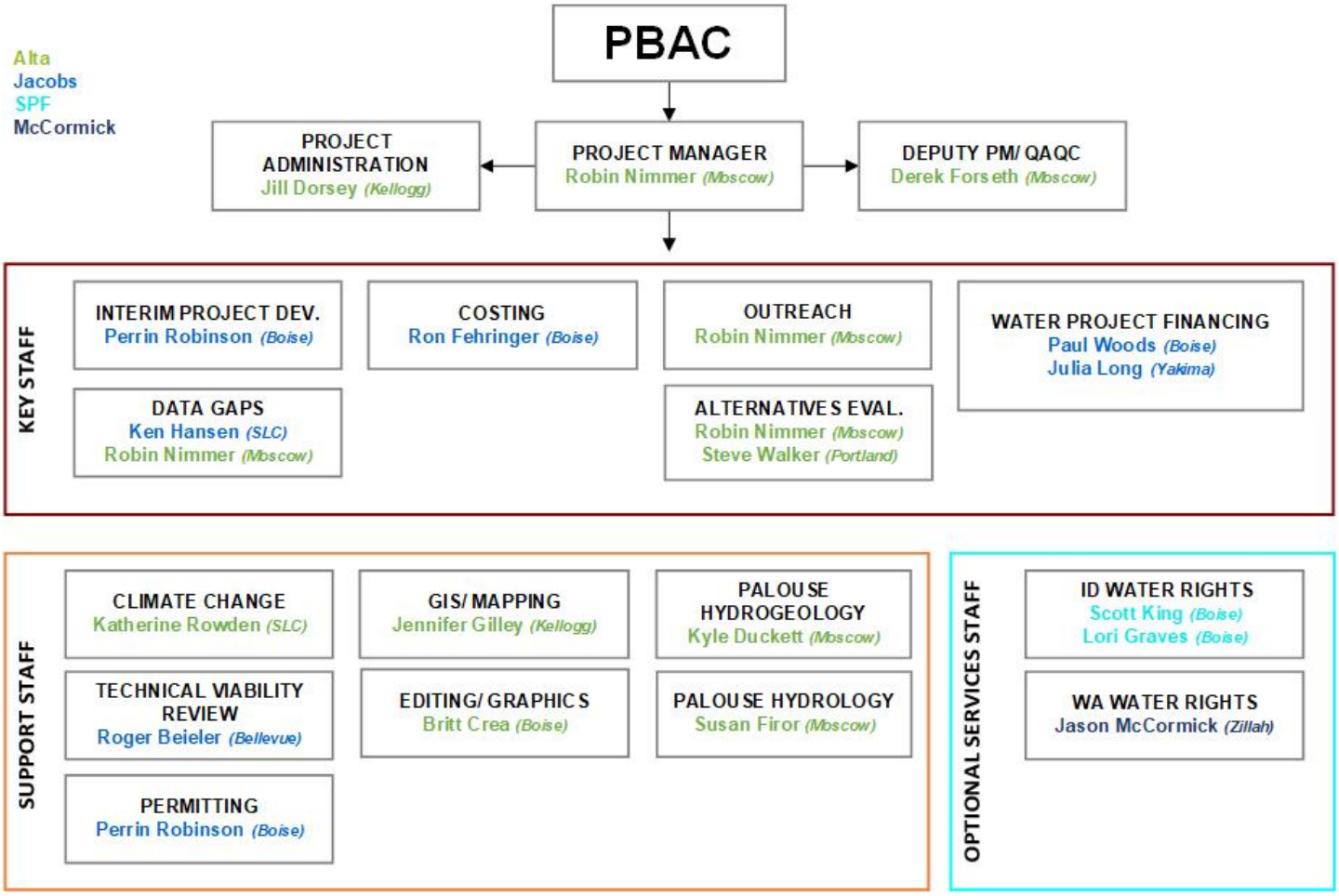
Mr. Forseth resides in Moscow and is Alta's CEO and Principal Engineer. He is licensed in both Washington and Idaho, with 24 years of experience in an extensive range of civil and environmental projects. His career has centered on public works and municipal engineering support on projects of all sizes and scope.

Mr. Forseth's primary responsibility is to ensure that Alta provides exceptional client service while fulfilling our contract obligations. He will be fully engaged in the project and able to assume project management in the unlikely event that Robin is unable to complete the assignment for any reason. This provides redundant assurance of timely completion of this critical project.

"During the time I have worked with Dr. Nimmer, she has demonstrated a high level of technical scientific analysis and formulation of hypothesis for a complex groundwater water level, recharge, age dating and water chemistry assessment for the Lewiston Plateau Groundwater Management Area and the City of Genesee.

You can expect excellence and professionalism from Dr. Robin Nimmer."

–Al Beardslee, Senior Water Resource Agent, IDWR



KEY PERSONNEL	RELEVANT PROJECT EXPERIENCE	BENEFIT TO THE PROJECT
Ken Hansen, PE (Jacobs) ✓ Data Gaps ✓ 28 years of professional experience in hydraulic structures, dams, conveyance, fish passage	▪ Chief of Hydraulic Design USACE Walla Walla district ▪ Technical Lead, 2018-2019 Feasibility, Data Analysis, and Environmental Review for the Walla Walla Basin Integrated Flow Enhancement Study	▪ USACE experience adds Agency perspective ▪ Full range of water resource project experience: planning, design, Quality Management, CM, commissioning ▪ Aquifer recharge, ASR, modeling, and alternative evaluations
Julia Long (Jacobs) ✓ Funding and Financing ✓ Federal agency processes	▪ US Bureau of Reclamation ▪ Project Manager, Long-term Plan to Protect Late Summer Adult Salmon in the Lower Klamath River ▪ Project Manager, Kachess Drought Relief Pumping Plant and Keechelus Reservoir-to-Kachess Reservoir Conveyance Project, Yakima, WA	▪ Broad understanding federal agencies; offers knowledge and relationships: Reclamation, USFWS, BIA, NMFS, USFS, BLM, NPS, NEPA and local Tribes ▪ Understands Federal funding and processes
Perrin Robinson, PE (Jacobs) ✓ Interim Project Development ✓ 20 years of professional water resources design experience in ID and WA	▪ Walla Walla Basin Integrated Flow Enhancement Study ▪ Facility Layouts, Cost Analyses, Appraisal-Level Designs for Selected Off-Channel Storage Features, Columbia River Mainstem Storage Options, USBR	▪ Planning, modeling, design; CM, and project management ▪ River restoration and salmonid habitat; aquifer recharge; off-channel water storage intake facilities; storm water quality and quantity mitigation facilities; hydrologic and hydraulic modeling; open channel and pipe conveyance

Ron Fehringer, PE (Jacobs) ✓ Cost Opinion/ Constructability ✓ 29 years of experience in ID and WA. water planning, design, CM,	▪ Tieton Canal Replacement Project, Yakima-Tieton Irrigation District (YTID), Yakima, WA ▪ North Fork Cowiche Creek Reservoir Feasibility Study, Yakima Basin Integrated Plan, WA ▪ System Upgrade and Water Conservation Program, Little Wood River Irrigation District (LWRID) and Natural Resources Conservation Service (NRCS), Blaine County, ID	▪ One of Jacobs' most experienced river intake specialists; proven manager for some of the firm's most complex and successful municipal and irrigation projects that involve river intakes, conveyance, and storage facilities
Paul Woods, PE (Jacobs) ✓ Funding and Financing ✓ 32 years developing water supply and wastewater treatment strategies	▪ Associate Director of the Environmental Finance Center at Boise State University (Boise, ID), Watershed Funding Workshops for EPA Region 10 ▪ AK, ID, OR, WA, and 271 Tribal Nations ▪ Executive Director, Boise River Flood Control District No. 10 ▪ Idaho Power Integrated Resource Planning, Boise, ID	▪ Innovative solutions to complex issues; considerable experience in regulatory program design and implementation; developing Facility Planning documents with innovative compliance options that focus on rate stability and community affordability ▪ Financial analysis and assessments to meet regulatory requirements ▪ Project scoping; regulatory analysis; project delivery and strategic implementation
Steve Walker, PE ret. (Alta) ✓ Alternatives Evaluation ✓ Outreach support ✓ 25 years of professional engineering experience followed by 15 years of management consulting	▪ Tucson Water 100-Water Long Range Masterplan ▪ City of Tempe, AZ Rio Salado Town Lake ▪ City of Salem, OR Water Master Plan ▪ City of Gresham, OR Environmental Division Strategic Plan ▪ Tualatin Valley Water District Engineering Div. Strategic Plan	▪ Water resource engineering and strategic planning ▪ Project Partnering and Chartering facilitation ▪ Stakeholder facilitation and conflict resolution, strategy development, perception and image surveys, image and branding strategies

E. PROJECT MANAGEMENT PROCEDURES

Robust management tools and processes tailored to your needs keep your project on track.

While *the Palouse Groundwater Basin Alternative Water Supply Project* goals and objectives are clear, the roadmap to achieve them is not rigidly defined and will require flexible and efficient responses to changes and new information. Given PBAC's tight timeline and fixed budget, keeping PBAC in complete control with no glitches or surprises, will require clear, consistent, proactive management of the project's scope, schedule, and budget along with timely and accurate communication. While working with you over the last 15+ years, we have tailored our processes to provide the real-time and transparent information you need. Dr. Robin Nimmer is our team's Project Manager; she will be responsible for working directly with the PBAC and for the overall contract success. The following sections are Alta's procedures for effective project management as we work together to move the alternatives to action.

PROJECT MANAGER'S STATEMENT OF COMMITMENT

"Sustaining the regional water supply is vital for our community, and it should be our community who finds the solution.

As someone who lives and works on water resource projects in the Palouse Groundwater Basin, I am 100% committed to PBAC's goal of moving the alternatives to action. As PBAC says, Water on the Palouse is essential."

-Robin Nimmer

PROCEDURES SUPPORTING BUDGET AND SCHEDULE

Scope Control. Robin is ready to charge forward and get the outcomes you want from this contract, and that begins with consensus on a crystal-clear documented scope of work that sets the timeline between now and December 2021. Our Project Management procedures will then effectively control the scope, schedule, and budget to achieve success. Understanding and managing the interrelationship of these three elements helps control costs, avoid delays, and provides the desired outcome. Alta organizes tasks, manages the level of effort, develops and monitors a critical-path schedule, and compares actual costs to planned costs at key milestones. Our proposed task organization and schedule is shown in Sections B and C.

The alternatives have data gaps. There are decisions to be made. This means there is some uncertainty in the scope because the outcomes of the data gaps and decisions are unknown. We anticipate some uncertainty in the

scope of work. Because we are located here on the Palouse with you, we will be a responsive and cost-effective consultant for this contract.

Budget Control. Our Project Manager will assure adherence to the project budget by using a robust system that tracks and forecasts the project finances with real-time budget reports. Alta uses a state-of-the-art project management and accounting platform from Deltek Ajera. The system is used by 30,000 organizations around the world. It has worked reliably for us on hundreds of projects. Projects and people are the center of our business. We depend on accurate and comprehensive budget controls. The system we use provides anytime, anywhere access to project budget reports. Project Managers, Principals, and our Accounting department see accurate cost information linked within one system.

Our Project Manager will provide a budget status report to you each month. The status reports will include budgetary look-ahead forecasting for any potential issues. A plan to remedy any budget issues will be provided during our monthly updates. The budget is linked to the detailed work breakdown and the project schedule. It is the Project Manager's responsibility to use the tools at her disposal to bring your project in on budget.

Schedule Control. We believe the best projects have honest schedules. We build-in holidays, resource availability, and other demands on ours and your time. We will assure adherence to the project schedule by;

1. Creating the baseline Gantt chart schedule
2. Identifying the critical milestones including meetings where decisions need to be made and deliverable dates
3. Linking together a detailed task breakdown to identify critical paths within the project
4. Assigning task start/end dates and durations
5. Assigning resources to the task

Monthly status reports will include project schedule reports with look-ahead forecasting for any potential delays. A plan to remedy any schedule setbacks will be provided during our monthly updates. An executive summary project schedule showing major task and milestones will be submitted to PBAC along with the highly-detailed work breakdown Gantt chart.

PBAC can expect an executive summary project schedule showing major task and milestones, along with a highly detailed Gantt chart like this one.

