

GREATER WENATCHEE IRRIGATION DISTRICT
3300 SE 8TH STREET, EAST WENATCHEE, WA 98802-9130
(509) 884-4042

VARIABLE FREQUENCY DRIVE AND SOFT START PUMP MOTOR UPGRADES

**Water Conservation Field Services Program
(FOA BOR-PN-17-F001) Grant Application for Funding to Design
Variable Frequency Drive and Soft Start Pump Motor
Upgrades**

Funding Category: Water Management Improvement Design

Prepared by:
RH2 Engineering, Inc.
300 Simon Street SE, Suite 5
East Wenatchee, WA 98802

RH2 Contact:
Mr. Paul Cross, P.E.
Phone: (509)886-6779
Fax: (509)886-2313
pcross@rh2.com

District Contact:
Mr. Mike Miller, Secretary/Manager
Phone: (509)884-4042
Fax: (509)884-8763
mikem@gwid.org



TABLE OF CONTENTS

SF-424 Application for Federal Assistance.....	Preface
SF-LLL Disclosure of Lobbying Activities.....	Preface
SF-424A Budget Information – Non-Construction Programs.....	Preface
SF-424B Assurances – Non-Construction Programs.....	Preface
Title Page	1
Contact Information.....	1
Funding Category.....	1
Table of Contents.....	2
Detailed Scope of Work	3
District Background, Location, and Relationship to Reclamation.....	3
Proposed Activity and Desired Outcome.....	4
Tasks and Approach	4
Milestone Schedule	6
Benefit Outcomes	7
Performance Measurement and Evaluation	8
Project Applicable Criteria	9
Detailed Budget Narrative.....	12
Budget Proposal	12
Funding Plan.....	12
Vicinity Map	13
RH2 Scope of Work.....	14
RH2 Fee Estimate	18
Official Resolution	19

DETAILED SCOPE OF WORK

District Background, Location, and Relationship to Reclamation

General Information

The Greater Wenatchee Irrigation District (District) is part of the United States Bureau of Reclamation (Reclamation) Chief Joseph Project in the Columbia River Basin and was authorized by Congress on May 5, 1958, pursuant to Public Law 85-393. The District's facilities are located in Douglas and Chelan counties in Washington and were planned, designed, and constructed by Reclamation.

The District serves approximately 9,745 acres of irrigable lands through three closed-pipe distribution systems. Chief Joseph Dam, constructed by the U.S. Army Corps of Engineers, is on the Columbia River in north central Washington. The District was originally built by Reclamation in the years 1960 to 1965. Approximately 93 percent of the water use is agricultural, primarily to irrigate apple orchards. The District is composed of three units: the East Unit; Brays Landing; and Howard Flats. Each unit is comprised of an independent irrigation system with unique source and conveyance facilities, which are described in the following sections (**Vicinity Map** attached).

East Unit

The East Unit serves approximately 5,575 acres in the East Wenatchee area of Douglas County. The water demand in the East Unit has averaged 2.83 acre-feet (af) per acre in the last 10 years. The East Unit includes Washington State water rights S3-00800C, S4-26127P, S4-28566P, and S4-29269P, totaling 27,012 af of annual withdrawal volume. Water rights are held in the name of the United States acting through the Regional Director, Pacific Northwest Region, Reclamation. The water is supplied to this unit via a two-stage pump station located on the Columbia River, approximately 3 miles southeast of East Wenatchee. There are a total of 44.36 miles of District-owned steel, polyvinyl chloride (PVC), asbestos cement, and concrete pipeline in the East Unit. There are four reservoirs with a combined storage capacity of 129.55 af. The East Unit has six pump stations with a combined rated capacity of 184.9 cubic feet per second (cfs).

Brays Landing Unit

The Brays Landing Unit is located approximately 8 miles north of Orondo, in Douglas County. The water supply for this unit is pumped from wells located adjacent to the Columbia River. The service area of this unit is approximately 2,818 acres in size. The water demand in the Brays Landing Unit has averaged 3.08 af per acre in the last 10 years. The Brays Landing Unit includes Washington State water rights 7150, G4-26878P, and G4-26128P, totaling 11,272 af of annual withdrawal volume. Water rights are held in the name of the United States acting through the Regional Director, Pacific Northwest Region, Reclamation.

There are a total of 22.1 miles of District-owned steel, PVC, and asbestos cement pipeline in the Brays Landing Unit. The unit contains 11 pressure reducing valves (PRV) in laterals. There are five reservoirs with a combined storage capacity of 4.08 af, and ten pump stations with a combined rated capacity of 157.08 cfs.

