

PROJECT: Dallas County Water & Sewer Authority
Rehabilitation of Well No. 1 and Well No. 3 (DWSRF No. FS010316-01)
KG Project No. 22-0020

ADDENDUM NO. One (1)

DATE: June 24, 2026

TO: All Registered Contract Document Holders

This Addendum is issued to all registered plan holders pursuant to the Conditions of the Contract.

This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. This addendum and its attachments shall become a part of the plans and specifications and shall apply to the bid proposals for the above-named project.

The bidder(s) shall notify all affected subcontractors, material suppliers, and others to incorporate necessary cost and schedule updates, to the bid proposal and the work changes affected by this Addendum.

The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form. Bidders must also acknowledge receipt by email to jessica@kelleynetwork.com.

In the event of conflict between plans and specifications and this addendum, the addendum shall take precedence. Any modifications necessary to incorporate the revisions shall be included in the appropriate bid prices. The bid documents are hereby corrected, modified, and/or amended in the following manner:

General:

1. The minutes and attendance roster from the Pre-Bid Conference held virtually on Tuesday, June 16, 2026, at 1:00 p.m. are attached.
2. To provide clarification regarding SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS, Article 19.06 shall be struck through.
3. To provide clarification, Hawkins, Inc. has a consistent working relationship with Dallas County Water and Sewer Authority (the Owner), and has provided equipment and services throughout the Owner's system and at Well #1 and #3. For this reason, the Owner prefers to work with Hawkins, Inc. and their subsidiaries where possible. While the Contractor may utilize Hawkins, Inc. to provide chemical feed, chemical analysis, filter media, FRP building, etc. for this project, they are not strictly required to do so, provided the chosen supplier and/or manufacturer meets all specification requirements for given equipment or media.
4. To provide clarification on the chemical feed pump quantity, revise the equipment quantities and skid configurations specified in SECTION 46 33 00 – LIQUID CHEMICAL FEED EQUIPMENT to require a total of eight (8) peristaltic metering pumps distributed across four

- (4) dedicated chemical feed skids (one skid per chemical system). To satisfy this requirement, each of the four skids shall be supplied as a complete factory-piped duplex pump configuration, ensuring that exactly two (2) pumps are provided for each chemical service.
5. To provide clarification on the chemical feed metering pump type and skid requirements, remove and replace SECTION 46 33 00 – LIQUID CHEMICAL FEED EQUIPMENT with the revised SECTION 46 33 00 – LIQUID CHEMICAL FEED EQUIPMENT – ADDENDUM #1 (7 pages total) attached hereto. Key changes from the original include the following:
- a. **Pump Type – Peristaltic (Revised from Diaphragm)**
The chemical metering pumps specified herein are peristaltic type, not diaphragm. The basis of design is the Watson-Marlow Qdos 60 Universal+, with Blue-White FLEXFLO as an acceptable alternate. The revised specification reflects this change throughout, including pump and skid requirements, equipment, and accessories.
 - b. **SCADA Remote Control Interface (New Requirement)**
All metering pumps shall be furnished with remote communication capability compatible with the Owner's SCADA system. The CONTRACTOR shall coordinate with the Owner's SCADA integrator prior to equipment procurement to confirm the required protocol. The pump drive shall support, as native features, any or all of Modbus (RTU or TCP/IP), 4-20 mA analog input, or pulse output.

All signal wiring between the pump drives and the skid junction box shall be provided, installed, and connected by the CONTRACTOR for the Owner's Integrator to then perform integration into the SCADA system. Pumps that do not offer any or all three interface types as native drive features are not acceptable.
6. The following questions were received during the project's advertisement and/or the Pre-bid Conference:

Q1: Will an Engineer's estimate or budget for this project be provided?

A1: Bidders are advised that the total appropriated funding available for the construction of this Contract is strictly limited to \$1,064,000, though the anticipated scope of work is expected to exceed this amount. ADEM requires bidding to proceed as designed to obtain actual pricing, as additional recaptured funds may be allocated to this project. Upon receipt of bids, results will be submitted to ADEM for review, with a Board award anticipated the week of July 12. Following this review, the project will either be provided additional funding utilizing the existing budget supplemented by recaptured funds, or it will be value-engineered to align with the \$1,064,000 budget threshold.

Q2: Who is the existing SCADA Integrator?

A2: C2i currently works with the Owner and is familiar with their existing SCADA architecture. The Owner prefers to utilize C2i due to the familiarity with their SCADA environment. While the Contractor may utilize C2i to perform the SCADA controls and installation for this project, they are not strictly required to do so, provided the chosen

sub-contractor meets all specification requirements for compatibility with the existing system. Final SCADA integration will be performed by the Owner's plant operator.

- Q3:** There are concerns with the project completion deadline. If additional funding is obtained, could the deadline also be extended?
- A3:** As long as the project is bid and placed under contract prior to the ARPA funding expenditure deadline, ADEM has advised that funds may be fully drawn down and held by the Owner. Payments to the Engineer and Contractor may then be made by the Owner as work progresses. A deadline extension is not anticipated to be necessary under this arrangement.
- Q4:** Sheet C-17 calls for only nuts, bolts, washers, and gaskets to be replaced, with existing piping to be abrasive-blasted and painted. The condition of this piping is questionable and active leaks have been observed. Should bidders quote only what is shown and anticipate a change order for additional work?
- A4:** Bidders shall quote the scope of work as shown on the Contract Drawings. The ENGINEER is not aware of pinholes or pipe that is failing to hold pressure. Blasting, painting, and hardware replacement were specified because similar pipe gallery conditions have been observed on comparable projects where the pipe remained structurally sound. If, upon blasting, any segment of pipe is found to be structurally deficient and not suitable for continued service, the CONTRACTOR shall immediately notify the ENGINEER. Replacement of any such segment with ductile iron pipe will be addressed by Change Order.
- Q5:** Sheet C-9 also calls for blasting and painting of existing piping, with hardware replacement only. Blistering of the existing pipe has been observed. How should the Contractor proceed if the pipe is not suitable for abrasive blasting?
- A5:** CONTRACTOR shall attempt to abrasive-blast the pipe as specified. If blasting is found to be problematic due to pipe condition, the CONTRACTOR shall halt that portion of the work and consult the ENGINEER before proceeding. ENGINEER will evaluate the condition and provide direction. Do not proceed with blasting pipe that, in the CONTRACTOR's judgment, presents a risk of structural failure without prior ENGINEER concurrence.
- Q6:** The Contractor Note on Sheet C-12 requires the Contractor to inspect the existing clearwell. Without the ability to inspect prior to bid, could this item be carried as an allowance?
- A6:** No allowance is required. The clearwells at both Well No. 1 and Well No. 3 were inspected and confirmed to be free of sediment accumulation at the time new pumps were installed within the past year. Bidders shall include the clearwell inspection in their base bid. If inspection reveals conditions requiring remediation beyond the specified scope, the Contractor shall notify the Engineer and a Change Order will be evaluated at that time.

- Q7:** Is only the shingle roof over the electrical room to be replaced, or does the scope include roof decking and water barrier over the pipe gallery as well?
- A7:** Bidders shall include replacement of the full roof assembly over both the electrical room and the pipe gallery, including roof joints, supports, decking, water/moisture barrier, and shingle roofing.
- Q8:** What is the diameter of the pressure filter tank vessels and what are the quantities of filter materials expected to be replaced in them?
- A8:** Filter media quantities are based on 10-foot diameter vessels with media bed depths as noted in the Contract Documents and below. Required quantities per tank and total for all six vessels (three per site, two sites) are as follows:
- Anthracite (0.6–0.8 mm) – 1.5 ft bed depth: 118 cu ft per tank / 708 cu ft total
 - Greensand (OxiPlus12 or Approved Equal) – 1.5 ft bed depth: 118 cu ft per tank / 708 cu ft total
 - Graded Gravel – 1.0 ft bed depth: 79 cu ft per tank / 474 cu ft total
- Quantities above should be reviewed and approved or modified as recommended by filter media manufacturer prior to submittal creation. CONTRACTOR shall remove and dispose of all existing filter media and perform interior pressure vessel work prior to installing new media in the quantities listed above.
- Q9:** Can Peerless Pumps be named as an Approved Equal manufacturer for the vertical turbine pumps?
- A9:** Yes, in addition to the National Pump Company, Gould's Water Technology, or an ENGINEER approved equal, Peerless Pumps may be utilized for the vertical turbine pumps.
- Q10:** Can Openchannelflow be named as an Approved Equal manufacturer for the FRP building?
- A10:** Yes, in addition to Engineered Fiberglass Composites Inc. or an ENGINEER approved equal, Openchannelflow may be utilized for the FRP building. Any manufacturer of FRP building should adhere to SECTION 13 34 23 – FIBERGLASS REINFORCED PLASTIC (FRP) CHEMICAL EQUIPMENT BUILDING – ADDENDUM #1 (5 pages total) attached hereto.
- Q11:** Can Blue-White Industries be named as an Approved Equal manufacturer for the chemical feed equipment?
- A11:** Yes, in addition to Watson-Marlow, Inc. or an ENGINEER approved equal, Blue-White Industries may be utilized for the chemical feed equipment.
- Q12:** The specifications currently call for a five-year warranty on pump materials, which exceeds the standard one-year manufacturer's warranty. Because this extended warranty will

escalate costs, will the five-year requirement be maintained? If so, can a separate line item be added to the Bid Form for the additional warranty costs to keep the base equipment bids cleaner?

A12: The five-year warranty requirement will be strictly maintained. Please note a five-year warranty is required for **all treatment equipment** provided under this contract as indicated in the Contract Documents, not just pump materials.

The Owner explicitly requires this extended coverage to ensure operational stability and mitigate unforeseen maintenance expenses while the Owner builds its capital improvements fund. It is acknowledged that this exceeds standard industry warranties and will impact equipment pricing; Contractors must coordinate with their suppliers to procure this extended coverage accordingly.

No separate line item will be added to the Bid Form for warranty costs. All costs associated with securing and providing the mandatory five-year warranties must be fully incorporated into the base bid price of the respective equipment items.

Q13: Regarding SECTION 46 21 11 – VERTICAL CENTRIFUGAL PUMPS, are the extended stuffing box(es) and automatic grease system required?

A13: Remove and replace SECTION 46 21 11 – VERTICAL CENTRIFUGAL PUMPS with the revised SECTION 46 21 11 – VERTICAL CENTRIFUGAL PUMPS – ADDENDUM #1 (16 pages total) attached hereto. Key changes from the original include the following:

- a. Acceptable Manufacturers: Peerless Pumping Company has been added as an approved manufacturer. The complete list of specified manufacturers is now National Pump Company, Goulds Water Technology, Peerless Pumping Company, or an Engineer-approved equal.
- b. Lubrication Systems: The requirement for an automated grease lubrication system has been completely struck from the specification and will not be required.
- c. Shaft Sealing Options: The shaft sealing requirements have been revised to allow for either a water-flushed packed stuffing box or a mechanical seal. The final sealing configuration shall be strictly dependent upon the specific pump manufacturer's recommendation for the specified service conditions and discharge head castings. An extended stuffing box will not be required.

Q14: Should startup chemicals be provided with the chemical storage tanks?

A14: Yes, chemicals should be provided with the chemical storage tanks for startup.

Specifications:

1. Add SECTION 13 34 23 – FIBERGLASS REINFORCED PLASTIC (FRP) CHEMICAL EQUIPMENT BUILDING – ADDENDUM #1 (5 pages total) attached hereto, to the Contract Documents.

2. Remove and replace SECTION 46 21 11 – VERTICAL CENTRIFUGAL PUMPS with the revised SECTION 46 21 11 – VERTICAL CENTRIFUGAL PUMPS – ADDENDUM #1 (16 pages total) attached hereto.
3. Remove and replace SECTION 46 33 00 – LIQUID CHEMICAL FEED EQUIPMENT with the revised SECTION 46 33 00 – LIQUID CHEMICAL FEED EQUIPMENT – ADDENDUM #1 (7 pages total) attached hereto.

This Addendum No. 1 shall be attached to the front of your set of Specifications and made a part of the Specifications and Contract Documents. Acknowledgment of receipt of Addendum No. 1 shall be noted on Page 00 41 43-1 of the Bid Form.

THE KELLEY GROUP, LLC.

By: *Bart Taft*
Bart Taft, P.E.

Addendum #1 is 57 total pages.
This concludes Addendum #1.

VIRTUAL PRE-BID CONFERENCE MINUTES

DALLAS COUNTY WATER & SEWER AUTHORITY REHABILITATION OF WELL NO. 1 AND WELL NO. 3

TUESDAY, JUNE 16, 2026, AT 1:00 P.M.

DWSRF ARPA PROJECT NO. FS010316-01 / KG PROJECT NO. 22-0020

Note: The following is a combination of the pre-bid meeting agenda and minutes. It does not attempt to, nor does it represent a total recapitulation of Project requirements and does not change or alter same in any respect.

