

Resolution 2025-R-39

A Resolution accepting the Bid for the Pump and Motor Installation at Well 7 and Authorizing the Mayor to Execute Documents Related Thereto

WHEREAS, the invitation to bid for the Pump and Motor Installation at Well 7 was prepared in compliance with the provisions of the Alabama Bid Law; and

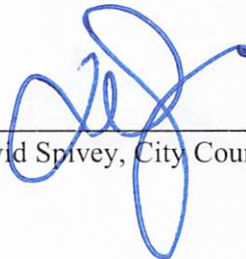
WHEREAS, the City of Irondale publicly opened and read aloud the Project bids that were submitted, as shown in the table below:

COMPANY	TOTAL BID PRICE
Morrow Water Technologies, Inc.	\$149,000.00

THEREFORE BE IT RESOLVED by the City Council of the City of Irondale, Alabama, in regular meeting duly assembled, a quorum being present as follows:

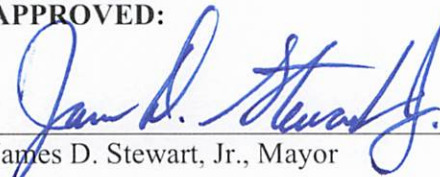
1. The bid for the pump and motor installation at well 7 in the total amount of One Hundred Forty-Nine Thousand and 00/100 Dollars (\$149,000.00) is hereby accepted.
2. Mayor James D. Stewart, Jr., or his designee, is hereby authorized to execute any necessary documents with Morrow Water Technologies, Inc. for such amount not to exceed \$149,000.00 to effectuate this bid acceptance.

ADOPTED & APPROVED: This 18th day of February, 2025.



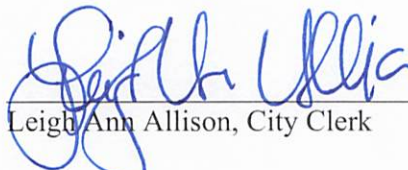
David Spivey, City Council President

APPROVED:



James D. Stewart, Jr., Mayor

ATTESTED:

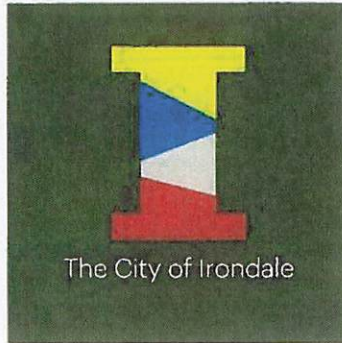


Leigh Ann Allison, City Clerk

CERTIFICATION

I, Leigh Ann Allison, the City Clerk of the City of Irondale, Alabama, hereby certify that the above to be a true and correct copy of a resolution adopted by the City Council of the City of Irondale at its regular meeting held on February 18, 2025, as the same appears in the minutes of record of said meeting.

Leigh Ann Allison, City Clerk



ADVERTISEMENT FOR BIDS

Sealed proposals for **Well 7 Motor and Pump Replacement** will be received by the City of Irondale, Alabama (“Owner”) in the Council Chambers at the City Hall in Irondale, Alabama at 101 20th Street South, Irondale, Alabama, until **10:00 a.m.**, the prevailing time on **February 18, 2025** or by mailing to 101 20th Street South, Irondale, Alabama 35210 at which time and place they will be publicly opened and read. The bid is comprised of the following:

Motor and Pump Replacement at Well 7

Specifications may be inspected and obtained at the Irondale Water Department. All Bidders must be responsible, meeting the criteria and requirements set forth in the specification documents. Prequalification of Bidders is not required.

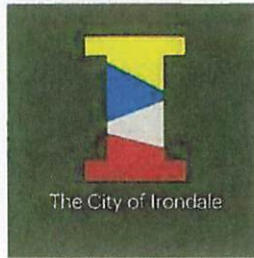
This project is governed by competitive bid laws as contained in Title 39 of the Alabama Code. Bidders should be familiar with this code.

The Owner reserves the right to reject any or all proposals and to waive any informalities. No Bidder may withdraw his bid within sixty days from the date set for receiving of the same.

