

**JORDAN VALLEY WATER CONSERVANCY DISTRICT**

**98<sup>th</sup> & 23<sup>rd</sup> Well Development Pumping and Pump Testing  
Project #4119  
January 12, 2021**

**DESCRIPTION OF WORK:** This project consists of the installation of well pumping development equipment and pump testing of the culinary water well located at 9800 South 2300 East. The data collected from the pump testing will be used to size the permanent pumping equipment for the well. The permanent pumping equipment will be sourced through a separate contract following the completion of the 98<sup>th</sup> & 23<sup>rd</sup> Well Development Pumping and Pump Testing project.

**PROJECT SCHEDULE:** The project shall be completed within 60 calendar days from the date of acceptance of the Award of Purchase Order. If the work is not completed within the specified time frame, the bidder herein agrees to accept liquidated damages in the amount of \$100 per day.

**RECEIPT OF BIDS:** Sealed bids will be received at the administration office of the Jordan Valley Water Conservancy District, Owner of the Work, located at 8215 South 1300 West, West Jordan, Utah 84088, until **3:00 pm, on Friday, January 22, 2021**, for the 98<sup>th</sup> & 23<sup>rd</sup> Well Development Pumping and Pump Testing project.

Electronic Bids will also be acceptable. Electronic bids shall be submitted to the Engineering Department's Administrative Assistant as listed below in the Address and Marking of Bid.

**OBTAINING CONTRACT DOCUMENTS:** The Contract Documents are entitled: "98<sup>th</sup> & 23<sup>rd</sup> Well Development Pumping and Pump Testing". All Contract Documents may be obtained on the District's website ([www.jvwcd.org](http://www.jvwcd.org)). Prospective bidders must register at the District's web site under the project to receive project notifications and addenda, if any. Contractors are required to check the District's web site for any addenda prior to submitting a responsive bid. Bids determined to be non-responsive may be rejected.

JVWCD project manager/contact person: Kevin Rubow  
Telephone Number: (801) 565-4300  
Email Address: [KevinR@jvwcd.org](mailto:KevinR@jvwcd.org)

**SITE OF WORK:** 9800 South 2300 East Well: 9785 Eastdell Drive, Sandy, Utah

**PRE-BID Meeting:** A non-mandatory pre-bid meeting will be held at **2:00 pm on Tuesday, January 19, 2021** via a virtual online meeting. Prospective bidders with questions regarding the project are encouraged to attend and shall request a meeting link via email from the Engineer at [mark.chandler@crsengineers.com](mailto:mark.chandler@crsengineers.com) prior to the pre-bid meeting.

**AWARD OF CONTRACT:** An Award of Contract, if awarded, will be made within 60 calendar days of the opening of bids. Contract will be awarded based upon the lowest cost responsive bid.

**BONDS:** Bid bonds and Performance Bonds shall be required for any bid with a total cost greater than \$50,000.

**BIDDER REQUIREMENTS:** The bidder shall have a valid Utah Business license and a valid Utah Contractors license appropriate for the work. The successful bidder will have completed a minimum of three (3) projects of similar nature. The Owner shall be entitled to contact each reference listed by the contractor.

<u>Job Name/Description</u>	<u>Contact</u>
1.	
2.	
3.	

**ADDRESS AND MARKING OF BID:** The envelope enclosing the bid shall be sealed and addressed to the Jordan Valley Water Conservancy District and delivered or mailed to 8215 South 1300 West, West Jordan, Utah 84088. The envelope shall be plainly marked in the upper left-hand corner with the name and address of the bidder and shall bear the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids.

Electronic bids shall be submitted to the Engineering Department's Administrative Assistant, Ellisa Demetsky at [EllisaD@jvwcd.org](mailto:EllisaD@jvwcd.org), as an email attachment with the words "Bid for," followed by the title of the Contract Documents for the work and the date and hour of opening of bids in the subject line of the email. Electronic bids shall be received prior to the time and date listed in the Receipt of Bids.

**PROJECT ADMINISTRATION:** All questions relative to this project prior to the opening of bids shall be directed to the Engineer for the project. It shall be understood, however, that no interpretations of the specifications will be made by telephone, nor will any "or equal" products be considered for approval prior to award of contract.

**OWNER'S RIGHTS RESERVED:** The Owner reserves the right to reject any or all bids, to waive any informality in a bid, and to make awards in the interest of the Owner.

**ENGINEER**  
CRS Engineers  
4246 South Riverboat Road Ste. 200

Salt Lake City, Utah 84123  
Telephone: (801) 359-5565  
Contact: Mark Chandler, PE, PG  
Email: [mark.chandler@crsengineers.com](mailto:mark.chandler@crsengineers.com)

Owner

Jordan Valley Water Conservancy District  
Project Manager: Kevin Rubow, P.E.  
8215 South 1300 West  
West Jordan, Utah 84088  
Telephone: (801) 565-4300  
Email: [KevinR@jvwcd.org](mailto:KevinR@jvwcd.org)

JORDAN VALLEY WATER CONSERVANCY DISTRICT

## INSTRUCTIONS TO BIDDERS

**WARRANTY:** The successful bidder shall warrant the equipment and installation to be free of defects in materials and workmanship for a period of one (1) year following satisfactory start-up and testing of the equipment.