Howard Flats Unit

The Howard Flats Unit is located east of Chelan in Chelan County. The water supply for this unit is pumped from wells located adjacent to the Columbia River. The service area of this unit is approximately 1,240 acres, and the water demand has averaged 3.04 af per acre in the last 10 years. The Howard Flats Unit includes Washington State water rights 6592-A (Cert. Rec. 14 Pg. No. 6592-A), G4-26879P, and G4-26129P, totaling 5,068 af of annual withdrawal volume. Water rights are held in the name of the United States acting through the Regional Director, Pacific Northwest Region, Reclamation.

There are a total of 8.2 miles of District-owned concrete, asbestos cement, and PVC pipeline in the Howard Flats Unit. There are also 18 PRVs. There are three reservoirs with a combined storage capacity of 3.9 af. The Howard Flats Unit has six pump stations with a combined rated capacity of 67.58 cfs.

Proposed Activity and Desired Outcome

The proposed activity for this grant is to design electrical system upgrades to improve energy efficiency. Specifically, this activity involves the design of variable frequency drive (VFD) or soft start upgrades for existing pump motors.

The District's current *Water and Energy Conservation Plan* (WECP) identifies the opportunity to add soft starters and VFDs to existing pump motors to improve energy efficiency. Often, significant energy savings can be realized when standard motor starters are replaced with VFDs to optimize the best efficiency point of a particular pump. The constant cycling of pumps to match system demands leads to unnecessary wear and tear on the pumps and motors, as well as poor efficiencies if a less efficient pump is operating just to match demand. VFD units can save maintenance costs and energy.

The District has identified the three stage starters at the Airport Reservoir Pump Station as specifically requiring upgrades, but maintains a long-term plan to replace most or all motor starters throughout all three systems. As part of this activity, RH2 Engineering, Inc., (RH2) will work with the District to produce specifications and plans intended for the Airport Reservoir Pump Station, with significant generic portions that can be re-used for additional equipment in the future with only minor updates.

The desired outcome of the activity is for the District to have complete bid documents (plans and specifications) ready to solicit bids for VFD and/or soft start upgrades for the Airport Reservoir Pump Station. A secondary outcome of this activity is for the District to obtain generic bid documents that can be re-used with minor updates to upgrade additional pumping equipment with VFDs and soft starts in the future to accomplish its long-term goal of upgrading all pumping plants system wide.

Tasks and Approach

The District will employ RH2 to assist with the design of the electrical upgrades. Preparing the design will consist of a preliminary design and analysis phase, a 60-percent design phase, a 90-percent design phase, and a final design phase.

The major project tasks are described as follows.

Task 1 – Preliminary Design and Analysis

1. Work with District management and staff to identify specific equipment, wiring, raceway, devices, and material to be upgraded before preparing the design plans and technical specifications. Develop an approach to maximize the extent that generic upgrade specifications can be utilized to upgrade more than one plant.
 - a. Collect and review as-built drawings and operations and maintenance (O&M) manuals related to the Airport Reservoir Pump Station. Develop a list of questions to discuss with the District during a site visit.
 - b. Perform a site visit at the Airport Reservoir Pump Station with District staff to measure and document the existing building and equipment that will be impacted during the construction of the electrical improvements. Document location of electrical equipment inside and outside of the building.
 - c. During the site visit, conduct comprehensive pump efficiency testing to identify the existing pump efficiencies. Use the results in concert with the hydraulic model of the East Unit to model the advantages gained with a VFD as compared to a soft start reduced voltage starter.
 - d. Prepare a base drawing of the existing building and equipment in AutoCAD. This AutoCAD drawing will be used as the base drawing for the design plans.
 - e. Identify the approach for replacing the existing electrical equipment within the available construction period, which is understood to be from October 15th to March 15th each year, depending on weather. Evaluate the:
 - i. Availability of existing equipment;
 - ii. Cost and availability of new equipment;
 - iii. Re-use of existing conduit and conductors;
 - iv. Availability of space;
 - v. Availability of qualified contractors;
 - vi. Pre-ordering the switchgear and motor control equipment;
 - vii. Compatibility of the motor control panels with other control system improvements; and
 - viii. Project staging limitations.
 - f. Develop an approach to maintain generic portions of specifications so they can be applied to future pump stations.
 - g. Prepare a short preliminary design letter report to identify the design criteria established after the completion of the above subtasks. The preliminary design letter report will be used as a guideline for preparing the construction documents.

Review the letter report with the District and revise the letter per review comments. Finalize the letter for the file.