This project is governed by the applicable bid laws and practices of the state of Alabama.

By: Leigh Ann Allison

Title: City Clerk



Invitation to Bid

Well 7 Motor and Pump Replacement

Sealed bids will be received by the City of Irondale, Alabama for the Irondale Water Department, City Hall, 101 20th Street South, Irondale, Alabama 35210 until 10 a.m. CST on February 18, 2025, at which times bids will be opened publicly and read in the City Council Chambers. The City reserves the right to reject any or all bids and to waive informalities in awarding this bid to the lowest responsive bidder. Bidders are to state that bids submitted are firm and that no claims for errors will be made after bids are opened and subsequent thereof. If you have questions concerning this bid, contact Jared Morris in writing at jmorris@cityofirondaleal.gov.

GENERAL INFORMATION

All bidders must use the form provided in the bid package for submitting their bids. All bids must be sealed and marked in the lower left corner "Well 7 Motor and Pump Replacement". Late bids will not be opened.

Records showing successful bidder(s) and prices quoted will be placed on file and may be examined upon request.

Should there be a change in ownership or management, the contract may be canceled at the City's discretion unless a mutual agreement is reached with the new owner or manager to continue the contract with its present provisions and prices. The contract is not transferable by either party.

METHOD OF AWARD

The award will be made to the lowest bidder meeting specifications. It is not the policy of the City to purchase on the basis of low bid only. Quality, conformity with the specifications, terms of delivery and past service and experience are among the factors that may be considered in determining the responsive bidder.

COMPLETION DATE

Pump and Motor shall be installed within thirty (30) days of issuance of a purchase order by the City of Irondale.

INSURANCE AND BONDS

Prior to commencing any work, successful bidder shall provide to the City written evidence of the minimum requirements for insurance set forth herein and include such costs in pricing to the City.

The successful bidder shall procure and maintain during the performance of and until the completion of the work at the successful bidder's expense the insurance coverages set forth in the Insurance Exhibit A attached hereto. A cashier's check or bid bond payable to the City of Irondale, Alabama, in an amount not less than five percent (5%) of the amount of the bid, but in no event more than \$10,000.00, must accompany the bidder's proposal. Performance and statutory Labor and Material Payment Bonds will be required from the successful bidder prior to the commencement of any work.

LAWS AND ORDINANCES

The supplier shall observe and comply with all federal, state, local and municipal laws, ordinances, rules and regulations that would apply to this contract.

Leigh Ann Allison
City Clerk

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work: New Deep Well Vertical Turbine Pump Head & Column Using Existing Discharge Head

1. Furnish all labor, materials, equipment and incidentals required to attach new pump head, shaft and column assembly to an existing Goulds discharge head to match the existing dimension and THD/Flow requirements (see attached chart). In general, the following equipment/work shall be furnished:
 - a. New multi-stage vertical turbine pump head capable of providing approximately 2,100 GPM at 220 feet TDH with the existing discharge head and replace motor with new VHS 150 HP, 1780 RPM motor.
 - b. New 10" schedule 10 steel Pump Column with spiders and rubber dog bone bushings designed to match existing overall length as required to work with new pump and existing discharge head.
 - c. New 416 SS line shafts, 416SS head shaft and 416SS shaft couplings as required to attach new pump to existing motor with the existing discharge head.
 - d. Refurbish existing Discharge Head to include:
 - i. Grit blast, inspect and reuse;
 - ii. Set-up to check register fits as well as flange concentricity/parallelism;
 - iii. Record all critical tolerances and fits;
 - iv. Machine new bronze stuffing box bearing;
 - v. Re-Tap all threaded holes;
 - vi. Prep to Paint; and
 - vii. Paint all external surfaces with 2-part Epoxy paint.
 - e. Refurbish existing Stuffing Box to include:
 - i. Grit blast, inspect, reuse;
 - ii. New Buna stuffing box o-ring;
 - iii. New Dry Run Packing;
 - iv. Machine new bronze bearing.
2. These Specifications are intended to give a general description of what is required, but do not cover all details which will vary in accordance with the requirements of the equipment application. It is, however, intended to cover the furnishing, the shop testing the delivery and appurtenances for the complete pumping unit as herein specified, whether specifically mentioned in these Specifications or not.
3. For all units there shall be furnished and installed all necessary and desirable accessory equipment and auxiliaries whether specifically mentioned in these Specifications or not, as required for an installation incorporating the highest standards for this type of service.