Communication. Now more than ever with the COVID-19 Pandemic, we are finding new ways to collaborate faster and more effectively using tools such as MS Teams, Zoom, Huddle, Webex, and Asana. Effective communication with PBAC, team partners, and stakeholders is the priority management objective. Alta's communication plan is designed to keep everyone on the project team current and informed. Project kickoff meetings will set the stage for each task. Written project management plans with the scope, schedule, and budget will be provided to all team members. Communication will occur as face-to-face meetings, regular phone calls, online video conferencing, project status meetings, and email correspondence. In addition to the required monthly and quarterly progress updates, we recommend weekly email updates and twice-monthly meetings with the EM. We will attend PBAC meetings and provide project updates. Schedules will be prepared in Gantt chart format for simple tracking. Invoices will have detailed supporting information. Deviations in scope will be discussed with the EM for authorization prior to performing the work.

Decision Support. One key element to completing your project with your budget and schedule will be timely decision making by PBAC. Part of our job is to help you to make hard decisions and keep the project moving ahead. Section C illustrates the proposed schedule including tasks and milestones. We have identified some of the most critical decision points in the project. Due to the complexity and tight schedule of the project – and the various demands on BPAC – we propose a decision support process for facilitating the key decisions.

Along with each monthly status report, we will identify key decisions to be made in the following month, the need for the decision, and the impacts of delay. Two weeks prior to the decision deadline, we will prepared a brief Decision Support Memorandum. This memo will lay out the reason for the decision, who "owns" and who contributes to the decision, the options as we understand them, evaluations of each option, and our recommendation for your consideration. If appropriate, we will suggest a meeting or video conference to further discuss the decision to help facilitate the process.

F. QAQC MANAGEMENT

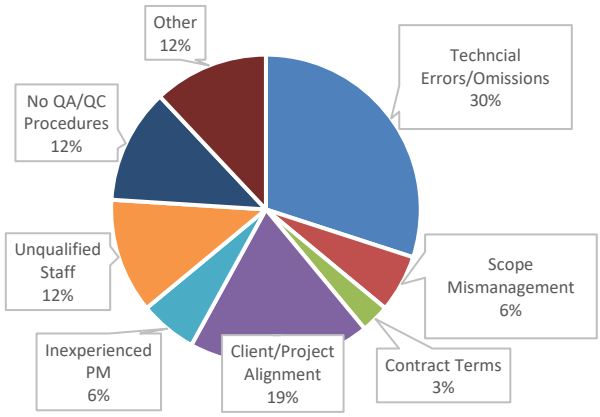
Do the right things – and do things right!

Quality results from sharp, technical expertise and caring greatly about our customers' experience working with us. Fundamentally, we believe it is essential to **start with the right people** assigned to the job. Quality Assurance and Control processes polish the final result. Our team is led by an outstanding Project Manager and Subject Matter Expert (SME) who is supported by a blue-ribbon team of qualified water supply project experts.

We also care about quality management from the practical standpoint of minimizing risk exposure to us and our clients, and we know that quality service and products result in trust, credibility, and customer loyalty. The name Alta is of Latin origin meaning high or elevated. This embodies our culture and standards through elevated expectations of ourselves and each other, meeting the high expectations of our clients, and always having a high degree of integrity and professionalism.

Our QAQC procedures systematically focus on preventing issues that fall into the "eight causes of claims" indexed by the Architecture/ Engineering (A/E) Industry. Deliverables undergo a rigorous Quality Control review ensuring the work product is correct and achieves the project's goals. For technical excellence, Principals and SMEs review all deliverables before submitting them to you. Quality Management is integrated into the project schedule, providing realistic review time expectations. A rigorous project workplan, budget, and schedule ensure our team produces the results you want.

TOP CAUSES OF INSURANCE CLAIMS IN A/E INDUSTRY



Alta's QAQC process is successful because it is designed to mitigate every high-risk category

This project and the results of our work are anticipated to be highly visible in the community. The results will reflect on PBAC, its individual representatives, and us. The quality of the deliverables will set a tone with funding partners. Our QAQC process includes non-technical reviewers with an eye on overall message clarity using straightforward language and stellar graphics.

G. POINT OF CONTACT AND SIGNING AUTHORITY

Robin Nimmer is locally available and will serve as the point of contact during the evaluation process:

Robin Nimmer, Ph.D., PG, LG - Project Manager
220 East 5th Street, Suite 325, Moscow, Idaho 83843
Phone: 208.882.7858 | Fax: 208.883.3785 | Cell: 208.301.2078
Robin.Nimmer@alta-se.com

Derek Forseth is locally available and authorized to negotiate and execute any contract:

Derek Forseth, PE - Principal/ Deputy Project Manager
220 East 5th Street, Suite 325, Moscow, Idaho 83843
Phone: 208.882.7858 | Fax: 208.883.3785 | Cell: 509.330.0344
Derek.Forseth@alta-se.com

ROBIN NIMMER, Ph.D., P.G., L.G.

Project Manager

Alta Science & Engineering, Inc.

Alta-se.com

Education

- Ph.D. Geology
  University of Idaho
- M.S., Hydrology
  University of Idaho
- B.S., Geology
  University of Wisconsin, Milwaukee

Areas of Expertise

- Project Management
- Water Resources
- Hydrogeology
- Groundwater flow and transport analysis, groundwater flow in unconsolidated media, as well as fractured rock systems
- Groundwater–surface water interactions
- Water quality monitoring programs
- Contamination and remediation of soils
- Environmental site characterization

Certifications/Training

- PSMJ Project Management Boot Camp, 2010
- Professional Geologist, Idaho #1400
- Licensed Geologist, Washington #2907
- HAZWOPER, 40 hour +refreshers, current
- National Ground Water Association (NGWA) Short Course: Environmental Geochemistry of Metals: Investigation and Remediation, 2012
- National Ground Water Association (NGWA) Short Course: Low-Cost Remediation Strategies for Contaminated Soil and Ground Water, 2009

Special Appointments, Memberships, or Affiliations

- Board Member - Palouse Basin Water Summit, 2015–Present
- Member – National Ground Water Association, 1995–Present

Experience Summary

Dr. Robin Nimmer has been involved with water on the Palouse for over 20 years, and has managed and worked on several projects for PBAC or in collaboration with PBAC. A local resident, she is also a board member of the Palouse Basin Water Summit.

Dr. Nimmer brings more than 15 years of experience in water resources hydrogeology; groundwater flow and transport analysis; groundwater–surface water interactions; groundwater, surface water, and soil sampling and monitoring; and environmental site characterizations. She has worked on several local and regional hydrogeology and water resources projects as well as several environmental projects, from all aspects of the project spectrum, including managing drilling operations, logging well installation, sampling water and soil, data interpretation, preparing reports, and providing technical expertise.

Where collaboration between clients and other agencies is required, Dr. Nimmer has demonstrated herself as an effective project manager having managed over 120 projects for clients ranging from private individuals and companies to city, state, and tribal entities – with durations ranging from weeks to more than a decade. She is organized, personable, an effective communicator, has good negotiation and leadership skills, and is skilled at bringing parties together to resolve issues. Utilizing her leadership skills, she is also the Water Resources Division leader for Alta.

Project Experience

Palouse Ground Water Basin Framework, Data Gap Filling Investigation, and Well Installation Preparation Projects, Idaho and Washington, 2009–2012

Dr. Nimmer was the project manager and technical lead in the Palouse Ground Water Basin project, funded by the Palouse Basin Aquifer Committee (PBAC) through the Palouse Conservation District. This project entailed assembling existing hydrogeologic documents, synthesizing the hydrogeologic information, discerning the areas with data gaps, and developing recommended projects to better understand the hydrogeology of the Palouse Basin to secure the future drinking water supply.

This project involved working closely with members of PBAC as well as the Washington Department of Ecology. The follow-on projects Dr. Nimmer managed resulted in a detailed evaluation of the recommended high priority data-gap fulfillment projects, including investigating the hydrogeology west of Pullman to better understand the potential groundwater barrier, surface water/groundwater interaction northwest of Pullman to evaluate recharge, investigating of upper aquifer pumping, and preparation for new several deep monitoring wells including a well siting

analysis and development of a Quality Assurance Project Plan (QAPP) for the well construction (see next project description).

Washington Department of Ecology Well Construction Oversight, 2012-2013

Dr. Nimmer was the project manager and technical lead for this deep well installation project funded by the Washington State Department of Ecology, which provided crucial geological and hydrogeological data. Our work included hydrogeologic oversight of drilling six deep monitoring wells installed in the Palouse Basin.

Environmental Site Assessments & Remedial Designs, 2008–present

Dr. Nimmer was the project manager and technical lead for environmental site assessment (ESA) projects, involving several sites. These projects entailed conducting Phase I ESAs, preparing Sampling and Analysis Plans/ Quality Assurance Project Plans (SAP/QAPP), and conducting Phase II ESAs. Clients range from the private sector to local and state governments. Client, property owner, and public relations are often key aspects of these projects.

Hydrogeologic Site Characterization Projects, Idaho, 2015–present

Dr. Nimmer was and is the project manager and technical lead on several hydrogeologic site characterization projects in the region for private individuals or entities. Projects range from conducting and analyzing data from aquifer tests in the Palouse Basin to conducting surface water / groundwater interaction studies in northern Idaho.

Water Monitoring at the Bunker Hill Mining and Metallurgical Complex Superfund Site, Idaho, 2010–present

Dr. Nimmer is the project manager for the ongoing water-level and water-quality monitoring project located in the Bunker Hill Mining and Metallurgical Complex Superfund Site (BHSS). For the Idaho Department of Environmental Quality (IDEQ) in Operable Unit 2, she is responsible for supervising field crews who collect bi-annual samples from a portion of the 120+ groundwater sites and historically from 20 surface water sites, and who download dataloggers from over 45 sites bi-weekly. She is responsible for overseeing assembly of field and analytical data, data quality review, as well as data interpretation, reports preparation, and data transfer.

Dr. Nimmer has/had the same diverse array of responsibilities related to groundwater and surface water level and water quality monitoring at several repositories with metals-laden waste associated with the BHSS. Two of the repositories shifted to the Coeur d'Alene Trust in early 2016. Alta has since been conducting the water monitoring at these and other locations in the Basin for Maul Foster and Alongi, the Trust's contractor.

In addition, Dr. Nimmer is also currently the project manager for the US Army Corps of Engineers contractor to conduct water level monitoring at 30+ sites for several aquifer tests associated with determining the remedial effectiveness of a groundwater cutoff wall.

For all of these projects Dr. Nimmer is responsible for allocating resources to perform the work, maintaining the budgets, preparing project communication, and communicating with multiple government agencies and their contractors. Dr. Nimmer also reviews water-related reports and provides technical assistance as needed.

Lewiston Plateau Hydrogeology Project, Idaho, 2016–2017

Dr. Nimmer was the project manager and technical lead of the Lewiston Plateau Hydrogeology project with Ralston Hydrologic Services for the Idaho Department of Water Resources (IDWR) and funded by the Idaho Water Resource Board.

The purpose of the project was to better understand the hydrogeology and recharge potential of two subareas of the Lewiston Plateau Ground Water Management Area. This project involved acquiring and reviewing well logs, acquiring and interpreting water-level data, reviewing geologic maps and reports, preparing update memoranda, presenting at public meetings, and working with well owners and IDWR.

DEREK FORSETH, P.E.

Deputy Project Manager/ QAQC

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Experience Summary

Mr. Forseth is the Chief Executive Officer and Principal Engineer of Alta Science and Engineering. He is a licensed Civil Engineer in Washington, Oregon, Idaho, and Nevada with 24 years of experience in an extensive range civil and environmental projects. His primary responsibility is to ensure that Alta provides exceptional client service while fulfilling our contract obligations.

In a technical capacity, Mr. Forseth provides project management, design, cost estimating, and oversees Alta's construction engineering support. His career has centered on public works and municipal engineering support on projects of all sizes and scope. Mr. Forseth has worked with Ports, Cities, Counties, State and Federal Governments throughout his career.

Education

- B.S., Civil Engineering
  Washington State University

Areas of Expertise

- Cost and Quality Controls
- Project Management
- Stormwater Management
- Civil and Environmental Engineering
- Engineering Design, PS&E

Special Appointments, Memberships, or Affiliations

- U.S. Department of Interior Partners in Conservation Award, Bayhorse Mining District Cooperative Conservation Partnership, 2009
- American Society of Civil Engineers – Member #331556
- National Society of Professional Engineers Member

Certifications/Training

- Professional Engineer Idaho, #12175, Oregon #63131
- Certified Erosion and Sediment Control Lead, WA Ecology #5848
- OSHA 29 CFR 1910.120 HAZWOPER, 40-hour, 2006 and refreshers, current
- PSMJ Project Management Boot Camp (16 hrs), August 2007
- Northwest Stream Restoration Design Symposium
- First Aid/CPR Certification

Project Experience

Highway 95 Water Main Replacement, City of Moscow/Idaho Transportation Department, 2010

Mr. Forseth was the engineering lead for designing approximately 1,000 feet of water main replacement under Highway 95. The project was a joint project between the City of Moscow and the Idaho Transportation Department. Mr. Forseth provided engineering design and cost estimating and produced the technical specifications for the projects.