**INSURANCE REQUIREMENTS:** Prior to awarding a purchase order the bidder must furnish certificates of insurance to include the following policies. The limits of liability for the insurance required in this project shall provide for not less than the following amounts or greater where required by Laws and Regulations:

1.    Workers' Compensation

    A.     State: Utah   Statutory

2.    Comprehensive General Liability

    A.     Bodily Injury (including completed operations and products liability):

          \$500,000   Each Occurrence  
          \$1,000,000   Annual Aggregate  
          or a combined single limit of                 \$1,000,000

    B.     Property Damage liability insurance including Explosion, Collapse and Underground coverages where applicable.

    C.     Personal Injury, with employment exclusion deleted.  
          \$1,000,000   Annual Aggregate

3.    Comprehensive Automobile Liability:

    A.     Bodily Injury

          \$500,000   Each Person  
          \$1,000,000   Each Occurrence

    B.     Property Damage:

          \$500,000   Each Occurrence  
          or combined single limit of                 \$1,000,000

**BID SCHEDULE**

<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Est. Qnty.</b>	<b>Bid Unit Price</b>	<b>Bid Price</b>
1	Mobilization/ Demobilization	LS	1		
2	Furnish, Install, and Remove Temporary Pump	LS	1		
3	Pump Development	HR	40		
4	Step Drawdown Test	HR	12		
5	Constant Rate Test	HR	24		
<b>Total of All Unit Price and Lump Sum Bid Items</b>					\$

**Total Bid Price** including all system features shown or specified to make all project components complete and operable for the 98<sup>th</sup> & 23<sup>rd</sup> Well Development Pumping and Pump Testing in words:

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Bidder (Company name): \_\_\_\_\_

By: \_\_\_\_\_  
(Signature)

Dated: \_\_\_\_\_

Name: \_\_\_\_\_  
(Print)

Title: \_\_\_\_\_

**ATTACHMENTS TO THIS BID**

The following documents are attached to and made a condition of this Bid:

1. Required Bid security in the form of Bid Bond.
2. Information Required of Bidder.

## INFORMATION REQUIRED OF BIDDER

The Bidder shall furnish the following information. Failure to comply with this requirement may render the Bid non-responsive and subject to rejection. Additional sheets shall be attached as required. No bid for the work will be considered from a bidder who does not hold an active license in good standing applicable to the type of work bid upon at the time of submission of the bid.

1. Contractor's name: \_\_\_\_\_

2. Contractor's address: \_\_\_\_\_

\_\_\_\_\_

Contractor's Primary Contact: \_\_\_\_\_

Email address of Contractor's primary contact: \_\_\_\_\_

Contractor's telephone number: \_\_\_\_\_

3. Utah Department of Commerce Information  
Business Entity Number: \_\_\_\_\_  
Delinquent Date: \_\_\_\_\_

4. Contractor's Utah License Number: \_\_\_\_\_  
Expiration Date: \_\_\_\_\_  
Primary Classification: \_\_\_\_\_  
Supplemental Classification held, if any: \_\_\_\_\_

5. Number of years as a contractor in work of this type:  
\_\_\_\_\_

6. As necessary, attach to your bid technical information showing compliance with the defined scope of work and/or technical specifications.

**Project Requirements:**

The work to be performed under this project shall consist of furnishing all labor, materials, and equipment necessary or required to complete the work in all respects as shown on the Drawings and as herein specified. All work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary to complete the construction of the work in good faith shall be performed, furnished, and installed by Contractor as though originally so specified or shown, at no increase in cost to Owner.

Contractor is required to provide all necessary City construction permits as required to complete the work at its cost. Contractor is responsible to keep the work site in a clean and safe condition while completing the work. The Contractor shall comply with its written safety policy for all work which shall include air-quality testing and use of personal protective equipment. Sanitary equipment, including one portable toilet, shall be provided by the Contractor for the duration of the work.

Payment shall be made by the Owner upon monthly submittal of a PAYMENT APPLICATION AND CERTIFICATE (included). Payment will be made within 30 days of approval of work completed by the project manager. Change Orders (if any), will be per the District's standard form (included). Substantial Completion and Final Completion certificates (included) shall be presented by the contractor to the Owner's Project Manager for approval.

**AWARD OF PURCHASE ORDER**

The Jordan Valley Water Conservancy District (Owner) hereby accepts your Bid dated \_\_\_\_\_ . In accordance with your Bid and the Owner’s Contract Documents dated \_\_\_\_\_ , the Owner has created a purchase order in the amount of \$ \_\_\_\_\_ for the project entitled “ \_\_\_\_\_ ”. The completion date is \_\_\_\_\_ calendar days from the Acceptance Date of this Award by you.

You should sign and return this Award of Purchase Order within 10 calendar days from the date of this notice to you.

Sincerely,

Alan E. Packard, P.E.  
Assistant General Manager and Chief Engineer

\_\_\_\_\_  
Award Date

**ACCEPTANCE OF AWARD**

\_\_\_\_\_, a corporation qualified to do business in the State of Utah, hereby agrees to perform as specified in its Bid, the Owner’s Contract Documents, and this Award of Purchase Order.

\_\_\_\_\_

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Acceptance Date

Attachments: Bid



**PAYMENT APPLICATION AND CERTIFICATE No.** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**SHEET** \_\_\_\_\_ **OF** \_\_\_\_\_

PERIOD FROM \_\_\_\_\_ TO \_\_\_\_\_, 20\_\_\_\_

PROJECT: \_\_\_\_\_

JVWCD PROJECT NO.: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

ENGINEER: \_\_\_\_\_

1. ORIGINAL CONTRACT PRICE:..... \$ \_\_\_\_\_
2. NET CHANGE ORDERS APPROVED TO DATE:..... \$ \_\_\_\_\_  
(Attach Summary Sheet)
3. REVISED CONTRACT AMOUNT:..... \$ \_\_\_\_\_  
(Sum of Lines 1 & 2)
4. TOTAL VALUE OF WORK COMPLETED TO DATE ..... \$ \_\_\_\_\_  
..... (Attached Payment Breakdown)
5. PERCENT PROJECT COMPLETE: ..... \_\_\_\_%  
(Divide Line 4 by 3 and multiply by 100)
6. LESS AMOUNT RETAINED (5%) ..... \$ \_\_\_\_\_
7. MATERIALS ON HAND..... \$ \_\_\_\_\_  
(95% of Value, Listing Attached)
8. SUBTOTAL (Sum of Lines 4, Line 6 and Line 7) ..... \$ \_\_\_\_\_
9. LESS PREVIOUS PAYMENTS ..... \$ \_\_\_\_\_
10. CURRENT PAYMENT DUE: ..... \$ \_\_\_\_\_  
(Line 8 & 9)

Payment Application and Certificate No \_\_\_\_\_

SHEET \_\_\_\_\_ OF \_\_\_\_\_

**CONTRACTOR'S Certification:**

The undersigned CONTRACTOR certifies that: (1) all previous progress payments received from OWNER on account of work done under the Contract referred to herein have been applied to discharge in full all obligations of CONTRACTOR incurred in connection with work covered by prior Applications for Payment numbered 1 through \_\_\_ inclusive; and, (2) title to all materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all liens, claims, security interests and encumbrances (except such as covered by bond acceptable to OWNER).

