SECTION 43 21 13

RECOVERY WELL PUMPS

PART 1. GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required to install four Well Pumps as detailed in this section. Installation shall be complete and include, but not be limited to: pump controls, level switches, connectors, clamps, couplings, discharge hose, support cables, electrical cables, and appurtenances as shown on the Technical Drawings and referenced in the Technical Specifications.

1.2 RELATED SECTIONS

A. Section 01 01 00 Scope of Work

B. Section 01 33 00 Submittal Procedures

C. Section 01 78 00 Closeout Submittals

D. Section 01 78 23 Operation and Maintenance (O&M) Data

E. Section 41 10 02 Process Piping and Appurtenances

F. Section 26 00 00 Basic Electrical Materials and Methods

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced.

HYDRAULIC INSTITUTE STANDARDS FOR CENTRIFUGAL, ROTARY, AND RECIPROCATING PUMPS (HI)

ANSI/HI 1.1-1.6 Centrifugal Pumps

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 240 316/316L Stainless Steel

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

(ISO)

ISO 9001 Quality Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG1 Motors and Generators.

1.4 SUBMITTALS

A. The following shall be submitted in accordance with Section 01 33 00 Submittals:

1. Shop Drawings: Submit shop drawings for pumps including, dimensions, materials of construction, bills of materials, motor data, certified performance curves, parts lists, pumps mounting arrangement, and tie in connections.

2. Product Data: Submit product data describing equipment features, materials of fabrication, general dimensions, pump curves, and general operating parameters.

3. Factory Tests: Test reports in booklet form showing the results of factory tests performed.

4. Field Tests and Inspections: Test reports in booklet form showing results of the field tests performed to adjust each component following the installation of the system and the field tests performed to prove compliance with the specified performance criteria. Each test report shall indicate the final position of controls.

5. Submit the operation and maintenance (O&M) manual and required number of copies in accordance with Section 01 78 23.

1.5 DELIVERY AND STORAGE, AND HANDLING

A. All equipment shall be protected against damage during shipment.

B. All equipment shall be preassembled to the largest extent possible, compatible with transportation limitations and equipment protection considerations.

C. All equipment shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation. Exposed iron or steel surfaces shall be properly protected to prevent rust and corrosion.

1.6 QUALIFICATIONS AND WARRANTY

A. Manufacturer Qualification

1. The Pumps shall be supplied by a reputable Manufacturer having at least ten
(10) years' experience in the design and fabrication of pumps for the treatment of groundwater and water.

B. Warranty

1. Manufacturer shall provide warranty in accordance with Section 01 78 00 of the specifications.

1.7 TOOLS AND SPARE PARTS

A. All tools required for normal operation and maintenance of each piece of equipment shall be furnished. Special tools recommended by the Manufacturer shall also be furnished. The tools shall be stored in a dedicated cabinet or tool box and labeled "Groundwater Extraction Well Pumps". An inventory log shall be maintained and stored with the tools. All items shall be suitably packed and protected for long periods of storage.

1.8 EQUAL PRODUCTS

A. The Contract Drawings and Technical Specifications are based on using Grundfos pumps. Should the Contractor propose to furnish equal equipment of a different configuration, the Contractor shall be responsible for all revisions necessary to incorporate the proposed pumps into the design, and submit the necessary revised Contract Drawings and Technical Specifications for review and approval by the COR.

PART 2. PRODUCTS

2.1 PUMPS

A. Provide the pumps shown below in the pump list. The proposed equipment is subject to verification of capacity per the field pump test as performed by the Contractor.

1. Recovery pumps and motors shall be preassembled as a single unit, submersible, shrouded, centrifugal, and of "Grundfos" make, or approved equivalent.

2. Built-in check valve with spring.

3. Check Valve Housing, Check Valve, Diffuser Chamber, Impeller, Suction Interconnector, Inlet Screen, Pump Shaft, Straps, Cable Guard, Priming Inducer: 304 SS

4. Check valve seat: PTFE

5. Impeller Seal Ring: PTFE

6. Coupling: 316 SS

7. Intermediate Bearings: PTFE

8. Pumps shall fit inside the well casing diameter as specified in the Contract Drawings (12" nominal).

9. Motors for P-8 shall have a 1.60 service factor and Motor for P-9 and P-10A shall have 1.15 service factor.

10. Motor for P-8 shall be suitable for 460V, 3 phase, 60Hz whereas motors for P-9 and P-10A shall be suitable for 230V, 3 phase, 60Hz power source.

11. Motors shall be furnished with a lifting eye and a power cable from the pump motor to the terminal box.

PUMPING SYSTEM LIST:

Pump ID	Manufacturer / Model	Connection Size	Operating Flow (gpm)	TDH (ft)	Motor (HP)
P-8 (for RW-8)	GRUNDFOS (MODEL 625S300-2AA)	6 inch	Design=450 Maximum=600	107 111	30
P-9 (for RW-9)	GRUNDFOS (MODEL 625S300-2AA)	6 inch	Design=450 Maximum=600	115 126	30
P-10A (for RW-10A)	GRUNDFOS (MODEL 625S400-2)	6 inch	Design=600 Maximum=700	145 159	40

2.2 MATERIALS FABRICATION

A. Pumps shall be fabricated from Stainless Steel material and chemically compatible with the groundwater contaminants. Impeller Seal Ring, Intermediate Bearings and Valve seat shall be PTFE (Teflon®).

B. The pump and applicable connections shall be rated for a minimum of 175 psi.

C. Each pump shall be supported by one 316 stainless steel support cable. Support cable shall be sized and connected in accordance with the pump manufacturer’s recommendations.

PART 3. EXECUTION

3.1 EXAMINATON

A. After becoming familiar with all details of the work, verify dimensions in the field, and advise the COR of any discrepancy before performing the work.

3.2 INSTALLATION

A. Installation of the pumps and all appurtenances shall be in accordance with the manufacturer’s recommendations.

B. The pump shall be inspected visually prior to installation.

C. Equipment installation shall be in accordance with the manufacturer's written instructions and in the presence of the Manufacturer’s representative.

D. Pumps discharge pipe, lifting cable and cables will extend thru a well cap located inside a valve pit. A level transducer will also be installed at each location and related control wire will be extended thru the well cap.

3.3 FIELD TESTS AND INSPECTIONS

A. Field tests shall not be conducted by the Contractor until such time that the entire installation is complete and ready for testing.

B. As part of the installation inspection, the Contractor shall operate the pumps and check for excessive noise, vibration or heating, and for discharge adequacy. The pumps shall be tested over the full range of flow conditions.

C. The pump and suction/discharge piping shall be inspected by the Contractor in the presence of the COR for leakage.

D. If the installation inspection reveals deficiencies, corrective measures shall be taken by the Contractor until the pumps satisfy the specified requirements.

3.4 MANUFACTURERS SERVICES

A. Installation, Adjustment, and Testing: Provide a manufacturer's representative who is experienced in the installation, adjustment, and operation of the equipment to supervise the installation, adjustment and testing of the equipment for a period of 5 working days (8 hours a day).

B. Conduct a video recorded training course for designated operating, maintenance and support staff members. The training period shall be a total of 4 hours of normal working time. Field training shall cover each item contained in the operating and maintenance manual.

END OF SECTION