Flood Control and Drainage Improvement Projects, Silver Valley, Idaho, 2012–Present

Mr. Forseth is the project manager of a multi-year flood control capital projects program in the Silver Valley. He is managing the engineering design teams with both the IDEQ and EPA's Work Trust to design and construct over $30M in flood control projects throughout the communities.

Sanitary Sewer Rehabilitation Program, City of Kellogg, Idaho, Present

Mr. Forseth completed Kellogg's comprehensive sewer plan and provided technical support for passing the City's sewer bond in 2015. Mr. Forseth was the project manager for the Comprehensive Plan and the Environmental Information Document (EID). He provided the City with grant writing support for Community Development Block Grant funds and U.S. Department of Agriculture Rural Development funding. Kellogg, Idaho, received the largest grant ever awarded in the State of Idaho to support their $8M sewer rehabilitation program. The project is located within the Bunker Hill Superfund Site (BHSS), requiring a higher degree of regulatory compliance.

Paved Roadway Reconstruction Program, Cities of Kellogg and Osburn, Idaho, 2012–Present

Mr. Forseth is Alta's Principal-in-Charge of a $20M paved roadway reconstruction program for Kellogg and Osburn, Idaho. He managed the creation of a 5-year capital plan, including project sequencing, coordination with utility upgrades, and cash flow strategies. He worked with the cities, Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (IDEQ) to set up the reconstruction programs that are currently rebuilding approximately $5M of paved roadways each year.

Bunker Hill Mining and Metallurgical Complex Superfund Site, Idaho, 2006–Present

Mr. Forseth provides the State of Idaho with engineering technical support, and his expertise in planning, design, and construction oversight has proven invaluable on numerous projects implemented at this site. Mr. Forseth

was the lead engineer for a 900,000 cubic-yard Soil Repository located on soft soils adjacent to a highway and Interstate 90.

Mr. Forseth developed over $30M in projects for the 2010 Focused Feasibility Study for Operable Units 1, 2, and 3. He provided technical and planning support for the record-of-decision amendment, provided engineering cost estimating, and technical support to the State of Idaho for Department of Justice litigation, completed infrastructure planning and design, and worked on a State plan to investigate and remediate abandoned mine lands.

Priest River Former Landfill Remedial Action, Bonner County, Idaho, 2010–2012

Mr. Forseth prepared the engineered plans, specifications, and cost opinion for remediating a former unregulated rural landfill. The design included bulk waste removal and reclaiming a 60-75% grade slope, soil excavation and placement, stormwater management, protection of the adjacent scenic river, and site revegetation. He prepared the design in cooperation with the USEPA Region X, the City of Priest River, Priest Community Forest Connection, and the IDEQ. Mr. Forseth provided engineering support throughout remedial action construction, maintained cost controls, and oversaw resident inspectors.

Bayhorse Townsite, Beardsley, and Pacific Mine Remediation & State Park Development, Challis, Idaho, 2006–2010

Mr. Forseth was the lead design engineer who developed engineered plans to convert a historic ghost-town mining district, contaminated by hard-rock mining waste, into a new Idaho State Park. He provided engineering support for the Analysis of Brownfields Cleanup Alternatives. He designed a mine tailings pile cap, slag pile closure, state park appurtenances, and controls for working sites contaminated with heavy metals and arsenic. He provided construction cost estimates and assisted the Idaho Department of Parks and Recreation in bidding the project for construction. Mr. Forseth prepared the site-specific Institutional Controls Program and Closure Report. The project received the 2009 U.S. Department of Interior Partners in Conservation Award for Cooperative Conservation Partnership.

Publications/Presentations

- Northwest Brownfields & Land Revitalization Conference, Spokane 2012, speaker
- WEF 2004 Collection System Specialty Conference – Applications of Portland's Explicit Model, speaker
- USGS Brownbag Series – Scalar Approach to CSO Facilities Modeling, speaker

Perrin Robinson, PE

Interim Project Manager

Education

BS, Civil Engineering, Virginia Polytechnic Institute & State University

Professional Registrations

Professional Engineer: Oregon (95101PE), Idaho (13223), South Carolina (21567), North Carolina (31891)

Relevant Experience

Perrin Robinson is a registered civil engineer and project manager with more than 20 years of experience. His water resource experience includes planning, modeling, design, construction administration, and project management for river restoration and salmonid fish habitat improvements; groundwater aquifer recharge; river off-channel water storage; river and reservoir intake facilities; storm water quality and quantity mitigation facilities; hydrologic and hydraulic modeling; and open channel and pressurized pipe conveyance systems.

Representative Projects

Deputy Project Manager, 2018-2019 Feasibility, Data Analysis, and Environmental Review for the Walla Walla Basin Integrated Flow Enhancement Study (Flow Study), Walla Walla Watershed Management Partnership, WA and OR. This phase of the Flow Study builds on nearly 20 years of planning and study by many parties in the Walla Walla Basin to improve flows in the mainstem Walla Walla River for native fish species while maintaining the long-term viability and water availability for irrigated agriculture, residential, and urban use. Supported the Project Manager with on the ground oversight and execution of project aspects. Performed activities to advance a new reservoir or pump exchange anchor project complemented by conservation and ASR. Developed an enhanced river response model to quantify flow requirements and standardized alternative performance. Performed analyses and evaluation for four selected alternatives in terms of meeting the instream flow objectives. Developed construction cost, annual operating cost, and life cycle cost analysis estimates. Developed alternative project feasibility-level design drawings. Developed and used a project alternative evaluation tool with primary and secondary project benefits and integration of temporal distribution from the river response model results.

Project Manager, Nason Creek Lower White Pine Oxbow Reconnection Project – Pre-Designs and Specifications, USBR, Pacific Northwest Region, WA. Provided hydrologic and geotechnical engineering technical assistance in the evaluation and design of the habitat complexity improvement project on Nason Creek, a tributary to the Wenatchee River in central Washington, as part of the Columbia-Snake River Salmon Recovery Program. The project involved reconnection of oxbows of the historic Nason Creek channel that were disconnected from surface flow in Nason Creek by a Burlington Northern Santa Fe (BNSF) railroad embankment. Prepared baseline environmental condition documentation pertaining to groundwater / surface water conditions, hydrology, and geology / geotechnical conditions. Provided evaluation of feasibility regarding use of trenchless technologies under the railroad embankment for installation of a large-diameter culvert connection. Performed on-track geotechnical drilling that required preparation of detailed drilling work plans and close coordination with BNSF. Provided geotechnical design requirements in support of a new railroad bridge design with driven piles and assisted with development of construction phasing plan.

Project Engineer, Facility Layouts and Cost Analyses, Appraisal-Level Designs and Cost Estimates for Selected Off-Channel Storage Features, Columbia River Mainstem Storage Options, USBR, Pacific Northwest Region, WA. Completed appraisal-level investigation of suitability and technical feasibility, cost, benefits, and objectives achievement, and environmental and socioeconomic impacts of six potential new off-channel storage facilities from 1 to 3.3 million acre-feet. Evaluation included water balance modeling, field reconnaissance, preliminary layouts, estimating of construction costs and Net Present Value, and impacts and benefits assessment. Submittals included more than 80 engineering drawings and geologic maps depicting layouts of dams, power generation (location of power lines and substations), and conveyance facilities. Conducted meetings with USBR and Ecology staff. Developed layouts for large off-channel storage reservoirs, large canals, pipelines, tunnels, penstocks, pumping plants, and fish screens. Delivered conceptual designs, environmental reconnaissance, decision support, and life cycle cost analyses in approximately 9 months. Developed water balance model based on 70 years of data to determine water demands and surpluses and impact on reservoir and conveyance facility sizes. Prepared a decision support model to assess a variety of project impacts and benefits and provided a means of comparing alternatives objectively. Included facilities for power generation, and the effect of power generation on annual net present value of project alternatives.

Project Manager, Unit A Pumping Plant #2 and Pipeline, A&B Irrigation District, Burley, ID. Provided engineering support during design, bid document preparation, construction contractor pre-qualification, equipment pre-construction

procurement, and construction for an irrigation groundwater to surface water conversion project consisting of a new inlet channel from the Milner Pool on the Snake River, pump station, and pressurized delivery pipe network. The project allowed for the conversion to surface water of approximately 1,500 acres of land and a new delivery system to 4,500 acres of land serviced by the existing Unit A Pumping Plant #1 to enhance the existing open channel conveyance system. Design included electrical engineering and instrumentation and controls engineering for the project in support of the overall pump station and pipeline designed by U.S. Department of Agriculture (USDA) NRCS. Collaborated with NRCS to prepare the final design and construction documents. The pumping plant consisted of six short-coupled multi-stage turbine pumps driven with 3-phase, 2,400-volt, 500-hp motors and two short-coupled multi-stage turbine pumps with 3-phase, 480-volt, 250-hp motors on variable frequency drives. The pumping plant has capacity to pump 107 cubic feet per second (cfs) at a total dynamic head of 208 feet. Pump intake protection entailed 12 rotating barrel screens with a pressurized backflush system. An automated control system with local and remote sensors was designed to maintain a minimum of 10 psi pressure throughout the pipeline system. The irrigation delivery pipeline consisted of approximately 94,000 linear feet of buried solid wall PVC pipe ranging in size from 54-inch to 2-inch nominal diameter.

Project Manager, Lake Walcott Groundwater Recharge, A&B Irrigation District, Minidoka County, ID. Groundwater recharge project to enhance the water supply available in the Eastern Snake Plain Aquifer with a target recharge rate of 100 cfs. Project elements included a new lake intake structure with fish screen, new pump station with two 50-cfs submersible pumps, a meter vault, 54-inch-diameter conveyance pipeline, and injection wells. Intake and pump station facility were to be located within the Minidoka National Wildlife Refuge managed by the USFWS. Tasks included development of conceptual alternatives, cost estimating, and evaluation. Prepared material in support of USBR WaterSMART grant application. Conducted multiple stakeholder meetings and review workshops to gain project endorsement and concept selection to advance to final design. Performed environmental, historical, and archaeological investigations and agency coordination in support of an Environmental Assessment to meet NEPA requirements. Project stakeholders included USFWS, USBR, Idaho Department of Water Resources (IDWR), Idaho Department of Fish and Game (IDF&G), A&B Irrigation District, and Magic Valley Groundwater District.

Project Engineer, System Upgrade (Canal-to-Pipeline Conversion) and Water Conservation Program, LWRID, NRCS, Blaine County, ID. Design, permitting, right-of-way descriptions, and NEPA environmental assessment of more than 32 miles of mainline and lateral pipelines to replace the existing gravity canal system. The design phase was contracted with the USDA-NRCS, and subsequent phases were contracted with the irrigation district. This water conservation project for the NRCS involved welded steel, HDPE, and PVC pipe ranging from 3 inches to 72 inches in diameter, and also included several pumps stations, a Coanda screen weir structure, more than 100 turnouts, and intake and metering structures along the alignment. The project is expected to conserve more than 20,000 acre-feet of water annually by eliminating seepage losses, and will also reduce power consumption and power costs by $500,000 annually by capitalizing on the available hydraulic head in the system to pressurize the pipeline and serve the majority of farm turnouts at the required sprinkler pressure without pumping. Worked with both the NRCS and the LWRID to conduct public meetings and design workshops to foster public involvement and improved communications with affected landowners. Following design, served as project engineer during preparation of an environmental assessment as part of NEPA compliance, preparation of permit applications, and right-of-way descriptions to facilitate land acquisition.

Ken Hansen, PE

Technical/Engineering Analysis Lead

Education

MS, Civil and Environmental Engineering, Utah State University
BS, Civil and Environmental Engineering, Utah State University

Professional Registrations

Professional Engineer: Idaho (8615); Wyoming (16102)

Relevant Experience

Ken Hansen is a senior technologist with 28 years of experience developing, designing, and commissioning hydraulic structures on rivers and tributaries. He has served as the task lead or project manager on the design and evaluation of several water resources-related projects, including spillways, stilling basin, outlet works, fish passage, fish hatcheries, irrigation facilities, hydroelectric power development, stormwater, river intakes, conveyance, and hydrologic studies. Prior to joining Jacobs, Ken served as the Chief of Hydraulic Design and Water Quality Section for USACE Walla Walla District, with responsibility for design of several hydraulic structures, dam safety, and fish passage-related projects for dams on the Snake and Columbia Rivers and tributaries. He was also the USACE technical lead for the hydraulic features of the current Pine Creek Water Delivery Study.