General Review Items

1	Welcoming remarks. Sign in sheet is attached.
2	Introduction of Owner: Dallas County Water & Sewer Authority (334) 872-2820 William Hasberry, Board Chairman Courtney Cunningham, General Manager Jason Bell, Operations Manager Introduction of Engineer: The Kelley Group, LLC (256) 248-7030 Bart Taft, P.E., Owner, bart@kelleynetwork.com Kelley Taft, MPA, Owner, kelley@kelleynetwork.com Chase Williams, P.E., chase@kelleynetwork.com Jessica Mandrell, Project Manager, jessica@kelleynetwork.com
3	<u>FUNDING BACKGROUND</u> Dallas County Water and Sewer Authority obtained funding through the Drinking Water State Revolving Fund (DWSRF Project No. FS010316-01) American Rescue Plan Act (ARPA) through the Alabama Department of Environmental Management (ADEM). The OWNER seeks to contract with the most qualified CONTRACTOR to mitigate risk and delays to project construction and funding timelines, as all ARPA funded projects must be completed and closed out by December 31, 2026. The CONTRACTOR's employee workforce, equipment, and availability will be key components of evaluation. <u>GENERAL</u> 1. At the time of the bid, each bidder must: a. Submit evidence of an Alabama Licensing Board for General Contractor's license with a major classification of MU (Municipal & Utility), or another AGC Licensing Board approved classification. If the bidder has a single or multiple specialties of MU, as long as those specialties are 51% or more of the total cost of the project, the GC can bid this project. License number and classification must be written on the outside of the sealed bid envelope. b. Supply the OWNER and ENGINEER with a minimum of three (3) references and validation of performing similar type of municipal water system improvements projects.

- c. Provide proof of enrollment in the Alabama eVerify program and continue to use eVerify to check employees as directed by the eVerify system if awarded the contract. This enrollment proof is a copy of the eVerify Memorandum of Understanding.
 - d. Provide proof of active registration with the System of Award Management (SAM) website.
2. **The CONTRACTOR that the contract is awarded to must also:**
 - a. Furnish a Performance Bond for one hundred (100%) percent of the bid amount and a Labor and Material Payment bond for one hundred (100%) percent of the bid amount and must secure bond from a bonding company's agent in the State of Alabama.
 - b. Provide the Beason-Hammon Alabama Taxpayer and Citizen Protection Act certification form.
3. **DBE Utilization** – It is the policy of the State Revolving Loan Fund (SRF) to promote a “fair share” of sub-agreement awards to small, minority, and/or women-owned businesses for equipment, supplies, construction, and services. Compliance with these contract provisions **is required** in order for project costs to be eligible for SRF funding. See SECTION 00 73 01 – ADEM Supplemental General Conditions in the project specifications for detailed information regarding this requirement.
4. **Davis Bacon Wages and Certified Payroll** – Davis Bacon Prevailing Wage Rates for Dallas County are required. Davis Bacon posters shall be posted at a prominent location at the job site (i.e. on back of project sign). WH-347 Certified Payroll forms are required to be submitted to the ENGINEER with each application for payment for every week during the project.
5. **Salary Surveys** to be conducted by the ENGINEER. Onsite employee interviews will be scheduled with the ENGINEER two (2) weeks from start of construction and again two (2) weeks from completion.
6. **American Iron and Steel (AIS)** – All iron and steel products used in the project are to be produced in the U.S.A. Certification of Compliance with AIS Requirements is required to be submitted with each pay application. AIS Manufacturer letters are required with material submittals.
7. **Build America, Buy America (BABA)** – A waiver was obtained for this project.
8. **DWSRF ARPA Project Sign** – A DWSRF ARPA project sign shall be installed at a location designated by the OWNER. The sign shall be placed in a prominent location, clearly visible and readable from an existing street or roadway, remain in place for the duration of the project, and comply with all ADEM DWSRF ARPA signage requirements.
9. **Invoicing** – Pay Applications are to be submitted to the ENGINEER on or before the 25th of each month. **No invoices should ever be submitted to the OWNER.** Release of Lien is required to be submitted with each pay application.
10. **Change Orders** – Change Orders are to be processed by the ENGINEER before any additional labor is performed, or materials are ordered. All change orders for items not listed in the bid form will be processed as outlined in the executed contracts. **Only formally executed and approved change orders will be recognized.** Bid Line items for work to be performed are only estimated quantities. A summary change order to resolve the actual quantities used is to be expected at the project's end.
11. If the OWNER allows work on the weekends, the CONTRACTOR may request approval from the ENGINEER to work Saturday and Sunday a minimum of 48 hours prior to the weekend.

12. **Weather Days** – Any weather days to be used by the CONTRACTOR shall be communicated by the CONTRACTOR to the ENGINEER with the Weather Delay Report provided in the contract specifications. CONTRACTOR to provide Weather Delay report with each pay application. Weather days will not be processed at the end of the project.

WORK UNDER THIS CONTRACT

1. The Work includes, but is not limited to, the items described in SECTION 01 11 13 – Summary of Work (attached for reference).
2. Bidders are advised that the total appropriated funding available for the construction of this Contract is strictly limited to \$1,145,000.
3. Bidders are advised to visit the sites to become familiar with the size, configuration and working conditions prior to submitting a bid. CONTRACTOR can make arrangements to inspect the sites by contacting Jessica Mandrell, Project Manager, at The Kelley Group, (256) 248-7030, or jessica@kelleynetwork.com.
4. Both wells are active drinking water treatment facilities. The CONTRACTOR shall coordinate all work, equipment outages, and operational interruptions with the OWNER and ENGINEER and shall maintain continuous facility operation except where specifically approved otherwise.

Well No. 1 Rehabilitation

1. Work for Well No. 1 consists of comprehensive rehabilitation of mechanical, process, electrical, and structural systems including high service pumps, aeration, chemical feed, flocculation, sedimentation, pressure filtration, clearwell, electrical systems, and site improvements.
2. The CONTRACTOR shall rehabilitate the existing induced draft aerator and furnish and install a new blower unit. Existing flocculation basin bearings, drives, and appurtenances, and the sedimentation basin vacuum track sludge collection system components required for rehabilitation, such as tubing, drives, etc. shall be removed and replaced.
3. Improvements include furnishing and installing a new chemical feed system with associated pumps, tanks, piping, containment, FRP building and concrete slab, and controls, and furnishing and installing chlorine room safety equipment including SCBA equipment and a chlorine gas detection and alarm system.
4. The existing high service pumps shall be removed and replaced, a new well pump VFD shall be furnished and installed, and designated valve actuators, gate valves, and check valves shall be replaced.
5. The three pressure filter tanks shall be rehabilitated, including interior sandblasting, repairs, recoating, filter media replacement, air release valve replacement, manway improvements, and disinfection prior to return to service.
6. The clearwell shall be drained, cleaned, repaired as directed by the ENGINEER, and disinfected prior to return to service.
7. Wellhouse improvements include interior wall and masonry repairs, cleaning and painting of existing wellhouse piping and fittings, roof rehabilitation, replacement of doors, windows, louvers, heaters, and blowers, and replacement of the entry gate and damaged chain-link fencing.
8. A \$150,000 Electrical Improvements Allowance is included for OWNER and ENGINEER-directed electrical improvements, including investigation and testing, MCC

	replacement, panelboard replacements, conduit and wiring replacement, LED lighting upgrades, flocculator and sedimentation equipment electrical feed replacement, treatment equipment reconnection, and VFD wiring and connection. All bidders shall carry the full allowance amount in their bids as specified in the Contract Documents. 9. A qualified Allen-Bradley/Rockwell Automation Controls Subcontractor shall investigate and evaluate the existing SCADA system and furnish and install replacement hardware as directed by the ENGINEER. 10. All SCADA programming, software configuration, I/O mapping, and integration of the PLC with facility process equipment shall be performed by the OWNER's designated plant operator. <u>Well No. 3 Rehabilitation</u> 1. Work for Well No. 3 consists of the rehabilitation of pressure filter tank interiors, media replacement, air release valves, manway appurtenances, and wellhouse piping. 2. The interiors of the three pressure filter tanks shall be sandblasted, inspected, repaired as necessary, recoated, and disinfected prior to return to service. 3. Existing filter media shall be removed and replaced in all three pressure filter tanks, including underdrain inspection and repairs as necessary. 4. Existing air release valves and associated piping shall be removed and replaced for all three pressure filter tanks. 5. Existing filter tank manway assemblies shall be inspected and repaired or replaced as necessary to provide watertight and safely operable access openings. 6. All wellhouse piping, fittings, and associated appurtenances shall be sandblasted, cleaned, and painted, with work coordinated to minimize disruption to facility operations.
4	Project plans and specifications are available at www.kelleynetworkplans.com for reproduction costs, non-refundable.
5	Bids will be received until Tuesday, June 30, 2026, at 1:00 p.m. CST, at Dallas County Water & Sewer Authority's office, located at 2504 Old Montgomery Road, Selma, AL 36703.
6	<i>ALL</i> addenda shall be included in bid documents. At the time of the Pre-Bid, no addendums have been issued.
7	<i>ALL</i> questions shall be submitted in writing to Bart Taft, P.E., at bart@kelleynetwork.com and Jessica Mandrell, Project Manager, at jessica@kelleynetwork.com .

Contract Items

1	A Bid Bond no less than 5% of the bid amount, but in no event to exceed \$10,000, is required to be submitted with your bid.
2	Time for Completion & Liquidated Damages • One Hundred Twenty (120) calendar days for Substantial Completion. • One Hundred Fifty (150) calendar days for Final Completion. • Liquidated Damages - \$500.00/day

END OF PRE-BID CONFERENCE MINUTES

**ATTENDANCE ROSTER
VIRTUAL PRE-BID CONFERENCE
DALLAS COUNTY WATER & SEWER AUTHORITY
REHABILITATION OF WELL NO. 1 AND WELL NO. 3
TUESDAY, JUNE 16, 2026 AT 1:00 P.M.
DWSRF ARPA PROJECT NO. FS010316-01 / KG PROJECT NO. 22-0020**

NAME	REPRESENTING	PHONE NO.	EMAIL ADDRESS
Chase Williams, P.E.	The Kelley Group	205-234-0596	chase@kelleynetwork.com
Bart Taft, P.E.	The Kelley Group	256-443-4106	bart@kelleynetwork.com
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Jessica Mandrell	The Kelley Group	256-443-5188	jessica@kelleynetwork.com
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Jake Singleton	Hawkins Inc.	334-796-9505	jake.singleton@hawkinsinc.com
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Joelle Smith	The Kelley Group	256-248-7030	joelle@kelleynetwork.com
Tyler Carter	Hach	228-366-4671	tyler.carter@hach.com
Courtney Cunningham	Dallas County WSA	334-872-2820	ccunningham@dallascowateral.gov

SECTION 01 11 13 SUMMARY OF WORK

PART 1 – GENERAL

1.01 CONTRACT DESCRIPTION

- A. Contract Type: Unit Price as described in Agreement – EJCDC
- B. The contract award, if made, will be made to the low-responsive bidder. A “responsive” bid shall be evidenced by: (1) A Bid form complete in accordance with the Instructions to Bidders and with instruction and/or requests contained in any other sections of the Contract Documents; (2) A Bid Form not evidencing any apparent unbalanced pricing for performance of the Items of Work; (3) a Bid Form without excisions, special conditions or qualifications made by the Bidder; and (4) a Bid Form containing no alternative bids or offerings for any items unless such alternative bids or offerings are requested in the Technical Specifications or Contract Documents.
- C. The successful bidder must furnish a Performance Bond for one hundred (100%) percent of the bid amount and a Labor and Material Payment bond for one hundred (100%) percent of the bid amount and must secure his bond from a bonding company’s representative or agent in the State of Alabama.
- D. The attention of bidders is called to provisions of State Law Governing General Conditions, as set forth in Chapter 4 (Section 65 to 82, inclusive) of Title 46 of the Code of Alabama of 1940, as amended; and bidders shall be governed by law insofar as it is applicable. The above-mentioned provisions of the Code make it illegal for the OWNER to consider a Bid from anyone who is not properly licensed under such code provisions. The OWNER, therefore, will not consider any bid unless the bidder produces evidence that he is so licensed. **The bidder must submit evidence of the bidder’s Alabama Licensing Board for General Contractor’s license with a major classification of MU (Municipal & Utility), or another AGC Licensing Board approved classification. If the bidder has a single or multiple specialty licenses, as long as those specialties are 51% or more of the total cost of the project, the GC can bid this project.**
- E. Neither will the OWNER enter into a Contract with a foreign corporation which is not qualified under State Law to do business in the State of Alabama. **The CONTRACTOR must include his General Contractor’s license number and classification on the outside of the sealed bid envelope.**
- F. Unit Price
 - 1. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.
 - 2. The total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid for the item. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the

General Conditions.

3. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.
4. Bidders acknowledge that the OWNER may award all, some, or none of the bid items listed in the Bid Form. OWNER will choose which bid items, if any, to award at their sole discretion, or at the recommendation of the ENGINEER. Successful bidder shall reserve the right to accept award of contract at their sole discretion.

1.02 PROJECT DESCRIPTION

- A. The OWNER obtained funding through the Alabama Department of Environmental Management (ADEM) Drinking Water State Revolving Fund (DWSRF) and American Rescue Plan Act (ARPA) programs to make improvements to the water distribution infrastructure including the rehabilitation improvements at two existing potable water well facilities owned and operated by Dallas County Water and Sewer Authority (OWNER). The scope is divided into two sections:
 1. Section 1 – Well No. 1 Rehabilitation: Comprehensive rehabilitation of mechanical, process, electrical, and structural systems including high service pumps, aeration, chemical feed, flocculation, sedimentation, pressure filtration, clearwells, electrical systems, and site improvements.
 2. Section 2 – Well No. 3 Rehabilitation: Rehabilitation of pressure filter tank interiors, media replacement, air release valves, manway appurtenances, wellhouse piping.
- B. Bidder is advised to visit the Well site to become familiar with the size, configuration and working conditions prior to submitting a bid. CONTRACTOR can make arrangements to inspect the site by contacting Jessica Mandrell, Project Manager, at The Kelley Group, (256) 248-7030, or jessica@kelleynetwork.com.

1.03 WORK UNDER THIS CONTRACT

- A. Work to be performed, including work listed and unlisted in the contract documents, shall be in accordance with specifications and plans prepared by The Kelley Group, LLC.
- B. The CONTRACTOR will notify the ENGINEER by 8 a.m. Friday of the next week's operations and promptly notify the ENGINEER of any work stoppages due to weather or other conditions preventing work, partial or complete days. The CONTRACTOR will provide the OWNER and ENGINEER with the facilities where work will occur each week and the estimated time that the facilities will be out of service, should that be required.
- C. The OWNER seeks to rehabilitate Well No. 1 and Well No. 3 potable water facilities, including removal and replacement of high service pumps, aeration, chemical feed, flocculation and sedimentation equipment, pressure filter tank media and interior coatings,

valve actuators, electrical systems, and site improvements at Well No. 1, and removal and replacement of filter tank media, interior coatings, and appurtenances at Well No. 3.

- D. **The OWNER has obtained a waiver for the Build America, Buy America (BABA) Act; however, the CONTRACTOR must adhere to all American Iron and Steel (AIS) Provisions. The CONTRACTOR shall obtain AIS certification letters from manufacturers and provide to the ENGINEER during the submittal process for all applicable Iron & Steel materials to be used in the project.**

1.04 SUMMARY OF BID ITEMS

- A. Bid items are organized below to correspond directly with the Bid Form (SECTION 00 41 43). Where a single Bid Form item encompasses multiple scopes of work, each scope is described individually under a sub-item reference number (e.g., 1-3.1, 1-3.2) to assist the CONTRACTOR in understanding the full extent of work required. Sub-item numbers are provided for reference and scope clarity only; all costs associated with sub-items shall be included in the unit price submitted for the parent Bid Form item.

B. **Section 1 – Well No. 1 Rehabilitation Scope**

1. **Bid Item 1-1: ADEM DWSRF ARPA Project Sign**

- a. CONTRACTOR shall furnish and install the ADEM DWSRF ARPA project sign in accordance with the Contract Documents and applicable funding program requirements. Project sign submittal shall be approved prior to installation, and the project sign shall be installed prior to commencement of construction activities.
- b. One (1) DWSRF ARPA project sign shall be required for the entire project at a location designated by the OWNER during the pre-construction meeting. The project sign shall be placed in a prominent location, clearly visible and readable from an existing street or roadway, and shall remain in place for the duration of the project.
- c. The project sign shall comply with all ADEM DWSRF ARPA requirements, including applicable ARPA branding and acknowledgement language. Details for the DWSRF ARPA sign are included in SECTION 00 73 01 – ADEM Supplemental General Conditions.

2. **Bid Item 1-2: Mobilization & Demobilization**

- a. The mobilization and demobilization bid item shall be inclusive of all costs associated with the transport of specialized well-drilling rigs, service units, chemical injection systems, and support equipment to and from both well sites.
- b. Mobilization shall cover CONTRACTOR's cost for transportation of equipment, labor, materials, and other necessary items to the project site as well as setup of jobsite facilities, temporary facilities, bonds, insurance, etc.

- c. Bid Item #2 shall cover all of CONTRACTOR's costs for any required local permitting.
 - d. Demobilization shall cover CONTRACTOR's costs for removal of equipment, labor, leftover materials, etc. Demobilization shall also cover any costs associated with providing record drawings.
3. **Bid Item 1-3: Well #1 - External Treatment Equipment Rehabilitation And Remediation**
- a. This bid item covers the complete, in-place rehabilitation and remediation of the existing induced draft aerator, flocculation basin, and sedimentation basin treatment systems, including all labor, materials, mechanical components, structural anchoring, surface preparation, protective coatings, decommissioning, and manufacturer-certified testing and commissioning to provide fully functioning treatment systems as specified and shown on the Contract Drawings.
 - b. **1-3.1 Well #1 – Induced Draft Aerator**
 - 1) CONTRACTOR shall remediate and clean the existing induced draft aerator unit, including interior media, packing, baffles, and all interior surfaces, and shall furnish and install a new blower unit complete with motor, drive, vibration isolation, and all associated electrical connections and appurtenances required for a fully functional induced draft aerator system.
 - 2) CONTRACTOR shall coordinate with the OWNER to establish temporary aeration provisions during construction to maintain treatment capacity. Any proposed service interruption shall be submitted in writing and approved by the OWNER and ENGINEER prior to shutdown.
 - c. **1-3.2 Well #1 – Flocculation Basin Bearings, Drives, and Appurtenances**
 - 1) CONTRACTOR shall remove the existing flocculation basin bearing assemblies, drive units, and associated appurtenances, and shall furnish and install new replacement bearings, drive units, and all hardware required for a fully operational flocculation basin.
 - 2) New equipment shall be sized and selected to match the existing basin geometry and design mixing requirements. CONTRACTOR shall submit manufacturer's performance data with shop drawings for ENGINEER review and approval prior to procurement. All wetted components shall be of materials compatible with the process water chemistry.
 - d. **1-3.3 Well #1 – Sedimentation Basin Vacuum Track System**
 - 1) CONTRACTOR shall remove the existing sedimentation basin vacuum track sludge collection system in its entirety, including the drive unit, tubing, chains, appurtenances, and all associated components necessary to rehabilitate the

existing sedimentation system.

- 2) The new system shall be designed and sized to suit the existing basin dimensions and hydraulic loading. CONTRACTOR shall field-verify basin dimensions prior to equipment fabrication and shall submit manufacturer's shop drawings, installation procedures, and operational data for ENGINEER review and approval prior to procurement.

4. Bid Item 1-4: Well #1 - Chemical Feed & Chlorine Room Equipment Integration

- a. This bid item covers the complete integration of the chemical feed architecture and chlorine room safety systems, including all labor, materials, chemical piping, electrical hookups, decommissioning, structural anchoring, containment modifications, and manufacturer-certified testing and commissioning, as detailed in SECTION 46 33 00 of the Specifications and the Contract Drawings.

b. 1-4.1 Well #1 – Chemical Feed Equipment

- 1) CONTRACTOR shall remediate the existing chemical feed equipment, including cleaning, inspection, and repair of components designated to remain, and shall furnish and install a new chemical feed system including metering pumps, day tanks, secondary containment, piping, tubing, injection points, and controls.
- 2) All chemical contact materials shall be compatible with the chemicals to be fed. CONTRACTOR shall submit chemical compatibility documentation with shop drawings for ENGINEER review and approval prior to procurement.
- 3) The new chemical feed system shall be integrated into the facility control system as directed by the ENGINEER. The system shall include appropriate safety features including secondary containment, chemical-resistant coatings, and emergency shutoffs.
- 4) CONTRACTOR shall coordinate all work to minimize disruption to well operations. If temporary shutdown is required, CONTRACTOR shall coordinate with OWNER and ENGINEER to schedule work appropriately.
- 5) CONTRACTOR shall provide startup services, calibration, and testing to ensure proper operation of the new chemical feed system prior to notifying ENGINEER of completion. ENGINEER shall observe equipment operation and verify function prior to payment for this bid item.

c. 1-4.2 Well #1 – Chlorine Room Equipment

- 1) CONTRACTOR shall furnish and install new Self-Contained Breathing Apparatus (SCBA) equipment appropriate for chlorine gas emergency use, and shall furnish and install a chlorine gas detection and alarm system including sensors, audible alarms, and visual warning devices inside and outside the

chlorine room.

- 2) The alarm system shall be integrated into the facility emergency notification system as directed by the ENGINEER. All equipment shall meet OSHA 29 CFR 1910.119 and applicable NFPA requirements for hazardous chemical handling.

5. Bid Item 1-5: Well #1 – High Service Pumps, Well Pump VFD, Controls, And Wellhouse Mechanical Infrastructure Overhaul

- a. This bid item covers the complete, in-place modernization of the internal mechanical and electrical infrastructure of the Well No. 1 wellhouse, including removal and replacement of high service pumps, variable frequency drive, valve actuators, valves, filter tank interiors and media, clearwells, and all associated wellhouse internal piping cleaning and painting, as specified and shown on the Contract Drawings.

b. 1-5.1 Well #1 – High Service Pumps

- 1) CONTRACTOR shall remove the existing 15 HP and 30 HP high service pumps, including soft motors, base plates, mechanical seals, and all associated hardware, and shall furnish and install new 15 HP and 30 HP high service pumps complete with motors, base plates, mechanical seals, coupling guards, and reduced voltage solid-state (RVSS) starters.
- 2) New pumps shall be sized and selected to match or exceed the existing system hydraulic requirements. CONTRACTOR shall submit pump curves, NPSH data, and motor data sheets with shop drawings for ENGINEER review and approval prior to procurement.
- 3) All suction and discharge piping connections, isolation valves, and fittings disturbed during pump replacement shall be repaired or replaced as required to provide leak-free connections. CONTRACTOR shall perform pump alignment, vibration testing, and operational verification upon installation and shall submit a commissioning report to the ENGINEER.

c. 1-5.2 Well #1 – Variable Frequency Drive (VFD) on Well Pump

- 1) CONTRACTOR shall furnish and install a new Variable Frequency Drive (VFD) for the well pump, sized appropriately for the pump motor horsepower, in a NEMA-rated enclosure suitable for the installation environment. Work shall include all associated conduit, wiring, disconnect means, and terminations in accordance with NFPA 70 (NEC).
- 2) CONTRACTOR shall perform full programming and commissioning of the VFD, including integration with the facility SCADA/PLC control system as directed by the ENGINEER. As-built wiring diagrams and VFD programming parameters shall be provided to the OWNER upon project completion.

d. **1-5.3 Well #1 – Valve Actuators**

- 1) CONTRACTOR shall remove the existing actuators on the designated 6-inch and 8-inch gate valves and shall furnish and install new electric or pneumatic actuators as shown on the Drawings. Actuators shall be sized for the valve torque requirements and suitable for the service conditions.
- 2) CONTRACTOR shall integrate actuator controls into the existing facility control system as directed by the ENGINEER, including position feedback and remote open/close capability. CONTRACTOR shall coordinate controls integration with the facility control system integrator as directed.

e. **1-5.4 Well #1 – Butterfly Valves**

- 1) CONTRACTOR shall remove two (2) existing butterfly valves at locations indicated on the Drawings and shall furnish and install two (2) new replacement butterfly valves, including flanges, gaskets, bolts, and all associated hardware. Valves shall be of the size, pressure class, and material specified on the Drawings and in the Contract Documents. All flanged connections shall be made in accordance with applicable ANSI/AWWA standards.

f. **1-5.5 Well #1 – Check Valves**

- 1) CONTRACTOR shall remove two (2) existing check valves at locations indicated on the Drawings and shall furnish and install two (2) new replacement check valves, including flanges, gaskets, bolts, and all associated hardware. Valves shall be of the size, pressure class, type, and material specified on the Drawings and in the Contract Documents. Flow direction and valve orientation shall be verified prior to installation.

g. **1-5.6 Well #1 – Filter Tank Interior – Sandblast, Repair, and Recoat (3 Tanks)**

