



# Qualifications for the Department of Social and Health Services

Project No. 2024-464:  
Water Well Design Services Required for  
WSH-East Campus Well Replacement

Name of Firm:  
RH2 Engineering

Date of Submission:  
October 17, 2024

**RH2 Managing Office**  
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Suite 210  
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**Dear Selection Committee,**

Thank you for the opportunity to present our qualifications to assist the Washington State Department of Social and Health Services (DSHS) with the Western State Hospital (WSH) East Campus Well Replacement, Project No. 2024-464. With 46 years of providing similar services for Washington State clients, our long history with the Lakewood Water District, our specific experience with DSHS in evaluating the WSH water system and preparing its Water System Plan (WSP), and our local team of in-house experts, we believe RH2 Engineering is exceptionally qualified to assist with this work.

RH2 works closely with a variety of clients to provide a full suite of engineering services related to water system planning and design, including well and water facility design, hydraulic modeling, and improvement planning. Our team is currently assisting DSHS with the West Campus Water System Improvements and Water System Assessment and Improvement projects. I serve as the Design Project Manager on these projects, managing the team during the pipe condition assessment portion of the work and assisting with estimating costs for the WSP Capital Improvement Plan. We look forward to continuing our relationship with DSHS and working in coordination with one of our oldest clients, Lakewood Water District.

As the Project Manager, I have 26 years of experience designing water facilities, including wells, reservoirs, booster pump stations, and transmission mains. Michele Campbell will be the principal-in-charge and provide quality assurance/quality control (QA/QC) support. I will be working alongside Max Freimund, PE, who will be the Project Engineer. Max recently assisted with reviewing the water main design for the new Forensic Hospital and has recently assisted Lakewood Water District with similar well design projects. We will be supported by Andy Dunn, LG, LHG, LEG, a hydrogeologist and water rights specialist, who has supported other WSH water right efforts and is experienced in water rights transfers between jurisdictions. Our other in-house areas of expertise include licensed civil, structural, electrical, chemical, and mechanical engineers, allowing us to seamlessly coordinate across disciplines.

This RH2 team will be supported by two subconsultants who excel in providing clients with specialized services. Sitts & Hill Engineers, Inc., has extensive experience working with WSH and will provide the surveying for this project. Drayton Archaeology, a leading cultural resources firm in Washington State, will support the team by guiding compliance with the WSH Cultural Resource Management Plan.

We appreciate the opportunity to submit our qualifications and look forward to hearing from you about this work. If you have any questions or need additional information, please contact me at the information provided below.

**Sincerely and on behalf of our entire team,**

A handwritten signature in blue ink, appearing to read 'Edwin Halim', written over a horizontal line.

**Edwin Halim** PE

Project Manager  
425.951.5332 | [ehalim@rh2.com](mailto:ehalim@rh2.com)

A handwritten signature in blue ink, appearing to read 'Michele Campbell', written in a cursive style.

**Michele Campbell** PE

Principal-in-Charge  
425.951.5394 | [mcampbell@rh2.com](mailto:mcampbell@rh2.com)



STATE OF WASHINGTON  
DEPARTMENT OF ENTERPRISE SERVICES

1500 Jefferson St. SE, Olympia, WA 98501  
PO Box 41476, Olympia, WA 98504-1476

## Consultant Selection Contact Form

Designated Point of Contact for Statement of Qualifications  
For Design Bid Build, Design Build, Progressive Design Build, GC/CM & Job Order Contracting  
(JOC) Selections

Firm Name: <a href="#">RH2 Engineering, Inc.</a>		
Point of Contact Name & Title: <a href="#">Michele Campbell, PE, Principal-in-Charge</a>		
Email: <a href="mailto:mcampbell@rh2.com">mcampbell@rh2.com</a>	Telephone: <a href="tel:425.951.5394">425.951.5394</a>	
Address: <a href="#">22722 29<sup>th</sup> Drive SE, Suite 210</a>		
City: <a href="#">Bothell</a>	State: <a href="#">WA</a>	Zip: <a href="#">98021</a>

# Executive Summary

Our executive summary below is organized based on the SOQ Evaluation form on page 4 of the DSHS RFQ. We are confident that our team can provide exceptional value to your project.

## Qualifications of Key Personnel

**Familiarity with DSHS:** Michele Campbell started working with DSHS on the disinfection improvements project in 2021. She continued to support DSHS in the early phases of the New Forensic Hospital water system planning. Michele and Edwin Halim are currently working with DSHS on the 2020-403 West Campus Water System Improvements and 2024-435 Water System Assessment and Improvement projects. Through these projects, Andy Dunn has become deeply familiar with the current DSHS Water Rights status and is also highly experienced in water rights transfer between jurisdictions. Andy has assisted with dozens of water rights transfers over his career. Max Freimund was involved in reviewing the water main design for the New Forensic Hospital and assisted the RH2 planning group in developing estimates for the water system improvements.

Sitts & Hill also have specific experience with DSHS through their work on parking areas, Building 28, and a Boundary Line Adjustment, and is currently on the RH2 team that is working on the 2020-403 and the 2024-435 projects. While Drayton has not worked with DSHS in the past, they are the cultural resource subconsultant on the RH2 team that is currently working on the two projects.

**Background Knowledge on Project:** RH2 just recently submitted the preliminary WSH WSP to the Washington State Department of Health (DOH) and currently runs the water system hydraulic model. The WSP was completed in just four months, a record time. Our unmatched background on this project will enable our team to get started quickly, which will be essential to meeting the requested schedule. RH2 has completed the water system analysis and knows the potential connection points for the East Campus Well. In addition, our team has already planned the pipe improvements around the potential connection points such that there will be enough capacity to accommodate the future flow from the East Campus Well.

**Experience with Lakewood Water District:** RH2 has decades of experience working with Lakewood Water District. As a result, our planning and design staff have exceptional knowledge of the District's design standards. This will be advantageous when collaborating on potential solutions and developing the details of the design elements. Max is currently involved in the Lakewood Water District

Hipkins Well Improvements, which has a similar goal as the East Campus Well due to detections of PFAS. With his involvement in this project, Max is familiar with the Lakewood Water District's standards for designing wells.

## Relevant Experience

**Diverse In-House Services:** With a comprehensive range of in-house services, our team can skillfully and efficiently adapt and respond to the project's unique needs. Our firm's advantage lies in its size, allowing us to offer nearly all the expertise required for a well project in-house, with the exception of surveying and cultural resources support. This results in better control of both schedule and cost.

**Aligned Goals on Similar Projects:** Our team has completed similar projects over the last few years. This will help DSHS be confident in finding the preferred solutions with an approach that meets DSHS' project goals.

**Experience Coordinating with Reviewing Agencies:** Our strong relationships with the Lakewood Water District, DOH, and Washington State Department of Ecology (Ecology) underscore our commitment to navigating regulatory landscapes seamlessly. With our well-established processes, we can commence work immediately, aligning with your schedule to meet project milestones effectively.

## Past Performance

**Proven Approach:** Edwin and Max have a proven approach to managing successful projects with efficient in-house collaboration and detailed task-tracking spreadsheets and other tools for complex projects. Steve Nelson and Andy have worked together on numerous well projects, addressing the same issues that this project is looking to solve.

## Diverse Business Inclusion Strategies

RH2 is committed to supporting Diverse Business owned firms. Our team includes Drayton Archaeology, a certified Washington Veteran Owned Business (Certification No. WDVADAAR15), that will assist with cultural resource management in alignment with the WSH Cultural Resource Management Plan. Sitts & Hill qualifies as a Small Business Enterprise under Revised Code of Washington (RCW) 39.26.010, but is not certified yet.



# Qualifications of Key Personnel

## Team Organization

Our team has worked side-by-side with each other on many similar water system improvement and well replacement projects, bringing familiarity and efficiency to our team. RH2's goal in staffing any project is to provide a dedicated team from conceptual planning through design and construction. We have honed our ability to rely on each other to leverage our areas of expertise and we know how to utilize the appropriate specialty at the right phase of the project to efficiently progress the design and implement quality assurance and quality control.

