

# **Statement of Qualifications for the City of Snoqualmie**

Reclaimed Water Distribution System Improvements Construction Management and Inspection Services | April 2025

#### **Dear Andrew and Selection Committee,**

As a trusted partner of the City of Snoqualmie for the past 10 years, RH2 Engineering has valued the opportunity to collaborate with your staff and gain deeper insight into the complexities of your water and wastewater systems. With our history, strong working relationship, and experienced team, we believe we are well-equipped to provide construction management and inspection services for the Reclaimed Water Distribution System Improvements project.

Founded in 1978, RH2 is a full-service engineering firm specializing in public infrastructure projects from initial planning and design through construction and startup. With more than 150 professionals across nine offices in Washington, Oregon, and Idaho, we provide comprehensive water system planning, design, and construction administration services. Our team of engineers, geologists, hydrogeologists, scientists, and water rights specialists collaborate to develop effective strategies for water infrastructure development, and are invested in improving infrastructure for our communities.

RH2's efficient and responsive construction management team includes professionals who designed the improvements to your reclaimed water distribution system and are committed to guiding these improvements to successful completion. Additionally, our in-house multidisciplinary team has extensive knowledge of the Washington State Department of Ecology and Department of Health regulations, state funding processes, and environmental compliance. Our structural designers have expertise in all phases of prestressed concrete tank construction and will collaborate with our special inspections subconsultant, Professional Services Industries, Inc. (PSI), to uphold high standards of quality throughout construction.

As project manager, I will manage the efforts of our entire team and act as the City's main point of contact. I will work closely with our construction administration specialists, Marine Behr and Cassidy Brand, to complete the necessary services. As the construction administrator/assistant project manager, Marine's role will be to coordinate issues and documents with the contractor's project manager. Cassidy will provide on-site support to oversee compliance with the drawings with the contractor's superintendent and on-site staff to efficiently resolve field issues. Cassidy works out of both RH2's Bothell and Bellevue offices (45 and 25 minutes from the site, respectively) and can quickly travel to the site as needed. Dan Mahlum will act as the principal-in-charge, oversee our efforts, and utilize his decade of experience working with the City to provide valuable insight into your preferred processes and procedures. Together, our team brings a wealth of experience and a deep understanding of the City's needs. We are committed to delivering thorough, responsive, and proactive support throughout the project, fostering a smooth construction process and successful outcomes for the City.

We appreciate the opportunity to submit our qualifications, and look forward to continuing our partnership with the City. If you have any questions or would like additional information, please contact us at the information provided below.

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

**Barney Santiago PE** 

Project Manager 425.951.5456 | bsantiago@rh2.com

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Dan Mahlum PE

Principal-in-Charge 425.951.5340 | dmahlum@rh2.com

# **Project Organization and Staffing**

# **Team Organizational Structure**

Our team of experienced professionals specializes in water and wastewater facility improvements, as well as state-funded utility projects. RH2 has a strong track record of completing projects on time and within budget, backed by a commitment to provide clear communication and collaboration. With decades of experience in planning, designing, and overseeing the construction of reservoirs, booster pump stations, and utilities, our team is well-equipped for this project. The chart below outlines our key personnel and their roles.



# **Project Staffing and Resume Summaries**

After reviewing our current and projected assignments, we have confirmed that we have the capacity to staff this project. Our subconsultants have also verified their availability to assist. Based on this information, we have prepared the following chart for your reference, and the following pages provide summaries of our team's qualifications.



# Main Contacts



# **Barney Santiago** PE

# Barney is a water treatment expert and project manager with 20 years of experience in water infrastructure design, from initial conception through construction completion. His experience includes leading design teams, identifying and navigating critical path tasks, negotiating with various stakeholders, facilitating permits, assisting with funding opportunities, and complying with regulatory requirements.

During the construction phase, Barney has orchestrated successful implementation of infrastructure many times, including complicated treatment projects not designed by RH2. He is adept at coordinating with contractors, permit and funding agencies, subconsultants, and integration programmers to maintain positive forward progress. Barney understands all aspects of construction and can efficiently direct document reviews and troubleshoot construction problems. He has also navigated state funding requirements for a few projects, assisting with quarterly reports, change orders, and closeout documentation. Barney's expertise extends beyond construction as he remains a trusted resource for plant operators, helping them troubleshoot and optimize system performance long after a project is complete.