- 1) CONTRACTOR shall drain, isolate, and prepare each of the three (3) filter tanks for interior work in accordance with OSHA confined space entry requirements. Interior surfaces shall be sandblasted to SSPC-SP 6 Commercial Blast or better as required by the coating manufacturer.
- 2) CONTRACTOR shall inspect all interior surfaces, welds, seams, and appurtenance attachment points and shall repair any pitting, corrosion damage, or structural deficiencies identified prior to coating application. A new NSF 61-certified protective coating system suitable for potable water contact shall be applied per the manufacturer's recommendations. CONTRACTOR shall submit coating product data and surface preparation requirements with shop drawings for ENGINEER review and approval prior to commencing work.
- 3) Upon completion of coating work, each tank shall be disinfected in accordance

with AWWA C652 prior to return to service.

h. 1-5.7 Well #1 – Filter Tank Media (3 Tanks)

- 1) CONTRACTOR shall isolate and drain each of the three (3) filter tanks, remove all existing filter media, and legally dispose of all removed material. CONTRACTOR shall inspect the underdrain system upon media removal and shall repair or replace any damaged underdrain components prior to installation of new media.
- 2) CONTRACTOR shall furnish and install new filter media of the type, gradation, and depth specified in the Contract Documents. Media shall conform to AWWA B100 or other applicable standards as specified. CONTRACTOR shall submit gradation analysis and material certifications with shop drawings for ENGINEER review and approval prior to delivery. Media shall be backwashed and conditioned in accordance with the manufacturer's requirements prior to returning tanks to service.

i. 1-5.8 Well #1 – Filter Tank Air Release Valves (3 Tanks)

- 1) CONTRACTOR shall remove the existing air release valves (ARVs) and associated piping from each of the three (3) filter tanks and shall furnish and install new ARVs and all associated piping, fittings, isolation valves, and appurtenances. ARVs shall be of the size and type appropriate for the operating pressure and service conditions. All materials shall be NSF 61-certified for potable water service.

j. 1-5.9 Well #1 – Filter Tank Manways (3 Tanks)

- 1) CONTRACTOR shall inspect all three (3) existing 36-inch diameter filter tank manway assemblies, including covers, frames, gaskets, davit arms, and hardware. CONTRACTOR shall repair or replace manway components as necessary to provide a fully watertight and safely operable access opening. All replacement components shall be compatible with the existing tank construction and rated for the applicable operating pressure. Gasket materials shall be suitable for potable water service, and NSF 61-certified materials shall be used where applicable.

k. 1-5.10 Well #1 – Clearwells – Cleaning, Repairs, and Disinfection

- 1) CONTRACTOR shall drain and isolate the clearwell in accordance with OSHA confined space entry requirements. CONTRACTOR shall remove accumulated sediment, biological growth, and debris and pressure-wash all interior surfaces.
- 2) CONTRACTOR shall inspect all interior surfaces, inlet and outlet connections, overflow piping, and access hatches and shall perform repairs to cracked, spalled, or deteriorated surfaces as directed by the ENGINEER. Upon completion of cleaning and repairs, the clearwell shall be disinfected in

accordance with AWWA C652 prior to return to service. Disinfection records and water quality test results shall be submitted to the OWNER and ENGINEER.

1. 1-5.11 Well #1 – Wellhouse Internal Piping – Cleaning and Painting

- 1) CONTRACTOR shall sandblast, clean, and paint all internal piping and fittings within the Well No. 1 wellhouse as shown on the Drawings and specified in the Contract Documents. Surface preparation and coating system shall be compatible with the operating environment and shall be submitted with shop drawings for ENGINEER review and approval prior to commencing work.

6. Bid Item 1-6: Well #1 - Wellhouse Structural, Architectural, And Site Security Rehabilitation

- a. This bid item covers the complete, in-place rehabilitation of the building envelope, structural integrity, and site perimeter security for the Well No. 1 facility, as specified and shown on the Contract Drawings.

b. 1-6.1 Well #1 – Wellhouse Interior Wall and Structural Concrete/Masonry

- 1) CONTRACTOR shall sandblast, clean, repair, and paint wellhouse interior walls. CONTRACTOR shall perform complete building structural concrete and masonry cleaning, repairs, and disinfection, including inspection, crack repair, and surface restoration of all interior concrete and masonry surfaces.
- 2) Crack repair at masonry wall elements shall be performed using a stainless steel helical bar stitching system or equivalent approved method as specified in SECTION 04 01 20. All chemical contact areas and surfaces in chlorinated environments shall receive a chemical-resistant coating system approved by the ENGINEER.

c. 1-6.2 Well #1 – Roof Structural Investigation, Repair, and Replacement

- 1) CONTRACTOR shall perform a structural investigation of the existing roof system, including removal and replacement of deficient roofing components as identified during investigation. Scope includes removal and replacement of roof joints, supports, decking, and shingles as required to provide a fully watertight, structurally sound roof system. CONTRACTOR shall submit findings of roof investigation to the ENGINEER prior to procurement of replacement materials.

d. 1-6.3 Well #1 – Doors, Windows, Louvers, Heaters, and Blowers

- 1) CONTRACTOR shall remove and replace existing doors, windows, louvers, unit heaters, exhaust blowers, and other facility envelope and ventilation components throughout the Well No. 1 wellhouse. Replacement units shall be of commercial grade, suitable for the exposure conditions, and compatible with

the existing wall and frame construction.

- 2) Louvers and ventilation components shall be sized to meet minimum ventilation requirements for the spaces served. All openings shall be weathertight upon completion, with flashing, sealants, and anchorage provided as required.
- 3) CONTRACTOR shall take special care to ensure all components associated with the chlorine room are of appropriate design and material to ensure operator safety and full adherence to all applicable guidelines, recommendations, and codes.

e. **1-6.4 Well #1 – Entry Gate and Chain-Link Fencing**

- 1) CONTRACTOR shall remove and dispose of the existing site entry gate and all sections of damaged chain-link fencing and shall furnish and install a new site entry gate and chain-link fencing matching the existing height to re-establish site security. The entry gate shall be lockable and of sufficient width matching existing conditions to allow equipment access. All posts shall be set in concrete footings to the depth required for the soil conditions and fence height.

7. **Bid Item 1-7: Well #1 – Electrical Improvements Allowance**

- a. This item establishes a One Hundred Fifty Thousand Dollar (\$150,000.00) allowance to be used solely at the discretion and written direction of the ENGINEER and OWNER for necessary electrical improvements.
- b. Under this allowance, the CONTRACTOR shall perform testing, inspection, repair, and replacement of existing electrical systems throughout the Water Treatment Plant #1 (Well No. 1) facility to restore proper working order and ensure compliance with Code and EPA requirements. Specific anticipated work to be authorized and funded under this allowance includes, but is not limited to:
 - 1) **Main Electrical Room:** Demolition and replacement of the existing Motor Control Center (MCC) which has exceeded its expected service life. The CONTRACTOR shall coordinate with the OWNER, ENGINEER, and SCADA provider to evaluate the existing SCADA panel and determine any changes required to interface with proposed new process equipment.
 - 2) **Pump Room:** Demolition and replacement of Panelboards B and C and their associated indoor-rated service trough. The CONTRACTOR shall replace severely deteriorated metallic conduit with PVC-coated rigid metal conduit, ensuring new conductors match the ampacity and color coding of the existing ones. Existing lighting fixtures shall be replaced with LED units designed for corrosive environments.
 - 3) **Equipment Service Building:** Replacement of all outdated interior

fluorescent lighting and all exterior lighting with new industrial-grade LED fixtures.

- 4) **Chlorine Rooms:** Replacement of all surface-mounted fluorescent lighting in the Chlorine Storage Room and Chlorine Room with corrosion-resistant LED lighting.
 - 5) **Flocculator Assembly:** Replacement of the underground electrical feed from the MCC to the handrail-mounted disconnect switch and the adjacent on/off control station. The CONTRACTOR shall reconnect conductors and perform functional testing of the existing Flocculator drive unit. If the drive unit malfunctions during testing, replacement will be authorized under this allowance.
- c. All electrical work shall comply with NFPA 70 (NEC) and applicable local electrical codes. The CONTRACTOR (or the Subcontractor performing the work) shall be a licensed Electrical Contractor in the State of Alabama. As-built electrical drawings detailing all replacements, new conduit routing, and panel schedules shall be submitted to the OWNER and ENGINEER upon project completion.
- d. **Measurement and Payment** - Execution and payment under this allowance shall be governed by the following conditions:
- 1) **Prior Authorization:** The CONTRACTOR shall submit a detailed scope of work, cost proposal, and associated Subcontractor/Supplier quotes for any work to be paid from this allowance prior to the execution of said work. No allowance work shall commence without written authorization from the ENGINEER.
 - 2) **Actual Costs:** Payment will be based strictly on the actual, documented cost of materials, equipment, and labor required to perform the authorized work.
 - 3) **Overhead and Profit:** CONTRACTOR'S overhead, profit, bonding, and insurance costs related to this allowance are not to be billed against this allowance. These costs shall be included in the CONTRACTOR'S base bid under mobilization or other general conditions.
 - 4) **Reconciliation:** Upon completion of the project, any unexpended funds remaining in this \$150,000.00 allowance shall be deducted from the Contract Price via a deductive Change Order, and credited back to the OWNER.

8. **Bid Item 1-8: Well #1 – SCADA System Investigation And Equipment Rehabilitation**

- a. This bid item covers the investigation, evaluation, and rehabilitation or replacement of existing SCADA hardware and field instrumentation at the Well No. 1 facility, as necessary to provide a fully operational SCADA system capable of monitoring and controlling all rehabilitated process equipment. SCADA system programming,

software configuration, and integration with facility process equipment shall be performed separately by the OWNER's designated plant operator and is not included in this bid item.

b. 1-8.1 SCADA System Investigation and Evaluation

- 1) CONTRACTOR shall engage a qualified Controls Subcontractor to perform a complete field investigation of the existing Well No. 1 SCADA system, including the PLC processor, associated I/O modules, field wiring, instrumentation, network communications hardware, and all related control panel components. The Controls Subcontractor shall be an authorized Allen-Bradley/Rockwell Automation system integrator with a minimum of five (5) years of documented experience performing SCADA system investigation, rehabilitation, and hardware installation on municipal potable water facilities of similar size and complexity. Documentation of integrator qualifications shall be submitted to the ENGINEER for review and approval prior to commencement of investigation work.
- 2) The investigation shall assess the condition, functionality, and compatibility of all existing SCADA hardware with the rehabilitated process equipment to be installed under this Contract. The Controls Subcontractor shall provide the ENGINEER and OWNER with a written evaluation report documenting:
 - a) Condition and serviceability of the existing PLC processor and all associated I/O modules.
 - b) Condition and continuity of existing field instrument wiring and terminations.
 - c) Compatibility of existing hardware with the new high service pumps, VFD, valve actuators, chemical feed systems, and level controls being installed under this Contract.
 - d) Itemized list of components recommended for rehabilitation, replacement, or re-use, with cost estimates for each recommended action.
- 3) The evaluation report shall be submitted to the ENGINEER for review and written approval prior to procurement of any replacement equipment.

c. 1-8.2 SCADA Hardware Rehabilitation or Replacement

- 1) Based on the findings of the investigation described in Article 1-8.1 and upon written direction from the ENGINEER, CONTRACTOR shall furnish and install replacement SCADA hardware components as necessary to provide a fully operational system. The scope of hardware work shall be limited to deficiencies identified in the ENGINEER-approved evaluation report.

- 2) If the existing SCADA system is determined to be in serviceable condition and compatible with the rehabilitated facility equipment, CONTRACTOR shall perform only the repairs, re-terminations, and component replacements necessary to restore full functionality.
- 3) If the existing PLC processor or control hardware is determined to be non-serviceable or incompatible with the rehabilitated facility equipment, CONTRACTOR shall furnish and install a complete replacement PLC system. The basis of design for the replacement PLC system shall be the Allen-Bradley / Rockwell Automation Micro870 controller platform, including all required I/O modules, communications hardware, power supply, and control panel mounting hardware necessary for a complete installation. Proposed equals shall be submitted to the ENGINEER for review and approval prior to procurement and shall include documentation demonstrating equivalent I/O capacity, supported communications protocols (including compatibility with the OWNER's existing SCADA HMI software), and equivalent environmental ratings for the installation enclosure. Substitution requests that cannot demonstrate compatibility with the OWNER's existing HMI software will not be approved.
- 4) All SCADA programming, software configuration, I/O mapping, and integration of the PLC with facility process equipment shall be performed by the OWNER's designated plant operator and is explicitly excluded from the CONTRACTOR's scope under this bid item. CONTRACTOR shall coordinate hardware installation activities and schedule with the OWNER's plant operator to ensure installed hardware is ready for programming upon completion. CONTRACTOR shall not energize or functionally test the PLC system without the OWNER's plant operator present.
- 5) As-built panel wiring diagrams and a complete as-installed hardware schedule (processor model, I/O module types and quantities, communications hardware, and field instrument list) shall be submitted to the OWNER and ENGINEER as a condition of Substantial Completion.