B. General Design

1. The pumps will be of the above based discharge, vertical turbine type.
2. All working parts of the pump such as wearing rings, shafts, sleeves, etc., shall be of standard dimension built to limit gauges or formed to templates such that the Owner may at any time in the future obtain replacement and repair parts for those furnished in the original machines. All parts shall be properly stamped for identification and location in the machines as shown on the operation and maintenance manuals furnished.
3. All equipment, coatings, and materials that come in contact with raw or finished water shall comply with ANSI-NSF Standard 61.

1.02 QUALITY ASSURANCE

A. Qualifications

1. The equipment covered by these Specifications is intended to be standard pumping equipment of proven ability as manufactured by a reputable manufacturer and factory designated repair facility having a minimum of 10-years' experience in the production and repair of such pumps. The equipment furnished shall be designed, constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed. pumps shall be manufactured in accordance with the Hydraulic Institute Standards.
2. All equipment furnished under this Specification shall be new and unused and shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of five (5) years.
3. The manufacturer and/or repair facility shall be fully responsible for the design, arrangement, and operation of all connected rotating components of the assembled pumping unit to ensure that neither harmful nor damaging vibrations occur at any speed within the specified operating range.

B. Manufacturers

1. The naming or reference to a specific manufacturer does not indicate that the manufacturer's standard equipment is acceptable in lieu of the specified component features. This reference is only an indication that the named manufacturers may have the capability of supplying the equipment as specified.
2. The pump head shall be manufactured by:
 - a. Goulds
 - b. Equal approved by the Owner prior to bid opening

1.03 SUBMITTALS

A. Materials and Shop Drawings

1. Copies of all materials required to establish compliance with the Specifications shall be submitted. Submittals shall include at least the following:
 - a. Certified shop and erection drawings showing all important details of construction, dimensions and anchor bolt locations,

- and long-term storage requirements.
- b. Descriptive literature, bulletins, and/or catalogs of the equipment.
 - c. Data on the characteristics and performance of each jump. Data shall include guaranteed performance curves, based on actual shop tests of the actual units, which show that they meet the specified requirements for head, capacity, efficiency, NPSHR, and horsepower. Curves shall be submitted on 8-1/2-inch by 11-inch sheets, at as large a scale as is practical. Curves shall be plotted from no flow at shut off head to pump capacity at minimum specified total head. Catalog sheets showing a family of curves will not be acceptable.
 - d. Data including principal dimensions, materials of construction, space required, clearances, piping and electrical connections and requirements, controls, type of finish, installation instructions, and other pertinent information.
 - e. In the event that it is impossible to conform with certain details of the Specifications due to different manufacturing techniques, describe completely all nonconforming aspects.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.
- B. Finished surfaces of all exposed pump openings shall be protected by wooden blanks, strongly built and securely bolted thereto.
- C. Finished iron and steel surfaces not painted shall be properly protected to prevent rust and corrosion.

1.05 WARRANTY AND GUARANTEES

The equipment shall be warranted to be free from defects in workmanship, design, materials, and to perform in accordance with the Specifications and in the application in this contract for a period of three (3) years from the date of delivery. If any part of the equipment should fail during the warranty period, it shall be replaced in the machines and the units restored to service at no expense to the Owner.

PART 2 – PRODUCTS

2.01 GENERAL

A. General Information

- 1. The pumping units required under this Section shall be complete including proper alignment and balancing of the individual units. All parts shall be so designed and proportioned as to have liberal strength, stability, and stiffness and to be especially adapted for the service to be performed. Ample room for inspection, repairs and adjustment shall be provided.
- 2. Stainless steel nameplates giving the name of the manufacturer, the rated capacity, head, speed and all other pertinent data shall be attached to the discharge head.