Michele will oversee the team coordination and provide QA/QC review. Edwin will work closely with DSHS to scope this project, provide regular progress updates, and assign tasks to our team members. Michele and Edwin will collaborate with your staff to help meet the project goals.

The following illustrates the organization of our team, including the roles of the key personnel who are available to assist with this project. Also noted in the chart is an estimate of the percentage of time that each individual or subconsultant is anticipated to contribute to the project.

In addition to our key staff, RH2 has a wide array of talented engineers and other supporting staff to complete the variety of design and planning efforts that may be needed for this project. It is estimated that these additional supporting staff will contribute the remaining 28 percent of this project effort. If the need arises, our team has additional lead personnel who are available to add breadth of expertise and redundant support to help meet DSHS' schedule.

### Department of Enterprise Services and Department of Social and Health Services

Management Team		
<p><b>Michele Campbell</b> PE Principal-in-Charge 3% Assigned</p>		<p><b>Edwin Halim</b> PE Project Manager 7% Assigned</p>
Key Team Personnel		
<p><b>Max Freimund</b> PE Project Engineer 10% Assigned</p>	<p><b>Andy Dunn</b> LG, LHG, CWRE Hydrogeologist and Water Rights Specialist 7% Assigned</p>	<p><b>Steve Nelson</b> LG, LHG, LEG Hydrogeologist 10% Assigned</p>
In-House Specialty Resources		
<p><b>Barney Santiago</b> PE Water Quality Engineer 3% Assigned</p>		<p><b>Jon Conner</b> PE, SE Structural Engineer 3% Assigned</p>
<p><b>Mark Braaksma</b> PE Electrical Engineer 3% Assigned</p>		<p><b>Dylan Bright</b> PE Hydraulic Modeling 10% Assigned</p>
Subconsultants		
<p><b>Sitts &amp; Hill</b> Surveying 3% Assigned</p>		<p><b>Drayton Archaeology</b> Cultural Resource Management 3% Assigned</p>

## Team Resume Summaries

We have included brief summaries for our core team members in the remainder of this section, and more information on how our team's expertise relates to this project can be found in the Relevant Experience section starting on [page 8](#).



### Michele Campbell PE

Principal-in-Charge

Michele has been a dynamic contributor to RH2 since 1999, and is committed to providing creative and cost-effective strategies for complex engineering challenges. Highly experienced in hydraulic modeling, engineering planning, and design, she functions as a key member of our leadership team. Her background includes various municipal engineering planning efforts, and she is currently overseeing a hydraulic analysis and planning project for DSHS's WSH water system and recently assisted with completing DSHS's WSP. Michele effectively bridges the gap between engineering, planning, and design to guide her clients in making financially responsible investments towards their aging infrastructure.

#### Representative Project Experience

- Western State Hospital Disinfection Improvements Design, Washington State Department of Social and Health Services
- Wholesale Transmission Main Extension, Lakewood Water District
- Water System Plan Update and Illinois Well Outfitting Design, City of Ellensburg
- Pump Condition and Energy Efficiency Evaluation, Lakewood Water District
- Leak Row and Wilder Elementary School Water Main Improvements, Woodinville Water District
- Hydraulic Model Development and Calibration, Woodinville Water District

#### Education

BS Civil and Environmental Engineering  
University of Washington 2000

#### Licenses

Professional Engineer  
41414 (WA), 86637PE (OR)

#### Experience

25 years of experience; 25 years at RH2



### Edwin Halim PE

Project Manager

Edwin is a mechanical engineer and project manager with 26 years of experience designing water facilities. He specializes in the design of wells, transmission mains, reservoirs, booster pump stations, and water treatment facilities. In addition, he has extensive experience managing and inspecting projects during construction. Edwin and Michele have worked together for more than two decades and are highly skilled at collaborating with diverse teams and challenging projects. Edwin also has extensive experience designing booster pump stations that require complex controls for serving closed zones. All of the closed zone booster pump stations he has designed required multiple control and relief valves.

#### Representative Project Experience

- Western State Hospital Water System Improvements, Washington State Department of Social and Health Services
- Western State Hospital West Campus Water System Improvement, Washington State Department of Social and Health Services
- SW Well 1A Water System Improvements, City of Yelm
- Wholesale Supply, Lakewood Water District
- Well 4 Emergency Power Improvements, City of Auburn
- Historic Brewery Wellfield Infrastructure Evaluation, Cities of Tumwater, Olympia, and Lacey
- Sunnyside Well Treatment Facility Services During Construction, City of Marysville
- Wells 3 and 4 Improvements and Crest Reservoir Site, NE Sammamish Sewer and Water District

#### Education

MS Mechanical Engineering  
University of Washington 1998

BS Mechanical Engineering  
University of Washington 1997

#### Licenses

Professional Engineer  
38889 (WA), 94954PE (OR)

#### Experience

26 years of experience; 26 years at RH2



## Max Freimund PE

## Project Engineer

Working across multiple disciplines for municipal clients for 10 years, Max is an experienced, well-rounded engineer. His depth of experience provides him with an excellent perspective on how each phase of a project is related to the other, and has given him the necessary communication skills needed to accurately address issues and respond to our clients' concerns. Max has contributed and/or overseen multiple projects during the design and construction phases. His work, which includes wells and water transmission and distribution main design and improvements, gives him the opportunity to interface with our other in-house experts in electrical, mechanical, and structural engineering when developing a design. With this experience, he has been able to incorporate the interests of various parties to finish his projects on time and within budget.

### Representative Project Experience

- Western State Hospital Water System Improvements, Washington State Department of Social and Health Services
- Western State Hospital West Campus Water System Improvement, Washington State Department of Social and Health Services
- On-Call District Engineering, Lakewood Water District
- SW Well 1A Water System Improvements, City of Yelm
- Chase Wellfield Water Treatment Plant, Rainbow Water District
- Historic Brewery Wellfield Infrastructure Evaluation, Cities of Tumwater, Olympia, and Lacey
- Wholesale Transmission Main Extension, Lakewood Water District

#### Education

MS Civil Engineering  
Washington State University 2013

BS Civil Engineering  
Washington State University 2012

#### Licenses

Professional Engineer  
54888 (WA)

#### Experience

10 years of experience; 10 years at RH2



## Andy Dunn LG, LHG

## Hydrogeologist and Water Rights Specialist

Andy is a hydrogeologist and water rights specialist. He assists our clients with water rights analyses, aquifer testing and analysis, and hydrologic/hydrogeologic testing and field measurements. Prior to joining RH2, Andy served as a Section Manager and a hydrogeologist/permit writer for Ecology's Water Resources Program in the Northwest Regional Office. He worked with DSHS to summarize WSH's water rights portfolio and identified water right actions to be taken. Andy followed through with those recommendations and worked with Ecology to have the East Campus Well certificates conformed to be for municipal water supply purposes, and oversaw the water right change application processing of the claims associated with the Farm Well, which were changed to municipal water supply purposes, and provided clarity on the extent of WSH's entire water rights portfolio.