Representative Projects

Technical Lead, 2018-2019 Feasibility, Data Analysis, and Environmental Review for the Walla Walla Basin Integrated Flow Enhancement Study (Flow Study), WWWMP, WA and OR. This phase of the Flow Study builds on nearly 20 years of planning and study by many parties in the Walla Walla Basin to improve flows in the mainstem Walla Walla River for native fish species while maintaining the long-term viability and water availability for irrigated agriculture, residential, and urban use. Performed activities to advance a new reservoir or pump exchange anchor project complemented by conservation, managed aquifer recharge, and ASR. Developed an enhanced river response model to quantify flow requirements and standardize alternative performance. Refined seepage estimates for the study reaches of the Walla Walla River for inclusion in the river response model. Performed analyses and evaluation for four selected alternatives in terms of meeting the instream flow objectives. Developed construction cost, annual operating cost, and life cycle cost analysis estimates. Developed alternative project feasibility-level design drawings. Developed and used a project alternative evaluation tool with primary and secondary project benefits and integration of temporal distribution from the river response model results.

Project Technical Lead and Reservoir Modeling, Pine Creek Reservoir Water Delivery Study, Milton-Freewater, OR. As Project Technical Lead and in collaboration with WWBWC, Ken developed the reservoir operations model and the hydrology used to optimize project facilities size, capacity, and layout, given the available water supply, to meet water delivery objectives and instream flow targets. Criteria used for the timing of the river diversions also increases the opportunity for being accepted by Oregon State Water Commission. He developed pre- and post- project hydrographs to support investigation of the fisheries impacts and geomorphology investigations. He also coordinated investigation of hydropower considerations, Dry Creek Water supply, relocation of the river intake, Lowden pipeline consideration, utilizing Bennington Lake, and all hydraulic structures for the irrigation and dam structure.

Lead Hydraulic Structures Engineer, Feasibility Studies for North Fork Cowiche Creek Dam and Reservoir and Wapatox Conveyance Facilities, YTID, Yakima County, WA. Feasibility studies included 5 miles of a 96-inch pipeline, 35,000-acre-foot reservoir behind a 240-foot-high dam (RCC or concrete-faced rockfill), new point of diversion, and conveyance system. The hydraulic design was for developing concepts for the spillway, stilling basin, reservoir inlet, and outlet works.

Lead Hydraulic Engineer, Lane City Reservoir, TX. Project involved the design of a 40,000 acre-foot off-channel reservoir and associated conveyance to and from the reservoir. Hydraulic design lead for the dam emergency spillway, stilling basin, reservoir inlet outlet structure, reservoir outlet, 700-cfs relift pump station intake design, 450-cfs (700 cfs emergency) river outfall with a 24-foot rectangular stilling well in the river, and redesign of the vertical pump station intake at the river. Several unique structures were developed utilizing both CFD and physical hydraulic modeling to reduce construction costs while maintain function. A supercritical drop box spillway that passes high flows with relatively small increase in head by folding the crest. The canal inlet, canal outlet, and relift pump station intake were combined into one structure. The result was a structure that serves as both an efficient inlet when filling the reservoir (either by gravity or pumping) and an energy dissipater when functioning as an outlet to empty the reservoir. A canal intake efficiently transitions canal flow into a supercritical pipe flow to convey water to the river where it discharges into a unique non-

submerged stilling well using a baffled cone to assist in dissipating 43 feet of energy before entering the river. Ken has also assisted with commissioning hydraulic structures during the construction.

Hydraulic Task Lead, Engineering Report for Box Creek Dam and Reservoir, Aurora Water, Aurora, CO. The Box Creek storage site is located approximately 8 miles south of Leadville in the Box Creek Valley, a direct tributary to the Upper Arkansas River. The proposed Box Creek Reservoir will provide an important water storage asset to the City of Aurora's water supply portfolio. Developed all the hydraulic structures related to the 170-foot-high dam including a spillway chute and conduit design that mitigated many dam-related issues including avoiding historic landslides at an abutment while also avoiding issues related to the relatively high embankment settlement. His hydraulic design efficiently combined discharge from the low-level penstock and valve chamber with the spillway conveyance to one stilling basin strategically located to efficiently transition back to the natural stream. Design of the inlet structures mitigated icing related issues both in the conveyance from the river diversion and in the reservoir. Currently developing the concept design for the river intake and 8 miles of conveyance pipeline to the dam. Developed the design for the 200 cfs river intake and 8 miles of conveyance pipeline to the dam and 2 miles of conveyance pipeline for the outlet to the river.

Lead Hydraulic Structures Engineer, Harris Reservoir Expansion Project, Dow Chemical Company, Brazoria County, TX. Task lead responsible for hydraulic design and development of all hydraulic structures related to the construction of the 48,000-acre-foot water storage reservoir including an innovative spillway design that utilizes a baffled drop to avoid a high-velocity concrete chute on the embankment and tailwater requirements at the stilling basin. The structure was also combined with the low-level outlet works to minimize structures on or through the dam embankment.

Water Resources Task Lead, Irrigation Development on the Blackfeet Reservation, U.S. Bureau Indian of Affairs, Browning, MT. Evaluated irrigation development projects for over 70,000 acres on the Blackfeet Indian Reservation to determine required irrigation facilities and economic feasibility of the irrigation projects. This evaluation included an analysis of water supply, reservoir storage, pipeline and canal conveyance, irrigation distribution systems, pump stations, check structures, and on-farm application systems.

Lead Hydraulic Engineer, Duck River Water Supply Project, Cullman, AL. The 2,400-foot-long "run of the river" dam includes rockfill and clay core dam sections along both the right and left abutments and a 300-foot RCC gravity spillway section across Duck River. The hydraulic design includes design of a multiple-depth intake tower, 500-cfs conveyance pipelines for both the dam outlet works and a future pump station, and outlet works for regulating both high- (36-inch fixed cone valve) and low-flow releases (15-inch plunger valve), modifying both the inlet and outlet for a 10-foot- diameter concrete pipe to utilize for river diversion conduit during the construction. The RCC section of the dam serves as a 195-foot-long spillway with a RCC stepped spillway chute, stilling basin, and river transition to safely pass the PMF flood event of 76,100 cfs. A CFD analysis was performed of the non-typical transition of the stilling basin into the river.

Hydraulic Design Lead, Rondout Reservoir Siphon Spillway Design, New York City Department of Environmental Protection (NYC DEP), New York, NY. The project, currently under construction, is a temporary siphon spillway at Rondout Reservoir as part of an overall Rondout-West Branch Tunnel (RWBT) project that provides about 50% of New York City's total yearly water supply. The outage of the RWBT during construction substantially reduces the existing flow release capacity, creating a greater potential for having greater and more frequent uncontrolled spills. A siphon spillway with a design life of 10 years was designed to provide up to 600 cfs of additional release capacity to mitigate floods.

Ron Fehringer, PE

Costing Manager

Education

MS, Agricultural Engineering, Oregon State University
BS, Agricultural Engineering, Oregon State University

Professional Registrations

Professional Engineer, Idaho (12064); California (C051483); Washington (46718)

Relevant Experience

Ron Fehringer has 29 years of experience serving as project manager, lead engineer, and task manager for a variety of conveyance system and fish passage design projects. Ron is one of the firm's most experienced river intake specialists. He is a proven manager for some of the firm's most complex and successful municipal and irrigation projects that involve river intakes, conveyance, and storage facilities. In addition to design work, he has also participated in value engineering efforts and completed numerous studies focusing on water supply and irrigation systems.

Representative Projects

Project Manager, 2018-2019 Feasibility, Data Analysis, and Environmental Review for the Walla Walla Basin Integrated Flow Enhancement Study (Flow Study), Walla Walla Watershed Management Partnership, WA and OR. This phase of the Flow Study builds on nearly 20 years of planning and study by many parties in the Walla Walla Basin to improve flows in the mainstem Walla Walla River for native fish species while maintaining the long-term viability and water availability for irrigated agriculture, residential, and urban use. Managed activities to advance a new reservoir or pump exchange anchor project complemented by conservation, managed aquifer recharge, and aquifer storage recovery (ASR). Developed an enhanced river response model to quantify flow requirements and standardize alternative performance. Refined seepage estimates for the study reaches of the Walla Walla River for inclusion in the river response model. Performed analyses and evaluation for four selected alternatives in terms of meeting the instream flow objectives. Developed construction cost, annual operating cost, and life cycle cost analysis estimates. Managed alternative project feasibility-level design drawings. Developed and used a project alternative evaluation tool with primary and secondary project benefits and integration of temporal distribution from the river response model results.

Senior Reviewer/Project Engineer, Intake and Conveyance System, Pine Creek Reservoir Water Delivery Study, Milton-Freewater, OR. This study developed dam and reservoir configurations and conveyance alternatives for augmenting in-stream summer flow in the Walla Walla River by diverting and storing excess flow during winter months. Ron assisted with team coordination and preparation of the summary report.

Project Engineer, Tieton Canal Replacement Project, Yakima-Tieton Irrigation District (YTID), Yakima, WA. Jacobs has been helping YTID evaluate options to upgrade or replace its 12-mile-long Tieton Canal, which is the backbone of their water supply system. Served as project engineer during evaluation of several alternatives, including full in-kind canal replacement (with pipe and RCB box), a new reservoir, and a new pump station and pressured conveyance system. The project is being coordinated with efforts under the Yakima Basin Integrated Plan (YBIP), which addresses water supply reliability, habitat improvement, and other vital resource issues in the basin.

Project Engineer, North Fork Cowiche Creek Reservoir Feasibility Study, Yakima Basin Integrated Plan, WA. Completed a feasibility evaluation of a proposed new 35,000-acre-foot reservoir formed by a new 1,200-foot-long, 240-foot-high earthfill or roller-compacted concrete (RCC) dam, new 12,000-hp pump station, and 96-inch-diameter pipeline. The reservoir would provide additional storage and flexibility for agricultural and environmental benefits in the Yakima Basin, consistent with the goals and objectives of the YBIP.

Project Engineer, Appraisal-level Designs and Costs Estimates for Selected Off-Channel Storage Features, Columbia River Mainstem Storage Options, USBR, Pacific Northwest Region, WA. Managed appraisal-level investigation of suitability and technical feasibility, cost, and benefits, and environmental and socioeconomic impacts of six potential new off-channel storage facilities from 1 to 3.3 million acre-feet. Managed project team and subconsultants, led meetings with USBR and Ecology staff, and coordinated the development of water balances, project drawings and reports, and cost estimates. Developed water balance model based on 70 years of data to determine water demands and surpluses and impact on reservoir and conveyance facility sizes. Prepared a decision support model to assess a variety of project impacts and benefits and provide a means of comparing alternatives objectively.

Design Manager, Lane City Reservoir Project, Lower Colorado River Authority, Austin, TX. Jacobs (CH2M) completed design and is providing construction observation and engineering services during construction for a new

40,000-acre-feet off-channel reservoir and associated conveyance facilities, which include a 700-cfs pump station; rehabilitation of two existing pump stations on the Colorado River; widening and other improvements to approximately 3 miles of canal to increase capacity and allow bi-directional flow; construction of four new canal structures on the canal to control, receive, and release flows; multiple energy-dissipation structures between the reservoir and the river; and several thousand linear feet of pipeline ranging from 42 to 120 inches in diameter.

Design Manager, System Upgrade and Water Conservation Program, Little Wood River Irrigation District (LWRID) and Natural Resources Conservation Service (NRCS), Blaine County, ID. The proposed project involves converting the existing open canal delivery system to a closed pipeline delivery system. The project includes approximately 32 miles of pipeline ranging from 72 inches to 3 inches in diameter, an intake screening structure, two large pump stations, several small pump stations, over 100 farm turnouts, and conversion of certain canals to floodways.

Program Manager, Consecutive IDIQs for Multi-disciplinary Engineering and Design Services, U.S. Army Corps of Engineers (USACE), Walla Walla District, WA. Task orders have included designs and hydraulic modeling for dams, pumping plants, and fish passage facilities; safety evaluations at government dams; designs for fish hatchery improvements; and a cost reduction analysis for the Walla Walla River pumpback project.

Project Manager, Dworshak Fish Hatchery, Orofino, ID. Project included a site investigation, preliminary design, feasibility study, and final design to achieve NPDES compliance. Modifications to fish-rearing structures will accommodate full-flow treatment of fish-rearing water, improved measurement, modernized electrical equipment, and improved management of flows. Led the final design of improvements to the hatchery to comply with its NPDES permit. The hatchery, owned by the USACE and co-managed by U.S. Fish and Wildlife Service (USFWS) and the Nez Perce Tribe, annually raises 2 million steelhead smolts, 1 million Chinook salmon smolts, 280,000 Coho salmon smolts, and 15,000 rainbow trout.