C. Section 2 – Well No. 3 Rehabilitation Scope

1. **Bid Item 2-1: Well #3 – Filter Tank Interior – Sandblast, Repair, And Recoat (Per Tank, 3 Tanks)**
 - a. CONTRACTOR shall drain, isolate, and prepare each of the three (3) filter tanks for interior work in accordance with OSHA confined space entry requirements. Interior surfaces shall be sandblasted to SSPC-SP 6 Commercial Blast or better as required by the coating manufacturer.
 - b. CONTRACTOR shall inspect all interior surfaces, welds, seams, and appurtenance attachment points and shall repair any pitting, corrosion damage, or structural deficiencies prior to coating application. A new NSF 61-certified protective coating system suitable for potable water contact shall be applied per the manufacturer's

recommendations. CONTRACTOR shall submit coating product data and surface preparation requirements with shop drawings for ENGINEER review and approval prior to commencing work.

- c. Upon completion of coating work, each tank shall be disinfected in accordance with AWWA C652 prior to return to service.

2. Bid Item 2-2: Well #3 – Filter Tank Media – Removal And Replacement (Per Tank, 3 Tanks)

- a. CONTRACTOR shall isolate and drain each of the three (3) filter tanks, remove all existing filter media, and legally dispose of all removed material. CONTRACTOR shall inspect the underdrain system upon media removal and shall repair or replace any damaged underdrain components prior to installation of new media.
- b. CONTRACTOR shall furnish and install new filter media of the type, gradation, and depth specified in the Contract Documents. Media shall conform to AWWA B100 or other applicable standards as specified. CONTRACTOR shall submit gradation analysis and material certifications with shop drawings for ENGINEER review and approval prior to delivery. Media shall be backwashed and conditioned per the manufacturer's requirements prior to returning tanks to service.

3. Bid Item 2-3: Well #3 – Filter Tank Air Release Valves (Arvs) – Removal And Replacement (Per Tank, 3 Tanks)

- a. CONTRACTOR shall remove the existing ARVs and associated piping from each of the three (3) filter tanks and shall furnish and install new ARVs and all associated piping, fittings, isolation valves, and appurtenances. ARVs shall be of the size and type appropriate for the operating pressure and service conditions. All materials shall be NSF 61-certified for potable water service.

4. Bid Item 2-4: Well #3 – Filter Tank Manways – Inspection, Repair, And/Or Replacement (Per Tank, 3 Tanks)

- a. CONTRACTOR shall inspect all three (3) existing 36-inch diameter filter tank manway assemblies and shall repair or replace manway components as necessary to eliminate leaking and provide a fully watertight and safely operable access opening. All replacement components shall be compatible with the existing tank construction and rated for the applicable operating pressure. NSF 61-certified materials shall be used where required.

5. Bid Item 2-5: Well #3 – Well-House Pipe Cleaning And Painting

- a. CONTRACTOR shall sandblast, clean, and paint all piping, fittings, and associated appurtenances within the Well No. 3 wellhouse as shown on the Drawings and specified in the Contract Documents. Surface preparation shall be in accordance with the coating manufacturer's requirements. The coating system shall be suitable

for the service environment and submitted with shop drawings for ENGINEER review and approval prior to commencing work.

- b. CONTRACTOR shall coordinate pipe cleaning and painting activities with filter tank work to minimize disruption to facility operations. Any required service interruptions shall be submitted in writing and approved by the OWNER and ENGINEER prior to shutdown.

1.05 PROJECT OBJECTIVES

- A. Rehabilitate Well No. 1 potable water facility, including removal and replacement of high service pumps, induced draft aerator, chemical feed system, chlorine room safety equipment, flocculation and sedimentation equipment, pressure filter tank media and interior coatings, valve actuators, clearwells, and electrical systems.
- B. Furnish and install site improvements at Well No. 1, including replacement of doors, windows, louvers, heaters, blowers, entry gate, and chain-link fencing.
- C. Rehabilitate Well No. 3 potable water facility, including removal and replacement of pressure filter tank media, interior coatings, air release valves, and manway appurtenances.

1.06 SERVICES AND PRODUCTS

A. OWNER's Responsibilities

- 1. Review shop drawings and submittal data following approval by CONTRACTOR within ten (10) days following receipt.
- 2. Arrange for and deliver OWNER reviewed Shop Drawings, Product Data, and Samples to CONTRACTOR.
- 3. Make payments on properly submitted and approved payment requests within 30 days of ENGINEER's review of the submitted invoice.

B. CONTRACTOR's Responsibilities

- 1. Provide detailed instructions for the construction process/timetable. Supply the OWNER and ENGINEER by 8:00 a.m. each Friday with the planned location of work for the following week. Work will not be performed on weekends, only Monday through Friday unless previously authorized by the OWNER.
- 2. Schedule for delivery with Suppliers; Receive and unload products at site; inspect for completeness or damage.
- 3. Handle, store, and install finished products in accordance with manufacturer instructions. Provide ENGINEER with written planned execution of the work including plan for the handling, storage, and installation of the supplied products.

4. Provide ENGINEER with CONTRACTOR's invoice by the Friday nearest the 25th of each month. Invoices may be submitted after the 25th of each month, however, only one invoice per month will be processed by the OWNER.
5. Attend progress meetings that will be held monthly as close to the 25th of the month as possible, or as needed, to review installations prior to submitting invoice. Approximately one week prior to invoice submittal, contact the ENGINEER's representative for review of quantities. Invoices will not be processed by the ENGINEER until quantities have been reviewed.
6. Davis Bacon wage rates are a requirement on this project. Require ALL employees associated with the project to be available for salary surveys performed on site. Interviews will be conducted approximately 10 working days after CONTRACTOR notifies OWNER and ENGINEER of the date crews will begin to work. If additional employees are brought to the site after the salary surveys have been performed, the CONTRACTOR is responsible for making arrangements to have late-arriving employees interviewed by the ENGINEER at the OWNER's office. Interviews will occur again approximately two (2) weeks prior to substantial completion of work. Substantial Completion payment will not be made to the CONTRACTOR until all interviews are performed.

1.07 STORED MATERIALS

- A. The quantities contained in the Proposal are approximate, and actual installed work may differ from the quantities shown. The CONTRACTOR shall be responsible for inventory control and shall take special care not to order any excess materials.
- B. The OWNER will not be responsible for any stored or leftover materials ordered by the CONTRACTOR. CONTRACTOR shall submit a final invoice for materials that is identical to the quantities installed.
- C. Stored materials may be listed on invoices once confirmed by the ENGINEER's representative. The CONTRACTOR will maintain insurance on any materials listed as stored materials.

1.08 CONTRACTOR'S USE OF SITE

- A. Cooperate with property owners and adjacent property owners to minimize conflict.
- B. Assist OWNER with any site security issues because of construction.

1.09 WORK SEQUENCE

- A. Coordinate construction schedule and operations with the OWNER and ENGINEER.
- B. Provide weekly schedule updates, including changes as they occur.

1.10 LICENSES AND PERMITS

- A. The CONTRACTOR shall be responsible for securing from the Local Municipalities all permits, licenses and for paying all taxes required to perform the Contract Work, if required.
- B. This project is being bid excluding taxes, and requires the CONTRACTOR comply with the requirements of Act 2013-205, which was signed into law on May 9, 2013. The CONTRACTOR and the OWNER will be required to apply for Certificates of Exemption with the Alabama Department of Revenue which will handle administration of the Certificates. The CONTRACTOR shall account for the tax savings on the Proposal Form.
- C. The CONTRACTOR shall be responsible for compliance with all Federal, State and local laws and ordinances regarding licenses and permits.

1.11 PROTECTION OF THE OWNER, WORKMEN, AND THE PUBLIC

- A. The CONTRACTOR is responsible for the safe execution of the work.
- B. The ENGINEER and the OWNER shall not be required to act as Safety Engineers or Safety Supervisors.
- C. It is the CONTRACTOR's responsibility to secure advice from the Safety officer from his insurance company.

1.12 LOCATION OF UNDERGROUND OBSTRUCTIONS.

- A. The CONTRACTOR shall be responsible for carefully protecting utilities and storm drains during the execution of the work.
- B. Utilities that are damaged due to activities of the CONTRACTOR shall be repaired at no expense to the property OWNER.

1.13 REGULATORY REQUIREMENTS

- A. Secure from the office of the Inspection Services, Division of the Public Works Department of the Local Municipalities, Information for regulatory licenses, and permits required.
- B. Obtain permits and licenses from each Municipality, if required.
- C. Requirements contained in each individual authority's permit shall become the provisions and requirement for completion of the work.

1.14 ROCK EXCAVATION AND DISPOSAL

- A. The cost for rock excavation or removal and disposal shall be included in the overall project cost. No extra payment will be made for rock excavation, removal, or disposal.
- B. "Rock" includes all materials which, in the opinion of the ENGINEER, require blasting,

barring, wedging and/or special impact tools such as jack hammers, sledges, chisels, or similar devices specifically designed for use in cutting or breaking rock for removal from their original beds and which have compressive strengths in their natural undisturbed state in excess of 300 psi. Boulders or masonry larger than one cubic yard in volume are classed as rock excavation.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 13 34 23
FIBERGLASS REINFORCED PLASTIC (FRP) CHEMICAL
EQUIPMENT BUILDING – ADDENDUM #1

PART 1 – GENERAL

1.01 SCOPE

- A. This section specifies the design, fabrication, and installation of a modular, engineered Fiberglass Reinforced Plastic (FRP) equipment building used for the housing of chemical storage and feed equipment.
- B. The building shall be provided as a completely integrated, factory-assembled, and pre-wired unit, requiring only field offloading, anchoring to a concrete foundation, and connection to site utility power.
- C. *Note:* This building is not intended for chlorine gas storage or feed service.

1.02 REFERENCES

- A. ASTM D256 – Impact Resistance of Plastics.
- B. ASTM D638 – Tensile Properties of Plastics.
- C. ASTM D790 – Flexural Properties of Reinforced Plastics.
- D. ASTM D2583 – Barcol Hardness of Rigid Plastics.
- E. ASTM E84 – Surface Burning Characteristics. F. National Electrical Code (NEC).

1.03 SUBMITTALS

- A. Shop Drawings: Show dimensions, wall cross-sections, details of door hardware, lifting eyes, and base mounting flange.
- B. Electrical/Mechanical Schematics: Provide complete wiring diagrams, panelboard schedules, and equipment cut sheets for all specified accessories.
- C. Structural Calculations: Provide calculations stamped by a Professional Engineer licensed in the state of the project, demonstrating compliance with local wind, snow, and seismic load requirements.
- D. Manufacturer's chemical resistance data for the interior FRP resin, specifically verifying suitability for the stored chemical.

1.04 WARRANTY

- A. Building shell shall be warranted against defects in materials and workmanship for a

minimum of five (5) years.

B. Electrical and mechanical equipment shall carry the manufacturer's standard warranties.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. The building shall be manufactured by one of the following, or an Engineer-approved equal, provided all performance and dimensional requirements are strictly met:

1. Engineered Fiberglass Composites Inc.
2. Openchannelflow (OCF)
3. Or Engineer Approved Equal

2.02 BUILDING CONSTRUCTION

A. Building Dimensions

1. Nominal size: 12 feet wide × 12 feet long
2. Minimum sidewall height: 8 feet
3. Peak roof height: approximately 8 feet 6 inches minimum

B. Construction

1. Modular FRP construction.
2. White exterior gel coat with UV inhibitors.
3. White interior finish.
4. Roof shall be peaked and sloped for drainage.
5. Minimum 2-inch roof overhang.
6. Provide four stainless steel or galvanized lifting eyes.
7. Open-bottom construction suitable for installation on a concrete slab.

C. Structural Laminate

1. Fiberglass reinforced plastic laminate utilizing ISO polyester or vinyl ester resin.
2. Orthophthalic resins shall not be permitted.

3. Minimum properties:
 - a. Tensile Strength: 16,000 psi.
 - b. Flexural Strength: 27,000 psi.
 - c. Flexural Modulus: 1,100,000 psi.
 - d. Barcol Hardness: 30 minimum.
 - e. Notched Izod Impact: 8 ft-lb/in minimum.
4. Minimum 30 percent glass content by weight.

D. Insulation and Core

1. Fully encapsulated closed-cell foam insulation.
2. Minimum thickness: 1.5 inches.
3. Minimum R-value: 10.
4. Insulation shall be integrated into wall and roof panels.
5. Construction shall prevent delamination between FRP skins and insulation core.

E. Material and Finish

1. Standard White UV-resistant exterior gel coat. White interior finish.

F. Equipment Support

1. Provide one (1) 24" x 24" x 1/2" thick piece of embedded backing lumber seamlessly fiberglassed into the interior wall to serve as a structural mounting plane for chemical feed equipment.