### Representative Project Experience

- Western State Hospital Water System Improvements, Washington State Department of Social and Health Services
- Historic Brewery Wellfield Infrastructure Evaluation, Cities of Tumwater, Olympia, Lacey
- Highway 9 Site Exploratory Well Drilling and Testing, City of Marysville
- Bryant Well No. 2 Replacement - Phase 1, City of Stanwood
- Water System Consolidation and Well No. 2 Relocation, City of College Place
- Water System Plan Update and Illinois Well Outfitting Design, City of Ellensburg
- Well No. 8 Design, Nob Hill Water Association
- Central Well Development, City of Sumner
- SW Well 1A Water System Improvements, City of Yelm

#### Education

MS Hydrology, New Mexico Institute of Mining and Technology 2001

BS Geology, Environmental and Engineering Concentration  
Western Washington University 1997

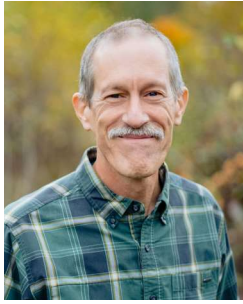
#### Licenses

Hydrogeologist/Geologist: 822 (WA)

Certified Water Right Examiner:  
0001 (WA)

#### Experience

27 years of experience; 14 years at RH2



## Steve Nelson LG, LHG, LEG

## Hydrogeologist

Steve is a licensed hydrogeologist and engineering geologist with technical and project management experience involving infrastructure siting investigations, geologic hazards, foundation studies, dewatering, watershed planning, hydrology, and infiltration studies. He works with our design teams to contribute his knowledge and expertise of the soil, rock, groundwater, and watershed conditions that will affect the design, construction, and operation of water infrastructure. Steve participates in analysis and design decisions involving siting, geohazards, constructability, resilience, and integration of infrastructure with the environment to minimize risk and cost and maximize reliability and performance of water and sewer systems. Steve will assist the project team with hydrogeological tasks associated with drilling the replacement well.

### Representative Project Experience

- Water System Consolidation and Well No. 2 Relocation, City of College Place
- Well No. 8 Design, Nob Hill Water Association
- Barrett Test Well Report, Nob Hill Water Association
- Bryant Well No. 2 Replacement – Phase 1, City of Stanwood
- SW Well 1A Water System Improvements, City of Yelm
- Central Well Development, City of Sumner
- Well No. 1 Replacement – Drilling and Testing Support, Hartstene Pointe Water-Sewer District
- Well 3 Screen Reconstruction, NE Sammamish Sewer and Water District
- Well 4 Emergency Power Improvements, City of Auburn
- Canterwood Water System Well #5 Replacement, Peninsula Light Company

#### Education

MS Geology  
University of Arizona 1986

BS Geology  
California State University 1981

#### Licenses

Licensed Hydrogeologist and  
Engineering Geologist  
1402 (WA)

#### Experience

38 years of experience; 19 years at RH2



## Barney Santiago PE

## Water Quality Engineer

Barney is a potable water treatment expert and project engineer. His experience with all aspects of a treatment project allows him to creatively approach treatment problems in a holistic way. He is adept at bench scale testing, and conducting and operating pilot plants that are used to size treatment equipment and determine chemical doses. Although the facilities themselves can be large and complex, the 3D to scale drawings allow our clients to easily see how their facilities will look and operate. Barney has also assisted plant operators with troubleshooting problems with their treatment process. Most recently, he assisted DSHS with the design of the chlorination systems for the East Campus and Farm Wells, and obtaining approval of the project from DOH. Barney will provide support for any treatment-related concerns as needed.

### Representative Project Experience

- Western State Hospital Water System Improvements, Washington State Department of Social and Health Services
- Wells 3 and 4 Improvements and Crest Reservoir Site, NE Sammamish Sewer and Water District
- SW Well 1A Water System Improvements, City of Yelm
- Central Well Development, City of Sumner
- Beall Production Well, Water District No. 19
- Downtown Wells' Treatment Facility Upgrade, City of Yelm
- Well 7 Water Treatment Residuals Management, City of Lacey

#### Education

BS Chemical Engineering  
Minor in Chemistry  
University of Washington 2005

#### Licenses

Professional Engineer  
46529 (WA)

#### Experience

19 years of experience; 19 years at RH2





## Jon Conner PE, SE

## Structural Engineer

Jon is a project engineer specializing in structural analysis and design. He has completed the structural design of water and wastewater treatment facilities, booster pump stations, water reservoirs, and site planning design, including sanitary sewer and water main layouts. His experience includes design and analysis of steel, timber, reinforced concrete, and masonry structures. Jon’s work involves performing load calculations and designing structural components utilizing design aids including AutoCAD and finite element analysis software. He also has field experience providing engineering construction observation services.

### Representative Project Experience

- Central Well Development, City of Sumner
- Sunnyside Well Treatment Facility, City of Marysville
- Bryant Well – GWI and Arsenic Preliminary Evaluation, City of Stanwood
- SW Well 1A Water System Improvements, City of Yelm
- Lake Goodwin Well Site, City of Marysville
- Hawks Prairie Well Source 31 Design, City of Lacey
- Well 4 Emergency Power Improvements, City of Auburn
- Design of New Well No. 5, Malaga Water District
- Water System Consolidation and Well No. 2 Relocation, City of College Place
- Water System Plan Update and Illinois Well Outfitting Design, City of Ellensburg

#### Education

MS Civil Engineering  
Washington State University 2004

BS Civil Engineering  
Washington State University 2003

#### Licenses

Professional Structural Engineer  
44672 (WA), 87075PE (OR), 20366 (ID)

#### Experience

19 years of experience; 19 years at RH2



## Mark Braaksma PE

## Electrical Engineer

Mark is an electrical engineer whose experience includes electrical, control, and communication design for various projects. He has also assisted in the electrical design of water and wastewater facilities. His work involves performing load calculations, sizing electrical equipment and conductors, designing standby power generation systems, designing instrumentation, coordinating utilities, and designing electrical systems in AutoCAD. In addition to design, Mark performs electrical construction inspection, control system factory and field testing, and construction document review.

### Representative Project Experience

- Central Well Development, City of Sumner
- Well 4 Emergency Power Improvements, City of Auburn
- Sunnyside Well Treatment Facility Services During Construction, City of Marysville
- Well No. 8 Design, Nob Hill Water Association
- SW Well 1A Water System Improvements, City of Yelm
- Bryant Well No. 3 Facility, City of Stanwood
- Hawks Prairie Well Source 31 Design, City of Lacey
- Cedarhome Well Retrofit, City of Stanwood
- Scotts Well Field Improvements Phase 1, Lakewood Water District
- Well 7 Water Treatment Residuals Management, City of Lacey

#### Education

BS Electrical Engineering  
South Dakota State University 2009

#### Licenses

Professional Engineer  
51635 (WA), 104363PE (OR), 16988 (HI)

#### Experience

16 years of experience; 16 years at RH2



## Dylan Bright PE

## Hydraulic Modeling

In Dylan’s tenure at RH2, he has worked on a variety of water and sewer systems, and he specializes in hydraulic modeling and planning projects. His experience also includes the WSH system. He has experience utilizing a variety of modeling software, including WaterCAD, SewerCAD, InfoWater Pro, and PCSWMM. As a part of RH2’s Planning and Analysis group, he supports several on-call utility clients and has developed experience with many types of projects, including water system seismic resilience planning, booster pump station design, and developing comprehensive water and sewer system plans. Dylan’s technical abilities and knowledge provide our team with quality and valuable deliverables that can be produced in a timely and budget-efficient manner.

### Representative Project Experience

- Western State Hospital Disinfection Improvements Design, Washington State Department of Social and Health Services
- Water System Plan Update and Illinois Well Outfitting Design, City of Ellensburg
- Wholesale Transmission Main Extension, Lakewood Water District
- Water and Sewer Hydraulic Modeling, City of Kirkland
- Water Model Update, City of Kirkland
- On-Call Water Modeling, City of Port Angeles
- Water System Plan Update, City of Woodland
- Hydraulic Modeling Services Contract, Tacoma Water
- On-Call Water System Engineering Support, City of Marysville

#### Education

BS Civil Engineering  
Washington State University 2019

#### Licenses

Professional Engineer  
24024592 (WA)

#### Experience

5 years of experience; 5 years at RH2

## Sitts & Hill



## Gary Letzring PLS

## Surveying

Gary has more than 40 years of land surveying experience with extensive knowledge of the AutoCAD drafting platform, including Civil 3D. He has extensive experience in boundary, topographic, cadastral, construction and right-of-way surveys throughout Washington State. Sitts & Hill recently completed surveys and civil designs of the parking areas, Building 28, and a boundary line adjustment for WSH. Additionally, they performed numerous surveys for the Lakewood Water District, including boundary line adjustments, rights-of-way and topographic surveys for design, lot combinations and monument destruction permits, and survey construction staking. Sitts & Hill also has a strong working relationship with RH2, having worked together for many years now.