- h. Prepare a budget-level construction cost estimate for the proposed improvements identified in the preliminary design letter report.

Task 2 – 60-percent Design

2. Develop 60-percent electrical plans and costs for the equipment upgrades.
 - a. Prepare 60-percent electrical design plans, including a one-line diagram, electrical demolition plan, power distribution and signal plan, motor control equipment details, electrical schedules, electrical details, and automatic control and telemetry plans.
 - b. Prepare a 60-percent construction cost estimate.

Task 3 – 90-percent Design

3. Develop 90-percent bid documents and costs for the equipment upgrades.
 - a. Prepare 90-percent electrical design plans.
 - b. Prepare 90-percent general provisions and technical specifications, including materials and finishes in Washington State Department of Transportation (WSDOT) Standard Specifications format. Specifications shall maintain generic portions that can be re-used for future pump stations with minor updates.
 - c. Prepare 90-percent construction cost estimate.
 - d. Perform internal quality assurance/quality control (QA/QC) review of the plans and specifications.

Task 4 – Final Design

4. Prepare bid-ready plans, technical specifications, and construction cost estimate for a public works construction contract.
 - a. Prepare bid-ready plans incorporating final District comments.
 - b. Prepare bid-ready specifications with revisions to the general special provisions and technical provisions as needed for a completed project. Specifications shall maintain generic portions that can be re-used for future pump stations with minor updates.
 - c. Prepare an engineer's probable estimate of construction costs.

Milestone Schedule

RH2 will proceed with the design upon approval of the contract by the District. The schedule presented in **Table 1** can be accelerated if funding is awarded earlier.

Table 1: Milestone Schedule

Task	May 2017	June 2017	July 2017	Aug 2017	Sep 2017
i. Notification of Award	X				
ii. Funding Awarded		X			
1. Preliminary Design and Analysis		X	X		
2. 60-percent Design			X		
3. 90-percent Design				X	
4. Final Design					X

Benefit Outcomes

The addition of soft starters and VFDs will have a significant effect on energy use for the District, resulting in increased energy efficiency and decreased energy consumption. This directly conserves energy (making it available for other societal uses) and decreases operating expenses for the District.

All water supplied by the District is pumped. Therefore, the sources of electrical power and the use of electrical energy are management priorities. In recent years the District’s total energy requirement for pumping has averaged about 32,950,000 kilowatt-hours (kWh) per year, which is enough to power over 3,000 residential homes for a year. The District’s current WECF reports average annual power expenses of approximately \$173,000. Any savings in power consumption results in real and meaningful cost savings for the District.

The Bonneville Power Association summarizes the benefits of VFDs as follows:

A VFD controls the rotational speed of an electric motor by controlling the frequency of the electrical power supplied to the motor. They are proven to substantially reduce energy use. Non-VFD motor-driven systems are often designed to handle peak loads and the VFD can slow down the motor to better match the part load requirements. Also, they can reduce the impact of starting the motor.

Controlling motors with a VFD offers energy savings when motor-driven processes and power demand vary over time. Energy savings from variable-frequency drives can be significant, although the amount of energy reduction will vary depending on the motor’s operation and energy usage. On a turbine pump, even a small reduction in motor speed can reduce a pump’s energy use by as

much as 30%. Payback can range from few months to less than 10 years.

Variable frequency drives also allow more control of processes such as water distribution, aeration and chemical feed. The variable frequency lessens mechanical and electrical stress on motors and can reduce maintenance and repair costs as well as extending motor life.

Performance Measurement and Evaluation

Energy savings resulting from the proposed upgrades can be directly measured from power meters and evaluated. The District compiles a comprehensive analysis of energy consumption and rates in its WECP, which is updated approximately every 5 years. This project offers unparalleled ease of measuring performance and evaluating success, in that the cost of the improvements can be directly compared to the energy savings on a regular basis.

PROJECT-APPLICABLE CRITERIA

Sub-Criterion No. 1: Association with Reclamation project water supplies (up to 25 points)

Points will be awarded if the proposed activity is in a basin with connections to a Reclamation Project or activity. No points will be awarded for activities without connection to a Reclamation Project or Reclamation activity. Consider the following questions when addressing this sub-criteria element:

- *How is the proposed activity connected to a Reclamation Project?*
- *Does your entity receive Reclamation Project water?*
- *Is the proposed activity on Reclamation Project lands or involve Reclamation facilities?*
- *Is the proposed activity in the same basin as a Reclamation Project or activity?*
- *How will the proposed activity improve water availability in a basin where Reclamation is located?*

The District is part of Reclamation's Chief Joseph Project and was authorized by Congress on May 5, 1958, pursuant to Public Law 85-393. The District is within Reclamation's Pacific Northwest Region, Columbia-Cascades Area Office, Ephrata Field Office. The District's water supply is provided by ten separate Washington State water rights certificates and permits held by Reclamation. The District's facilities were planned, designed, and constructed by Reclamation, and title to those facilities is held by the United States. The District and its water supply are within the Columbia River basin, and all benefits to water availability resulting from the project will directly benefit users in the Columbia River basin.