2.02 MATERIAL AND EQUIPMENT

A. General

1. The pump unit shall be water lubricated, open line shaft, vertical turbine type suitable to pump finished water from the clear well into a pressurized distribution network.

B. Performance Requirements

1. When operating at the design output speed of its squirrel cage induction motor the pump shall have a characteristic performance curve which meets all the minimum conditions listed in section 1.01.A.1.a. The Pump head selection to meet TDH requirements shall address all losses from the pump intake suction bell to the pump discharge flange.
2. The nameplate rating of the existing motor shall not be exceeded, nor shall the design service factor be reduced when the pump is operating at any point on its characteristic curve at maximum speed. The term "at any point on its operating curve" shall mean all points from no flow at shut-off head to maximum flow at minimum TDH. All rotating parts of the specified equipment shall be mechanically and hydraulically balanced so as to operate throughout the required range without excessive end thrust, vibration, and noise. The maximum allowable vibration measured at the top motor bearing for vertical pumps shall not exceed the maximum peak to peak amplitude as set forth in the Hydraulic Institute Standards, latest edition. Failure to meet this criterion shall be sufficient cause to reject the equipment.
3. When operating at full motor speed, the maximum brake horsepower required by the pump at any point on the pump operating curve shall not exceed the nameplate horsepower of the existing motor. If a pumping unit requires more than the nameplate horsepower of the existing motor at the motor output shaft at any full motor speed operation point, it will be rejected.
4. There shall be no significant change in vibration and noise level over the entire listed range of speed and flow of the pumping system.

2.03 VERTICAL TURBINE PUMPS (Open Lineshaft)

A. General Information

1. Stated total dynamic head (TDH) includes lift and all system pressure. Pump manufacturer shall include pump's internal losses.
 - a. Pump item number: Deep Well Water Pumps
 - b. Number of required units: 1
 - c. Condition "A" (Design Point)
 - i. GPM: 2100 GPM
 - ii. TDH, head in feet: 220.0' TDH
 - d. Condition "D" (Shutoff)
 - i. GPM: 0 GPM
 - ii. TDH, head in feet: 300.0' THD
 - e. Condition "E" (Runout)

- i. GPM: 2120 GPM
- ii. TDH, head in feet: 151.0' TDH
- f. Driver Horsepower: 150 Hp
- g. Minimum bowl efficiency, Percent (design point): 82.25%
- h. Maximum pump operating speed: 1,770 RPM
- i. Minimum column and discharge diameter, inches: 10.0"
- j. NPSHR not to exceed: 34.8'
- k. Condition "A" as listed above is the design point and will be used for any performance evaluation in accordance with the 2B grade standards of the Hydraulic Institute.
- l. The pump horsepower requirements for any point on the curve shall not utilize the service factor nor exceed the motor nameplate horsepower rating.

2. Discharge Heads

- a. The discharge heads shall be refurbished as listed in section 1.01.A.1.d.
- b. The discharge head shall be fitted with the refurbished discharge head as listed in section 1.01.A.1.e.

3. Column and Lineshafting

- a. The pump head shaft shall be constructed of ASTM A582-88a 416 stainless steel alloy. Shaft diameter shall be determined by the AWWA Standard for Vertical Turbine Pumps – Line Shaft and Submersible Types, ASNI/AWWA E101 (latest), Section A4.1.5.
- b. The pump column shall be constructed of threaded steel pipe in accordance with ASTM A53. Bolts, nuts, and washers for flanges shall be of Type 316 stainless steel or a similar grade of stainless steel recommended by the pump manufacturer.
- c. The pump line shaft shall be constructed of ASTM A582-88a 416 stainless steel alloy and its diameter determined as described. The spacing of line shaft bearings shall not exceed 10 feet.
- d. The weight of the column shall be no less than that stated in ANSI Specification B58.1. Friction loss through the columns shall not exceed 5 feet per 100 feet.
- e. Head shafting or an adjustable spacer coupling shall be provided to allow the removal of the packing seal and stuffing box without disturbing the driver.
- f. Shafting shall be polished over its full length.
- g. Total lateral deflection of the shaft above the packing box shall not exceed 0.007-inch total indicator reading. Shaft couplings for shaft diameters two (2) inches or larger shall be of the key and thrust-ring types or other non-threaded design of Type 416 stainless steel.
- h. Lineshafting shall not exceed 10 feet in length and shall have butting faces machined square to the axis of the shaft with

angular misalignment of thread and shaft axis not exceeding 0.002 inches by 6 inches.