## Drayton Archaeology

## Ryan Schmidt PHD

## Cultural Resource Management

Drayton offers complete archaeological and cultural resource management services. They specialize in compliance management to meet the regulatory requirements of the various state, federal, and tribal laws and regulations to protect the finite resources associated with our shared human heritage. They have extensive experience working with WSDOT and federally funded projects. Ryan is Drayton’s project manager. He is responsible for daily scheduling, task management, report writing and editing, as well as preparing cultural resource assessment proposals and estimating costs for clients ranging from property owners to state and government agencies. Drayton will carry out the requirements of the WSH Cultural Resource Management Plan throughout the duration of the project.

Drayton is certified in Washington State as a Veteran Owned Business (certification number WDVADAAR15).

# Relevant Experience

RH2 is committed to providing engineering solutions for safe and reliable water and other utility infrastructure to every client and the communities they serve. At the heart of our design philosophy is an approach that seamlessly aligns with our clients' immediate needs, while anticipating the long-term operations and maintenance requirements of the facility. Through our thoughtful design process, we carefully consider the materials, layout, and function of all facility equipment and structures to minimize capital and long-term maintenance costs, and for ease of use through a long life-cycle. As a partner during the construction phase of many projects, we understand how disruptive this phase can be and strive to incorporate elements into the design plans and specifications to minimize this disturbance. This design approach that we apply to every project aligns with DSHS' goals for the East Campus Well replacement project. Throughout the well project, we will also align the design with the proposed consolidation plans RH2 has developed for the WSH water system, and coordinate the design efforts as necessary with Lakewood Water District. The following projects highlight RH2's commitment in every project towards similar goals as DSHS' for the East Campus Well replacement project.

Project, Client, Year	Well Info			Similar Key Elements				
	Flow (gpm)	Pump Type	Depth	Water Rights	Hydrogeologic Assessment	Alternative Drilling Methods	Well Building Design	Water Quality
Wixson Well No. 2 Improvements, Silverdale Water District*	880						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Well No. 3 Improvements, City of College Place*	1,500			<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Groundwater Source Investigation, City of Kelso*	N/A	N/A		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Well No. 8 Design, Nob Hill Water Association*	3,000			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WSP and Illinois Well Outfitting Design, City of Ellensburg (2022)	2,500						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Scott Well Field Improvements Phase 1, Lakewood Water District (2021)	1,000						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Regional Water Exploratory Drilling and Testing, City of Wenatchee (2021)	N/A	N/A		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Crescent Bar Well No. 1B, Grant County PUD (2020)	290			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Water System Consolidation: Well 4 and Well 6, City of College Place (2020)	1,750/2,750			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PRRE Well Drilling and Testing, Grant County PUD (2020)	2,000			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Lacey Wells S31 & S19 Pump Improvements, NW Land & Water (2019)	1,000/500				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Tacoma Point Wells and Aquifer Evaluation, City of Bonney Lake (2019)	800/900/1,200				<input checked="" type="checkbox"/>			
Groundwater Replacement Well 4, Hartstene Pointe W&S District (2019)	100						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Crescent Bar Well No. 1 and 1A, Grant County PUD (2019)	1,325/650			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exploratory Well Drilling and Testing Hwy 9 Site, City of Marysville (2019)	N/A	N/A		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Gateway Well No. 1, Port of Vancouver (2019)	150				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Chase Well No. 2 and Wellfield WTP, Rainbow Water District (2018)	1,100						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New Production Well Drilling and Testing, City of Fife (2018)	N/A	N/A			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Central Well Equipping and Treatment Facility, City of Sumner (2017)	1,050						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SW Well 1A Well Equipping and Treatment Facility, City of Yelm (2017)	1,500						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wanapum Indian Village Well No. S1 and S2, Grant County PUD (2016)	120/160			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Palermo Wells 16 and 17, City of Tumwater (2016)	400/350				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wanapum Maintenance Center Source No. 2 Well, Grant County PUD (2016)	1,000			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bryant Well No. 3 and Treatment Facility, City of Stanwood (2015)	1,000			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Submersible Vertical Turbine < 100 feet 100-500 feet > 500 feet

\*In progress



# SW Well 1A Well Equipping and Treatment Facility

## City of Yelm

### Key Elements

- Water Quality
- Manganese Removal
- Pilot Study Testing
- Water Treatment Design
- Filtration
- Chemical Feed
- Chlorination
- Hydraulic Analysis
- Booster Pump Station
- Well Pump Design
- Structural Design
- Standby Generator
- DOH Permitting



The City of Yelm historically relied on their two Downtown Wells for potable water supply. Since these wells were unlikely to meet future demand, the City drilled SW Well 1A, the first well in the SW Wellfield.

Water quality testing of the SW Well 1A showed levels of manganese above the secondary maximum contaminant level (SMCL) and the presence of ammonia. Since the existing Downtown Wells have low to no manganese, the City chose to include manganese treatment as part of the SW Well 1A water system improvements. Other major improvements included a well pump station, a reservoir for additional storage, and a booster pump station.

Yelm retained RH2 to prepare preliminary design of these improvements. This started with a pilot study to determine oxidation and filtration treatment parameters to result in effective manganese removal and prolonged filter run times. Preliminary design also determined the design criteria of the 1,450 gpm well, the 600,000-gallon reservoir, and the booster pump station. To minimize wastewater, the filter backwash water was to be captured in a storage tank where the solids would settle by gravity over time and the clarified water could be recycled for treatment. During the pilot study, RH2 determined that the filter backwash water consisted of suspended particles, likely due to the manganese, which would not settle naturally by gravity. Filter backwash samples were then shipped to a polymer supplier to determine polymer type and dose to assist with solids settling.

Full scale design of the 2,400-square-foot facility was completed in spring 2015 and construction was completed in December 2016. The facility includes the SW Well 1A pump station, pyrolusite pressure filtration system, 48 pound per day on-site sodium hypochlorite generation and feed system, 50,000-gallon filter backwash storage tank and recovery system, laboratory, engine generator, and booster pump station. This facility has space for future expansion to increase treatment capacity from 1,450 gpm to 2,100 gpm with the addition of an off-site well and another filter vessel. The at-grade steel reservoir is adjacent to the treatment facility on-site and provides the breakpoint chlorine contact time necessary to fully react with ammonia and minimize off tastes and odors.

### Client Contact

Patrick T. Hughes PE  
City of Yelm  
City Engineer  
360.878.2042

### Relevant Team Members and Role

**Edwin Halim:** Project Manager  
**Steve Nelson:** Hydrogeologist  
**Barney Santiago:** Water Quality Engineer  
**Jon Conner:** Structural Engineer  
**Mark Braaksma:** Electrical Engineer

### Delivery Method and Budget

**Project Type:** Design, Bid, Build  
**Engineer's Estimate:** \$6M  
**Lowest Bid:** \$4.4M  
**Final Construction Cost:** \$4.5M





# Central Well Equipping and Treatment Facility

## City of Sumner

### Key Elements

- Water Quality
- Manganese Removal
- Hydrogen Sulfide Mitigation
- Pilot Study Testing
- Water Treatment Design
- Filtration
- Taste and Odor Improvement
- Chemical Feed
- Chlorination
- Hydraulic Analysis
- Well Pump Design
- Structural Design
- Standby Generator
- DOH Permitting



The City of Sumner relies on spring sources year-round and supplements that water supply with well sources to meet summer demands. In order to meet projected water demands and improve operational flexibility, the City had a new well constructed. Construction and testing of the Central Well was completed in November 2010. Water quality testing of the Central Well showed levels of manganese above the SMCL and the presence of ammonia.