Sub-Criterion No. 2: Extent to which the proposed activity will result in the applicant to be better suited to implement a project expected to improve water management (up to 20 points)

Points will be awarded for a proposed activity that is supports future implementation.

- *Will the proposed activity result in the applicant to be better suited to implement a water management project?*

The outcome of this project is for the District to have bid-ready construction documents for electrical upgrades at the Airport Reservoir Pump Station and generic specifications that can be re-used for future VFD and soft start upgrades at other facilities in upcoming years. These outcomes result in the District being extremely well-suited to implement these water management projects (at not only one facility, but District-wide). After this activity is

completed, the District will have one shovel-ready project (and multiple near-shovel-ready projects) that enhance operational efficiency and result in water better managed.

Sub-Criterion No. 3: Extent to which Federal funding would promote completion of an activity that might otherwise be delayed or postponed (up to 15 points)

Points will be awarded for a proposed activity that demonstrates financial need in order to get the activity accomplished. Consider the following questions when addressing this sub-criteria element:

- *Has the proposed activity been delayed or postponed due to past funding constraints? If so, for how long?*
- *If this is a newly proposed activity and if funds were not awarded, would that cause the completion of the activity to be delayed or postponed? If so, for how long?*
- *Explain why funds awarded under this FOA would help to accomplish the proposed activity.*
- *What is the extent of need for federal funds in order to complete the proposed activity?*
- *Would the proposed activity be accomplished at some point in the future without federal funding assistance?*

Variable frequency drive and soft start upgrades were first identified as opportunities for improvement in the 2011 Water and Energy Conservation Plan. If funds were not awarded, the District may elect to continue delaying the upgrades so other improvements that are already underway (e.g., the automatic meter reading replacement program) can continue. Funds awarded under this FOA would help accomplish this activity by allowing the District to continue implementing previously identified opportunities for improvement without further delaying the VFD and soft start upgrades. The maximum allowable federal funding amount is needed to complete the proposed activity as currently envisioned. The activity might be updated at some point in the future without federal aid, but at the expense of other programs and projects that also achieve the larger goals of the Water Conservation Field Services Program.

Sub-Criterion No. 4: Reasonableness of costs (up to 15 points)

Points may be awarded when the costs associated with the proposed activity are reasonable and the ratio of benefits to these is substantial.

The work will be completed in the most cost-effective manner. RH2 prepared the District's WECP and has completed all appurtenant hydraulic modeling for the District to date. RH2 is uniquely suited to complete this work in the most efficient way possible, with long-standing relationships with the District and other stakeholders already established. RH2 has been working with the District for over 12 years and is intimately familiar with

the District's system, future goals, and previous water and energy management efforts. RH2's rates and efficiency are extremely competitive. The costs for completing the electrical improvements, including design, are small in comparison to the value of the potential benefits, considering the large quantities of energy that the District consumes. In recent years, the District's total energy requirement for pumping has averaged about 32,950,000 kWh per year, which is enough to power over 3,000 residential homes for a year. The District's current WECP reports average annual power expenses of approximately \$173,000. It is difficult to estimate energy savings before performing pump efficiency testing, but even a modest 5-percent savings in energy expenses would pay for the electrical upgrades in less than 6.5 years. Any savings in power consumption results in real and meaningful cost savings for the District, which directly offset the cost of the activity.

Sub-Criterion No. 5: Connection to existing water management and conservation plan or previous system optimization review (up to 10 points)

Points will be awarded for a proposed activity that is related to previous planning.

- *Is the proposed design related to a water management improvement project identified in a previous planning effort lead by the application (i.e., Water Conservation Plan, System Optimization Review)?*

Chapter 6 of the District's current WECP identifies the upgrading of pump motors with VFDs and soft starts as a primary opportunity for improvement. The activity is directly related to previous planning efforts.

Sub-Criterion No. 6: Extent to which applicant's water management plan is complete and updated (up to 10 points)

The most current edition of the District's WECP was adopted in 2015. The previously adopted edition went through comprehensive updates in 2011.