- i. Pump shall have open self-lubricated lineshafts.

4. Bowl Assembly

- a. Each bowl assembly shall consist of the discharge bowl, impeller and impeller shafting, and bearings. Bearings shall be located above and below the impeller.
- b. The pump bowls shall be constructed of ASTM A48 Class 30 or 50 cast iron. The pump bowls shall be of sufficient thickness to withstand stresses and strains at full operating pressure. The bowls shall be subjected to a hydrostatic test 140 percent of that specified at the minimum pump shutoff head condition. The bowls shall be designed and manufactured with open and smooth water passages to assure efficient, reliable operation. Each bowl shall have a replaceable wear ring. Bowl to bowl fits shall be rabbet fit.
- c. Bowls shall be flanged with male and female rabbet or threaded for joining to the suction bell and the discharge column. Waterway and the diffusion vanes shall be smooth and free from nodules, bumps, and dips.
- d. The bowls shall be fitted with ASTM B505-91 alloy 954 wear rings.

5. Suction Bell

- a. The suction bell shall have, as an integral part, vanes supporting a central hub in which the bottom bearing is carried below the impeller. The outer suction bell entrance shall be at least the size of the maximum pump bowl dimension and as large as is practical. Maximum entrance velocity shall not exceed six (6) fps. The contour between the outer edge and the impeller suction eye shall be smooth, continuous and bell shaped.

6. Impellers

- a. Pump impellers shall be of the closed or semi-enclosed type. Impellers shall be of ASTM B148-89a Alloy 952 aluminum bronze or 304 stainless steel. Impellers shall be cast in one piece and machined to fit the contour of the bowl. Impellers shall be equipped with replaceable wear rings or with wearing ring hubs for mounting wear rings during future repair or with a bronze bowl liner.
- b. Attach impellers to the shaft with tapered collets or with a Type 316 stainless steel split ring and key.

7. Fasteners

- a. All pumps and column fasteners shall be of Type 316 stainless steel.

8. Motor

- a. Each turbine pump shall be driven by a 150 Hp vertical

hollow shaft motor suitable for 480 volt, 3 phase, 60 hertz. The motor shall be an integral part of the pumping unit, and shall be suitable for mounting as shown on the plans. All motors shall be sized so that they will not be overloaded at their rated capacity at any point on the pump performance curves. Motors shall be TEFC with Class F insulation and shall have a minimum service factor of 1.15.

- b. Each motor shall have thrust bearing(s) capable of carrying the dead weight of all rotating parts of the pump plus the hydraulic thrust incurred during operation.
- c. Motor shall be vertical solid-shaft, squirrel cage induction type and shall conform to AIEE standards. All bearings shall be oil or grease lubricated, with proper provisions made to guard against the escape of lubricant.
- d. Motors shall be “inverter duty rated” and shall conform to the NEMA “High” standard for premium efficiency. The nameplate on the motor shall also indicate the motor is “inverter duty rated” to the NEMA “High” standard for premium efficiency. A 120V space heater shall be supplied with the motor.
- e. Thermostats shall be provided in the windings of each phase to afford protection against excessive operating temperature. Thermistors shall be normally closed, suitable for operations on 120 VAC, with leads from the same routed to an accessory conduit box for connections separate from the power wiring.

2.04 SHOP PAINTING

- A. The interior and exterior of the pump column, pump bowl, discharge head, and any other ferrous metal surface that may come into contact with raw or potable water shall be coated with a high build modified epoxy meeting the requirements of the National Sanitation Foundation Standard 61. The coating shall have a dry film thickness of at least 10 mils. Vitreous enamel may be used in lieu of epoxy for the interior of the pump bowls.