2.03 DOORS AND HARDWARE

- A. Door Configuration: One (1) set of 6'-0" Wide x 6'-6" High FRP flush-fitting double doors.
- B. Door Hardware: Continuous stainless steel piano hinges, stainless steel panic hardware, exterior keyed cylindrical lockset, stainless steel surface bolts on the inactive leaf, door hold-open chains, threshold, and neoprene weather seals. All hardware shall be highly corrosion-resistant.

2.04 HVAC AND VENTILATION

- A. Exhaust Fan: One (1) corrosion-resistant exhaust fan (FRP housing), 115-volt, delivering a minimum of 1100 CFM free air. Exhaust pickup shall be located low on the wall, with the intake point no greater than 12 inches above the finished floor elevation. Discharge through an exterior weather hood with an insect screen.
- B. Air Intake: One (1) 12" x 12" gravity-operated FRP air intake louver located on the opposite wall from the exhaust fan to promote full-room air circulation.
- C. Controls: Fan controlled by an exterior disconnect switch and a local HOA switch.
- D. Heating: One (1) 2250-Watt, 240-Volt wall-mounted, fan-forced electric heater with integral thermostat. Heater shall maintain interior temperature above 40°F under local winter design conditions for freeze protection.

2.05 ELECTRICAL SYSTEMS

- A. General: All factory wiring shall be stranded copper THHN/THWN conductors (Minimum No. 12 AWG) installed within surface-mounted Schedule 40 PVC conduit.
- B. Load Center:
 - 1. Minimum 100-Amp, 120/240-Volt, 1-Phase service housed in a NEMA 4X fiberglass enclosure.
 - 2. Minimum 12-space panelboard with main breaker. Provide a minimum of 25 percent spare breaker spaces. Mixed manufacturer breaker and panel combinations shall not be permitted.
- C. Lighting: Two (2) interior 48" long, wet-location rated, corrosion-resistant LED light fixtures delivering a minimum of 6,000 lumens each. Controlled by an exterior weatherproof switch.
- D. Receptacles: Three (3) interior, 15-Amp, 120-Volt GFCI duplex receptacles.

PART 3 – EXECUTION

3.01 FOUNDATION & INSTALLATION

- A. Install building on a reinforced concrete slab furnished under another section. The concrete slab shall extend a minimum of 6 inches beyond the building footprint and be no less than 6 inches thick.
- B. Install the building plumb and level. Anchor using all manufacturer-provided anchor locations with Type 316 stainless steel wedge anchors.

- C. Seal the building base to the slab with a continuous butyl or bituminous sealant to ensure a watertight and vapor-tight seal.
- D. Verify and demonstrate the proper operation of all doors, ventilation equipment, heaters, and lighting to the Owner.

END OF SECTION

SECTION 46 21 11
VERTICAL CENTRIFUGAL PUMPS – ADDENDUM #1

PART 1 – GENERAL

1.01 SUMMARY

- A. The CONTRACTOR shall provide vertical turbine high service pumps with associated appurtenances, complete and operable, in accordance with the Contract Documents.
- B. An authorized representative of the Pump Manufacturer shall examine the site conditions, intended application, and operation of the pump system and recommended pumps that will best satisfy the indicated requirements. This includes review of installed equipment to be reused and coordination to assure the compatibility of new and existing equipment.
- C. CONTRACTOR shall protect, retain, and reuse the existing pump discharge piping and appurtenances. The new pumps shall be designed, manufactured, and installed to fit within the laying lengths, space, and available tolerances of the existing equipment.
- D. CONTRACTOR shall protect and remove the existing pumps and place them in a location as directed by the OWNER at the OWNER's water treatment plant site or other site as may be selected.
- E. The Pump Manufacturer shall be made responsible for furnishing the work and for coordination of design, assembly, testing, and installation of the Work of each pump system; however, the CONTRACTOR shall be responsible to the OWNER for compliance with the Contract Documents.
- F. All pumps shall be produced by the same Manufacturer.
- G. Pumps that are supplied under this specification shall be vertical turbine open line shaft design with product lubrication, including a bowl assembly, column assembly, discharge head and driver. The discharge head shall be designed to carry the entire weight of the bowl and column assembly along with the specified driver without excessive vibration or noise. All of the supplied equipment shall conform to this specification.
- H. The required units shall be soft start, National Pump Company, Gould's Water Technology, or an ENGINEER approved equal.
- I. CONTRACTOR shall provide a technical manual that contains comprehensive information for each pump installed, including parts and materials, dimensions, hydraulic performance, test data, as well as installation, operation, and maintenance information.
- J. CONTRACTOR shall provide factory test data that is signed, dated, and certified factory test data for each pump system and shall be submitted before shipment of equipment.
- K. CONTRACTOR shall submit the following Certifications:

1. Manufacturer's certification of proper installation.
 2. CONTRACTOR's certification of satisfactory field testing.
- L. The supplier shall revisit the pumps after installation to verify clearances have not changed between impellers, bowls, etc. The period of time to lapse after pumps begin operating shall be stated by the manufacturer in the pump submittal.

1.02 QUALITY ASSURANCES

A. Warranty

1. All products, equipment, labor, and services provided shall be warranted for a period of five years after final completion.
2. It is understood that the service of the pumps could be severe, and erosion of wetted parts is considered normal wear and will not be covered by the two-year warranty.

B. Certifications

1. The pump manufacturer shall be certified to the ISO 9001 standard for design and manufacture of vertical turbine pumps.
2. The manufacturer shall be capable of producing vertical turbine pumps certified to NSF/ANSI 61 & 372.
3. Pressure containing fabrications shall be welded only by those who are qualified on ASME code section IX. Welder certification shall be provided with the submittal package.

C. Foundry

1. The manufacturer shall own and operate its own U.S. based foundry producing vertical turbine components.

D. Testing Standards

1. All vertical turbine pumps shall conform to ANSI/AWWA E101-88 and to the most current edition of Hydraulic Institute Standards.

1.03 SUBMITTALS

- A. The CONTRACTOR shall submit complete fabrication and assembly drawings together with detailed specifications covering materials, parts, devices, and accessories. The data and specifications for each pumping unit shall include, but not be limited to the following:

1. Name of Manufacturer

2. Type and Model
3. Design Rotational Speed
4. Number of Stages
5. Type of Bowl Bearings
6. Type of line shaft bearings
7. Size of Shafting
8. Size of Pump Column
9. Size of Discharge Outlet
10. OD of Pump Bowls
11. Weight
12. Type of Finish
13. Total Weight
14. Total Pump Length
15. Complete performance curves showing capacity versus head, NPSH required, efficiency, pump efficiency, and BHP plotted scales consistent with performance requirements
16. The equipment manufacturer shall indicate separately the head, capacity, horsepower demand, overall efficiency, and minimum submergence required at the design flow conditions.
17. Performance curves at intervals of 100 RPM from minimum speed to maximum speed shall be furnished for each pump equipped with a variable speed drive.
18. The Pump Manufacturer shall indicate the limits on the performance curves recommended for stable operation without surge, cavitation, or excessive vibration. The stable operating range shall be as wide as possible based on actual hydraulic and mechanical tests.
19. Technical data for coating products for each piece to be coated, number of coats, primer products, topcoats, final dry film thickness (DFT), color, and compatibility of shop and field applied coating in accordance with the Contract Documents.

20. Detailed method for incorporation of controls to systems including details of additional terminals, enclosures, and appurtenances to receive inputs or transmit outputs to the local control panel and controls system.
21. Wiring diagram of field connections with identification of terminations between local control panels, junction terminal boxes, and equipment items.
22. The CONTRACTOR shall provide electrical submittals signed, dated and stamped by a professional electrical engineer licensed to work in the State of Alabama to include, at a minimum, proposed electrical layout of treatment equipment and calculations verifying sizing of electrical equipment.
23. Complete electrical schematic diagram.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Materials shall be suitable for the intended application; materials not indicated shall be high-grade, standard commercial quality, free from defects and imperfections that might affect the serviceability of the product for the purpose for which it is intended, and shall conform to the following requirements:
 1. Miscellaneous stainless-steel parts shall be Type 316 unless otherwise noted.

2.02 FLANGES AND BOLTS

- A. Discharge flanges shall conform to ASME B16.5 – Pipe Flanges and Flanged Fitting dimensions. Bolts shall be in accordance with the following:
 1. Standard Service Bolts (Not Buried or Submerged)
 - a. Except where otherwise shown or specified, all bolts, anchor bolts, and nuts shall be steel, galvanized after fabrication as specified herein. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. Except as otherwise specified herein, steel for bolts, anchor bolts, and cap screws shall be in accordance with the requirements of ASTM A307.
 2. Buried or Submerged Bolts
 - a. Unless other corrosion-resistant bolts are shown, all bolts and washers that are submerged, or within the pump can shall be of Type 316 stainless steel, with bronze nuts, or cap screws (where screwed into stainless steel), of copper-silicon alloy, conforming to ASTM B98, alloy C 65100, designation H04, or alloy C65500, designation H04. Wherever stainless-steel bolts and nuts are specified, it shall refer to the above material combination, unless specifically excluded.

3. Bolt Requirements

- a. The bolt and nut material shall be free-cutting steel.
- b. The nuts shall be capable of developing the full strength of the bolts. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads. All bolts and cap screws shall have hexagon heads and nuts shall be Heavy Hexagon Series.
- c. The length of all bolts shall be such that after joints are made up, each bolt shall extend through the entire nut, but in no case more than 1/2-inch beyond the nut.

2.03 PUMP REQUIREMENTS

A. MANUFACTURER

1. National Pump Company, a Gorman-Rupp Company
2. Goulds Water Technology, A Xylem Brand
3. Peerless Pumping Company
4. Or Engineer Approved Equal
5. The equipment covered by this specification shall be standard products as manufactured by National Pump Company, Gould's Water Technology, Peerless Pumping Company, or an Engineer Approved equivalent having a minimum of 20 years' experience in the production of such equipment. All pumps and pump components specified in this specification shall be supplied by a single pump manufacturer. The pump manufacturer shall be required to supply the pumps and drivers and shall be responsible for their compatibility only.
6. A factory authorized service facility shall have trained service technicians and be able to show evidence of parts inventory for routine maintenance items such as bearings, gaskets, shafts, and sleeves.

B. OPERATION SELECTION

1. The pumps shall be suitable for long-term operation under the following conditions:
 - a. Duty: Continuous
 - b. Drive: Variable Speed
 - c. Ambient Environment: Indoors
 - d. Fluid: Drinking Water

2. Stated total dynamic head (TDH) includes lift and all system pressure. Pump manufacturer shall include pump's internal losses.
 - a. Pump item number: Not used.
 - b. Number of required units: 2
3. Pump #1
 - a. Condition "A" (Design Point)
 - 1) Capacity, GPM: 600
 - 2) TDH, head in feet: 150
 - 3) Efficiency: 75%
 - b. Condition "D" (Shutoff)
 - 1) Capacity, GPM: 0
 - 2) TDH, head in feet: 213
 - c. Driver horsepower: 30 hp
 - d. Minimum bowl efficiency
 - 1) Percent (design point): 75%
 - e. Maximum pump operating speed: 1770 RPM
 - f. Minimum column and discharge diameter, inches: 8".
 - g. NPSHR not to exceed: 8.88 feet at design
4. Pump #2
 - a. Condition "B" (Design Point)
 - 1) Capacity, GPM: 290
 - 2) TDH, head in feet: 30
 - 3) Efficiency: 81%
 - b. Condition "D" (Shutoff)

- 1) Capacity, GPM: 0
- 2) TDH, head in feet: 43
- c. Driver horsepower: 15 hp
- d. Minimum bowl efficiency
 - 1) Percent (design point): 81%
- e. Maximum pump operating speed: 1770 RPM
- f. Minimum column and discharge diameter, inches: 7.5”.
- g. NPSHR not to exceed: 6 feet at design
5. Condition “A” as listed above is the design point and will be used for any performance evaluation in accordance with the standards of the Hydraulic Institute.
6. The pump horsepower requirements for any point on the curve shall not utilize the service factor nor exceed the motor nameplate horsepower rating.