Sub-Criterion No. 7: Amount and sources of non-Federal funding (i.e. cost-share) (up to 5 points)

Points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs and there are additional non-Federal contributors.

The District intends to exceed the minimum 50-percent share of project costs by providing funding for approximately 55-percent of the total project cost.

DETAILED BUDGET NARRATIVE

The work will be completed by the District's engineering consultant (RH2) on a time and materials basis. RH2's fee estimate and scope of work to complete the work is included at the end of this application (**Attachment 1**). RH2's costs are shown in **Table 2** as direct contractual costs. District personnel hours have been estimated and applied to District salaries, wages, and fringe benefits, as shown in **Table 2**. No equipment costs, travel/mileage costs, subcontracts, environmental/regulatory compliance costs, or indirect costs are proposed.

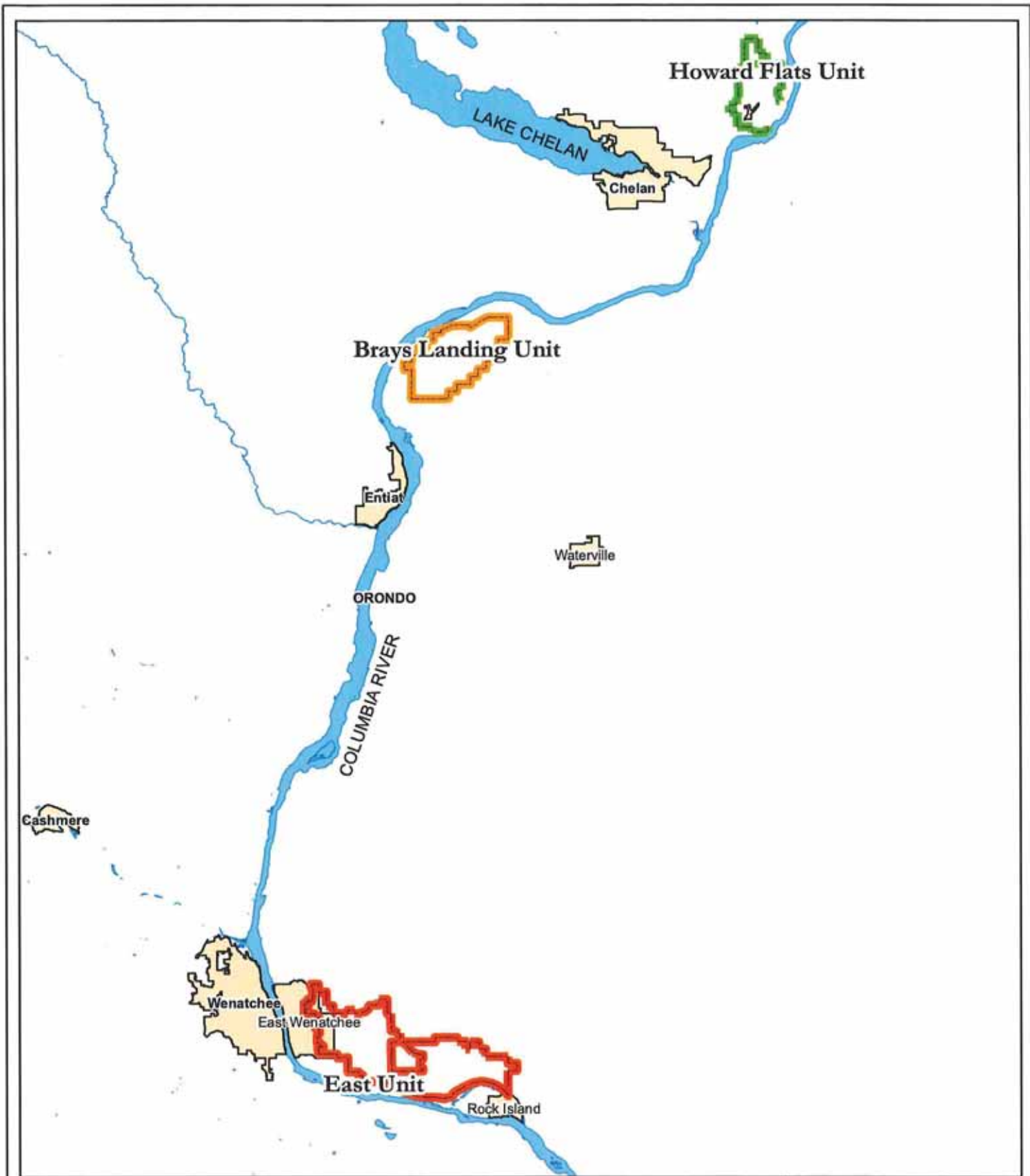
Table 2: Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION	Quantity	TOTAL COST
SALARIES AND WAGES	Price/Unit		
Manager/Secretary	\$41.50/hr.	20	\$ 830
Office Manager	\$22.55/hr.	20	\$ 451
FRINGE BENEFITS			
Manager/Secretary	\$26.41/hr.	20	\$ 528
Office Manager	\$15.22/hr.	20	\$ 304
CONTRACTUAL			
RH2 Engineering (see attached scope and fee)	\$ 53,085.00	--	\$ 53,085
TOTAL DIRECT COSTS			\$ 55,199
INDIRECT COSTS			
None.	--		--
TOTAL ESTIMATED PROJECT COSTS			\$ 55,199