Dated: \_\_\_\_\_ CONTRACTOR: \_\_\_\_\_

By: \_\_\_\_\_

**Recommendation:**

This Application (with accompanying documentation) meets the requirements of the Contract Documents and payment of the amount due this application is recommended.

Dated \_\_\_\_\_  
Project Representative

Dated \_\_\_\_\_  
Project Manager

**CHANGE ORDER**

Order No: \_\_\_\_\_

Date: \_\_\_\_\_

Page \_\_\_ of \_\_\_

NAME OF PROJECT: \_\_\_\_\_

PROJECT NUMBER: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

CONTRACT DATE: \_\_\_\_\_

The following changes are hereby made to the CONTRACT DOCUMENTS:

- 1)
- 2)
- 3)

Total Change to CONTRACT PRICE: ..... \$

Original CONTRACT PRICE: ..... \$

**Current CONTRACT PRICE adjusted by previous CHANGE ORDER(S) ..... \$**

**The new CONTRACT PRICE including this CHANGE ORDER will be ..... \$**

The CONTRACT TIME will be increased by \_\_\_\_\_ calendar days.

The date for Substantial Completion will be \_\_\_\_\_, 20\_\_.

The date for Final Completion will be \_\_\_\_\_, 20\_\_.

The Contractor agrees to furnish all labor and materials and perform all work as necessary to complete the change order items for the price named herein, which includes all supervision and miscellaneous costs. This change order constitutes full and mutual accord and satisfaction for all time and all costs related to this change. By acceptance of this change order the Contractor agrees that the change order represents an equitable adjustment to the Contract, and further agrees to waive all right to file a claim arising out of or as a result of this change. This document will become a supplement to the Contract, and all provisions will apply hereto, upon approval by the Owner.

**CHANGE ORDER  
(CONTINUED)**

Order No. \_\_\_\_\_

Date: \_\_\_\_\_

Page \_\_\_ of \_\_\_

Accepted:

\_\_\_\_\_  
Contractor -

\_\_\_\_\_  
Date

Approved:

\_\_\_\_\_  
Owner - Jordan Valley Water Conservancy District

\_\_\_\_\_  
Date

**CONTRACTOR'S CERTIFICATE  
OF  
SUBSTANTIAL COMPLETION**

**OWNER**

TO: Jordan Valley Water Conservancy District  
8215 South 1300 West  
P. O. Box 70  
West Jordan, Utah 84088

PROJECT: \_\_\_\_\_

ATTENTION: \_\_\_\_\_

FROM: \_\_\_\_\_  
Firm or Corporation

This is to certify that I, \_\_\_\_\_ am an authorized official of working in the capacity of \_\_\_\_\_ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been substantially performed and all materials used and installed to date are in accordance with, and in conformity to, the contract drawings and specifications. A list of all incomplete work is attached.

The Contractor hereby releases the Owner and its agents from all claims of and liability to the Contractor for anything done or furnished for or relating to the work, as further provided in Article 14.08B of the General Conditions, except demands against the Owner for the remainder of progress payments retained to date, and unresolved written claims prior to this date.

The contract work is now substantially complete, ready for its intended use, and ready for your inspection. You are requested to issue a Certificate of Substantial Completion.

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

**CONTRACTOR'S CERTIFICATE  
OF  
FINAL COMPLETION**

**OWNER**

TO: Jordan Valley Water Conservancy District  
8215 South 1300 West  
P. O. Box 70  
West Jordan, Utah 84088

PROJECT: \_\_\_\_\_

ATTENTION: Project Representative: \_\_\_\_\_

**FROM:** \_\_\_\_\_

Firm or Corporation

This is to certify that I, \_\_\_\_\_ am an authorized official of working in the capacity of \_\_\_\_\_ and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been performed and all materials used and installed to date are in accordance with, and in conformity to, the contract drawings and specifications.

The Contract work is now complete in all parts and requirements, excepting the attached list of minor deficiencies and the reasons for each being incomplete to date, for which exemption from final payment requirements is requested in conformance to Article 14.09A of the General Conditions of our Contract (if no exemptions requested, write "none") \_\_\_\_\_. The work is now ready for your final inspection. The following items are required from the Contractor prior to application for final payment (such as O & M Manuals, guarantees, record drawings, etc.) are submitted herewith, if any:

\_\_\_\_\_

I understand that neither the issuance by the Engineer of a Notice of Completion, nor the acceptance thereof by the Owner, shall operate as a bar or claim against the Contractor under the terms of the guarantee provisions of the Contract Documents.

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

**SPECIFICATIONS  
&  
DRAWINGS**

**SECTION 01 02 50  
MEASUREMENT AND PAYMENT**

**PART 1 GENERAL**

1.1 SECTION INCLUDES

- A. Measurement and payment criteria applicable to portions of the Work performed under a unit price payment method.
- B. Defect assessment and non-payment for rejected work.

1.2 RELATED WORK

- A. Bid Form

1.3 SUBMITTALS

- A. Submit the payment request to Engineer at least 20 days before the date established in the Agreement for each progress payment. Engineer will, within 10 days of receiving the payment request, complete the review of the progress payment and either recommend it for payment to the Owner or return it to the Contractor for correction, per the requirements of the Contract.
- B. Submit an updated progress schedule with each Application for Payment.
- C. Submit Application for Payment on a form approved by the Engineer.