C. MATERIALS AND CONSTRUCTION

1. The vertical turbine line shaft sump pump shall conform to the materials of construction for open lineshaft design.

DISCHARGE HEAD ASSEMBLY			
Description	MC	Material Description	ASTM
Motor Coupling Assembly	2265	SST 416	A582M
Slinger	5121	Rubber EPDM	D3568
Discharge Head	9645	Fabricated Carbon Steel	A120 GRB
Stuffing Box Bearing	1109	Bronze	B584 C90300
Stuffing Box	1003	Cast Iron	A48 CL30
Stuffing Box Gasket	5136	Acrylic Yarn & Graphite	Garlock Blue Guard
Split Gland	1203	SST 316	A744M
Gland Adjusting Screw	2229	SST 316	A276
Packing	5026	Graphite	ML402-99

COLUMN AND LINESHAFT ASSEMBLY			
Column Pipe (FLG)	6501	Black Pipe Sch. 40	A53
Column Coupling	9645	Carbon Steel Fab	A53
Lineshaft	2227	SST 416	A582 S41600
Bearing Retainer	1003	SST 304	A744M
Lineshaft Bearing	1109	Rubber Epdm	D3568
Lineshaft Coupling	2265	SST 416	A582M

BOWL ASSEMBLY			
Bowl Shaft	2227	SST 416	A582 S41600
Intermediate Bowl	6911	Cast Iron CL30 Enamel	A48
Inter Bowl Bearing	1109	Bronze Bismuth	B584 Modified
Impeller	1398	SST 316	A744M
Impeller Taper Lock	2242	Steel 1018	A108
Wear Rings (optional)	1128	N/A	N/A
Hex Bolt	2298	SST 316	A276
Sand Collar	1205	SST 304	A744M
Suction Bowl / Bell	1003	Cast Iron Cl30	A48 CLASS 30B
Suction Bearing	1109	Bronze C90300 "G" Mod	B584
Suction Strainer	6952	SST 304	A240M
Plug	1046	SST 316	A276

2. Bowl Assembly

- a. The suction bell shall be designed to provide conservative entrance velocities and direct the flow to the first stage impeller. The inner surface of the suction bell shall be smooth and free of sharp projections which could cause turbulence or cavitation. The suction casing shall be designed to house the suction bell bearing by means of four vanes.
- b. The bowls shall be smooth and free of sharp projections and shall have register fits for alignment and be connected by flanged and bolted construction. Bowl sizes 6" to 15" shall be porcelain enameled on the bowl interior. Bowl sizes 16" and larger shall be epoxy-lined.
- c. The impellers shall be machined and finished smooth to insure proper performance. They are to be balanced prior to assembly. The impellers shall be connected to the bowl shaft by means of collet design. The impeller shall be made

of investment cast stainless steel. Impellers made of stainless-steel sand cast shall not be allowed.

- d. The suction strainer shall be a clip-on basket design and have a free inlet area of at least 3-4 times the impeller eye area. The suction strainer shall be connected to the bowl assembly suction casing. The strainer shall be made of stainless steel.

3. Column Assembly

- a. The column shall include threaded connections and shall be of open design with product lubrication.
- b. The bearing spacing shall be selected to insure operation at a minimum of 25% above or below the first critical speed. Bearing spacing shall not exceed 10 feet.
- c. For 3"-12" product lubricated column assemblies, the column shall be designed with drop-in steel or cast-iron bearing retainers. The interior of the column shall be free of offsets, burrs, discontinuities and irregularities.
- d. The lineshaft shall be of adequate size to transmit the full power of the pump without slip, excessive vibration or elongation, and shall have threaded joints. Lineshaft lengths shall not exceed 10 feet. The lineshaft shall have left hand threads that tighten during pump operation.

4. Discharge Head Assembly

- a. For underground service with a motorstand, the discharge head shall be fitted with a flanged discharge connection.
- b. The flange shall be a 150 LB R.F. ANSI flange for fabricated steel heads.
- c. The discharge head shall be designed to carry the entire weight of the complete pump and driver without distortion when spanning an opening of sufficient size to permit removal of the complete pump assembly.
- d. The discharge head shall be provided with a coupling guard. Lifting lugs shall be provided as standard.

5. Shaft Sealing

- a. General: The pump shaft shall be sealed at the discharge head utilizing either a traditional packed stuffing box or a mechanical seal. The specific sealing method shall be dictated by the pump manufacturer based on their strict recommendation for the specified service conditions and their standard discharge head casting. All wetted components and sealing materials must be NSF/ANSI Standard 61 certified for potable water contact.

- b. Packed Stuffing Box Option: If a stuffing box is recommended, it shall be designed to accommodate a minimum of five (5) rings of packing and a water-seal lantern ring. The packing gland shall be a two-piece, split design (bronze or Type 316 Stainless Steel) to facilitate maintenance without removing the motor. The discharge head shall feature an integral drip pocket to capture continuous packing leakage, which the CONTRACTOR shall pipe via gravity to the nearest facility floor drain.
- c. Mechanical Seal Option: If a mechanical seal is recommended, it shall be a single, internally mounted type featuring a carbon/ceramic face and stainless steel hardware. The seal shall be designed for continuous operation without requiring external flush water, unless otherwise explicitly dictated by the manufacturer's operational guidelines.

6. Driver

- a. The drivers shall be vertical electric motors compatible with the specified vertical cylindrical pump design. The drivers and all related equipment shall ship unmounted from the pumps.
- b. Pump 1 Driver: The motor shall be a 15 HP, 1770 RPM, Totally Enclosed, Fan-Cooled (TEFC) or WP-1 enclosure as recommended by manufacturer.
- c. Pump 2 Driver: The motor shall be a 30 HP, 1770 RPM, Totally Enclosed, Fan-Cooled (TEFC) or WP-1 enclosure as recommended by manufacturer.

D. COATING

- 1. The bowl assembly exterior shall be coated with Tnemec 141; minimum dry film thickness 8 mils.
- 2. The column assembly interior and exterior shall be coated with Tnemec 141; minimum dry film thickness 8 mils. minimum.
- 3. The head assembly interior shall be coated with Tnemec 141 (NSF) Epoxy; minimum dry film thickness 8 mils.
- 4. Head OD Gould's Water Technology standard blue enamel.

E. PUMP APPURTANENCES

- 1. Nameplates
 - a. Each pump shall be equipped with a stainless-steel nameplate indicated serial number, rated head and flow, impeller size, pump speed, and Manufacturer's name and model number.
- 2. Gauges

- a. Pumps shall be equipped with pressure gauges installed at pump discharge lines.
- b. Gauges shall be located in a representative location, where not subject to shock or vibrations, in order to achieve true and accurate readings. Where subject to shock or vibrations, the gauges shall be cabinet mounted and connected by means of flexible connectors. Gauges shall have the signal routed to the PLC.
- c. Gauges shall have a 4-20 mA output for input into the SCADA system.

~~3. Automatic Grease Lubrication System~~

- ~~a. The CONTRACTOR shall provide an automated grease lubrication system for each pump supplied. Grease lines shall be plumbed to each of the stuffing box ports. The automated grease systems shall be Graco G3 Max with a 12-liter grease reservoir, or ENGINEER approved equal.~~
- ~~b. CONTRACTOR shall install the automated grease lubrication system, including power supply, control conductors and conduit according to the manufacturer's recommendations. The system shall be able to start/stop with pump operation, apply lubrication on 1) pump start, 2) a timed interval, and 3) high temperature.~~
- ~~c. CONTRACTOR shall install a stuffing box temperature probe that is suitable for the operating conditions and will supply continuous temperature reading to the plant control system.~~
- ~~d. CONTRACTOR shall fill the stuffing boxes to the level required by the pump manufacturer and fill the grease reservoirs completely. Grease shall be NSF Standard 61 approved and meet NLGI #2.~~

F. VIBRATION AND TEMPERATURE CONTROL

- 1. The pump shall be fitted with a Vibration and Temperature monitoring device
- 2. The device shall be capable of measuring the following:
 - a. Temperature
 - b. 3 Axis Vibration (RMS Velocity)
 - c. Kurtosis
 - d. Machine run-time counter
 - e. Fast Fourier Transform
 - f. Time Waveform

3. The device shall be rated for the following environments:
 - a. IP67 water and dust protected
 - b. Intrinsically safe
 - c. Class I, II, III, Division I Groups C,D,E,F,G
4. The device shall be power by a 3.6V Lithium Batter with a life expectancy of 2 to 3 years.
5. The device shall sync via Bluetooth 5.0 to the following devices:
 - a. iPhone 15, 16, 17, and above
 - b. iPad Air (M2/M4), iPad Pro (M4/M5), iPad (10th/11th Gen), Mini (7th Gen)
 - c. Samsung Galaxy S24, S25, S26
 - d. Google Pixel 9, 10, 11
6. The device shall be an i-ALERT 2 manufactured by Goulds Pumps, Inc.

G. TESTING

1. Each pump shall be tested at the factory in accordance with the most current edition of the Hydraulic Institute Standards ANSI/HI Standard 14.6. All pump performance testing shall be performed at the manufacturer's facility.
2. Test shall be performed using the job bowl assembly and lab motor for the pumps. If OWNER furnished motors cannot be used, the manufacturer shall perform the tests with an ENGINEER approved drive system. If not used in pump testing, job motors shall be tested under full load and variable speed at the motor testing facility to ensure problem free operation from full speed to minimum speed at 100 rpm intervals. The following minimum test results shall be submitted:
 - a. Pump curves showing head, flow, bhp, and efficiency requirements.
 - b. Certification that the pump shaft horsepower demand did not exceed the rated motor horsepower of 1.0 service rating at any point on the curve.
 - c. The pump manufacturer shall record vibration during the performance test.
3. The test shall cover seven points including the design point (HI 14.6). The design point shall be used for any performance evaluation. Testing grade shall be HI 2B.
4. Field/functional testing will be performed by the CONTRACTOR to insure proper mechanical operation at the jobsite.

5. In the event of failure of any pump to meet any of the requirements, the CONTRACTOR shall make necessary modifications, repairs, or replacements to conform to the requirements of the Contract Documents and the pump shall be re-tested until found satisfactory.

2.04 SPARE PARTS

- A. One complete set of spare parts shall be furnished for each of the pump supplied. The spare parts shall be as listed below:
 1. O-rings (complete set)
 2. Packing (complete set)
 3. Packing gland
 4. Lantern ring
 5. Stuffing box bearing
 6. Stuffing box shaft sleeve
 7. Line shaft coupling
 8. Line shaft bearing (complete set)
 9. Line shaft bearing sleeve
 10. Bowl shaft
 11. Bowl bearings (one for each bowl)
 12. Bowl wear rings, if applicable (one for each bowl)
 13. Impeller wear rings, if applicable (one for each impeller)
 14. Impeller collets, or key (one for each impeller)

PART 3 – EXECUTION

3.01 SHIPPING

- A. Pumps that are less than 30 feet in length shall be shipped fully assembled with the driver and shaft seal unmounted. The discharge flange shall be protected with a wooden flange cover.

3.02 STORAGE, HANDLING, AND INSTALLATION

- A. The skidded pump and related equipment shall be unloaded, stored, and installed in agreement with the Manufacturer's operation and installation manuals. If storage is planned to be longer than six months or in harsh environment, long term storage practices should be followed per the Manufacturer's operation and installation manuals.

3.03 START-UP FIELD SERVICES

A. Inspection, Startup, and Field Adjustment

1. An authorized service representative of the Manufacturer shall be at the site for a minimum of three (3) work days during installation of the system to witness the following and to certify in writing that the equipment and controls have been properly installed, aligned, lubricated, adjusted, and readied for operation.
 - a. Installation of the equipment
 - b. Inspection, checking, and adjusting the equipment
 - c. Startup and field testing for proper operation
 - d. Performing field adjustments to ensure that the equipment installation and operation comply with the requirements.
2. The ENGINEER may require that the inspection, startup, and field adjustment services above be furnished in up to three (3) separate trips.

B. Instruction of the OWNER's Personnel

1. An authorized training representative of the Manufacturer shall visit the site for one (1) day to instruct the OWNER's personnel in the operation and maintenance of the equipment, including step-by-step troubleshooting with necessary test equipment. Instruction shall be specific to the models of equipment provided.
2. The representative shall have at least two (2) years' experience in training. A resume for the representative shall be submitted.
3. Training shall be scheduled a minimum of three (3) weeks in advance of the first session.
4. Proposed training material and a detailed outline of each lesson shall be submitted for review two weeks in advance of training. Comments shall be incorporated into the materials.
5. The training materials shall remain with the trainees and a complete digital copy of the training materials shall be provided to the OWNER.
6. The OWNER/ENGINEER may record the training for later use with the OWNER's personnel.

3.04 INSTALLATION

A. General

1. Pumping equipment shall be installed in accordance with the Manufacturer's written recommendations.

B. Alignment

1. Equipment shall be field tested to verify proper alignment and freedom from binding, scraping, shaft runout, or other defects. Pump drive shafts shall be measured just prior to assembly to ensure correct alignment without forcing. Equipment shall be secure in position and neat in appearance.