Funding Plan

Cash funding for the non-federal share will be provided directly from the District's 2017 operations budget. The District is fully capable of supporting these costs within its existing budget. In-kind funding for the non-federal share will also be provided by the District personnel shown in **Table 2**. The Program Manager for the work will be Michael L. Miller (District Secretary/Manager). Fringe benefits include standard social security, Medicare, Labor and Industries (workers compensation), Public Employees Retirement System, life insurance, medical, dental, annual leave, and sick leave. District labor will be limited to coordination with RH2 and review of draft work products.

Besides the federal funding from this grant, there will be no other funding partners or contributors. Contact information for the District is included on the title page of this grant application. No costs incurred before the project start date are sought to be included as project costs. No other federal funding will be utilized and no other pending funding requests exist for this project.



1 in = 4 miles
 4 Miles
 DRAWING IS NOT TO SCALE
 IF BAR IS NOT 2" LONG

Vicinity Map Greater Wenatchee Irrigation District

FIGURE 1

- Legend**
- Howard Flats Unit Boundary
 - East Unit Boundary
 - Brays Landing Unit Boundary
 - Waterbodies
 - Cities



Exhibit A
Scope of Work
Greater Wenatchee Irrigation District
Variable Frequency Drive and Soft Start Pump Motor Upgrades
Professional Engineering Services

February 2017

BACKGROUND

The Greater Wenatchee Irrigation District (District) is located within Chelan and Douglas counties in Washington. Approximately 9,745 acres of irrigable lands are being served by closed pipe systems of the East, Howard Flats, and Brays Landing units. The three units are separate land areas requiring independent irrigation systems. The District was formed to operate and maintain facilities constructed by the United States Bureau of Reclamation (Reclamation) in the mid-1960s.

The District's current *Water and Energy Conservation Plan (WECP)* identifies the opportunity to add soft starters and variable frequency drives (VFD) to existing pump motors to improve energy efficiency. Often, significant energy savings can be realized when standard motor starters are replaced with VFDs to optimize the best efficiency point of a particular pump. The constant cycling of pumps to match system demands leads to unnecessary wear and tear on the pumps and motors, as well as poor efficiencies if a lesser efficient pump is operating just to match demand. VFD units can save maintenance costs and energy.

The District has identified the three stage starters at the Airport Reservoir Pump Station as specifically requiring upgrades, but maintains a long-term plan to replace most or all motor starters throughout all three systems. As part of this project RH2 will work with the District to produce specifications and plans intended for the Airport Reservoir Pump Station with significant generic portions that can be re-used for additional equipment in the future with only minor updates.

The major design and project elements include:

1. Preliminary design and analysis; and
2. Preparation of design plans and specifications.

PHASE I – PRELIMINARY DESIGN AND ANALYSIS

Task 1 – Preliminary Design and Analysis

Objective: Work with District management and staff to identify specific equipment, wiring, raceway, devices, and material to be upgraded before preparing the design plans and technical specifications. Develop approach to maximize the extent that generic upgrade specifications can be utilized to upgrade more than one plant.

Approach:

- 1.1 Collect and review as-built drawings and operations and maintenance (O&M) manuals related to the Airport Reservoir Pump Station. Develop a list of questions to discuss with the District during the site visit.