Alta Science & Engineering, Inc.

STEVEN R. WALKER

Stakeholder Liaison

Alta-se.com

Education

- B.S., Hydrology and Water Resource Administration, University of Arizona

Areas of Expertise

- Professional Engineer, Civil, OR, AZ, NV (*retired*)

Special Appointments, Memberships, or Affiliations

- Society of Marketing Professional Services
- American Consulting Engineers Council
- American Society of Civil Engineers

Experience Summary

Steve Walker brings 25 years of professional engineering experience followed 15 years professional management consulting experience to his operations, marketing and project management roles.

Mr. Walker's experience includes strategic planning, stakeholder facilitation and conflict resolution, strategy development, perception and image surveys, image and branding strategies. His results-oriented management style has proven effective in the execution of planning, design and construction projects.

Project Experience

City of Gresham, Stormwater Division, OR

Over a three-year period, the City of Gresham, Oregon "re-invented" the Stormwater Division of the City's Environmental Services Department. To assist them in this effort, Mr. Walker facilitated a series of meetings, workshops, and a retreat during which the teams created a new vision and specific strategies to achieve it. The resulting organization created a new model for the City's Department of Environmental Services and has become one of the City's most successful business units.

City of Salem, Salem Water Management Plan, OR

Mr. Walker served as project manager for the Salem Water Management Plan, which broke new ground for environmentally conscious water stewardship in the Willamette Basin. This project faced several significant challenges from both internal and external stakeholders. Changes in statewide water policy placed its water supply at risk, forcing the City to become a partner with adversarial stakeholders.

Internally, there were strongly held opinions and convictions on how best to address the changes and risks to its water supplies. Mr. Walker designed and led a program that reengaged both the internal stakeholders and the City's neighbors.

Internal Stakeholder Chartering

- First, formal "Chartering" sessions were held where City officials, managers and staff came together to agree on program needs, goals, policies and strategies. They worked together to reach consensus on operating "rules" for effectively working together, conflict resolution processes, and success measures.

External Stakeholder "Re-Engagement"

- The process of rebuilding damaged relationships with neighboring communities started with a telephone survey of public officials, business leaders, and citizens

who had commented or complained publicly about Salem's policies and/or leaders.

- The next step was a set of "Listening Sessions." This was a series of meetings where senior leadership from Salem met one-on-one or with small groups from the stakeholder communities and ask several questions designed to allow the airing of grievances and concerns. The staff was prepared and rehearsed to ask clarifying follow-on questions but not to refute concerns or justify past actions; only listen.
- The third step was a response to the interviewees, confirming that their concerns had been heard and presenting a plan for addressing the concerns with actions, outcomes, and schedules. The results of the program were renewed constructive relationships with the City's neighbors and support for the City's water management program.

Portland State University, Civil and Environmental Engineering Department, OR

The PSU Department of Civil and Environmental Engineering (CEE) elected to work through a process to set the strategic direction for the Department. This direction was intended to help them move into the next level of growth and performance in supporting the engineering program.

In the retreat session, the faculty team was able to come to consensus on their desired outcomes as well as the critical barriers and strengths of the department to achieve this vision. They prioritized the barriers and created initiative teams to address the most constraining of them and brainstormed and prioritized a set of initiatives to help them achieve this vision.

SMPS, Oregon Board of Directors Strategic Planning Retreat, OR

Mr. Walker designed and facilitated a half day strategic planning retreat for the Board of Directors of the Oregon Chapter of the Society for Marketing Professional Services. The goal of the retreat was to set the stage for responding to members' needs and suggestions and bring new energy to the Chapter.

organization structure or business practices that would enhance its opportunities for profitable long-term growth.

Tualatin Valley Water District/Joint Water Commission Engineering Division Team Charter and Strategic Plan

In 2019, TVWD reorganized its Engineering Division to prepare for the operations and maintenance demands of a a massive new regional Willamette Water Supply Program (WWSP). Steve was contracted by the Chief Engineer to facilitate a new strategic plan and charter the team's reorganization to meet their changing and growing role. Steve developed and facilitated a 2-day planning and team building workshop that brought transformational change to the team

City of Tucson, 100-Year Assured Water Supply Project, AZ

As Project Engineer for CH2M HILL, Mr. Walker was responsible for preparing and facilitating effective stakeholder and advisory committee meeting and public outreach efforts for this critical and highly controversial 100-yr assured water supply project. Due to falling aquifer levels, the City of Tucson needed to shift water use away from the local ground water supply in favor of alternative surface water supplies. The project evaluated a very broad range of alternatives including Aquifer Storage and Recovery (ASR) potable and non-potable reuse, surface water transfers from interstate projects such as the Salt River Project and agricultural retirement – even iceberg harvesting was evaluated.

City of Tempe, Arizona, Tempe Town Lake, AZ

Mr. Walker served as the Project Manager for a major river restoration project for the City of Tempe, near Phoenix, Az. This creative and unique project returned water to the normal dry Salt River using a combination inflatable dams, aquifer storage and recovery systems, stormwater and reclaimed wastewater to create a riparian space in the middle of the Phoenix metro area. As PM one of Steve's responsibilities was to be the project spokesperson and facilitator to help the City build a broad public and political base of support needed to make this project succeed. Today this lake is a destination attraction for Tempe and the Phoenix area with boating, fishing, outdoor public spaces and major economic development.

Paul R. Woods, PE

Water Project Financing

Education

MS, Public Administration, Boise State University, 2000
BS, Civil Engineering, University of Wisconsin, 1986

Professional Registrations

Professional Engineer: Idaho (No. 9953)

Relevant Experience

Paul is a Civil and Environmental Engineer in Jacobs's Boise, Idaho office. He has 32 years of experience in developing water supply and wastewater treatment strategies following the Clean Water Act and Safe Drinking Water Act regulatory compliance requirements. His work experience demonstrates an ability to deliver innovative solutions to complex issues. He has considerable experience in regulatory program design and implementation; developing Facility Planning documents with innovative compliance options that focus on rate stability and community affordability; and financial analysis and assessments to meet regulatory requirements. Paul's technical skills include project scoping; regulatory analysis; project delivery and strategic implementation.

Representative Projects

Project Lead, Associate Director of the Environmental Finance Center at Boise State University (Boise, ID), Watershed Funding Workshops for EPA Region 10 (AK, ID, OR, WA, and 271 Tribal Nations). Led implementation of a pilot program to deliver watershed funding workshops to small rural communities. Presented information on funding from USDA NRCS, USBR, USACE, EPA 319, and CWSRF as well as private philanthropy sources. Received an official recognition from EPA Region 10 in 2002 for his work on the program.

Project Lead, Implementation of US Mayor's Climate Initiative, City of Boise, ID. In 2006, the City of Boise signed on to the US Mayor's Climate Initiative. Paul led the City's efforts to inventory carbon emissions from all operations and identify opportunities to fund renewable energy projects. One of the successful projects was a public-private partnership for a 25-MW solar array at the City's 20 Mile South Biosolids Farm.

Executive Director, Boise River Flood Control District No. 10. Mr. Woods served as the Executive Director of Flood Control District No. 10 implementing flood control and stream bank stabilization projects throughout the lower Boise River. The scope of work consisted of doing in-stream work under a US Army Corps of Engineers permit as well as working with private land owners on stream bank stabilization projects.

Project Lead, Idaho Power Integrated Resource Planning, Boise, ID. Represented the City of Boise in development of Idaho Power Company's Integrated Resource Plan from 2012 to 2014. Participated in detailed analysis and discussion of resource needs, role of wind and solar contribution to reliability, transmission's role in firm capacity, and net metering for residential solar customers.

Lead Negotiator, Dixie Drain Offset Project, City of Boise, ID. Served as Lead Negotiator with EPA Region X and Idaho DEQ to allow an NPDES offset project as a means of compliance with new permit limit for total phosphorus. The project set a new precedent for Clean Water Act compliance and provided economic benefits to rate payers while also creating better environmental outcomes.

Client Representative, Treasure Valley Comprehensive Aquifer Management Plan; City of Boise; ID. Represented the City of Boise on the Treasure Valley CAMP advisory committee. Led discussion regarding the Department's Reasonably Anticipated Future Needs rules framework and was part of a select subset of the Committee charged with drafting the final document.

Project Manager, Lander Street and West Boise Facility Plan; Boise, ID. Supervised the project scoping and management of the City's 2014 Facility Plan update that addressed new limits for nutrients and temperature; wastewater reuse; and facility consolidation.

Client Representative, NPDES Permit Negotiations; Ontario, OR. Represented the City in NPDES permit negotiations with Oregon DEQ concerning a precedent setting limit for total arsenic that is lower than the Drinking Water standard. Facilitated discussions with Governor's Office and EPA Region X to identify a solution that provides for a 15-year schedule of compliance that is limited by the economic affordability of the community.

Julia Long

Water Funding (Washington)

Education

B.S. Natural Resources Management, University of Alaska Fairbanks

Professional Registrations

Professional certificate in River Restoration, Portland State University

Relevant Experience

As a Project Manager and project lead, she has developed these relationships within Reclamation (e.g. local area office, Regional Office, and at the Technical Service Center in Denver, CO), other Federal Agencies (e.g. USFWS, NMFS, BIA, USFS, BLM, NPS), State (e.g. Ecology, WDFW), Irrigation Districts (e.g. Roza Irrigation District, Westlands Irrigation District), and the local Tribe (e.g. Yakama Nation). She works to maintain open and clear lines of communication, have a reputation for being trustworthy, and work hard to earn and give respect. As a leader, she aims to build collaborative relationships through team building and training to reach common goals.

Representative Projects

Project Manager, Kachess Drought Relief Pumping Plant and Keechelus Reservoir-to-Kachess Reservoir Conveyance Project, Employed by Bureau of Reclamation, Yakima, WA. Project Manager for the Kachess Drought Relief Pumping Plant Project Environmental Impact Statement. As a Project Manager, she coordinated monthly meetings with Reclamation's Regional Director, NEPA Lead, and Subject Matter Experts. She coordinated hydrologic modeling and Safety of Dams meetings between our project proponent, Pacific Northwest Region staff, the Denver Technical Services Center staff, and Washington State Department of Ecology. In addition, she worked with Reclamation Solicitor's and pertinent staff to prepare for briefings with the Commissioner and Deputy Secretary.

Project Manager, Long-term Plan to Protect Late Summer Adult Salmon in the Lower Klamath River, Employed by Bureau of Reclamation, Redding, CA. Project Manager for the $2 Million-dollar Long-Term Plan (LTP) for Protecting Late Summer Adult Salmon in the Lower-Klamath River Project Environmental Impact Statement (EIS), FAITAS Level II Contracting Officer Representative (COR). In 2002 there was an unprecedented die-off of adult salmon in the lower Klamath River due to an epizootic disease outbreak. Her role was to coordinate contracting of the environmental analysis and cooperating agency involvement in the preparation of an EIS and Record of Decision.

She developed the Performance Work Statement, Evaluation Plan, Quality Assurance Surveillance Plan, and assisted with the Independent Government Cost Estimate to hire a consultant for development of the EIS. She worked to hire the consultant for the LTP EIS and provide technical and regulatory review of documents to ensure compliance with environmental laws. She has exercised optional tasks in the contract to adjust to evolving objectives and regularly coordinated with the consultant to ensure the schedule was adhered to and work was performed on time and within budget.

She represented Reclamation at four Public Scoping Meetings to kick-off the environmental analysis process for the Long-Term Plan. Coordinated and presented a PowerPoint at six Tribal Information Meetings. The Tribal Information Meetings were intended to provide a venue to the local Tribes and impart additional input on the EIS planning process. During the public comment period open house and public hearing, she presented a slide show to inform the public on the status of the Draft EIS and results of the effects analysis.

KATHERINE ROWDEN

Watershed Scientist

Alta-se.com

Education

- B.S. Civil Engineering / Concentration in Environmental Engineering, Summa Cum Laude
  Gonzaga University

Special Appointments, Memberships, or Affiliations

- National Oceanic and Atmospheric Administration (NOAA) Administrator's Award for working with communities and emergency managers in Eastern Washington to prepare them for post-fire flash floods and debris flows. 2016
- Washington Association of Conservation Districts award for partnership and service. 2018
- Conservation Excellence Award for work after 2014 Carlton Complex Wildfire. 2015
- Climate Impacts Research Consortium (NOAA RISA) Advisory Council. 2017- Present

Scientific/Technical Knowledge

- Strong knowledge of post-wildfire impacts and responses
- ESRI GIS Software: ArcGIS, ArcMap, ArcGIS Collector, ArcGIS online
- Automated Geospatial Watershed Assessment (AGWA) tool: utilized for post-wildfire hydrologic modeling
- Wildcat5 model: utilized for post-wildfire hydrologic modeling

Publications/Presentations

- Fire Impacts on Hydrology. Presentation at the American Society of Civil Engineers Climate Change and Water Resource Engineering Seminar, Spokane, WA.