# **Representative Project Experience**

- Reclaimed Water Distribution System Improvements, City of Snoqualmie
- Water Reclamation Facility Phase 3, City of Snoqualmie
- Water Reclamation Facility Phase 1 and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Water, Sewer, and Stormwater System Plans, City of Snoqualmie
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District
- West Pasco Water Treatment Plant Improvements, City of Pasco (Design and Construction Lead)

#### **Education**

BS Chemical Engineering Minor in Chemistry University of Washington 2005

#### Licenses

Professional Engineer 46529 (WA)

#### Experience

20 years of experience; 20 years at RH2



# Marine Behr PE

#### **Construction Administrator/Assistant Project Manager**

Since joining RH2 8 years ago, Marine has been a key contributor to the success of numerous complex water and wastewater infrastructure projects, actively engaging in the planning, design, and construction phases. As the construction administrator and assistant project manager, she will be responsible for coordinating with the contractor's project manager to finalize monthly pay applications, ensuring overall schedule milestones meet expectations, and allocating staff and resources as needed to keep construction activities moving forward. Marine's expertise includes water main replacements, transmission main extensions, booster pump station designs, sanitary sewer rehabilitation, and lift station projects. Her collaborative approach with team members, vendors, and contractors has consistently delivered innovative, cost-effective solutions that meet client needs.

# **Representative Project Experience**

- Water Reclamation Facility Phase 3 Improvements, City of Snoqualmie (Construction Administrator)
- Water Reclamation Facility and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Lift Station Improvements, City of Snoqualmie
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District
- West Pasco Water Treatment Plant Improvements, City of Pasco
- Booster Pump Station Upgrades, City of Mercer Island
- Pump Station 8 and Pump Station 9, Highline Water District

#### Education

BS Civil Engineering California Polytechnic State University, SLO 2016

#### Licenses

Professional Engineer 22011224 (WA)

#### Experience

8 years of experience; 8 years at RH2

**Project Organization and Staffing** 





# Cassidy Brand EIT



Cassidy is a staff engineer in RH2's Bothell and Bellevue offices with experience in water and wastewater projects spanning all phases of design and construction. She has contributed to water and wastewater utility design, reservoir design, and lift station design, as well as provided on-site construction observation for water and irrigation utility projects. Her proficiency in AutoCAD and Civil 3D allows her to develop 3D facility models and detailed construction plans that effectively communicate designs and reduce conflicts during construction. As the construction staff engineer, she will assist in the field, directly coordinate with the contractor's superintendent to troubleshoot problems, and will lead reviews of submittals, requests for information, and change order proposals. Her intimate knowledge of the project as lead designer will allow her to efficiently navigate construction issues that may arise.

# **Representative Project Experience**

- Reclaimed Water Distribution System Improvements, City of Snoqualmie
- Water Reclamation Facility Phase 3 Improvements, City of Snoqualmie
- Local Water System Improvements to LOJO Property, Chelan Douglas Regional Port Authority (Construction Field Engineer)
- 40th Avenue West Tank Improvements, City of Lynnwood
- Main Zone Capacity Improvements Services During Construction, City of Chelan
- Holmes Point Drive Water Main Replacement, Northshore Utility District

#### Education

BS Civil Engineering University of Colorado, Boulder 2022

#### Licenses Engineer-in-Training

22027206 (WA)

#### **Experience** 3 years of experience; 3 years at RH2

Principal-in-Charge

# Supporting Staff



# Dan Mahlum PE

Dan is the head of RH2's Treatment Group and oversees complex, cutting-edge facility projects that include well development and rehabilitation, groundwater and surface water treatment, and wastewater planning and improvements. For the past 29 years, he has expanded RH2's treatment experience, giving our company the breadth and depth to meet our clients' needs for water and wastewater solutions. Dan is involved in every aspect of the projects he manages, from pilot studies and preliminary design to construction management, startup, and testing services. As a result, he effectively directs the conceptual planning of a facility knowing what will be successful after construction is complete and the operations phase begins.