- 1.2 Perform one (1) site visit at the Airport Reservoir Pump Station with District staff to measure and document the existing building and equipment that will be impacted during the construction of the electrical improvements. Document location of electrical equipment inside and outside of the building.
- 1.3 During the site visit, conduct comprehensive pump efficiency testing to identify the existing pump efficiencies. Use the results in concert with the hydraulic model of the East Unit to model the advantages gained with a VFD as compared to a soft start reduced voltage starter.
- 1.4 Prepare a base drawing of the existing building and equipment in AutoCAD. This AutoCAD drawing will be used as the base drawing for the design plans.
- 1.5 Identify the approach for replacing the existing electrical equipment within the available construction period, which is understood to be from October 15th to March 15th each year, depending on weather. In addition to the items evaluated in the subtasks above, RH2 will evaluate the following.
 - Availability of equipment.
 - Cost and availability of new equipment.
 - Re-use of existing conduit and conductors.
 - Availability of space.
 - Availability of qualified contractors.
 - Pre-ordering the switchgear and motor control equipment.
 - Compatibility of the motor control panels with other control system improvements.
 - Project staging limitations.
- 1.6 Develop an approach to maintain generic portions of the specifications so they can be applied to future pump stations.
- 1.7 Prepare a short preliminary design letter report to identify the design criteria established after the completion of the above subtasks. The preliminary design letter report will be used as the guideline for preparing the construction documents. Review design report with the District and adjust the letter, per review comments. Finalize the letter for the file.
- 1.8 Prepare a budget-level construction cost estimate for the proposed improvements identified in the preliminary design letter report.
- 1.9 Maintain project files and perform ongoing client communications and monthly billing, as requested.

Assumptions: *A professional land surveyor will not be used to survey the existing pumping plant.*

Provided by District:

- O&M manuals for equipment, if available.
- As-built record drawings for equipment, if available.
- Written review comments for the preliminary design letter report.

RH2 Deliverables:

- Preliminary design letter report for review by District in electronic PDF.
- Final design letter report in electronic PDF.
- Budget-level construction cost estimate.

PHASE II – PREPARATION OF DESIGN PLANS AND SPECIFICATIONS

Task 2 – 60-percent Design

Objective: Develop 60-percent electrical plans for the equipment upgrades.

Approach:

- 2.1 Prepare 60-percent electrical design plans, including one-line diagram, electrical demolition plan, power distribution and signal plan, motor control equipment details, electrical schedules, electrical details, and automatic control and telemetry plans.
- 2.2 Prepare 60-percent construction cost estimate.

RH2 Deliverables:

- 60-percent design drawings in electronic PDF.
- 60-percent construction cost estimate in electronic PDF.

Task 3 – 90-percent Design

Objective: Develop 90-percent electrical plans for the equipment upgrades.

Approach:

- 3.1 Prepare 90-percent electrical design plans.
- 3.2 Prepare 90-percent general and technical specifications, including materials and finishes in Washington State Department of Transportation (WSDOT) Standard Specifications format.
- 3.3 Prepare 90-percent construction cost estimate.
- 3.4 Perform internal quality assurance/quality control (QA/QC) review of the plans and specifications.

RH2 Deliverables:

- 90-percent design drawings in electronic PDF.
- PDF copy of general special provisions and special technical provisions using WSDOT Standard Specifications format. Specifications shall maintain generic portions that can be re-used for future pump stations with minor updates.
- 90-percent construction cost estimate in electronic PDF.

Task 4 – Final Design

Objective: Prepare bid-ready plans, technical specifications, and cost estimate for a public works construction contract.

Approach:

- 4.1 Prepare bid-ready plans incorporating final District comments.
- 4.2 Prepare bid-ready specifications with revisions to the general special provisions and technical provisions as needed for a completed project. Specifications shall maintain generic portions that can be re-used for future pump stations with minor updates.
- 4.3 Prepare an engineer's estimate of probable construction cost.

Assumptions: *The District will incorporate the plans and specifications into the final construction contract documents, duplicate, and assemble for distribution.*

Provided by District:

- Payment for all permits and fees.

RH2 Deliverables:

- One (1) PDF copy of final plans. Hard-copy production of plans by RH2 is outside the scope of this contract authorization.
- One (1) PDF copy of final specifications.
- One (1) PDF copy of engineer's estimate.

PROJECT SCHEDULE

RH2 will proceed with the work upon approval of the contract. It is anticipated that the contract will be approved by May 31, 2017, in conjunction with the award of grant funding, and the work will be complete by October 1, 2017.