Experience Summary

Katherine Rowden has worked in the engineering field for several years prior to joining the National Weather Service (NWS) and Alta Science and Engineering. She is the Hydrology Program Manager for the NWS's Western Region in the area of floods, flash floods, water supply forecasts, droughts and other hydrometeorological services and programs.

She focuses on post-wildfire flood and debris flow risk, from community outreach and education to working on Burned Area Emergency Response (BAER) Teams. She works collaboratively with public officials and researchers to identify means to reduce post-wildfire flood and debris flow risk. She leads the NWS' Post-Wildfire Hydrology Working Group.

Experience Summary

- Watershed Scientist, Alta Science and Engineering, Utah, 2019-present
- Western Region Hydrology Program Manager: NWS/NOAA, Utah, 2019-Present
- Service Hydrologist: NWS/NOAA, Washington, 2010-2018
- Staff Water Resources Engineer: CH2M HILL, Washington, 2006-2010
- Transportation Engineer: Washington State Department of Transportation, Washington, 2005–2006
- Environmental Engineering Adjunct Instructor: Gonzaga University, Washington, 2006

Roger Beieler, PE

Technical/Engineering Analysis Quality Control Manager

Education

MS, Civil Engineering, Washington State University
BS, Agricultural Engineering, Washington State University

Professional Registrations

Professional Civil Engineer: Washington (15420); Oregon (9583); British Columbia; California (26075); Idaho (11393)

Relevant Experience

Roger Beieler has over 45 years of experience with planning, design, and construction of water and wastewater facilities in the Northwest, including outfalls and pipelines. He has designed projects using high density polyethylene pipe, fiberglass pipe, steel pipe, ductile iron pipe, and PVC pipe. He has presented papers at over 20 ASCE and AWWA conferences on topics related to conveyance pipelines. He has served as senior reviewer for quality control on several large pipeline projects. Roger has a vast amount of experience with open cut installations as well as various types of trenchless installations including HDD and microtunneling.

Representative Projects

Technical Lead, 2018-2019 Feasibility, Data Analysis, and Environmental Review for the Walla Walla Basin Integrated Flow Enhancement Study (Flow Study), Walla Walla Watershed Management Partnership, WA and OR. This phase of the Flow Study builds on nearly 20 years of planning and study by numerous entities in the Walla Walla Basin to improve flows in the mainstem Walla Walla River for native fish species while maintaining the long-term viability and water availability for irrigated agriculture, residential, and urban use. Performed hydraulic analyses of several Columbia River pump exchange project alternatives to size the primary pumping plant, three booster pump stations, and the system conveyance and distribution pipelines. Developed construction cost and annual operating cost estimates for the pump exchange project alternatives.

Project Manager, Walla Walla River Water Exchange Conveyance System, USACE, Walla Walla District. Responsible for a feasibility study to serve 175 cfs from the Columbia River to irrigated lands in the Walla Walla River Valley. The system would include two crossings of the Walla Walla River, 60 miles of pipeline, five large pumping stations, and several regulating tanks. The total length of the conveyance system varied from 32 miles to 69 miles depending on the conceptual alternative. Maximum pipe size was 78 inches.

Project Manager, Pressurized Pipeline System, LWRID, Carey, ID. Managed design of a pressurized pipeline system to replace existing system of open canals and laterals. Project included 31 miles of pipeline varying in diameter from 72 inches to 4 inches, a diversion/ screening structure, several pumping plants, and miscellaneous pipeline appurtenances. The pipeline routes included crossings of the Little Wood River, major canals, and several creeks.

Design Lead, Powell Butte Reservoir No. 2, Portland Water Bureau, Portland, OR. Responsible for design of conveyance facilities leading to and from Reservoir No. 2. The conduits included more than 5,000 feet of steel pipelines ranging in size from 90 inches to 48 inches. Tasks included coordinating connections to valve vaults, meter vaults, inspection structures, and various pipe appurtenances. Preliminary design efforts also included planning for two large-diameter microtunnels.

Senior Reviewer, King County, Brightwater Treatment Plant, Conveyance System, King County Department of Natural Resources, WA. Senior reviewer for pipelines in conveyance system. Reviewed the design and pipe class selection for several pipe systems, including steel, ductile iron, PVC, HDPE, and low-pressure drain pipes. Design factors considered included depth of cover, working pressure, test pressure, soil loads, traffic loads, temporary construction loads, pipe deflection, pipe wall buckling, temperature of fluid, soil strength, linings, coatings, and specified pipe class.

Project Manager, Tolt Pipeline Project, City of Seattle, Seattle, WA. Managed the design of this $39M project, including preparing drawings and specifications, property acquisition efforts, permitting, and construction services. The project includes 14 miles of steel pipe with diameters ranging in size from 54 inches to 81 inches. The crossing of the Sammamish River was noted for minimal environmental disruption. The project included the crossing of several wetlands and associated mitigation measures. The microtunnel crossing of the Snoqualmie River won the Trenchless Technology Project of the Year award.

Senior Pipeline Designer, Second Supply Pipeline Project, Tacoma Water, City of Tacoma, WA. Assisted with design of 2 miles of 48-inch-diameter steel pipeline, river crossings, and associated appurtenances.

JENNIFER GILLEY, GISP

Geographic Information Systems Specialist

Alta-se.com

Experience Summary

Jennifer Gilley is Alta's lead Geographic Information Systems Professional (GISP) with more than 12 years of experience supporting environmental projects using GIS and database tools. She provides interdisciplinary GIS and database support on projects throughout Idaho, Washington, and Montana, including the Hanford Site and the Bunker Hill Mining and Metallurgical Complex Superfund Site (BHSS). She also has experience with Surveying, LiDAR point cloud classification and processing, data collection, spatial analysis, developing online mapping resources, Natural Resource Damage Assessment (NRDA) support, and grant project management.

Education

- M.S., Geographic Information Sciences
  University of Denver
- B.S., Environmental Science (Magna cum laude)
  Northern Michigan University, Marquette, MI

Areas of Expertise

- Geographic Information Systems
- Global Mapper with LiDAR processing add-on
- Proficient with Software including ArcGIS Suite, ArcGIS Online, SQL Server, and Microsoft Office
- Proficient with Survey data collection and processing.
- Proficient with data collection on GPS units, GIS data collection apps on multiple platforms
- Proficient with FlexViewer and Adobe Photoshop CS5

Project Experience

Alta UAS LiDAR Program, Inland Northwest Region

Mrs. Gilley provides technical support to the Alta UAS LiDAR program by processing point cloud data as it comes in from the field. She classifies, and analyzes the data for quality control and converts it into various deliverable formats for delivery to Clients. She also is able to set survey ground control points for UAS LiDAR flights in the field and process the data.

Alta Relational Database Support, Silver Valley, Idaho

Mrs. Gilley provides support to Alta's database administrators by completing maintenance and update tasks within the company databases. She queries data regularly and compiles data reports for various project managers throughout the year. She beta tests new database functions and web interfaces.

Hanford Site Data Compilation Project, Hanford, WA

Mrs. Gilley provides support for the data compilation projects for the CTUIR HNRTC by researching sample reports completed at the Hanford site for hundreds of different analytes in several media types. She utilizes several software suites to analyze documents, data points, and methods for gaps in data or methodology to vet the pedigree of the reports. Since 2014 she has supported the project through Aquatic and Terrestrial data research.

Hanford Site Risk Calculator Project, Hanford, WA

Mrs. Gilley provided support for the CTUIR Risk calculator since working to secure a subcontractor to write the software necessary for the tool. She aided in communications between several different parties necessary to translate the Paul Rittmann Risk models from their original format into a relational database with software that processed the complex equations and displayed them in an online graphical user interface.

Hanford Site 100-F Pilot Project, Hanford, WA

Mrs. Gilley supported the CTUIR-EESP by collecting and compiling data sources for entry into a SQL Server relational database and analyzing various media formats to translate into GIS authored spatial data layers. She used concentration data from the HEIS database to run with the Paul Rittmann risk analysis model for the Native American Residential Tribal Scenario to create spatial datasets and develop 3-dimensional contoured surfaces displaying risk outcomes. Working together with the CTUIR GIS Program, she provided technical guidance while they developed the online Web Mapping Gallery and online documentation inventory database that she helped to create.

Bunker Hill Mining and Metallurgical Complex Superfund Site, Silver Valley, Idaho

Mrs. Gilley provides GIS support for various projects at the Bunker Hill Superfund Site (BHSS). She coordinates with local entities on ownership and GIS data, manipulates and displays a variety of environmental and infrastructure data, integrates AutoCad and GIS processes and functions, updates the SQL database and GIS data on revolving schedules, and provides client support for database and GIS services. She has created several complex interactive web mapping applications that are used by agencies on a daily basis to complete the remediation of residential properties and to continue monitoring the success of the remedy through the Institutional Controls Program.

Mine and Mill site IDEQ Preliminary assessments and site investigation Program

Mrs. Gilley provides GIS support for various crews that routinely work out in the field, locating features of concern and samples of various media requested by our clients. She assists field crews through creating mobile data collection applications through ESRI ArcGIS Online services and Trimble TerraFlex mobile data collection software. She coordinates tasks and data that field teams are required to collect, and she posts processes spatial data and runs corrections as necessary. She is able to manipulate data services and templates to accommodate fluctuating data collection conditions and allow for seamless data, syncing back to local servers for secured daily data backups.

Coeur d'Alene Tribe GIS Department, Plummer, Idaho, 2008–2012

Mrs. Gilley worked for the Coeur d'Alene Tribe GIS Department as a full time GIS Technician for four years. Her skills and responsibilities include experience with Visual Studio 2008, SQL Server, and for the Coeur d'Alene NRDA staff on several tasks. She also purchased for several accounts as a USDA grant project manager. She wrote and assisted with several successful grant applications totaling over $12M and developed outreach materials for several tribal departments as well as federal agencies. She collected spatial data using global positioning system (GPS) units, tablets, Trimble, and hands-on collection.

Coeur d'Alene Tribe Forestry Department, Plummer, Idaho, 2008

Mrs. Gilley completed an SCA Fire Monitoring Internship with the Coeur d'Alene Tribe Forestry Department in the summer of 2008. She received training on GPS, JFiremon program, ArcGIS 9.2 and 9.3. She was trained in using map/compass navigation and the use of a Trimble. She also received training in plant identification, fuel load sampling, and tree data collection, including DBH, and using clinometers to ascertain heights.

Additional Experience

Mrs. Gilley volunteered at the Plummer, Idaho, Information Technology building in 2008, working with ArcGIS 9.2 and 9.3.

Scientific/Technical Knowledge

- Geographic Information Systems
- Public Land Survey
- Wildlife management
- Fisheries Management
- Environmental Policy and Regulation
- GIS Project Design, Cartographic design, Web Mapping, ArcServer, GIS in Telecommunications
- Remote Sensing
- Geography Research and Methods, Intermediate SQL Server, Beginner JavaScript

Certifications/Training

- GIS Professional, GIS Certificate Institute (#91274)
- HAZWOPER, 40 hour +refreshers, current

Special Appointments, Memberships, or Affiliations

- NRURISA Treasurer, 2015-2017
- NRURISA Vice President 2013-2015
- AmeriCorps Scholarship, 2008
- Federal SMART Grant, 2007–2008
- Member of Environmental Science Organization, 2004–2008

BRITT CREA

Content Editor/ Coordinator

Alta-se.com

Education

- B.S. Public Relations, University of Idaho's School of Journalism and Mass Media

Areas of Expertise

- Copy writing
- Training, workflow reference materials
- Brochures
- Internal sales guides
- PR, marketing plans
- Proposals and qualifications
- Email marketing
- Team coordination/ leadership
- Independent or collaborative work
- Deadline management
- CRM utilization, report extraction
- Technical editing, AP-style writing
- Social media writing, content remarketing
- Questionnaires, surveys
- Business reports, SWOT analyses, Hambrick /Strategy Diamond reports
- Interview/script writing

Software/ Hardware/ Platform Tools

- Campaign Monitor
- Adobe
- Deltek CRM
- LinkedIn, Instagram, Energy Central, Twitter
- Unbounce
- WordPress
- Video production, editing, camera equipment

Experience Summary

Britt Crea brings more than five years' experience coordinating document materials and teams in the engineering and science industry.