The City retained RH2 to prepare the preliminary design for equipping the Central Well and constructing an oxidation and filtration treatment plant at the well site. After completion of the preliminary design, a pilot study was performed by Tonka Equipment Company to finalize design criteria. The pilot study results revealed that the treated water had a foul taste and odor. In addition, hydrogen sulfide odors not previously encountered were detected in raw water samples from the well. Additional pilot study testing was performed by RH2 and resulted in the recommendation to add granular activated carbon (GAC) filtration.

Design of the 2,400 square foot treatment plant was completed in summer 2015 and construction was completed in 2017. The well pump and water treatment plant processes were designed for 1,050 gpm flow rate with provisions for expanding the facility to pump and treat 2,100 gpm. The water treatment processes include a 48 pound per day (ppd) on-site sodium hypochlorite generation system; a horizontal, pressurized filter vessel; two vertical GAC contactors with an aeration skid system; and a 700 LF, 48-inch-diameter on-site steel pipeline for breakpoint chlorination. Large skylights were included to allow for the removal of the GAC contactors. Additional features were designed for equipment and piping that addressed operation and maintenance activities for the City to operate this source on a seasonal or part-time basis.

### Client Contact

Joe Fessler PE  
Associate City Engineer  
253.299.5704

### Relevant Team Members and Role

- Edwin Halim:** Mechanical QA/QC
- Barney Santiago:** Water Quality Engineer
- Andy Dunn:** Water Rights Specialist
- Steve Nelson:** Hydrogeologist
- Jon Conner:** Structural Engineer
- Mark Braaksma:** Electrical Engineer

### Delivery Method and Budget

- Project Type:** Design, Bid, Build
- Engineer's Estimate:** \$4.4M
- Lowest Bid:** \$4.5M
- Final Construction Cost:** \$4.6M



## Well No. 8 Design

### Nob Hill Water Association

#### Key Elements

- Well Design, Drilling, and Testing
- Hydrogeologic Analysis
- Coordination with DOH
- DWSRF Loan Funding
- SEPA Coordination

#### Client Reference

Zella West  
 Manager  
 509.966.0272

In 2017, RH2 began assisting the Nob Hill Water Association (NHWA) with analyzing preferred locations for a new groundwater well and obtaining additional source capacity to meet the future demand projections and provide redundancy if one of the system’s existing wells is out of service. Our hydrogeologist prepared specifications and observed key elements for drilling a large-diameter well using rotary methods to 1,450 feet. Well testing confirmed sustainable yield up to 2,500 gpm. RH2’s pump station design included the civil, geotechnical, mechanical, structural, electrical, and control elements to bring the well into service. RH2 worked with NHWA to select the well building type and appurtenances, operational elements, such as electrical drives, disinfection systems, metering, and SCADA, and on-site access alternatives. Design and construction of the well is funded by a DWSRF loan. Within this contract, RH2 assisted with preparing the necessary documents and submittals to meet the federal and state requirements of the DWSRF loan, including a cultural resource review and SEPA. Drilling is complete and the well house structure, site improvements, pump installation, and building interior mechanical are complete. Outstanding electrical components are arriving as of Q4 of 2024, with startup and testing planned for December 2024.

#### Relevant Project Team Members and Roles

**Steve Nelson:** Hydrogeologist; **Andy Dunn:** Water Rights Specialist;  
**Mark Braaksma:** Electrical Engineer; **Barney Santiago:** Water Quality Engineer; **Jon Conner:** Structural Engineer

#### Delivery Method and Budget

**Project Type:** Design, Bid, Build, **Engineer's Estimate:** \$2.4M, **Lowest Bid:** \$1.92M, **Final Construction Cost:** \$1.93M



## Water System Consolidation: Well 4 and Well 6

### City of College Place

#### Key Elements

- Water System Design
- Water Supply Development
- Deep Well Drilling and Support
- Permitting Assistance
- Services During Bidding and Construction

#### Client Reference

Mike Rizzitiello  
 City Administrator  
 509.394.8506

The City of College Place selected RH2 to provide well site analyses, prepare well specifications and well design, observe drilling and testing, and provide hydrogeologic analysis, water main design, permitting assistance, and environmental compliance assistance for two new deep basalt wells (Well 4 and Well 6). Our team assisted with project administration of federal funding requirements including both cultural assessments and SEPA; prepared funding applications; assisted with right-of-way and easement acquisition; assisted with public meetings; and provided services during bidding and construction. Both wells were drilled in Columbia River basalts to depths of 800 feet. Well 4 yields up to 1,750 gpm and Well 6 yields up to 2,750 gpm. RH2 evaluated pump options, treatment requirements, and SCADA control.

#### Relevant Project Team Members and Roles

**Steve Nelson:** Hydrogeologist; **Barney Santiago:** Water Quality Engineer; **Jon Conner:** Structural Engineer

#### Delivery Method and Budget

**Project Type:** Design, Bid, Build, **Engineer's Estimate:** \$4.5M, **Lowest Bid:** \$4.1M, **Final Construction Cost:** \$4.1M

# Past Performance and References

Our proposed project manager, Edwin Halim, is skilled at organizing team resources to complete complex projects. Edwin will be your main point of contact for the initial design-related tasks, including preliminary well siting, investigation, documenting existing conditions, and schematic design. He will work closely with Max, Andy, and Steve on design development and construction documents.

Edwin's longevity at RH2 is another strong factor in his ability to lead, as he has worked with our proposed team for many years on similar projects and understands when coordination needs to happen for the various components of the well design.



Michele and Edwin have collaborated on projects at RH2 for more than two decades. Their longevity and expertise will be valuable for this effort.

Edwin is currently working on the Wixson Well No. 2 Improvements project with Silverdale Water District. This project is to equip the existing well that has been drilled and to add a chlorination system for the well. A summary of this project is provided on the next page. The anticipated capacity of the East Campus Well project is similar to the

City of Yelm's SW Well 1A Improvements, which is described on [page 9](#). The City drilled the well, while RH2 designed all necessary improvements, including well equipping, water treatment, a water reservoir, a pump station, and a water main to connect SW Well 1A to the City's existing water system. A similar approach was used to make the Yelm project successful.

## Project Management Approach

We believe that our approach to project management is what makes RH2 so successful and efficient in delivering projects. We are deeply dedicated to assisting our clients by meeting their needs and goals, and establishing and growing long-lasting working relationships. We have found that everything else falls into place when this is at the forefront of our approach. Because RH2 understands the importance of putting the client first, our project managers make a point of including you every step of the way and are committed to meeting your expectations.

This design effort will be approached as a collaboration and not an exclusive experience for DSHS staff and RH2. Our team includes you, your staff, and key stakeholders, such as DOH, Ecology, and Lakewood Water District. The fact that we have successfully developed many design projects as a cooperative partnership proves that this approach is effective in developing highly useful planning documents and plan sets that our clients are proud to have helped develop.

This collaboration also provides a smooth and expeditious review process by regulatory agencies. Edwin has facilitated this process many times during his career, coordinating in the early planning and predesign stages of a project, and smoothly facilitating the project and management duties into the design and construction phases.

## RH2's 5-Phase Project Management Approach

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Initiation and Conception	Planning	Launch and Execution	Monitoring and Control	Project Closeout
<ul style="list-style-type: none"> <li>Meet with stakeholders</li> <li>Define project goals</li> <li>Identify project challenges</li> </ul>	<ul style="list-style-type: none"> <li>Develop scope and budget</li> <li>Identify deadlines</li> <li>Develop schedule</li> <li>Define team roles</li> <li>Prepare Communication plan</li> <li>Identify risks and prepare risk management plan</li> </ul>	<ul style="list-style-type: none"> <li>Budget management</li> <li>Resource planning</li> <li>Team meetings</li> <li>Risk management</li> <li>Communications facilitation</li> <li>Project status reports</li> </ul>	<ul style="list-style-type: none"> <li>Project goals</li> <li>Quality of deliverables</li> <li>Team progress and performance</li> </ul>	<ul style="list-style-type: none"> <li>Project review and analysis</li> <li>Client feedback</li> <li>Project closeout</li> </ul>





## Wixson Well No. 2 for the Silverdale Water District

The Silverdale Water District intends to construct an additional reservoir and well at the District's Wixson Reservoir site. The Wixson Reservoir No. 2 and Wixson Well No. 2 will share the site with the existing Wixson Reservoir and well building. The proposed well is intended to allow the District to utilize its full instantaneous (Qi) water right. RH2 is under contract for concurrent design of both facilities.