#### **Representative Project Experience**

- Reclaimed Water Distribution System Improvements, City of Snoqualmie
- Water Reclamation Facility and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Water, Sewer, and Stormwater System Plans, City of Snoqualmie
- West Pasco Water Treatment Plant Improvements, City of Pasco
- Wastewater Treatment Facility Improvements, City of Cashmere
- Water Treatment Plant Improvements, Town of Eatonville
- Central Well Development, City of Sumner
- Hawks Prairie Treatment Facility and 400 Pressure Zone Booster Pump Station, City of Lacey

#### **Education**

BS Chemical Engineering University of Washington 1996

#### Licenses

Professional Engineer 37045 (WA), 86798PE (OR)

#### Experience

29 years of experience; 29 years at RH2

# Tank and Pump Station Expert



Edwin is a mechanical engineer with 27 years of experience designing water facilities. He specializes in reservoirs, booster pump stations, water treatment facilities, and transmission mains, with extensive experience managing and inspecting projects during construction. In recent years, Edwin has led the design of numerous projects that integrate both reservoirs and pump stations. His work on booster pump stations spans a wide range, from submersible pumps with pitless adapters delivering 45 gpm to complex vertical turbines with multiple stages capable of pumping over 3,000 gpm. He also has deep expertise in designing booster pump stations for closed zones, incorporating intricate control systems that rely on multiple control and relief valves to maintain efficient and reliable operation.

### **Representative Project Experience**

- Lift Station Improvements, City of Snoqualmie
- Keys Reservoir, City of Scappoose
- Minor Road Reservoir Replacement, City of Kelso
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District

Edwin Halim PF

- Reservoir 11, Sunrise Water Authority
- 10th Street Reservoir, East Wenatchee Water District
- Southern Tank and Booster Pump Station, Mt. View-Edgewood Water Company
- Pump Station 8 and Pump Station 9, Highline Water District
- Booster Pump Station Upgrades, City of Mercer Island
- Central Well Development, City of Sumner

#### Education

MS Mechanical Engineering University of Washington 1998

BS Mechanical Engineering University of Washington 1997

#### Licenses

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

#### Experience

27 years of experience; 27 years at RH2

Structural Engineer



#### Jon Conner PE, SE

Jon is a licensed structural engineer specializing in structural analysis and design. He has completed the structural design and/or analysis of more than 50 reservoirs in his 20 years of experience at RH2. His experience includes the structural design and detailing of water reservoirs including steel, reinforced concrete, and prestressed concrete. Jon is routinely involved in siting and alternatives analyses and has also prepared the site planning design and mechanical layouts for several reservoir projects. His work involves performing load calculations and designing structural components using design aids including AutoCAD and finite element analysis software. He also has extensive field experience as RH2's primary structural inspector providing engineering inspection services during construction.

# **Representative Project Experience**

- Water Reclamation Facility and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Lift Station Improvements, City of Snoqualmie
- Minor Road Reservoir Replacement, City of Kelso
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District
- West Pasco Water Treatment Plant Improvements, City of Pasco
- Southern Tank and Booster Pump Station, Mt. View-Edgewood Water Company
- Wastewater Treatment Facility Improvements, City of Cashmere
- Reservoir 11, Sunrise Water Authority

#### 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

20 years of experience; 20 years at RH2





Kevin is an electrical engineer whose experience includes electrical power distribution, control, and communication design for various projects including water and wastewater facilities. His work involves performing load calculations, sizing electrical equipment and conductors, designing standby power generation and fuel storage systems, selecting electrical equipment and instrumentation, coordinating with utilities, and designing electrical system layouts in AutoCAD. In addition to design, Kevin performs power system analysis, electrical construction inspection, control system factory and field testing, construction document review, and arc flash analysis.

#### **Representative Project Experience**

- Water Reclamation Facility and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Lift Station Improvements, City of Snoqualmie
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District
- West Pasco Water Treatment Plant Improvements, City of Pasco

Kevin Schalk PF

#### Education

BS Electrical Engineering Gonzaga University 2014

Licenses Professional Engineer: 57189 (WA)

Hydrogeologist/Engineering Geologist

**Experience** 11 years of experience; 11 years at RH2



### Steve Nelson LG, LHG, LEG

Steve previously completed the geotechnical investigation and report for the City's upcoming projects and will be a valuable resource to our team during construction. He is a licensed hydrogeologist and engineering geologist with technical experience involving infrastructure siting investigations, geologic hazards, foundation studies, dewatering, watershed planning, hydrology, and infiltration studies. Steve 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.