2.05 QUALITY CONTROL

- A. **Functional Tests:** Test complete assemblies for correct rotation, proper alignment and connection, and quiet operation.
- B. **Performance Tests:** In accordance with Hydraulic Institute Standards.

PART 3 – EXECUTION

3.01 PREPARATION

A. Shop Painting

- 1. Before exposure to weather and prior to shop painting, all surfaces shall be thoroughly cleaned, dry and free from all mill-scale, rust, grease, dirt and other foreign matter.
- 2. All nameplates shall be properly protected during painting.
- 3. Gears, bearing surfaces, and other similar surfaces obviously not to be

painted shall be given a heavy shop coat of grease or other suitable rust resistant coating. This coating shall be maintained as necessary to prevent corrosion during periods of storage and erection and shall be satisfactory to the Engineer up to the time of the final delivery.

4. Certify coatings in contact with raw or potable water meet NSF Standard 61.

3.02 INSPECTION AND TESTING

A. General Information

1. The Engineer shall have the right to inspect, test or witness tests of all materials or equipment to be furnished under these specifications, prior to their shipment from the point of manufacture.
2. The Engineer shall be notified in writing prior to initial shipment, in ample time so that arrangements can be made for inspection by the Engineer.
3. Field tests shall not be conducted until such time that the entire installation is complete and ready for testing.

B. Factory Pump Tests

1. Certified pump performance curve shall be submitted, including head, capacity, brake horsepower, and pump efficiency. Certified data shall be provided to indicate the NPSH required by the pumps will not exceed the amount of NPSH available at any point on the operating curves. Not required in emergency situations.

3.03 MATERIALS OF CONSTRUCTION

1. Pump Shafts, Shaft Coupling, and Sleeves – ASTM A582-88a 416 Stainless Steel.
2. Bowl Wear Rings or Seal Rings for Bowls 24” Diameter and Larger - ASTM B505-91 Alloy 954.
3. Bearing Retainers (fabricated integral) – Carbon Steel, A 283, Grade B
4. Bearing Retainers - Cast Iron ASTM B 584, Alloy C 93700, or C-83600
5. Impellers Aluminum Bronze – ASTM B148-89a, Alloy 954
6. Lantern Ring Bronze – B 584, Alloy C 83600 or ASTM B 62
7. Pump Bowls and Suction Intake – Cast Iron, A 48, Class 30 or 50
8. Bowl Bearings Bronze – B 584, Alloy C 93700; SAE 660 Bronze, Alloy 932.00
9. Lineshift Bearings – Neoprene
10. All parts made of fabricated steel – Carbon Steel, ASTM A 283, Grade B or C, or ASTM A 53, Grade B
11. Flanges, ASTM A 105, A 181, or A 182
12. Bolts – Type 316 stainless steel conforming to ASTM A 193, Grade B8M
13. Nuts – Type 316 stainless steel conforming to ASTM A 194, Grade 8M
14. Stuffing Box Glands Parts – Bronze, ASTM B 584, Alloy 836, or ASTM B 62 or 416 stainless steel, or ASTM A226, Type 316
15. Gland Nuts and Bolts – Stainless Steel, ASTM A 276, Type 316 Bolts

with Bronze Nuts

Notes:

Materials of construction for components not listed shall conform to AWWA E101, Part A, Table 1, except that the materials shall be considered required, not typical. Do not construct the impeller and bowl liner of the same material.

4.01 REPAIR SHOP REQUIREMENTS

A. General

1. An updated Quality Control Manual outlining processes and procedures for the complete process of pump disassembly, cleaning, inspection, repair, assembly, and coating shall be maintained and available for review upon request. The manual shall be based on generally accepted standards as related to factory standards, HSI standards, and machining techniques.
2. Written documentation with measurements, pictures and pertinent information shall be recorded during the DCI of the pump indicating actual measurements and clearances as found. Upon completion of the repair an as built document shall be prepared with photos throughout the assembly process.
3. A final inspection shall be performed by a dedicated full time Quality Control Inspector to ensure quality of the repair and that process and procedures were followed. The unit shall not leave the repair facility without final inspection being completed and proper documentation of the final inspection.