Ms. Crea's experience includes copy writing, PR and marketing plans/ implementation, performance metrics and reference materials. Her focus on document compliance, effective communication and organization has proven valuable on countless projects and deadlines.

Project Experience

POWER Engineers, Marketing Coordinator, ID

Marketing Coordinator for the Advanced Technology Services Lab team, a senior marketing focus group tasked with identifying, developing and meeting business development goals to utilize POWER's Advanced Technology Services Lab (previously named 'NexStation').

In addition to planning and leading monthly meetings, measuring email marketing success metrics, and CRM management, she also coordinated various sub-teams tasked with producing technical content for external publication. Ms. Crea spearheaded a complete modernization and relaunch of a decade-old email marketing campaign titled 'Lab Reports' in 2019.

POWER Engineers, Marketing Coordinator, ID

Marketing Coordinator for the Cybersecurity in Energy Team. This cross-divisional marketing focus group was tasked with identifying, developing and meeting business development objectives for POWER Engineer's Cybersecurity services. Ms. Crea led an original internal sales guide publication to very positive reception in 2018; this successful concept was later adopted by other marketing focus groups. Typical work also included:

- External, internal publications
- Firm credentials and marketing collateral
- PR and marketing campaigns, content remarketing
- Staff engagement and coordination

POWER Engineers, Proposal Coordinator, ID

Proposal Coordinator for the production and delivery of proposals, qualification packages, presentations and other materials in response to a wide range business development needs. Ms. Crea met challenging deadlines and technical documentation requirements for parallel proposal teams across departments and divisions. She managed proposals for projects ranging from $20,000 to more than $10M and performed technical editing and detailed CRM management.

KYLE DUCKETT, MS

Hydrogeologist

Alta-se.com

Experience Summary

Kyle Duckett is a hydrogeologist in Alta's Moscow office. He has a B.S. in Geology as well as in Environmental Science, and an M.S. in Geology, with a focus on aspects of geochemistry and hydrogeology. His education has shown him a large variety of sample collection, sample analysis, QA/QC, multiple forms of modeling, interpretation of results, and drafting these results into manuscripts.

Education

- M.S. Geology
  University of Idaho
- B.S. Geology and Environmental Science
  Eastern Washington University

Areas of Expertise

- Water Resource Design and Processes
- Quality Assurance/Quality Control
- Sample Collection and Analysis
- Safety and Scientific/ Technical Knowledge
- Strong Knowledge of Modeling Water Resource Processes
- Software: High proficiency with Python, Microsoft Office Suite (Access, Excel, PowerPoint, Word)

Certifications/Training

- OSHA 29 CFR 1910.120 HAZWOPER 24 Hour – current

Experience

Palouse Basin Aquifer Committee, Annual Aquifer Monitoring Event, Moscow Idaho

Field Technician for water level data collection and delivery, as well as documentation of field work. The project featured frequent correspondence with local water managers and members of the community, as well as navigation to remote field sites over uneven terrain. Mr. Duckett was responsible for collecting and downloading various styles of pressure transducers from both private and municipal production wells used as monitoring locations, to assist to the understanding of annual water usage and aquifer behavior. Additional responsibilities including processing data and delivering to the client along with documentation and individualized instructions for the process at each of the field sites.

Idaho Department of Environment Quality, Biweekly Aquifer Monitoring Events, Kellogg Idaho

Field Hydrogeologist for the collection of water level data from monitoring locations in and around the Central Impoundment Area Repository in the Silver Valley, as well as processing and delivering the data as groundwater elevation time series. The project featured the processing of large datasets with quick turnaround demands and a high level of required precision. Mr. Duckett was responsible for collection of data and processing of data to produce project deliverables.

University of Idaho, August 2017 – May 2019

As a Teaching Assistant, Mr. Duckett designed course relevant course materials and delivered weekly course lectures for up to 25 students on topics of physical geology.

Eastern Washington University, June 2016-June 2017

Mr. Duckett performed work as both a Lab Assistant and a Teaching Assistant. As a Lab Assistant, Mr. Duckett prepared ICP-OES for Geochemical analysis of ions in solution for aqueous samples. He also conducted QA/QC. As a Teaching Assistant, Mr. Duckett used hands on methods of teaching to help students learn principles of the scientific method, including physical geology.

Idaho Power Company, Intern, June 2018 – August 2018

Mr. Duckett conducted efficient data manipulation in Python. He delivered fast and repeatable data analysis by developing original Python scripts using concise functions. He prepared a comprehensive final report for Idaho Power Company and presented rationale for methodology and results of analysis, with consultation regarding direction for continued analysis.

SUSAN FIROR, P.E.

Restoration and Hydraulic Engineer

Alta-se.com

Experience Summary

Susan Firor is a Principal Restoration and Hydraulic Engineer for Alta Science & Engineering, Inc. Ms. Firor is an expert in habitat and wetland restoration, hydraulic modeling, wetlands mitigation, and environmental compliance with 27 years of experience.

Ms. Firor is an expert in environmental compliance and permitting for restoration projects. She has written numerous Biological Assessment and Biological Evaluation documents for consultation under the Endangered Species Act. Permitting for these projects often includes consultation with United States Army Corps of Engineers (USACE) for Clean Water Act permitting, and projects near rivers often require No-rise certification. Ms. Firor is a member of a small volunteer group that live traps "nuisance" beavers and releases them at restoration sites. She manages the Moscow, Idaho, technical region for Alta and leads the Natural Systems Restoration Group.

Education

- M.S., Environmental Engineering
  Humboldt State University
- B.S., Environmental Resources Engineering
  Humboldt State University

Areas of Expertise

- Hydrologic and Hydraulic Modeling
- Stream, Meadow, and Wetland Restoration
- Project Permitting
- Environmental Monitoring
- Computer Modeling
- Engineering Design
- Project Management
- Construction Oversight
- Geomorphic Assessment
- Wetland Delineation and Assessment
- Wetland Restoration and Mitigation Design

Project Experience Examples

East Fork Potlatch River, 2014 - Present

Alta's Natural Systems Restoration Group under Ms. Firor's direction completed Final Design for this multi-phase project to reintroduce the east Fork Potlatch River to historical channel alignments through Two Mile Meadow. This Forest Service project includes beaver meadow restoration, wood habitat structures, new channel construction, extensive revegetation, and site access challenges. Phased construction began in 2018. Susan was responsible for construction oversight on this complex project during the 2018 construction season.

Big Bear Creek Meadow Restoration

Ms. Firor's Natural Systems Restoration Group has designed eight projects to date in the Big Bear watershed, all on private lands, and all with the Latah Soil and Water Conservation District. These projects focus on reconnection of incised channels to their floodplains, rehydrating meadows, converting hay fields and pastures back to functional floodplains, often while maintaining livestock operations, and holding water from spring runoff events in the system for longer through the dry summer months. Susan's team provides pre-project assessment, site survey, design, support during requests for funding and permitting, revegetation design support, construction monitoring, and post project evaluation and monitoring.

Upper Tee Meadow Restoration, near Deary, Idaho, 2016 - Present

The Upper Tee Meadow restoration project is located along a portion of the Mini East Fork Corral Creek (MEF), which is a tributary to the Potlatch River in the Clearwater River Basin. The Potlatch River Basin has historically been used for agricultural and logging purposes. As a result, the MEF channel through the Upper Tee Meadow was straightened, bermed, and has incised, preventing it from accessing its floodplain during spring flood events. These changes to the system's natural function have impaired rearing habitat for native fish in the watershed. Ms. Firor is Principal-in-Charge for this project in which Alta has provided services to Latah Soil and Water Conservation District starting with evaluation of the site through drone LiDAR survey, design, permitting, bidding, and construction starting in summer 2019. Bonneville Power Administration's restoration review team (RRT) has reviewed all permitting materials necessary to complete the project. In addition to the meadow restoration, this project includes replacement of a culvert to allow fish passage under Vassar Road. Susan's team will continue with this project in an oversight capacity until construction is complete.

Lower Clear Creek Design

Ms. Firor managed this project near Halfway, Oregon, for the Powder Basin Watershed Council. The 2-mile reach

intersects the property of seven different landowners, each with unique requirements for restoration in accordance with their use of the floodplain. Most landowners are concerned with preserving cattle operations, but one landowner is most interested in restoring songbird habitat. Several reaches have irrigation diversions that are blocking bull trout passage. Therefore, this 30% design required creativity and much landowner interaction. The Council is currently seeking funding to complete the design and implement the project.

Stream and Meadow Restoration, Potlatch River Basin, Northern Idaho, 2007–Present

For over a decade, Ms. Firor has been Principal-in-Charge, Project Manager, lead engineer, and Owner's Representative during construction on various projects to restore meadow hydration and habitat for endangered Steelhead and beavers on tributaries to the Potlatch River in northern Idaho. Her team is supplying assessment and planning, survey, conceptual to final design, permitting support (including ESA consultation) and construction oversight for almost 15 miles of stream re-alignment, floodplain reconnection, habitat structure installation, and beaver reintroduction. Several phases of this project have been constructed, while other projects are in the design and permitting phases. Long-term monitoring of meadow hydrology and habitat is underway.

Page Wetland Mitigation Design, 2005-2018

Ms. Firor was the Principal-in-Charge for this multi-faceted project to maintain and expand an existing waste repository as part of the Bunker Hill Superfund Site. Ms. Firor managed the team that designed facilities improvements, repository expansion, and mitigation wetlands. They assisted the State of Idaho in the assessment of the Page Wetlands and development of multiple mitigation sites required by the expansion. The Page Wetlands, being impacted by repository expansion, are the only existing palustrine forested wetlands remaining in the Silver Valley. Ms. Firor delineated the wetlands then studied their functions and values for permitting and effective mitigation design. Evaluation for mitigation opportunities were conducted on several degraded former wetland areas. Ms. Firor's team designing several mitigation sites, the first phase of which is in a highly mine-impacted area immediately adjacent to the Page Wetland. The first phase, an 18-acre mitigation wetland was constructed during the summer of 2012 under the oversight of the team. Efficacy monitoring was completed in 2018, and Susan performed much of the field work and wrote annual monitoring reports. This wetland is performing beautifully and is now one of Idaho DEQ's proudest achievements in the Silver Valley.

Certifications/Training

- Professional Engineer, Idaho #12040; Washington #48598; Montana #20393; South Dakota #11847; Oregon #91446
- HAZWOPER, 40 hour +refreshers, current
- FAA Remote Pilot Certificate #3948824 (Part 107)
- Stage-0 Stream Restoration, March 2020
- LiDAR USA Flight & Data Processing Training 2016
- HEC-RAS 2D Modeling, November 17-20, 2015

Special Appointments, Memberships, or Affiliations

- Member – University of Idaho Soil and Water Systems Advisory Committee, 2019 - Present
- Member – Clearwater Technical Review Team, 2009-Present
- Member – River Restoration Northwest Board of Directors January, 2011-2019

Presentations

- Firor, Susan. Beaver restoration in Racetrack Meadow. Presentation to Joint Regional Conference of Society of Wetland Scientists and Society for Ecological Restoration, Spokane WA, October 2019.
- Firor, Susan. Why Restore Rivers? Presentation for Annual Technical Leadership Meeting, Idaho Department of Fish and Game, August 2019.
- Firor, S. and T, Heekin. Process-based Restoration. Two-day workshop for the Potlatch Implementation Group, July, 2018.

Project Manager

Scott King, P.E.

SPF WATER ENGINEERING

Education

M.S., Civil Engineering, University of Idaho

B.S., General Engineering, Idaho State University

Professional Certification

Professional Engineer
Idaho No. 7914 (1995)
Oregon No. 84533PE (2010)

Certified Water Right Examiner
Idaho No. 133
Oregon No. 84533CWRE

Professional Affiliations

Idaho Water Users Association, Board Member

Areas of Expertise

- Water rights
  - investigations and analysis
  - permits and transfers
  - marketing and acquisitions
- Expert witness services
- Water resource investigations
- Water well design
- Surface water modeling
- Gravity irrigation systems
- Stream flow measurement
- Pipe flow measurement
- Pumping efficiency evaluations

Experience Summary

Mr. King has over 29 years of professional and academic experience in water resources engineering. He is currently a Project Manager with SPF Water Engineering, LLC and specializes in water right issues, water flow measurement, open-channel flow, pumping system design, water well design, and geographic information systems (GIS). Prior work includes 14 years of experience in a broad variety of Idaho Department of Water Resources' (IDWR) programs including water rights adjudication, water rights administration, safety of dams, and energy efficiency. He also has experience developing surface water models and providing consulting engineering services while employed at DHI, Inc, formerly known as the Danish Hydraulic Institute.