1.4 UNIT QUANTITIES SPECIFIED

- A. Quantities and measurements indicated in the Contract Documents are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment.
- B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum/prices contracted.

1.5 MEASUREMENT OF QUANTITIES

- A. Measurement Devices:
  - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
  - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
  - 3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.
- B. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other



metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

- C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- D. Measurement by Area: Measured by square dimension using mean length and width or radius.
- E. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- F. Lump Sum: Items measured as appropriate, as a completed item or unit of the Work.

## 1.6 PAYMENT

- A. Payment Includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; permits, taxes, overhead and profit.
- B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit sum/price for Work which is incorporated in or made necessary by the Work.
- C. It is the responsibility of the Contractor to fully inform himself regarding all Federal, State and local tax laws, rules or regulations furnished under this Contract, including all exemption provisions and procedures. All bid prices for material, equipment and labor for the Work under this Contract is inclusive of any tax for materials which are imposed by any governing agency to which the Work hereunder is subject. The Contractor is solely responsible for assuring that all applicable taxes are included in his bid.

## 1.7 DESCRIPTION OF BID ITEMS

- A. The work generally consists of the following, which are numbered according to the bid schedule found in the Bid Form:
  - 1. MOBILIZATION/ DEMOBILIZATION
    - a. Measured by lump sum.
    - b. Payment covers cost of mobilization, demobilization, installation of temporary facilities, bringing all necessary construction equipment to the site, all bonds, insurances, permits and fees, traffic control, clearing and grubbing, snow removal to the well site, quality control of materials, preparation of project schedule, final cleanup and project closeout, and all other items not specifically called for in any other bid item or called for in the plans and specifications or is customary, incidental or appurtenant to performance of a complete project.

c. Payment will be made according to the following schedule:

<u>Percent of Original Contract Amount Earned</u>	<u>Percent of Amount Bid for Mobilization to be Paid</u>
5%	40
15%	20
40%	30
50%	10

2. FURNISH, INSTALL, AND REMOVE TEMPORARY PUMP

- a. Measurement is per lump sum for each pump installed and removed
- b. This includes all labor, materials, supplies, tools, and equipment required to provide, install, and remove the pump and associated appurtenance for the development and testing of the production well as, required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.
- c. Payment shall be on a lump sum basis for each full installation and removal of temporary pump for pump development and testing.

3. PUMP DEVELOPMENT

- a. Measurement is on a per hour basis for each hour spent
- b. This item includes all materials, transportation, equipment, tools labor and other items required for performing pump development of the well.
- c. Payment shall be on a unit price basis for each hour spent performing pump development work as part of the project.

4. STEP DRAWDOWN TEST

- a. Measurement is on per hour basis for each hour spent.
- b. This item includes all materials, transportation, equipment, tools, labor, and other items required to perform the step-drawdown test as specified in these specifications.
- c. Payment of this item shall be on a unit price basis for each hour spent to perform the step-drawdown test at the unit price bid per hour.

5. CONSTANT RATE TEST

- a. Measurement is on a per hour basis for each hour spent.

- b. This item includes all materials, transportation, equipment, tools, labor, and other items required to perform the constant rate test as specified in these specifications.
- c. Payment of this item shall be on a unit price basis for each hour spent to perform the constant rate test at the unit price bid per hour.

**PART 2      PRODUCTS**

Not Used.  
**PART 3      EXECUTION**

Not Used.

**END OF SECTION**

## **SECTION 33 20 22 INSTALL DEVELOPMENT PUMP EQUIPMENT**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Work to be performed under this Section includes the work necessary to provide, install, and remove the pump and associated appurtenances for development, test pumping, and water level measurement, and includes installation of a 2-inch water level measurement access pipe.

#### **1.2 RELATED WORK**

- A. Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water

#### **1.3 REFERENCES**

Not Used.

#### **1.4 SUBMITTALS**

Not Used.

### **PART 2 PRODUCTS**

#### **2.1 GENERAL**

- A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

#### **2.2 PUMPING EQUIPMENT**

- A. The test pump shall be a vertical turbine line shaft type pump capable of pumping from 500 to 2000 gallons per minute under the head conditions anticipated for the project. The Contractor shall initially set the pump at 760-feet below ground surface but be capable of lowering the pump setting to achieve the maximum rated capacity of the pump, if necessary.
- B. The pump motor shall be of a variable-speed type and be equipped with sound deadening devices as appropriate. Discharge piping shall be provided by the Contractor and be of sufficient size and length to conduct water to the wastewater disposal area as specified in Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water. The Contractor shall provide instantaneous and totalizing flow meters or other approved devices that will-measure the flow rate to an accuracy of at least 5 percent. The Contractor shall also provide an orifice plate and manometer with appropriate apparatuses to measure discharge flow from the well.

### 2.3 SAMPLE PORT

- A. Provide a sample port at the well head for the collection of water quality samples.
- B. Provide an access port and tube for measurement of water level with an electric water level probe.
- C. Provide a 2-inch diameter access port and tube for water level sensing with a transducer and data logger.

### 2.4 DATA LOGGER AND ELECTRIC WATER LEVEL PROBE

- A. Provide a water level transducer and data logger along with an electric water level probe acceptable to the Engineer.

### 2.5 SAND CONTENT MEASURING DEVICE

- A. Provide a sand content measuring device such as a Rossum centrifugal sand separator, or equal.