B. Materials Identification

1. Shop shall maintain a calibrated materials of construction identification instrument capable of identifying each component's metallurgy. Shop shall insure proper materials are utilized in repair process to prevent galling and seizure of the rotating and stationary components.
2. Each rotating element shall be dynamically balanced as an individual component (each impeller). After the completion of the individual component balance to manufactures standard. The rotating element shall be assembled and balanced as a complete rotating assembly, timing marked, disassemble, and reassembled to insure proper assembly balance. A written report of individual and complete unit balancing shall be provided.
3. All measurement devices shall be calibrated by a third party capable of certifying the accuracy of the devices being utilized in the repair process.
4. Company performing repairs shall have a repair shop located within 40 miles of utility. The shop shall grant access to Owner at any point during the repair process to inspect work being performed to data. The repair facility shall have the capability and equipment needed to remove, install and start -up repaired equipment if so needed.

4.02 ADDITIONAL WORK

- 1. Change existing flow meter with FLG x FLG spool piece**
- 2. Install a new ARV**
- 3. Provide a spare 150 Hp motor**

BID QUOTATION SHEET

City of Irondale, Alabama


Item #	Quantity	Description	Total Lump Sum
1	1	Furnish and Install a New Deep Well Turbine Pump and Motor as Per Specification listed above.	\$ <u>149,000.00</u>
2	1	Delivery and Install Date	<u>3/12/2025</u>

THE AWARD OF THE BID WILL BE BASED ON THE TOTAL/SUM OF THE BASE BID PRICE AND THE DELIVERY DATE. ONCE THE CITY COUNCIL HAS APPROVED THE BID, THE SUCCESSFUL BIDDER WILL COORDINATE A DELIVERY/INSTALL DATE. THE PURCHASE ORDER WILL BE TRANSFERRED FROM THE OWNER TO THE SUCCESSFUL BIDDER. THE OWNER RESERVES THE RIGHT TO SELECT THE SUCCESSFUL BIDDER BASED ON THE DELIVERY AND INSTALL DATE.

THE UNDERSIGNED OFFERS THESE PRICES, TERMS, AND DELIVERY AS PER BID GENERAL CONDITIONS AND SPECIFICATIONS. BIDS SUBMITTED ARE FIRM AND NO CLAIMS FOR ERRORS WILL BE MADE AFTER BIDS ARE OPENED.

NAME OF COMPANY: Morrow Water Technologies

BY (Please Print): Carney Holland

SIGNATURE (Authorized Representative): 

COMPANY ADDRESS: 7440 Cahaba Valley Road
Birmingham AL, 35242

PHONE: 205.789.4556

E-MAIL: cholland@morrowwater.com

Exhibit A – Insurance Exhibit

Insurance Coverage to be Provided:

Commercial General Liability

Including products/completed operations, independent contractor's protective, broad form contractual liability, and broad form property damage, with no exclusions for explosion, collapse and underground property damage. The General Aggregate limit shall be on a per project basis and shall be shown as such on the certificate of insurance:

Bodily Injury and Property Damage	\$2,000,000 Each Occurrence
Personal Injury	\$2,000,000 Each Occurrence
General Aggregate	\$4,000,000
Products/Completed Operations Aggregate	\$4,000,000

Automobile Liability (Including all owned, hired/leased and non-owned automobiles.)

Bodily Injury and Property Damage	\$1,000,000 Combined Single Limit
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Umbrella/Excess Liability

Bodily Injury and Property Damage	\$5,000,000 Each Occurrence
	\$5,000,000 Policy Aggregate