#### **Representative Project Experience**

- Water Reclamation Facility and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Lift Station Improvements, City of Snoqualmie
- Minor Road Reservoir Replacement, City of Kelso
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District
- West Pasco Water Treatment Plant Improvements, City of Pasco

#### Education

MS Geology, University of Arizona 1986

#### Licenses

Licensed Hydrogeologist and Engineering Geologist: 1402 (WA)

**Environmental Compliance Specialist** 

#### Experience

39 years of experience; 20 years at RH2



#### Alicia Pettibone

Alicia works closely with RH2 staff and clients, as well as regulatory agencies throughout the state, to navigate the regulatory environment. She has facilitated approvals through local, state, and federal agencies for the following permits: SEPA; NEPA; Hydraulic Project Approval (HPA); Shoreline Management Act compliance; Critical Areas Ordinance compliance; Endangered Species Act (ESA) compliance; Clean Water Act Section 401, Section 404, and Section 10; NPDES Construction Stormwater General Permit (CSGP); Floodplain Development; Land Use, Site Development, Building, and Construction Permits; and Cultural Resources compliance.

#### **Representative Project Experience**

- Water Reclamation Facility and North Well Field Water Treatment Facility Improvements, City of Snoqualmie
- Reclaimed Water Distribution System Improvements, City of Snoqualmie
- Minor Road Reservoir Replacement, City of Kelso
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District

#### Education

BS Environmental Science Western Washington University 2001

#### Experience

24 years of experience



# **Description of Related Experience**

# **Firm Overviews**

# **RH2 Engineering, Inc.**

Founded in 1978, RH2 is a full-service engineering firm specializing in public infrastructure projects. Today, our team of more than 150 professionals operates from nine offices across Washington, Oregon, and Idaho. We excel in water system planning, design, and construction administration, consistently delivering solutions that align with our clients' needs and timelines.

For 47 years, we have guided water system improvement projects through every phase, from initial planning and design to construction and startup. With a multidisciplinary team of engineers, geologists/hydrogeologists, scientists, and water rights specialists, RH2 has developed an effective strategy for water infrastructure development and improvements across the Pacific Northwest.

Our expertise spans planning, design, and construction contract administration and observation services in the following areas:

- Water Treatment and Disinfection
- Water Distribution and Transmission Main Design
- Storage Tanks and Reservoirs
- Booster Pump Station Design
- Pressure Regulation
- Water System Planning

# **Professional Services Industries, Inc.**

Professional Services Industries, Inc. (PSI) will provide special inspection and materials testing per the 2021 International Building Code with Washington State Amendments and project specifications as directed by RH2 and/or the City of Snoqualmie. Anticipated inspections include soils, asphalt, structural shotcrete, concrete construction, post-tensioned concrete, post-installed anchors, masonry, and structural steel. PSI labs are WABO-approved, and their Tukwila lab holds A2LA accreditation for ASTM E329 and ISO 17025.

RH2 has worked with PSI on many construction projects in the past several years, including the City of Snoqualmie's Water Reclamation Facility Phase 1 and Phase 2 projects, the Town of Eatonville's Water Treatment Plant Improvements project, and Highline Water District's Pump Station 8 and Pump Station 9 projects. Our past experience working together has built a strong foundation for future partnerships, allowing us to efficiently execute projects that meet the highest standards of engineering and construction excellence.



- Hydraulic Modeling and Analysis
- Water System GIS and Mapping
- Supply Planning and Development
- Water Rights Assistance
- Wellhead Protection
- Energy Efficiency and Vibration Analysis



RH2 worked with PSI on the City of Snoqualmie's Water Reclamation Facility Phase 1 and Phase 2 projects, and we are prepared to collaborate again on the City's upcoming Reclaimed Water Distribution System Improvements.

# **Summary of Related Experience**

Since our inception in 1978, we have been at the forefront of innovation, incorporating state-of-the-art technologies to deliver sustainable solutions in water system infrastructure. RH2's success is emphasized by our commitment to our mission: *to improve everyday life in our local communities through technical expertise, innovative solutions, and trusted relationships.* The following infographic highlights our water system project experience from the past 10 years, and the remainder of this section details our relevant experience. For the majority of these, RH2 also provided construction phase services.

# RH2 Water System Projects





# **Prestressed Concrete Tanks**

RH2 has an extensive resume of reservoir design projects. Over the past 10 years, RH2 has successfully completed more than 60 reservoir projects across the Pacific Northwest, encompassing seismic assessments and retrofits, new construction, and replacements. These projects have spanned a wide range of capacities, from 30,000 to 33 million gallons. Our experience includes a wide range of reservoir types, with significant expertise in prestressed concrete tanks. These tanks offer durability, low maintenance, and excellent seismic performance, making them a preferred choice for municipalities seeking long-term, resilient storage solutions.