## **PART 3 EXECUTION**

### 3.1 GENERAL

- A. Following the completion of initial development with the cable tool rig, the Contractor shall install a deep well high capacity test pump to perform the development of the well by pumping. This pump shall not be removed from the well until all well testing, including recovery monitoring, is complete. All fuel shall be provided by the Contractor.
- B. Provide a 2-inch diameter sounding tube adequate for insertion of water level sensing devices into the well before, during, and after the test pumping. The access pipe must allow free passage of pressure transducers that are 1-inch in diameter and approximately 8-inches long. The sounding tube shall be securely fastened to the pump column assembly, terminate approximately 5 feet above the pump, and be perforated along the bottom 10 feet.
- C. Provide and install a water level transducer and data logger with an electric water level probe to a depth determined by Engineer. Water level transducer and data logger shall remain down-hole until all development and test pumping are complete. Failure of compliance or equipment failure shall result in the contractor performing the test pumping again until satisfactory records are produced from the water level transducer.

**END OF SECTION**

## SECTION 33 20 24 WELL DEVELOPMENT BY PUMPING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Work to be performed under this Section includes the work necessary to develop the production well by pumping.

#### 1.2 RELATED WORK

- A. Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water. Dispose of water and residual drilling fluids generated during surge block and air life or submersible pump development as specified herein.

#### 1.3 REFERENCES

- A. Journal of American Water Works Association, Volume 45, No. 2, February 1984

#### 1.4 SUBMITTALS

- A. The Contractor shall submit pump development data for the well using a form approved by the Engineer.

#### 1.5 NOTIFICATION OF THE ENGINEER

- A. The Contractor shall be responsible to give the Engineer 48-hour advance notice prior to beginning well development pumping for the well.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. The Contractor shall monitor and document the specific capacity (pumping rate and drawdown) of the well as they are developed with the pump. The monitoring frequency and instrumentation shall be approved by the Engineer.
- B. After installation of the test pump equipment, the Contractor shall commence well development by pumping and surging to clear the well of all additional accumulation of mud, sand, and sediment. The initial pumping rate shall be restricted and, as the water clears, shall be gradually increased until the maximum rate is reached. The step increase discharge schedule and maximum pumping rate shall be determined by the Engineer prior to the initiation of pumping. The quantity shall be measured by an approved flowmeter, orifice plate and manometer, or other method approved by the Engineer. At regular intervals, the pump shall be stopped and the water in the pump column allowed to surge back through the pump intake, and the pump restarted. These surging operations, with increasing pumping rates, shall be repeated as development of the well continues and shall be done in a manner satisfactory

- to the Engineer.
- C. The well shall be considered thoroughly developed when it produces water at its maximum discharge rate, based on the depth and nature of the strata screened, and does not produce fine sands in excess of the, sand production limitations or is considered sufficiently developed by the Engineer. The sand production limitations shall be that the water produced by the well contains less than 5 parts per million of sand after 20 minutes of surging and pumping at the desired capacity of the well. In addition, the specific capacity will be stable at any selected pumping rate. During the development pumping, the rate of sand production shall be measured by a centrifugal sand separating meter, such as a Rossum Sand Tester, as described in the Journal of American Water Works Association, Volume 45, No. 2, February 1984. The Rossum Sand Tester shall be provided by the Contractor and placed in a location approved by the Engineer. Development procedures, quantities, sand production, and times shall be recorded in the Driller's Log.
  - D. Upon completion of the development operations, the Contractor shall demonstrate to the satisfaction of the Engineer that the bottom of the well is clear of all sand, mud, and other foreign material.

**END OF SECTION**

## **SECTION 33 20 26 STEP-RATE DRAWDOWN TEST**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Work to be performed under this Section includes the work necessary to test the production well by the Step-Rate Drawdown Test.

#### **1.2 RELATED WORK**

- A. Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water.

#### **1.3 REFERENCES**

Not Used.

#### **1.4 SUBMITTALS**

- A. The Contractor shall submit pump test data for the well in hard copy and electronic form.

#### **1.5 NOTIFICATION OF THE ENGINEER**

- A. The Contractor shall be responsible to give the Engineer 48-hour advance notice prior to beginning the step rate drawdown test for the well.

### **PART 2 PRODUCTS**

#### **2.1 GENERAL**

- A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.
- B. Provide water level pressure transducer and data logger as specified.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. A step-rate drawdown (discharge) test shall be performed to determine well performance characteristics.
- B. The step-rate drawdown test will be performed after the well has been sufficiently developed by the test pump as approved by the Engineer.
- C. The Contractor shall monitor and document the specific capacity (pumping rate and



drawdown) of the well as it is pumped. The monitoring frequency and instrumentation shall be approved by the Engineer.

- D. During the step-rate drawdown test the discharge rates from the pump shall be controlled by both a valve and engine throttle. The discharge rate shall be controlled and maintained at approximately the desired discharge rate for each step with inaccuracy of at least plus or minus 5 percent. Pump discharge rates shall be measured with instantaneous and totalizing flow meters as approved by the Engineer.
- E. Step-Rate Drawdown Test: The well shall be "step" tested at rates of approximately 1/2, 3/4, 1, 1.25, and 1.5 times the design capacity of the well or at rates specified by the Engineer. The test shall be conducted under the supervision of the Engineer.
- F. Whenever continuous pumping at a uniform rate has been specified, failure of pump operation shall require that the test be aborted and further testing suspended until the water level in the pumped well has recovered to its original level for the purposes of this section, recovery shall be considered "complete" after the well has been allowed to rest-for a period at least equal to the elapsed pumping time of the aborted test, with the exception that if any three successive water level, measurements spaced at least 20 minutes apart show no further rise in the water level in the pumped well, the test may be resumed at the direction of the Engineer.
- G. Any test that does not meet the duration requirement specified above; or that is initiated too soon after an aborted test as defined above, shall be declared invalid, and the Contractor will not be paid for the invalid test.
- H. Water used for pump testing shall be disposed of per Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water.

### 3.2 WATER LEVEL MEASUREMENT

- A. Equipment needed to adequately monitor water level before, during, and after the step-rate drawdown test include:
  - 1. Electronic water level sounder (Solinst or equal) of sufficient length to monitor water level.
  - 2. Pressure transducer (In-Situ Inc. PXD-261, miniTROLL, or equal) to be placed in the water level sounding tube of sufficient length to remain below the water table during the entire duration of the pumping test.
  - 3. Data logger (Hermit 3000, miniTROLL, or equal) for the purpose of obtaining frequent and automated water level readings during the pump test.