Worker's Compensation

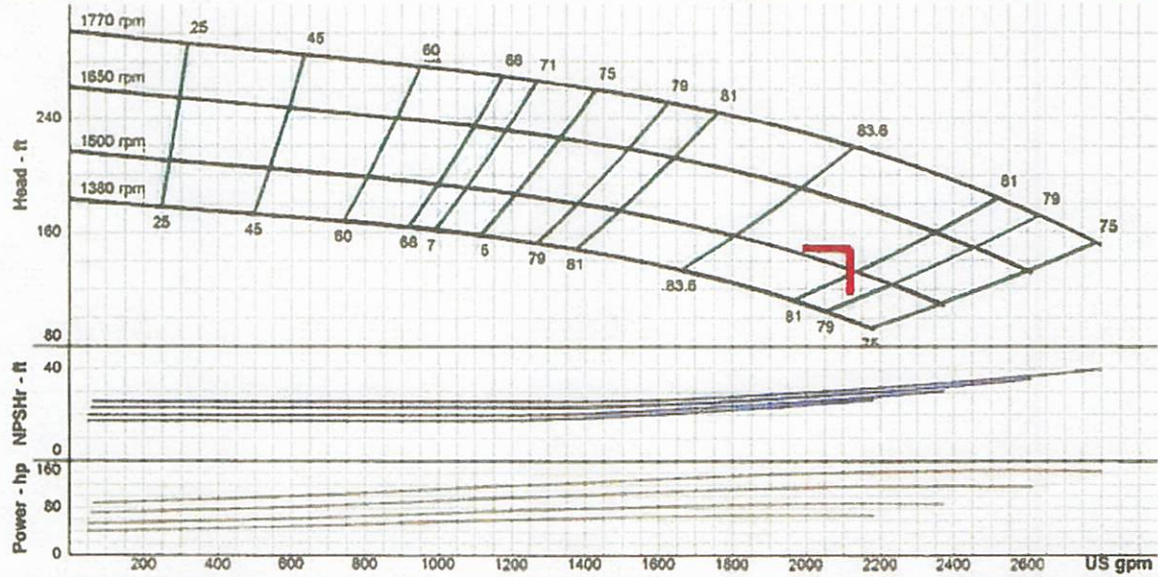
Limit of Liability	As required by Alabama law
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Employer's Liability

	\$1,000,000 Per Accident
	\$1,000,000 Disease (Policy Limit) \$1,000,000 Disease (Each)

Performance Curve

Product Name: DWT - Deep Well Lineshaft Turbine Quote Name: Random
Product Id: DWT Quote Number: 9001-240827-023



Curve & hydraulic data presented is nominal performance based on ANSI/HI 14.6 acceptance grade 1B. Design values are guaranteed within the following tolerances: Flow \pm 5%, Head \pm 3%, and optionally either Power + 4% or Efficiency - 3% at manufacturer's discretion.

Series	DWT	Max Power on Design Curve	145.00 Hp
Size	14RJHC	Flow at BEP	2,132 USgpm
Additional Size	-	Head at BEP	220 ft
Speed	1,770 RPM	NPSH Required	31.1 ft
Number of Stages	3	Specified NPSH Avail.	33.17 ft
Frequency	60 Hz	Specified NPSH Avail. Margin	1.1
Impeller Trim	8.9375 in	Min Flow	533 USgpm
Additional Impeller	-	Shut Off Head	302 ft
Specified Flow	2,120 USgpm	Shut Off Power	87.7 Hp
Specified Head	149 ft	Shut Off Disc Pressure	131 psi
Flow at Design	2,120 USgpm	Fluid Type	Water
Head at Design	221 ft	Water Temperature	68 F
Run Out Flow	2,802 USgpm	Allowable Sphere Size	1.06 in
Run Out Head	151 ft	Exact Bowl Diameter	13.63 in
Run Out Power	143 Hp	Thrust K Factor	16.2 lb/ft
Run Out Efficiency	74.6 %	Add Thrust K Factor	16.2 lb/ft
Run Out NPSHr	40 ft	Max Lateral	1.25 in
Efficiency at Design	83.60 %	Total Flow Derate Factor	1
Best Efficiency	83.6 %	Total Head Derate Factor	1
Driver Size	150 Hp	Total Efficiency Derate Factor	1
Power at Design	141 Hp	Total NPSHr Derate Factor	1
Flow on Design Trim @ Max Power	2,580 USgpm	Acceptance Grade	1B
Service Factor	No		