EXHIBIT B - PRELIMINARY

Greater Wenatchee Irrigation District

Variable Frequency Drive and Soft Start Pump Motor Upgrades

Fee Estimate

Description	Total Hours	Total Labor	Total Subconsultant	Total Expense	Total Cost
Classification					

PHASE I - PRELIMINARY DESIGN AND ANALYSIS

Task 1	Preliminary Design and Analysis	101	\$ 16,412	\$ -	\$ 1,089	\$ 17,501
1.1	Collect and review as-built drawings and O&M manuals	3	\$ 446	\$ -	\$ 11	\$ 457
1.2	Perform (1) site visit at the pumping plant	2	\$ 338	\$ -	\$ 62	\$ 400
1.3	Conduct pump efficiency testing, hydraulic modeling and reporting	51	\$ 8,150	\$ -	\$ 589	\$ 8,739
1.4	Prepare a base drawing of the existing switch yard and building	14	\$ 2,240	\$ -	\$ 196	\$ 2,436
1.5	Prepare a construction schedule and plan	6	\$ 1,064	\$ -	\$ 27	\$ 1,091
1.6	Develop generic specification approach	4	\$ 632	\$ -	\$ 52	\$ 684
1.7	Prepare a short preliminary design report letter	14	\$ 2,358	\$ -	\$ 95	\$ 2,453
1.8	Prepare a budget-level construction cost estimate	5	\$ 870	\$ -	\$ 22	\$ 892
1.9	Maintain project files and perform client communications/billings	2	\$ 314	\$ -	\$ 35	\$ 349

PHASE II - PREPARATION OF DESIGN PLANS AND SPECIFICATIONS

Task 2	60-percent Design	73	\$ 12,752	\$ -	\$ 459	\$ 13,211
2.1	Prepare 60-percent electrical design plans	66	\$ 11,472	\$ -	\$ 426	\$ 11,898
2.2	Prepare 60-percent construction cost estimate	7	\$ 1,280	\$ -	\$ 33	\$ 1,313

Task 3	90-percent Design	76	\$ 13,754	\$ -	\$ 546	\$ 14,300
3.1	Prepare 90-percent electrical design plans	34	\$ 5,864	\$ -	\$ 298	\$ 6,162
3.2	Prepare 90-percent general and technical specifications	26	\$ 4,688	\$ -	\$ 126	\$ 4,814
3.3	Prepare 90-percent construction cost estimate	4	\$ 748	\$ -	\$ 20	\$ 768
3.4	Perform internal QA/QC	12	\$ 2,454	\$ -	\$ 101	\$ 2,555

Task 4	Final Design	46	\$ 7,720	\$ -	\$ 354	\$ 8,074
4.1	Prepare bid-ready plans	21	\$ 3,348	\$ -	\$ 235	\$ 3,583
4.2	Prepare bid-ready specifications	21	\$ 3,624	\$ -	\$ 100	\$ 3,724
4.3	Prepare engineer's estimate	4	\$ 748	\$ -	\$ 20	\$ 768

PROJECT TOTAL	296	\$ 50,638	\$ -	\$ 2,447	\$ 53,085
----------------------	------------	------------------	-------------	-----------------	------------------

GREATER WENATCHEE IRRIGATION DISTRICT

3300 SOUTH EAST 8TH STREET EAST WENATCHEE WA 98802-9130
509-884-4042

Resolution 02.07.12.02

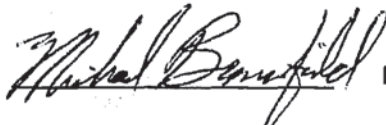
RE: Funding Opportunity Announcement No. BOR-PN-17-F001

The Board of Directors of the Greater Wenatchee Irrigation District, by resolution, hereby authorizes Mike Miller, Secretary/Manager to pursue Water Conservation Field Services Program BOR-PN-17-F001. By adopting this resolution, the Board of Directors has designated Mike Miller as the appropriate official to pursue this grant.

The Board also confirms there will be matching funds available upon acceptance of this Grant. Upon adoption, GWID agrees to work with Reclamation to meet all established deadlines for entering into a cooperative agreement.

Signed:

President, Michael Brownfield:



Date:

2/13/17

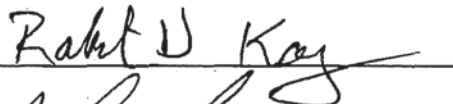
Vice President, Michael Clayton:



Date:

2-13-17

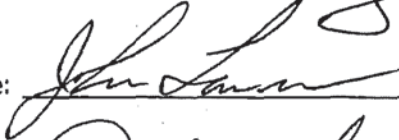
Robert Koenig:



Date:

2-13-17

John Lawrence:



Date:

2/13/17

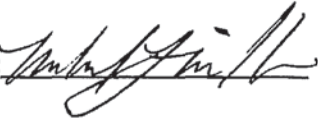
Douglas Bromiley:



Date:

2/13/17

Current Manager, Michael Miller:



Date:

2/13/17