**END OF SECTION**

## **SECTION 33 20 28 CONSTANT-RATE DISCHARGE TEST**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Work to be performed under this Section includes the work necessary to test the production well by the Constant-Rate Discharge Test.
- B. Water generated during pump testing shall be disposed of as specified in Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water.

#### **1.2 RELATED WORK**

- A. Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water

#### **1.3 REFERENCES**

- A. Safe Drinking Water Act

#### **1.4 SUBMITTALS**

- A. The Contractor shall submit pump test data for the well in hard copy and electronic form.
- B. The submittals shall be made in accordance with Section 01 00 10 – Special Conditions for Drilling.

#### **1.5 NOTIFICATION OF THE ENGINEER**

- A. The Contractor shall be responsible to give the Engineer 48-hour advance notice prior to beginning the step rate drawdown test for the well

### **PART 2 PRODUCTS**

#### **2.1 GENERAL**

- A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.
- B. Provide water level pressure transducer and data logger as specified.

### **PART 3 EXECUTION**

#### **3.1 GENERAL**

- A. A long-term constant-rate discharge test shall be performed to determine local aquifer characteristics.

- B. The constant-rate test shall be conducted not less than 12 hours after completion of the step test by pumping the well at the design rate for a period of 24 hours, or until the Engineer terminates the test. The test should not commence until drawdown has recovered at least 90% after the step rate drawdown test. When the pumping is terminated, the Contractor shall not conduct any activities for the duration that the well was pumped that might affect water levels in the well during the recovery period.
- C. The Contractor shall monitor and document the specific capacity (pumping rate and drawdown) of the well as it is pumped. The monitoring frequency and instrumentation shall be approved by the Engineer.
- D. During the constant-rate drawdown test, the discharge rate from the pump shall be controlled by both a valve and engine throttle. The discharge rate shall be controlled and maintained at approximately the desired discharge with an accuracy of at least 5 percent. Pump discharge rates shall be measured with an instantaneous and totalizing flow meter and orifice plate and manometer apparatus, as approved by the Engineer.
- E. Whenever continuous pumping at a uniform rate has been specified failure of pump operation shall require that the test be aborted and further testing suspended until the water level in the pumped well has recovered to its original level. For the purposes of this section, recovery shall be considered "complete" after the well has been allowed to rest for a period at least equal to the elapsed pumping time of the aborted test, with the exception that if any "three successive water level measurements spaced at least 20 minutes apart show no further rise in the water level in the pumped well, the test may be resumed at the direction of the Engineer.
- F. Any test that does not meet the duration requirement specified above, or that is initiated too soon after an aborted test, as defined above, shall be declared invalid and the Contractor will not be paid for the invalid test.
- G. The Contractor shall provide all information to the Engineer regarding the type, of pumping equipment used, including engines, drive components, bowls lines, and shafts. The Contractor shall keep records of the operation of equipment during the tests including engine rpm and horsepower, fuel use, and other essential-information that will be useful in designing a pump system.
- H. After completion of water level monitoring, and after the pump has been removed from the well, the Contractor shall remove all sand and debris that has accumulated in the bottom of the well.
- I. During the constant rate pump test, the Contractor will provide assistance and access to the Engineer for collecting water quality samples from the pump discharge water. Approximately one water quality sample may be taken for the full suite of Safe Drinking Water Act parameters near the end of the test.
- J. Water used for pump testing shall be disposed of per Section 33 20 61 – Disposal of Drilling Fluids, Cuttings and Pumped Water.

### 3.2 WATER LEVEL MEASUREMENT

- A. Equipment needed to adequately monitor water level before, during, and after the constant rate pumping test include:
1. Electronic water level sounder (Solinst or equal) of sufficient length to monitor water level.
  2. Two Pressure transducers (In-Situ Inc. PXD 261, miniTROLL, or equal) to be placed in the water level sounding tube of sufficient length to remain below the water table during the entire duration of the pumping test.
  3. Two Data loggers (Hermit 3000, miniTROLL, or equal) for the purpose of obtaining frequent and automated water level readings during the pump test.
- B. Hand (manual) measurements of depth to water shall be performed before and after the test using an electronic water level sounder to test the accuracy of the transducer. Manual measurements will also be performed during the pumping test -at a frequency approved by the Engineer. The data logger and transducer shall be set-up and started prior to the pump test so that the initial static water level is determined and recorded. Several measurements shall be taken over the 24-hour period before the test. The data logger will be set up to record water level measurements at a logarithmic time frequency as the pumping is started. At a minimum, water level measurements will be collected in accordance with the following table:

<b>Time Since Pumping Started/Stopped</b>	<b>Time Interval for Drawdown Measurements</b>
0-2 minutes	10 seconds
2-5 minutes	30 seconds
5-15 minutes	1 minutes
15-60 minutes	5 minutes
1-2 hours	10 minutes
2-8 hours	30 minutes
8-24 hours	1 hour

- C. Flow rates shall be measured accurately and recorded at the same time interval as drawdown data.
- D. After pumping is terminated (24-hour minimum test duration) the same pumping schedule shall be followed until drawdown has recovered at least 90%.

**END OF SECTION**

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## **SECTION 33 20 61 DISPOSAL OF DRILLING FLUIDS, CUTTINGS AND PUMPED WATER**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Work to be performed under this Section includes the labor, supplies, tools, materials, and equipment necessary to dispose all water generated during well development and well testing.

#### **1.2 RELATED WORK**

- A. Section 01 00 10 – Special Conditions for Drilling
- B. The Contractor shall comply with all applicable permits, laws, and regulations in disposing of water generated during well development and well testing. The permits, laws and regulations shall include, but not be limited to all federal, state, and local laws, regulations, and ordinances related to disposing of materials generated in constructing wells.