#### **Relevant Project Experience**

- Keys Reservoir, City of Scappoose+
- Meadow Wood Reservoir, City of Grants Pass+
- Southeast Water Reservoir, City of Tumwater\*
- North Phoenix Reservoir and Water Main, City of Phoenix\*
- Southern Tank and Booster Pump Station, Mt. View-Edgewood Water Company (2020)
- Rapp Road Reservoir, City of Talent (2021)
- Minnesota Reservoir, Nob Hill Water Association (2019)
- Reservoir 11, Sunrise Water Authority (2019)
- Minor Road Reservoir Replacement, City of Kelso (2019)
- 10th Street Reservoir, East Wenatchee Water District (2016)
- Thompson Hill Reservoir, City of Kennewick (2015)

+Under construction \*design in progress

# **Booster Pump Stations**

Due to the critical role that booster pump stations play in supplying water during times of emergency, RH2's approach focuses on delivering a highly reliable, resilient, and secure booster pump station. We design all of our booster pump stations using 3D AutoCAD to develop award-winning, highly detailed, and comprehensive construction documents. This approach allows us to build the structure as a digital model before the contractor builds it on the site. We conceptualize the design, analyze it, evaluate it, and resolve constructability issues during the design phase to help make sure the facility is built as intended.

#### **Relevant Project Experience**

- Booster Pump Station Upgrades, City of Mercer Island\*
- Maplewood Booster Pump Station, Cedar River Water and Sewer District\*
- West Hill Booster Pump Station Improvements, City of Renton (2023)
- Wholesale Transmission Main Extension and Booster Pump Stations, Lakewood Water District (2023)
- Pump Station 8 and Pump Station 9, Highline Water District (2022)
- Nyanza Reservoir and Booster Pump Station, Lakewood Water District (2021)
- Stratford Booster Pump Station Electrical and Control Design, City of Moses Lake (2020)
- Tacoma Intertie Booster Pump Station—Prairie Ridge, City of Bonney Lake (2020)
- South Talbot and West Hill Booster Pump Station Improvements, City of Renton (2019)
- 560 Zone Booster Pump Station Services During Construction, City of Marysville (2019)
- Hillside and Hillcrest Booster Pump Station, City of Longview (2019)
- Elevated Tank Replacement and Booster Pump Station, Port of Vancouver (2018)
- Southwest Well 1A Water System Improvements, City of Yelm (2016)

\*In progress

Description of Related Experience



# **State-Funded Projects**

Our in-house, multidisciplinary team has extensive experience with Washington State Department of Ecology funding, state environmental compliance, and other funding programs. We have successfully helped clients secure funding for a wide range of projects. Our staff stays up to date on current funding opportunities and requirements, helping clients navigate competitive loan and grant programs to maximize their eligibility. With a team well-versed in these programs, we guide our clients to meet all agency needs and requirements during the construction phase.

#### **Relevant Project Experience**

- West Pasco Water Treatment Plant Improvements, City of Pasco\*
- Boulevard Park Sewers, Valley View Sewer District\*
- Process Water Reuse Facility, City of Pasco\*
- Systemic Pedestrian Improvements, City of Aberdeen (2024)
- Complete Streets, City of East Wenatchee (2024)
- Rock Island Road Overlay, City of East Wenatchee (2024)
- Safe Routes to School (SRTS) Crosswalk Improvements, City of Shelton (2024)
- Well No. 7 Drilling and Design, City of College Place (2023)
- Non-Motorized Improvements, City of Mill Creek (2022)
- Water Treatment Plant Improvements, Town of Eatonville (2021)
- Highline Drive and 3rd Street SE Roundabout, City of East Wenatchee (2020)
- 4th Street SE Improvements, Douglas County Transportation and Land Services (2020)
- Overlay Project, City of East Wenatchee (2018)
- Red Apple Road Preservation, City of Wenatchee (2018)
- Central Well Development, City of Sumner (2017)
- South Kelso Drive Transmission Main, City of Kelso (2017)
- Meter Replacement Program, Greater Wenatchee Irrigation District (2017)
- Highline Drive Reconstruction, City of East Wenatchee (2017)
- Vantage Highway and Pfenning Road Signalization, City of Ellensburg (2016)
- Aplets Way Roundabout and Utility Improvements, City of Cashmere (2015)
- Yew Street Sidewalk and Water Main Replacement, City of Bellingham (2015)
- Wastewater Treatment Facility Planning and Improvements, City of Cashmere (2014)