SPF Water Engineering, LLC – 2005 to present

Mr. King is currently a Project Manager with SPF Water Engineering, LLC. SPF was founded in March 2004 to provide hydrologic characterization, water resource development, and public water system design and regulatory compliance. Mr. King provides consulting services on water rights issues, pump design, irrigation system evaluation, surface water hydrology, surface water modeling, and river hydraulics. His recent project experience includes the following:

- Extensive water right experience including
  - permit and transfer applications
  - mitigation plans
  - investigations and analysis
  - acquisitions and sales
  - beneficial use field examinations
  - adjudication claim preparation and support
- Gravity irrigation system design and analysis
- Stream flow measurement and monitoring
- Conveyance capacity determinations for streams, culverts, and other open-channel systems
- Water well design including designs to municipal public drinking water supply standards
- Well capacity determination
- Pumping system design

Idaho Department of Water Resources – 1990 to 2004

During 14 years with the Idaho Department of Water Resources, Mr. King held four engineering positions and gained experience in a wide range of IDWR activities. These positions included Technical Engineer in the Adjudication Bureau, and Staff Engineer positions in the Water Distribution Section, in Western Region's Safety of Dams unit, and in the Energy Division. Relevant experience includes the following:

Project Manager

Scott King, P.E.

Program Management

Managed Western Region's Safety of Dams program. Inspected dams and made recommendations for maintenance and operation to improve safety and meet state standards. Issued storage certificates and authorizations to fill.

Lead technical consultant in statewide water measurement program. Defined water measurement standards and implemented a program for measuring and reporting ground-water withdrawals. Coordinated field work performed by department staff and various measuring districts. Inspected contractor projects for adequacy and compliance with department standards. Designed and managed water measurement databases.

Water Rights

Reviewed complex water right claims and prepared water right recommendations for the Director's Report to the Snake River Basin Adjudication court. Provided technical analysis and recommendations for nonstandard water right claims, such as claims for diversion rates exceeding the standard allocation, and for claims to the use of water outside of the standard seasons of use.

Provided training and direction to new employees, water districts, water measurement districts, groundwater districts, and private consultants on water rights, water measurement programs, and adjudication procedures.

Worked with water users and their legal representatives on various water right enforcement issues, including excessive and illegal water diversions.

Experienced with all aspects of IDWR regional office operations including water rights, transfers, well drilling, adjudication, water district operation, violations, enforcement, and customer complaints.

Technical Expert to Snake River Basin Adjudication (SRBA) Court

Provided technical engineering support to department staff in the ongoing SRBA.

Designated as department expert to the SRBA court regarding irrigation requirements, evapotranspiration, and crop water requirements.

Public Relations

Presentations at public meetings to explain laws and regulations relating to water measurement and water appropriation.

Provided conflict resolution support for several water related disputes.

Technical

Developed and proposed to department administration and to the general public technically sound methods of using power records for estimation of pumped water diversions.

Determined acceptability and provided professional opinions for numerous non-standard water measurement methods and devices proposed to IDWR by engineering consultants and water users.

Determined conveyance capacity of pumps, diversions, pipelines, open channels, turbines, etc.

Water Right Specialist

Lori Graves

Areas of Expertise

- Field investigations, claim review and GIS analysis in support of the Snake River Basin Adjudication
- Water rights investigations and analysis
- Water permit and transfer applications
- Flow measurement
- GIS

Experience Summary

Ms. Graves has over 30 years of professional experience in water resources. She is currently a Water Rights Specialist with SPF Water Engineering and specializes in water rights issues and geographic information systems (GIS). Prior work includes 20 years of experience with the Idaho Department of Water Resources (IDWR) in both water right adjudications and water rights administration.

Relevant Experience

SPF Water Engineering, LLC – 2007 to present

Ms. Graves provides consulting services on water rights issues. Her project experience includes the following:

- Water right permit and transfer applications.
- Water right processes in the Snake River Basin Adjudication.
- Complex water right research, analysis, and report development.
- Advising clients on new water appropriations and water right development.
- Mitigation plans.
- Water acquisitions and sales.
- Flow measurement.

Recent Relevant Project Experience | City of Moscow Project – 2019

Lori worked with the City of Moscow to ensure that its municipal water-right portfolio authorized sufficient diversions to meet anticipated future water demand. Ms. Graves helped perform three tasks to assist the City in doing so: 1) prepared a municipal water-right transfer application that integrated the City's municipal water rights to achieve greater operational water system flexibility and bring the City into water-right compliance; (2) evaluated the adequacy of the City's current water-right portfolio to meet future water demand and the potential need for a Reasonably Anticipated Future Needs (RAFN) water-right application; and (3) reviewed historical information provided by the City documenting municipal water use prior to the City's current water-right priority dates to support preparation and filing of 15 adjudication claims in the Palouse River Basin Adjudication (PRBA). The claims reflect development of the City's municipal water use beginning as early as 1892.

Idaho Department of Water Resources – 1987 to 2007

During 20 years with the IDWR, Ms. Graves held two positions and gained experience in a wide range of IDWR activities. These positions included Sr. Water Resource Agent in the Water Allocations Bureau and Sr. Water Resource Agent in the Adjudication Bureau.

Relevant experience gained while working with IDWR includes the following:

Water Rights

Reviewed complex water right claims and prepared water right recommendations for the Director's Report to the Snake River Basin Adjudication court.

Reviewed and processed complex water right proposals involving new developments and/or changes to existing water rights.

Conducted beneficial use water right examinations for licensing of water right permit.

Provided training and direction to new employees, water districts, and private consultants on water rights and adjudication procedures.

Worked with water users and their legal representatives on various water right enforcement issues, including excessive and illegal water diversions.

Experienced with all aspects of IDWR regional office operations including water rights, transfers, well drilling, adjudication, water district operation, violations, enforcement, and customer complaints.

Public Relations

Presentations at public meetings to explain laws and regulations relating to water appropriation and the adjudication of water rights.

Provided conflict resolution support for several water related disputes.

Trained IDWR employees, state Watermasters, contractors, and consultants on water measurement standards, equipment, practices, and procedures through training sessions and individual assistance.

Report Development

Authored various reports including the following:

- Reports to IDWR and individual water users
- Co-authored Summary of Ground Water Conditions in South Canyon County, IDWR , July 1995
- Authored Ground Water Conditions in West Central Ada County, 1994 Technical Conference, Boise Idaho
- Authored Natural Flow and Storage Water Distribution, Canyon Creek Water District, 1993 Technical Conference, Boise Idaho
- Authored Aquifer Test Procedure, The Agent's Role in Data Collection, 1992 Technical Conference, Boise Idaho

Jason D. McCormick, CWRE | Principal

Jason D. McCormick is the Principal at McCormick Water Strategies (MWS) with over a decade of water resources experience. Jason is recognized regionally as a water rights and water transactional expert. In 2015, Jason formed MWS after working in the private and non-profit sectors. His formative experience includes ten years specializing in water transactions, trust water, mitigation banking, permitting and water rights administration, water right due diligence and examination, representing private and conservation buyers and sellers, and geospatial water rights evaluation across Washington State. Early in his career, Jason worked as a permit writer for the newly formed Washington State Department of Ecology, Office of Columbia River (OCR), where he focused on water right permitting, project planning, geospatial water resources mapping, program outreach, and coordinating initial grant solicitations. From his experience in the private, non-profit, and public sectors, he excels at water right permitting and administration, water transactions, water banking, water right evaluations and due diligence, and complex water resources problem solving. In addition, he draws a strong appreciation for the communities and unique values of Washington State from his local roots in Central Washington.

EDUCATION
BA, Geography and Land Studies, with Honors, Central Washington University

REGISTRATION
Certified Water Rights Examiner (CWRE), WA, 2014

Areas of Expertise

Water Transactions Summary

Jason has developed, negotiated, and implemented water resource transactions ranging from $800,000 to $10,000 through the Yakima River, White Salmon River, and Walla Walla River Basins in Central Washington. In total, he has successfully implemented over 30 water transactions, totaling more than $3,000,000, without a single failed transaction or lawsuit. Water transactions have included: acquisitions, short-term and long-term leasing, source substitutions, and diversion reduction agreements.

Rural Water Supply

Jason has developed rural water supply through the establishment of two water banks in the Yakima Basin. Following the creation of the water banks, he developed and managed the administrative processes and documents necessary to convey mitigation ensuring adequate legal water supply for rural properties and homeowners.

Water Right Due Diligence and Reliability Assessments

Over the past decade, Jason has developed specific expertise in water right due diligence and reliability assessments. For water buyers and sellers, an important step to fully understanding the value of water rights is to develop a risk profile around the exposure of administratively processing a water right. With this expertise, Jason briefs his clients on administrative and transactional risks.

Water Right Permitting and Certified Water Right Examination

Through Jason's tenure in water resources, he has served as the lead author and project manager on complex water permitting, ranging from providing reliable water supply to the City of Roslyn, developing and permitting a water supply for a fish hatchery in the Yakima Basin, and quantifying perfected water use as a Certified Water Right Examiner.

Completed Projects

Teanaway River Restoration Program Management

As a result of many years of work, Jason created the Teanaway River Restoration Program, Yakima River Basin. In total, he implemented $1,500,000 in water transactions (including the Masterson Ranch Water Bank, Acquisition and Leasing), created an instream flow monitoring program and protocols, and maintained a portfolio of over 20 water rights held as instream flow.

Bruton Ditch Project, Taneum Creek

In collaboration with five partner organizations, Jason developed, negotiated, and implemented a four-year project to remove an antiquated water diversion dam on Taneum Creek in the Yakima River Basin, and find the irrigators a reliable source of irrigation water. In total, the project cost $1,000,000, removed the aging dam, created instream flow through three water transactions, and left the irrigators with a new source of irrigation water supply. Ecology uses the water rights Jason acquired to operate the Yakima Basin Cabin Owner Mitigation Program.

Darling Family Water Bank

Through extensive work with the Darling family, Jason developed the necessary relationships and administrative documents to form the Darling Water, LLC water bank in the Big Creek Subbasin of the Yakima River. First, Jason implemented an Option Agreement with Washington Water Trust and Washington State Department of Ecology (Ecology) to permanently commit a significant quantity of the Darling Family's nonconsumptive water rights to instream flow. Then, Jason built a sustainable business model to assist the Darling family with developing the Darling Water, LLC Water Bank. Lastly, Jason negotiated with Ecology to administratively establish the water bank, developed the operational administrative tools, and currently serves as Darling Water, LLC's Water Bank manager.

Masterson Ranch Water Bank, Acquisition and Leasing

While working with the Masterson Ranch, Jason developed key relationships and implemented three discrete projects, totaling $1,000,000, in the Teanaway River Basin. First, Jason worked with the Masterson Ranch to secure an acquisition of 60 acres of irrigation water for a conservation buyer, and then built a sustainable business model to develop the Masterson Ranch Water Bank.

Melvin R. Sampson Coho Facility

Recently, Jason developed a new conjunctive use groundwater and surface water supply for Yakama Nation's Melvin R. Sampson Coho Facility (MRS). Applications were processed under Hillis Priority Processing Cost-Reimbursement in the Yakima Basin, where water budgets are extremely limited. The MRS Reports of Examination were completed in 2018, with Permits issued by Ecology that same year.

Kiona West Heights Association

As a Certified Water Rights Examiner, Jason documented, verified, and navigated a very successful outcome for the perfection of Kiona West Heights Association's (KWHA) 41 residential unit development municipal water right permit. Evaluating KWHA's water use involved detailed analysis of each residential unit's irrigated footprint and farm irrigation, determining deficit irrigation, calculating indoor water use, and mapping the full water system.

Water Right Changes, Nile Creek

Along with a partner organization, Jason worked with Nile Creek Ranch to develop, negotiate, and implement a six-year project to change the point of diversion, and establish instream flows in Nile Creek,

Yakima River Basin. The $600,000 project resulted in an irrigator with an improved irrigation system, complete restoration of Nile Creek, and three water rights changes. He was the lead author on the three water right changes, and navigated those changes through the Yakima County Water Conservancy Board.

Professional Membership

Board Member | American Water Resource Association–WA (AWRA–WA)

From 2011 to present Jason has served as a volunteer board member with AWRA-WA. He served as the 2018 Board President, 2016 Conference Co-chair, and continues to serve as the Student Committee Chair. Most notably, Jason formed a new Student Chapter at Central Washington University.