#### **1.3 REFERENCES**

- A. Utah Division of Water Quality Fact Sheet Regarding Water Discharge from Water Well Drilling and Operation

#### **1.4 SUBMITTALS**

- A. The Contractor shall submit the following:
  - 1. If applicable, or requested by the Engineer, approved chain-of-custody form(s) demonstrating compliance with federal, state, and local laws, regulations, and ordinances related to disposing of materials generated during well construction.

### **PART 2 PRODUCTS**

#### **2.1 GENERAL**

- A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

#### **2.2 OWNER-SUPPLIED FACILITIES**

- A. The Owner will make available to the Contractor the use of an existing storm drain to directly discharge well development water and pump test water. The locations to discharge water are shown on Drawings. The Contractor is responsible for supplying the transmission piping and other appurtenances to convey the water from the well to the designated discharge point. The Contractor is responsible to ensure the discharge water meets all applicable water quality standards prior to discharge.

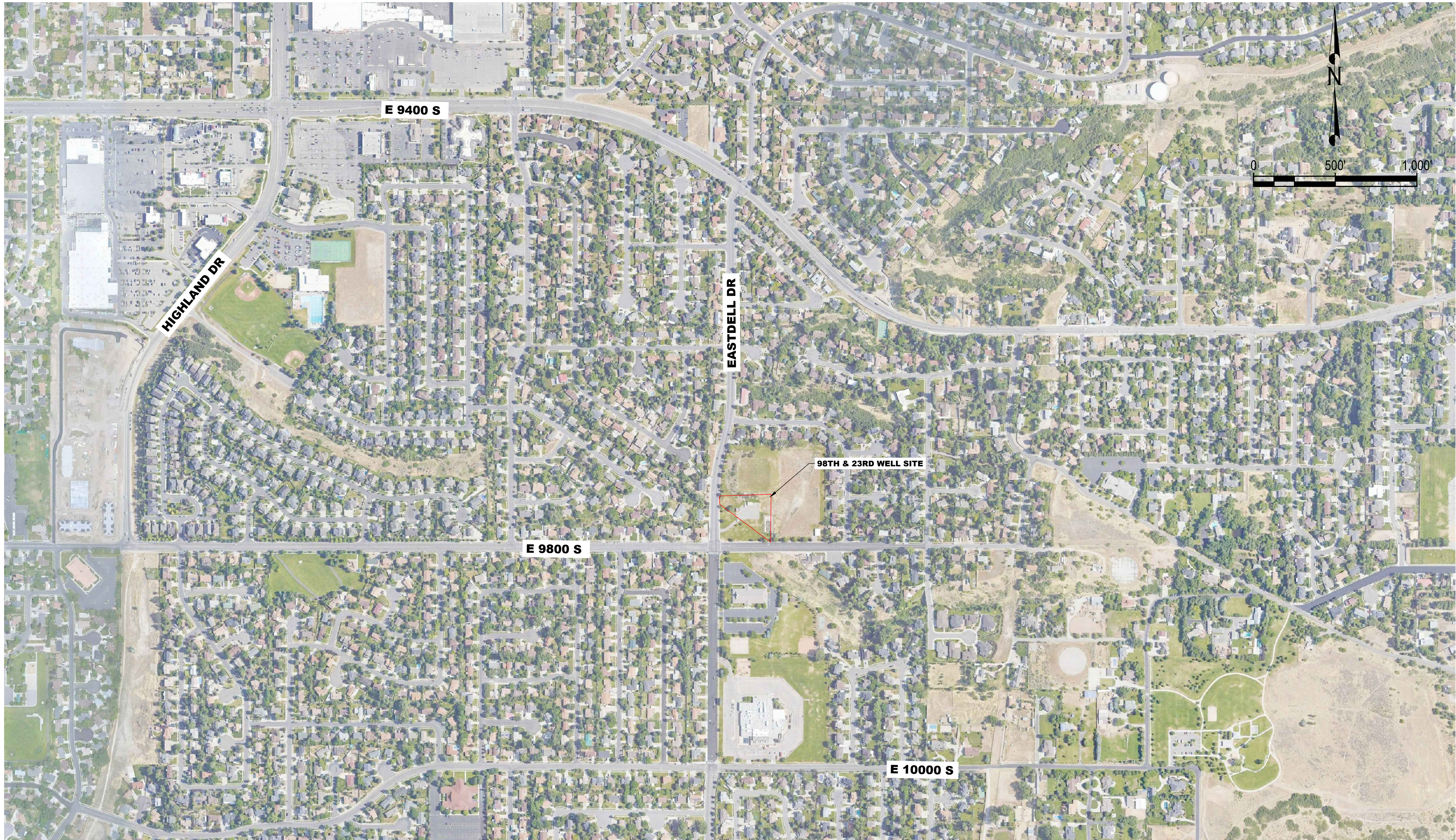
### **PART 3 EXECUTION**

#### **3.1 DISCHARGE WATER FROM DEVELOPMENT BY PUMPING AND WELL TESTING**

- A. All development and testing water shall be contained onsite in appropriate containers, such as Baker tanks, Frac tanks, or equivalent until such time water quality suitable for discharge is achieved in accordance with State of Utah regulations.
- B. Solid matter will be separated from the drilling fluids and displacement fluids prior to disposal.
- C. The water remaining after separation that meets State of Utah water quality standards shall be discharged to the Owner-designated location.
- D. The dewatered solid matter remaining after separation shall be disposed of properly off site at the Contractor's expense.
- E. The water discharged from pump development and well testing shall be disposed via temporary pipelines provided by the Contractor. Well development and testing water shall be disposed of at the locations shown on Drawings. The Contractor's pipelines shall have a minimum capacity to convey the maximum test pump rate for the well. The Contractor shall discharge water so as not to create erosion or cause turbidity in any surface water channel.
- F. It is the Contractor's responsibility to prevent the discharge stream from damaging or eroding the site or any drainage channel.
- G. It is the Contractor's responsibility to minimize impacts to access and use of private and public road by the transmission piping and discharge stream. Use of ramps, earthen berms, or similar means for pipeline crossings of public and private accesses shall be employed. In addition, caution signs and speed restrictions shall be employed where public right-of-ways are impacted. The Contractor shall coordinate ramps and signage with the Owner.