In 2021, the District drilled and tested the new well to a depth of 1,000 feet below ground surface. By 2023, they hired RH2 to support source approval, DOH project approval, well equipping, well building design, and treatment design. RH2 provided comprehensive services, including pump sizing, a detailed well profile design, and mechanical design featuring a 250 HP vertical turbine pump with associated control valves and a pre-lube system. The treatment design included an on-site hypochlorite generation system (OSHG) and injection system. Additionally, RH2 delivered structural design for a CMU well/treatment building and electrical/control design that seamlessly integrates with the District's existing on-site facilities.

The Wixson Well No. 2 project is in the final design and awaiting structural building permit approval and DOH approval. Initial comments from DOH on the design and project report have been received and are in the process of being resubmitted. Construction is anticipated to begin in the fall of 2024.

## Managing Scope, Maintaining Schedule, and Controlling Costs

Edwin will work with you to develop a detailed scope of work, schedule, and budget to clearly articulate RH2's role and tasks for the project. These items will be refined during contract development and will then serve as a guide for carrying out the project. Edwin and our team will frequently refer to these documents to keep the project on track.

RH2's project management software provides our project managers with up-to-the-minute status reports on project progress and budgets. It utilizes earned value management to quickly provide our project managers with a realistic view of the schedule, budget, and scope of work remaining to be completed. From this data, we can see any variances from the planned approach to assess performance. Edwin uses these reports, along with project-specific tracking tools, to maintain the schedule and communicate project progress with our clients. We have found that regularly scheduled monthly check-in meetings with our clients provide active time for collaborating on project tasks and managing the budget and schedule.

A project schedule will be compiled in Microsoft Project to articulate the critical path schedule from concept to construction. The schedule will reflect the dependencies of various tasks, decisions, and external factors such as water rights decisions, DOH mandates, funding limitations, etc. The project schedule will be updated as the design is refined and the interrelationship between each project element is more clearly understood.

## Quality Assurance/Quality Control Process

Each project is unique in size and complexity, and every client has their standards and preferences for balancing efficiency with the highest quality deliverables. While RH2 typically follows the process shown in the graphic below, we adjust our methods to meet the goals of each project and client, as needed.





For instance, some reviews may be best served by simply marking comments in a PDF review as "checked" or replying to revisions in tracked changes to acknowledge they have been reviewed and addressed. For more complex reviews, we may utilize advanced tracking spreadsheets to monitor and log each comment, revision, who is responsible, the date of finalization, and other information that may be requested by our clients.

## Approach Considerations: East Campus Well Replacement

### Background

DSHS recently discovered PFAS levels in its existing East Campus Well that are more than DOH State Action Levels, and as a result, the well has been out of service since 2023. DSHS intends to replace the existing 337-foot-deep East Campus Well, completed in the relatively shallow "C" Aquifer, with a new well that would be completed in a deeper aquifer ("E" or "G") that is hopefully hydraulically isolated from the "C" Aquifer, thereby attempting to reduce the risk of pumping groundwater that contains PFAS.

### Understanding of Project Components

One of the two wells serving the WSH campus has been affected by PFAS and is currently not in service. DSHS must get this water source back online as soon as possible. Well drilling, water quality analysis, and DOH approval are critical path items for this project. RH2's team of in-house hydrogeologists, engineers, treatment specialists, and environmental staff have the experience, expertise, and availability to complete this project in the shortest timeframe possible.

RH2 understands the risk that drilling could contaminate the deeper aquifer either by pulling contaminants from the shallow aquifer into the deeper aquifer or by inadvertently creating a temporary or permanent conduit for groundwater leakage from the shallow aquifer to the deep aquifer. RH2 will prepare targeted and detailed specifications and follow up by providing on-site technical expertise during drilling activities to reduce these risks. We propose to collect representative samples of the low permeability geologic units between the two aquifers to estimate their vertical hydraulic conductivity and evaluate groundwater level data after the new well is complete to assess the vertical hydraulic gradient between the aquifers. These parameters indicate the potential for groundwater withdrawal to induce downward migration of contaminants into the deeper aquifer. Based on this data, we will propose pumping strategies to mitigate risks.

In addition, well drillers currently have extremely long lead times. RH2 will prioritize developing the well drilling design

and specifications to bid the project as soon as feasible to get the project on the driller's schedule. RH2 has long-standing relationships with well drillers in Washington and Oregon and has already discussed this project with specific drillers, along with potential approaches to address the challenges of minimizing cross-contamination of aquifers and optimizing well performance. Our familiarity with the likely bidders will greatly enhance project communications and working through drilling and design tasks with the selected contractor.



Our team recently assisted the City of College Place with Wells 4 and 6, which were both drilled in Columbia River basalts to depths of 800 feet.

We are familiar with Tacoma-Pierce County Health Department (TPCHD) approval requirements for new wells and will work to streamline their review. We will provide TPCHD with a detailed summary of drilling and wellhead protection to minimize contaminant risk from nearby sources and shallow aquifer contaminants.

Another important component will be DOH approval, which cannot be obtained until a water quality/blending analysis is performed to determine required treatment. RH2's Treatment Group will utilize its relationship with DOH engineers and knowledge of treatment processes to complete any required treatment design and obtain DOH approval as efficiently as possible to keep this critical path item on track.

RH2's environmental staff has the expertise to navigate the environmental and cultural resources permitting associated with the funding. Early permitting efforts will focus on achieving funding requirements and approvals to facilitate well drilling, including coordination with DOH and TPCHD. After drilling, permitting efforts will focus on site development approvals, primarily through the City of Lakewood (City) and Pierce County (County), as needed. We teamed up with Drayton to address any cultural resources need.

The RH2 team has experience designing potable water facility infrastructure for new and existing wells, including well pump selection, permitting, mechanical, structural, electrical, controls, and water quality treatment.

## Prepare Plans, Specifications, and Cost Estimate for Drilling and Testing New Well

The first step will be to work with DSHS to identify a location for the proposed replacement well that will be protected from future development on the WSH campus, while understanding the water rights implications for various locations. The proposed location should also be confirmed that it will be suitable for use by Lakewood Water District in the event that the water systems are consolidated and the new East Campus Well is transferred to the District.

Close coordination with Ecology will be needed to make sure that the water right steps are known for the preferred location. Ideally, Ecology and DSHS will agree on where the replacement well can be located under RCW 90.44.100(3) for the two groundwater certificates without having to go through a water right change application process. If the well can be drilled in this location, then no water right change needs to occur and a simple form will need to be filed after the well is drilled to get it added to the two water right certificates associated with the current East Campus Well.

If the preferred location requires a water right change application to be filed, RH2 has water rights staff that can file the change applications and process the water right changes if needed under a cost reimbursement agreement, as was recently done with the Farm Well. This water rights work will also be coordinated with Lakewood Water District so that it is compatible with the proposed water system consolidation plans.



Our team's hydrogeologists, Andy Dunn (left) and Steve Nelson (right) have provided water rights and well planning and drilling support for similar projects for decades.

RH2 has developed well drilling specifications for more than 30 projects in the last 5 years. RH2 hydrogeologists, with assistance from RH2 engineers, will develop the well drilling and testing specifications based on the selected pump size and anticipated operation. RH2 will work with DSHS to identify water system requirements and target pumping rates and well performance. We will prepare engineering plans that properly size the depth and diameter of the casing and pumping chamber to so that the dynamic water

levels during the well's lifecycle are anticipated. We also will prepare an opinion of probable construction cost (OPCC) for the well drilling and testing. We are aware of the DSHS budget of \$3.1 Million for the construction of the well and will tailor the design to meet the project budget. The well specifications will be consistent with the District standards to facilitate potential consolidation of the water systems.