C. Lubricants

1. The CONTRACTOR shall provide all necessary oil and grease for initial operation.

3.05 FIELD TESTS

A. Each pump system shall be field tested after installation to demonstrate:

1. Satisfactory operation without excessive noise and vibration.
2. No overheating of bearings.

B. The following field testing shall be conducted:

1. Startup, check, and operate the pump system over its entire speed range. If the pump is driven by a variable speed drive, the pump and motor shall be tested at 100 RPM increments. Unless otherwise indicated, vibration shall be within the amplitude limits recommended by the Hydraulic Institute Standards at a minimum of four (4) pumping conditions defined by the ENGINEER.
2. Obtain concurrent readings of motor voltage, amperage, pump suction head, and pump discharge head for at least four (4) pumping conditions at each pump rotational speed at 100 RPM increments. Check each power lead to the motor for proper current balance.
3. Determine bearing temperatures by contact type thermometer. A run time until bearing temperatures have stabilized shall precede this test, unless insufficient liquid volume is available.
4. Electrical and instrumentation tests shall be conducted as necessary to demonstrate satisfactory performance, as determined by the ENGINEER.

- C. Field testing will be witnessed by the ENGINEER. The CONTRACTOR shall furnish minimum three (3) days advance notice of field testing.
- D. In the event any pumping system fails to meet the indicated requirements, the pump shall be modified or replaced and re-tested as outlined above until it satisfies the requirements.
- E. After each pumping system has satisfied the requirements, the CONTRACTOR shall certify in writing that it has been satisfactorily tested and that final adjustments have been made. Certification shall include the date of the field tests, a listing of persons present during the tests, and the test data.
- F. The CONTRACTOR shall be responsible for costs of field tests, including related services of the Manufacturer's representative, except for power and water, which the OWNER will bear. If available, the OWNER's operating personnel will provide assistance in field testing.

END OF SECTION

SECTION 46 33 00
LIQUID CHEMICAL FEED EQUIPMENT – ADDENDUM #1

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Basis of Design: Watson-Marlow Qdos 60 Chemical Metering Pump
- B. Blue-White FLEXFLO Peristaltic Metering Pump
- C. Or Engineer Approved Equal
 - 1. Pumps shall be positive displacement type complete with cartridge-style pump head, consisting of an eccentrically driven rotor which occludes a membrane against a track and self-contained variable speed drive as specified.
 - 2. Pumps shall be self-priming and shall have a maximum suction lift capability of up to 30' vertical water column.
 - 3. Discharge Pressure Rating: Up to 60 psi on Qdos 60.
 - 4. Pumps shall be capable of pumping both liquids and gases without vapor locking.
 - 5. Pump shall not require the use of back pressure valves, suction foot valves, strainers, pulsation dampeners, or auto degassing valves and shall not require dynamic seals in contact with the pumped fluid. Process fluid shall be contained within pump tubing and shall not directly contact any rotary or metallic components during operation. Upon failure, the process fluid shall be completely contained within the pump head to prevent hazardous exposure to operators. Manufacturers that do not offer a completely contained pump head are not acceptable.

1.02 QUALITY ASSURANCE

- A. This specification is the basis for the design of all chemical metering pumps. All pumps, whether named as an acceptable supplier or submitted as an equal shall, at a minimum, meet the following critical design requirements.
- B. Pump shall be 24 hr. continuous duty rated and have a five-year manufacturer's warranty from date of shipment.
- C. For quality assurance, pumps shall be supplied and labeled by the original manufacturer. Relabeled products, even under license by manufacturers, shall not be acceptable.
- D. Manufacturer shall have a minimum twenty (20) years of experience manufacturing peristaltic pumps, shall have a direct business presence in the United States for minimum of twenty (20) years, and shall employ a minimum of fifty (50) employees in the United States. Manufacturers without a direct American presence who distribute through a third-

party distributor are not acceptable.

- E. Pumps shall be manufactured in compliance with ISO 9001-2015 standards.
- F. Pumps shall meet CE, NSF 61 and applicable electrical standards.
- G. To ensure proper function and quality, pump head and drive shall be manufactured by the same company.

1.03 SUBMITTALS

A. Submit the following:

- 1. Certified shop drawings.
- 2. Performance curve showing flow rate as a function of RPM and pressure.
- 3. Dimensional drawings.
- 4. Operating, maintenance, programming, and wiring instructions
- 5. Tool-free pump head replacement instructions
- 6. Manufacturer's certification that pump head and drive are all manufactured by the same manufacturer.

PART 2 – PUMP DESIGN

2.01 MANUFACTURERS

- A. Basis of Design: Watson-Marlow, Inc.
- B. Blue-White Industries
- C. Or Engineer Approved Equal

2.02 PUMP PROCESS SCHEDULE

- A. Watson-Marlow Qdos 60 Universal +, Blue-White FLEXFLO, or Engineer Approved Equal Peristaltic Chemical Metering Pumps
 - 1. Quantity – 8
- B. Fluid:
 - 1. Well #1
 - a. Sodium Permanganate 20%

- b. Poly Aluminum Chloride
- c. Sodium Hydroxide 50%
- d. Poly Orthophosphate
- e. Flow Range Min– Max (GPH) 0.01 – 15.85
- f. Average Discharge Pressure (PSI) 10 PSI
- g. Maximum Discharge Pressure (PSI) 30 PSI

2.03 PUMP CONSTRUCTION

A. Pump head

1. Technology: Provide tool-free Conveying Wave Technology (CWT) cartridge style pump head, consisting of an eccentrically driven rotor which occludes an EPDM membrane against a PEEK track. For operator safety, pump head shall be serviceable as a single replaceable component. Pumps that require an operator to open the pump head for membrane replacement, cleaning, or rebuilding or that require tools for maintenance are unacceptable.
2. Max rating: With chemical compatible pump head – 15.85 GPH at 125 rpm and 60 psi of discharge pressure
3. Housing construction: Corrosion resistant and high impact resistant glass filled PPS.
4. Geometry: Pump head shall consist of sealed track housing with in-line porting. Suction and discharge ports shall be 180 degrees apart with bottom suction and top discharge.
5. Rotor: Pump head rotor shall be constructed of 303 stainless steel, sealed within the track housing, and supported by its own bearings. Occlusion levels shall be factory set to ensure flow accuracy of +/- 1% and repeatability performance of +/- 0.5% and shall not require any field adjustment.
6. Contact Materials: All pump head components in the fluid path shall be NSF61 listed and shall be of materials specified by the manufacturer as compatible with the process fluid.
7. Leak containment/detection: In the event of EPDM element failure, the leak sensor shall shut the pump down immediately with all process fluid contained within the sealed pump head.
 - a. Sensor type: Utilize non-contacting optical sensor. Sensor shall not encounter the process fluid, shall contain no moving parts, shall not depend on the capacitance of the process fluid, shall not require fluid to leak out of the pump housing for

engagement, nor shall require any sensitivity or calibration adjustment.

- b. Alarm: Sensor shall shut down the pump, give a visual indication on the drive controller, and if specified shall provide an output general alarm signal.
 - c. For operator and environmental safety, pumps which do not have leak containment, leak sensor, and shutdown are not acceptable. For additional overpressure safety, sealed pump head shall have a controlled drain-to-waste port.
8. Port connections: Pump head shall utilize PVDF compression fittings which shall mate to 1/4" x 3/8" or 3/8" x 1/2" PE interface tubing. Provide polypropylene compression by 1/2" NPT adaptors for connecting interface tubing to process line.
9. Spares: Provide one (1) spare pump head per pump supplied.

B. Drive

- 1. Rating: Continuous 24-hour operation, 45o C ambient.
- 2. Voltage: Drive shall be suitable for 100-240VAC, 50-60Hz, 1-Phase with an internal switch-mode power supply. Supply nine-foot length mains power cord with standard 115VAC three-prong plug.
- 3. Max drive power consumption: 190VA.
- 4. Enclosure: NEMA 4X constructed out of corrosion and impact resistant engineering plastic, 20% Glass filled PPE/PS. By nature of the environmental conditions, painted or unpainted metallic housing including 316SS are not acceptable. Enclosure shall house the drive motor and all control circuitry in one integrated unit. Separate VFDs and motors are not acceptable.
- 5. Direct coupled pump head with fully protected drive
 - a. Pump head shall direct couple mount to the controller via a splined drive shaft and shall be locked in place by two tool-free thumbscrews or lever mechanism.
 - b. Pump head shall be fully sealed to prevent any contamination of the controller or drive shaft by process fluid.
 - c. Pump head shall contain its own rotor bearings and not impart an overhung load on the pump shaft.
 - d. Pump heads shall be supplied mounted to the left or right side of the drive enclosure as specified in the drawings. If not specified, pump heads shall mount to right side of the enclosure.
 - e. Drive shall stop shaft rotation and give visual alarm in the event the pump head is removed.

6. Drive motor: brushless DC motor with integral gearbox and closed loop tachometer feedback.

- a. Circuitry complete with temperature and load compensation and protection.

C. Human-Machine Interface (HMI) and Control

1. Manual Control Interface

- a. Flow range: 7,930:1 flow range from 0.001-7.93 GPH in 0.001 GPH increments.
- b. Display: Backlit graphical TFT Display capable of up to 8 lines of text with up to 26 characters per line to display pump tag number, flow rate, and programming instructions. Display shall also provide visual indication of running status via screen color: Blue = Running, White = Stopped, and Red = Warning.
- c. Keypad: Keypad for start, stop, speed increment, speed decrement, rapid prime, and programming.
- d. Flow units: Programmable in either ml/min or gallons/hour.
- e. Security: Programmable keypad lock and PIN security for optional lockout of all keys except emergency start/stop.
- f. Auto Restart: feature to resume pump status in the event of power outage interruption.
- g. Multilingual menu: include programming menus in nine languages, including at a minimum English, Spanish, and French.
- h. Fluid level monitor: Programmable flow totalization to advise operator when their supply tank is low.
- i. HMI and mains power shall be accessible from the front of the enclosure.
- j. Minimum requirements: Pumps that do not meet the minimum manual control requirements as specified above are not acceptable.

D. Wall Mounted Dual Pump Skid

1. Remote Control Interface (SCADA)

- a. All metering pumps and associated skid equipment shall be provided with remote communication capability compatible with the OWNER's SCADA system. CONTRACTOR shall coordinate with the OWNER's SCADA integrator prior to equipment procurement to confirm the required interface protocol. Acceptable communication methods shall include, at a minimum, one of the following:

- 1) Digital communication: Modbus RTU (RS-485) or Modbus TCP/IP, enabling remote monitoring of pump run status, fault/alarm status, current flow rate, and cumulative flow totalization; and remote control of pump start/stop and speed setpoint.
 - 2) Analog input: 4–20 mA input signal for remote speed (dose rate) control proportional to a process variable such as flow or turbidity.
 - 3) Pulse output: Isolated dry-contact pulse output for flow totalization pacing to a remote counter or SCADA input register, with user-configurable pulse rate per unit volume.
- b. All signal wiring between the pump drives and the skid junction box shall be provided and terminated by the CONTRACTOR for the Owner's Integrator to perform integration into the SCADA system. Pumps that do not offer any or all three interface types – Modbus (RTU or TCP/IP), 4–20 mA input, and pulse output – as native features of the drive enclosure are not acceptable.
2. Contractor shall supply a wall mounted dual pump skid for each chemical. Skids shall be HDPE. Isolation ball valves shall be Asahi Type 21 true union ball valves. All accessories, inlet and outlet connections, and pump inlet and outlet connections shall be installed with valves. Skid shall have a junction box for communication wiring from the flowmeter. Accessories:
- a. (1) 250 mL calibration column
 - b. (1) pressure relief valve
 - c. (1) diaphragm protected gauge
 - d. (1) backpressure valve
 - e. (1) y-strainer
3. Contactor shall install new pipe saddles with removable injection quills. Valves shall be stainless steel with stainless steel safety chain. Quills shall be PVC with a Teflon liner. Injection quills shall be installed with a backpressure valve for accurate dosing.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install metering pumps and chemical feed accessories in conformance with:

1. The submittals reviewed by ENGINEER.
2. The Manufacturer's recommendations.

B. Materials of construction shall be compatible with the chemical service.

3.02 FIELD QUALITY CONTROL

A. Manufacturer's field service:

1. Arrange and pay for Manufacturer's service representative to:
 - a. Provide the services indicated below.
 - b. Minimum onsite time: 1 day.
2. Schedule the following:
 - a. As soon as practicable after installation.
 - b. At times approved by ENGINEER and OWNER.
3. Manufacturer's service representative: Check work.
4. Promptly make all changes and additions required by Manufacturer's service representative.
5. Manufacturer's service representative:
 - a. Assist in start-up.
 - b. Demonstrate operation and maintenance to OWNER's personnel.
 - c. Review operation and maintenance manual with OWNER's personnel.
6. Submit Manufacturer's service representative 's written approval of installation.

3.03 CLEANING

A. Torque Thoroughly clean all installed materials and products and related areas:

1. Prior to acceptance of the work of this Section.
2. In accordance with SECTION 01 74 00 – Cleaning and Waste Management.

END OF SECTION