\*In progress



# **Minor Road Reservoir Replacement**

#### **City of Kelso**

#### **Similar Key Elements**

- Construction Field Services
- Prestressed Concrete Reservoir Design
- Temporary Pump Station and Pipeline
- Geotechnical Analysis
- Overflow and Stormwater Considerations
- Neighborhood Coordination



#### **Project Team**

Edwin Halim, PE: Project Manager Steve Nelson, LG, LHG, LEG: Geologist/ Engineering Geologist Jon Conner, PE, SE: Structural Engineer Steve Nelson, LG, LHG, LEG: Geologist/ Engineering Geologist Alicia Pettibone: Environmental Permitting

#### **Client Contact**

Michael Kardas, PE Director and City Engineer City of Kelso 203 South Pacific Kelso, WA 98626 360.577.3376 mkardas@kelso.gov

#### **Completion Date**

2019

**Summary:** RH2 assisted the City of Kelso with replacing two partially buried concrete reservoirs with one single reservoir. The existing concrete reservoirs were built in 1924, had reached the end of their design life, and were leaking significantly. The site had limited space and was surrounded by a residential neighborhood. As part of the design, our team assisted with cost savings measures with alternatives to limit excavation, site disturbance, and access to the site.

During the reservoir sizing analysis, RH2 optimized the reservoir geometry to reduce the amount of earthwork required for constructing the reservoir. The final reservoir geometry includes an at-grade reservoir with a full perimeter access road for easy access and maintenance. The geology of the area includes weak sandstone at depth with weathered silt above. Groundwater seeps were present and commingling with the water leaking from the half-buried reservoirs. A series of underdrain piping was required to convey the existing groundwater from under the proposed reservoir floor. The project included significant excavation, steep slope retention, temporary access for hauling off site, retaining walls, and a strand-wrapped prestressed concrete reservoir sized to fit the available property, while maintaining residential views and site aesthetics, and minimizing maintenance.

This project was an example of the challenges that can occur when all phases of the project are not understood. RH2 was brought on board to design pre-established improvements for the City. During the beginning stages of construction, it was realized that the hydraulics of the system did not work as the City had originally understood. As a result, the City could not properly supply an upper zone when the existing reservoir was taken offline.

RH2, the City, and the contractor worked closely and diligently to address this issue. A packaged temporary booster pump station and pipeline were installed to provide water to the upper zone while the proposed Minor Road Reservoir was being constructed. Once these improvements were completed, the existing Minor Road Reservoir was reconstructed.

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#### **Project Team**

Edwin Halim, PE: Project Manager Marine Behr, PE: Civil Engineer Barney Santiago, PE: Treatment Engineer Kevin Schalk, PE: Electrical Engineer Jon Conner, PE, SE: Structural Engineer Steve Nelson, LG, LHG, LEG: Geologist/ Engineering Geologist Alicia Pettibone: Environmental Permitting

#### **Client Contact**

Marshall Meyer, PE, PMP General Manager Lakewood Water District 11900 Gravelly Lake Drive SW Lakewood, WA 98499 253.588.4423 mmeyer@lakewoodwater.org

#### **Completion Date**

2023

# Wholesale Transmission Main Extension and Booster Pump Stations

Lakewood Water District

#### **Similar Key Elements**

- Construction Field Services
- Booster Pump Station Design
- Water Main Design
- Stakeholder Coordination
- Easement Acquisition
- Permitting Assistance
- Environmental Survey
- Geotechnical Exploration

**Summary:** By the end of 2010, the Lakewood Water District had a wholesale water supply system in place to convey 7.4 MGD in additional purchased water rights to purveyors across the region. The system consisted of a large diameter transmission main and a booster pump station (WBPS1) to increase pressure to meet the hydraulic requirements of the District's wholesale customers. Since the wholesale system was constructed, the District determined it can provide up to 10.0 MGD in wholesale supply capacity, with existing wholesale customers interested in purchasing the additional capacity. As a result, the Wholesale Transmission Main Extension, upgrades to WBPS1, and a new, second booster pump station (WBPS2) were needed to increase the capacity of the District's wholesale system.