RH2 has in-house expertise with various drilling methods and can describe well drilling performance objectives that are protective of the deep aquifer. We will rely on the knowledge and expertise of our hydrogeologists to prepare a detailed drilling contract that reflects the current understanding of the aquifers in the surrounding area and the performance of similar deep well replacements. We will describe well sealing requirements and performance indicators that drilling contractors must follow to maximize the integrity of the borehole seal to protect the deeper aquifers. We also understand glacial aquifers, where sanding and biofouling may often develop in poorly designed wells; therefore, we will design a well screen to maximize well efficiency and minimize long-term maintenance needs.

The well boring will be drilled with sufficient diameter to accommodate a well casing that supports the well pump and can be completed in the target aquifer. Well drilling and testing may involve rotary (mud, air, direct, reverse circulation) or cable-tool methods, or a combination of both. RH2 has long working relationships with local cable-tool and rotary well drilling contractors and has technical insight into the different methods available for drilling cased borings in deeper aquifers. Our familiarity with local drillers and their expectations will be reflected in the specifications and will result in aiding the contractors in developing accurate bids based on likely conditions and project-specific drilling performance requirements.

## Support Well Drilling, Construction, and Testing

RH2 will oversee and document well drilling, construction, and testing activities. Our team appreciates the attention to detail necessary for observing well drilling activities, including borehole and aquifer conditions. We also have expertise documenting aquifer characteristics and the integrity of the well seal that will maintain the hydraulic isolation between aquifers. We will conduct a groundwater yield and water quality test once the well is constructed to demonstrate groundwater characteristics for water rights authorization and well capabilities for water supply development.

## Satisfy Ecology's Submittal Requirements for a Replacement Well

Ecology typically requires minor paperwork (submittal of a Showing of Compliance with RCW 90.44.100(3) form) to approve a replacement well as a new point of withdrawal when drilled near an existing well site. We expect the water rights component for source approval to be routine, but

will depend on the selected replacement well site. Our in-house water rights expert will be available to address any water rights issues that may arise from the proposed authorization.

## Water Quality/Blending Analysis and Treatment Evaluation

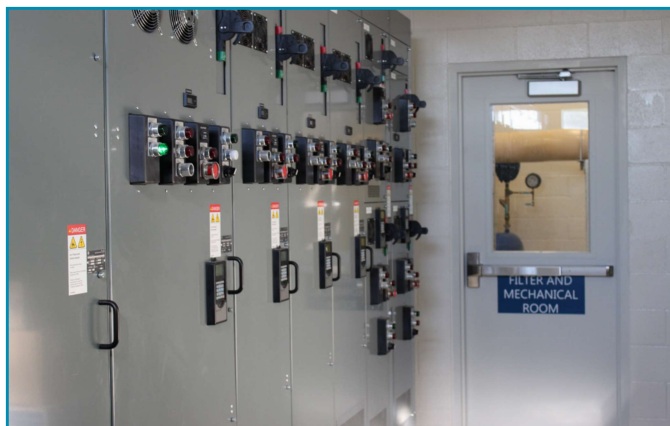
RH2's Treatment Group will analyze the groundwater quality and determine the steps needed to comply with state and federal drinking water regulations. Water quality samples will be taken after well testing and submitted for laboratory analysis of water constituents. A corrosivity assessment will evaluate the well's impacts of blending with the existing distribution system. If the new groundwater is more corrosive, pH adjustment may be needed, such as aeration or chemical feed, like caustic soda. If there are any contaminants (e.g., iron and manganese) in the groundwater that are above their maximum contaminant level, then source treatment would be required. Treatment options may include blending with higher quality sources or implementing a treatment process to physically remove contaminants to acceptable drinking water levels.

## Site Investigations, Conceptual Water Facility Design, and Cost Estimating

RH2 will utilize Sitts & Hill to obtain a full site topographic survey for preliminary design, along with well location and geotechnical test pit/boring locations after they are completed. RH2's in-house licensed engineering geologist will provide geotechnical site investigations and reporting to support the design of the new well building and other improvements.

RH2 will work with DSHS to develop a conceptual layout and facility design, including the well building and hydraulic, power, and treatment components. RH2 will develop a pump size and operation schedule that considers water system hydraulics, pump station operation, and treatment methods, if any. We will conduct a preliminary pump analysis to select a pump type and size that meets the planned pumping schedule and supports DSHS' intended electrical and control system and maintenance and monitoring schedule and constraints. We will estimate the power and control systems necessary to operate the new well pump and treatment system. Based on the preliminary design, we will summarize the costs and schedule to construct the well, meet with DSHS to discuss the design, and prepare a final conceptual design based on our discussions.

RH2 also will coordinate with DSHS to determine whether certain long-lead items should be pre-purchased to facilitate the project schedule. Determinations will be based on the supply climate, recent project experience, and information from industry insiders.



RH2's in-house electrical and control engineers can assist with estimating the power and control systems necessary to operate the new well pump and treatment systems.

## Permitting

Initial permitting efforts will focus on environmental (SEPA) and cultural resources approvals for state funding compliance to facilitate well drilling activities. RH2 anticipates the well drilling activities will be SEPA exempt, and cultural resources compliance will involve an EZ-1 form for Washington State Department of Archaeology and Historic Preservation (DAHP) and Tribal consultation. Drayton will help address cultural resources. RH2 will coordinate with the City to oversee that well drilling is conducted with the appropriate local permits.

Following well drilling and subsequent site design, RH2 will complete a project-level SEPA for the proposed site improvements and process it in coordination with DSHS and DOH. RH2 will reengage the City to confirm requirements and prepare local site development permits, which are anticipated to involve commercial building, electrical, grading, and possibly tree removal approvals. RH2 will also coordinate with the County and TPCHD for site approvals, as needed. Presently, RH2 anticipates the site being within City and DOH jurisdiction for site development and source approval, respectively, and TPCHD having well site approval authority.

## DOH Source and Construction Approvals

As part of the source approval process, DOH will require a demonstration that the risk of contamination between aquifers does not exist with the new well. RH2 will provide sufficient documentation of the well drilling and testing activities, along with an analysis of hydraulic separation between the two aquifers, in the source approval report.

After predesign, RH2 will prepare a Project Report to obtain DOH project approval, followed by construction document approval after final design. DOH review is a critical path item, and RH2 will coordinate with DOH early in the design process to minimize delays. DOH will review the water





quality/blending analysis to determine the required treatment and the potential interaction with other DSHS water sources in terms of corrosivity. The water quality/blending analysis cannot be completed until after the well is drilled and tested. RH2 will attempt to “prime the pump” with DOH for early project review before the completed water quality/blending analysis.

If additional treatment is needed, the Project Report and construction document submittals will incorporate treatment components. DOH review of these submittals will add time to the overall project schedule; however, RH2 has a great working relationship with DOH, and the Regional Engineer, Carol Stuckey, through recent projects with Tacoma Water and Lakewood Water District, and can navigate these steps early on to streamline approvals.

### **Final Water Facility Design and Cost Estimating**

The well profile and pump pad will be designed to accommodate the selected pump and other equipment to promote efficient operation and management of the pump, well, and groundwater resource. Our design will consider long-term maintenance requirements for the well, including groundwater monitoring and easy access for inspection, maintenance, and rehabilitation. The well building and treatment system will be designed based on DSHS preferences and utilizing commonly available equipment. RH2's well building design can range from simple and functional wood-framed structures to CMU and metal siding structures to meet DSHS's aesthetic preferences. RH2 has designed many sound dampening measures for pumps and generators, and can provide a similar design to the pump room if needed based on the selected building material and equipment. RH2's electrical team will complete electrical and telemetry designs with DSHS preferences. The well design will be consistent with Lakewood Water District standards to facilitate potential consolidation of the water systems and quick acceptance of the well facility by the District.

RH2 will proceed with final design efficiently and in accordance with the project's schedule. RH2's deliverables, QA/QC, and review processes will be employed at the 30-, 60-, and 90-percent, and bid-ready design phases. Detailed OPCC, schedule, and budget tracking will be developed at each milestone.

### **Services During Bidding**

RH2 has an excellent history of obtaining competitively bid projects that are close to our construction cost estimates. RH2's methodical designs, combined with our color 3D plans, eliminate conflicts and provide contractors with a realistic view of complex facilities. We will work with DSHS and bidders as questions arise in the bidding process to refine the design to an even greater extent to reduce contractor uncertainty.

### **Services During Construction**

RH2 will provide services during construction, as requested by DSHS. Edwin Halim and our team have experience assisting with construction contract administration, construction observations, geotechnical, and structure observations, startup, training, and project closeout. For well drilling and testing observations, RH2 will task Steve Nelson to observe critical elements of drilling and testing activities. For civil, mechanical, and structural observations, Edwin and engineers are available, and we have other resources and experts that can be called upon for assistance.



# Diverse Business Inclusion Strategies



**RH2 is committed to supporting Diverse Business enterprises by creating opportunities for these businesses within our community.**

While RH2 is not a Diverse Business, we understand the importance of creating additional opportunities for these enterprises. As such, our team member Drayton Archaeology is a Veteran Owned Business, and we have many successful examples of utilizing disadvantaged business enterprises (DBE) in Washington. The table at the bottom of the page highlights some of our recent partnerships with Diverse Business enterprises.

In addition to maintaining our own in-house list of M/W/ESB and Veteran or Service Member Owned firms that we have established relationships with, RH2 also utilizes

state and local agency online databases to find M/W/ESB and Veteran or Service Member Owned firms who provide the services we're looking for. After vetting their experience, we reach out and create new connections with these firms who then stay on our list of potential partnering companies for that area of expertise. There are also many instances of RH2 supporting firms that would fall under the category of M/W/ESB, but do not yet have their certification. This has proved to be beneficial for the firms as well as RH2, as we have broadened our network of companies we enjoy working with and helped spread project dollars throughout our community.

## M/W/ESB Partnerships

Firm Name	Certification	RH2 Project(s)	Contract \$ Spent
S&F	ESB	(1) North Transmission Line Intertie, City of Beaverton	(1) \$30,170
D & H Flagging	ACDBE, DBE, WBE	(1) Waterline Replacement Projects, City of Oregon City; (2) Hazelwood Drive Sewer Replacement, City of Oregon City	(1) \$300 (2) \$740
Emerio Design, LLC	DBE, MBE	(1) Cedar Hills, Jenkins Walker Water Main, City of Beaverton	(1) \$6,400
JLA Public Involvement	DBE, WBE	(1) TAP Emergency Intertie, City of Ashland	(1) \$3,500
GeoTest Services	SBE	(1) Smugglers Slough Habitat Restoration, Lummi Indian Nation	(1) \$16,640
HWA GeoSciences*	DBE, MWBE	(1) McMicken Heights Groundwater Treatment Plant, Highline Water District; (2) On-Call Services, Grant County PUD; (3) WRIA 40A Watershed Planning Improvements, Chelan County Natural Resources; (4) Issaquah Highlands, City of Issaquah; (5) Misty Cove Lift Station Replacement, City of Renton	(1) \$800 (2) \$3,100 (3) \$1,000 (4) \$7,700 (5) \$800
Karen Kiest Landscape Architects	DBE, WBE	(1) Bayshore Drive, Kitsap County (2) Highlands 435 Reservoir, City of Renton	(1) \$13,900 (2) \$2,600
Sargent Engineers	SBE	(1) Bellefield Pump Station Capacity Improvements, City of Bellevue, (2) Tank Analyses, Lakewood Water District, (3) Seismic Design, Lakewood Water District (4) Tank No. 2 Improvements, Spanaway Water Company	(1) \$950 (2) \$6,600 (3) \$25,500 (4) \$5,600
Staheli Trenchless Consultants	WBE	(1) The Loop Sewer Main, Valley View Sewer District	(1) \$23,850
The Philbin Group Landscape Architecture	WBE	(1) Cable Street, Ranch House, and Afternoon Beach Sewer Pump Station Improvements, Lake Whatcom Water and Sewer District; (2) H Street Downtown Revitalization Project, City of Blaine	(1) \$4,000 (2) \$9,600
TranTech Engineering	SBE, SEDBE	(1) Water Transmission Line Design, City of Blaine	(1) \$7,200
Advanced Underground Utilities	DBE, MBE	(1) On-Call Services, Grant County PUD; (2) CWM and CRL Water System Analyses, Waste Management	(1) \$2,100 (2) \$8,200

\*While we only list 5 projects here, RH2 has partnered with HWA on more than 20 projects.

# ARCHITECT-ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER (If any)

## PART II - GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (or Branch Office) NAME RH2 Engineering, Inc.			3. YEAR ESTABLISHED 1978	4. UNIQUE ENTITY IDENTIFIER 098560162
2b. STREET 22722 29th Drive SE, Suite 210			5. OWNERSHIP	
2c. CITY Bothell			2d. STATE WA	2e. ZIP CODE 98021
6a. POINT OF CONTACT NAME AND TITLE  Michele Campbell, PE, Principal-in-Charge			a. TYPE C - Corporation	
6b. TELEPHONE NUMBER 425.951.5394			b. SMALL BUSINESS STATUS 541330 Engineering Services	
6c. EMAIL ADDRESS mcampbell@rh2.com			7. NAME OF FIRM (If Block 2a is a Branch Office)	
8a. FORMER FIRM NAME(S) (If any)			8b. YEAR ESTABLISHED	8c. UNIQUE ENTITY IDENTIFIER

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. Function Code	b. Discipline	c. Number of Employees		a. Profile Code	b. Experience	c. Revenue Index Number (see below)
		(1) FIRM	(2) BRANCH			
02	Administrative	23	12	W03	Water Supply, Treatment, and Dist	8
10	Chemical Engineer	2	2	P04	Pipelines	7
12	Civil Engineer	65	21	H07	Highways, Streets	5
14	Computer Programmer	3	2	S04	Sewage Collection, Treatment	4
17	Corrosion Engineer	2	2	S13	Storm Water Handling	4
21	Electrical Engineer	10	3	U03	Utilities	3
24	Environmental Scientist	4	4	C18	Cost Estimating; Cost Engineering	3
30	Geologist	4	2	E12	Environmental Remediation	2
42	Mechanical Engineer	14	4	R03	Railroad; Rapid Transit	2
57	Structural Engineer	2	1	O01	Office Buildings; Industrial Parks	2
				S05	Soils & Geologic Studies	2
				H11	Housing	2
				P06	Planning (Site, Installation, Project	2
				W02	Water Resources; Ground Water	2
				I01	Industrial Buildings	1
				R04	Recreation Facilities	1
				S01	Safety Engineering	1
				P05	Planning (Community, Regional)	1
				A06	Airports: Terminals	1
				E02	Educational Facilities	1
				S11	Environmental Planning	1
<b>Total</b>				I06	Irrigation; Drainage	1

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)		PROFESSIONAL SERVICES REVENUE INDEX NUMBER			
a. Federal Work	2	1. Less than \$100,000	6. \$2 million to less than \$5 million	7. \$5 million to less than \$10 million	8. \$10 million to less than \$25 million
b. Non-Federal Work	9	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million	8. \$10 million to less than \$25 million	9. \$25 million to less than \$50 million
c. Total Work	9	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million	9. \$25 million to less than \$50 million	10. \$50 million or greater
		4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million		
		5. \$1 million to less than \$2 million	10. \$50 million or greater		

### 12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE 	b. DATE 2/1/2024
c. NAME AND TITLE Michele Campbell, PE (Principal-in-Charge)	