RH2 performed hydraulic analyses to evaluate the hydraulic grade line (HGL), intertie locations, and pressures for both pump stations to serve the new maximum capacity of 10.0 MGD. System head curves were then developed to select pumps for both stations and confirm that the pumps would operate at optimal efficiency. WBPS1 improvements were designed to upgrade the station with four new 250 horsepower vertical turbine pumps, with three pumps running in parallel, and the fourth pump provided for redundancy. WBPS2 was designed to operate in series with WBPS1 and increase the overall system capacity to 10.0 MGD with four 250 horsepower pumps available, operating similar to WBPS1. WBPS2 pumps will be operated based on system demands, with variable frequency drives provided to adjust the pump speed and maintain requested HGLs to the District's wholesale customers.

In addition, similar to WBPS1, WBPS2 was designed to blend in with the surrounding neighborhood, with an exterior that resembles the adjacent single-family houses. The site also was secured with perimeter fencing and lighting along the access road. Throughout the project, RH2 worked closely with the District to check that the pump stations would be able to meet the 10.0 MGD wholesale supply capacity of the District's water rights, and provide water to the wholesale customers at desired HGLs.

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# West Pasco Water Treatment Plant Improvements

**City of Pasco** 

**Similar Key Elements: Construction Field Services,** State Funding Compliance, Pump Analysis, and State Agency Permitting.

**Project Team:** Dan Mahlum, PE: Project Manager, Barney Santiago, PE: Treatment Engineer, Jon Conner, PE, SE: Structural Engineer, Kevin Schalk, PE: Electrical Engineer, Marine Behr, PE: Civil Engineer, Steve Nelson, LG, LHG, LEG: Geologist/Engineering Geologist, and Alicia Pettibone: Environmental Permitting.

**Completion Date:** In Progress

**Client Contact:** Maria Serra, PE, Public Works Director, City of Pasco, 525 North 3rd Avenue, 2nd Floor, Pasco, WA 99301, 509.544.4125, serram@pasco-wa.gov

**Summary:** The City of Pasco's West Pasco Water Treatment Plant (WPWTP) was equipped to supply 6 MGD and RH2 designed improvements to expand to 12 MGD, as well as meet additional regulatory requirements for membrane filtration. This plant was designed by a global engineering firm and the City has had many issues with operations and maintenance. Because our teams are local and well-practiced at finding solutions that meet our clients' needs, RH2 is highly skilled at thinking through these types of issues and implementing improvements that provide practical solutions, especially regarding handling and managing process waste waters.

Phases 1 and 2 of this project were awarded funds from Washington State Department of Health's (DOH) Drinking Water State Revolving Fund (DWSRF) program. RH2 worked closely with the City on permitting efforts, which included a State Environmental Policy Act (SEPA) checklist, City of Pasco Permits, DOH approval, and cultural resources. During construction, RH2 assisted with DWSRF funding compliance, assisting the City with quarterly statements and change order submittals to DOH. Phase 1 of the project was completed in fall 2023, construction of Phase 2 is nearly complete, and design of Phase 3 will begin soon.



# Local Water System Improvements to LOJO Property

**Chelan Douglas Regional Port Authority** 

Similar Key Elements: Construction Field Services, Construction Change Management, Water Main Design, Environmental Permitting, and State Agency Coordination.

**Project Team:** Erik Howe, PE: Project Manager, Cassidy Brand, EIT: Construction Field Engineer, Alicia Pettibone: Environmental Permitting, and Steve Nelson, LG, LHG, LEG: Geologist/Hydrogeologist.

**Client Contact:** Jon Johnston, Manager, Malaga Water District, 3957 Malaga Avenue, Malaga, WA 98828, 509.664.0142, mwdwater@nwi.net

Completion Date: Water Main Expansion Substantially Completed in 2023

**Summary:** The Chelan Douglas Regional Port Authority purchased a 72.5-acre parcel from LOJO Orchards in 2020 with the goal of recruiting new business and spurring economic growth in the region. One business has started to develop an industrial facility on the property that requires potable water service, cooling water discharge, and associated reservoirs and pumping facilities. RH2 assisted the Port and Malaga Water District to prepare a water main extension from Malaga Water District's distribution system to the LOJO Property to convey potable water to the industrial site. RH2 assisted with the design of approximately 4,500 LF of parallel 18-inch and 6-inch PVC water mains. This infrastructure also included fire hydrants, valve vaults, and a recirculation pump station. RH2 provided bidding services, construction administration, and construction observation for the entire project. Cassidy Brand was the field engineer for this project throughout construction and enforced design standards while keeping the overall project moving forward.