**END OF SECTION**

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NO.	DATE	DESCRIPTION

IF THE ABOVE SCALE BAR DOES NOT MEASURE 1-INCH IN LENGTH, DO NOT USE THIS DRAWING FOR SCALING PURPOSES. DIMENSIONS AND MEASUREMENTS SPECIFIED IN THE DRAWING TAKE PRECEDENCE TO SCALED MEASUREMENTS.

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 PROJECT MANAGER: M. CHANDLER PE., PG.  
 CHECKED BY:  
 DRAWN BY: C. HATCH  
 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JANUARY 2021



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JORDAN VALLEY WATER CONSERVANCY DISTRICT  
 JWCD 98TH & 23RD PUMP DEVELOPMENT AND PUMP TESTING  
 98TH & 23RD WELL LOCATION MAP

9799 S 2300 E

SANDY, UT 84092

STAMP

PROJECT NUMBER	2019-0113	
SHEET	1	OF 3
SHEET NUMBER	G001	



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 DRAWING SCALE: AS SHOWN  
 ISSUE DATE: JANUARY 2021

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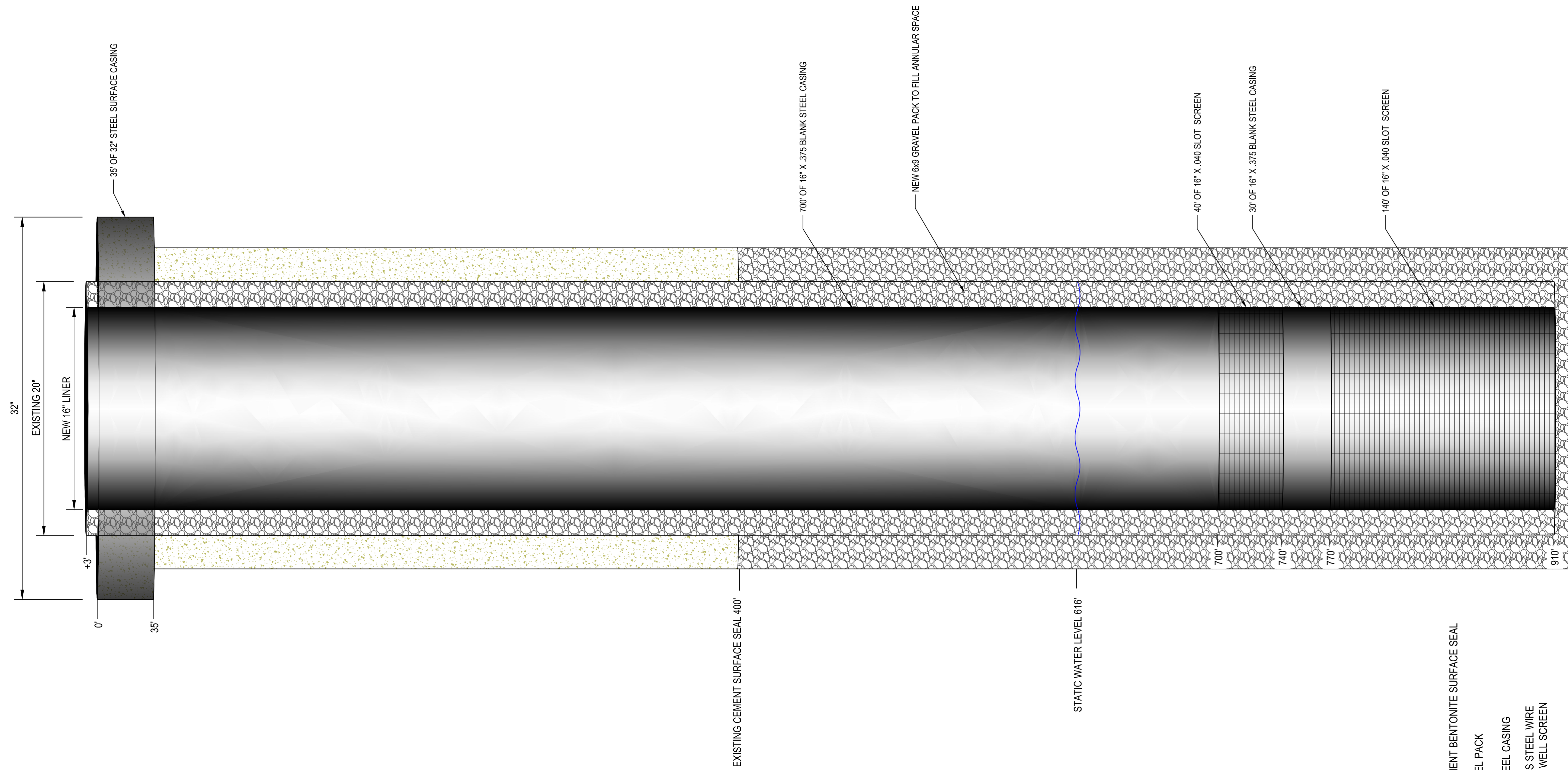
JORDAN VALLEY WATER CONSERVANCY DISTRICT  
 JWCD 98TH & 23RD PUMP DEVELOPMENT AND PUMP TESTING  
 98TH & 23RD WELL SITE MAP AND DISCHARGE

9799 S 2300 E SANDY, UT 84092

STAMP

PROJECT NUMBER	2019-0112	
SHEET	2	OF 3
SHEET NUMBER	G002	

**JWVCD  
98th & 23rd WELL  
NEW DESIGN**



- LEGEND**
- NEAT CEMENT BENTONITE SURFACE SEAL
  - 6#9 GRAVEL PACK
  - BLANK STEEL CASING
  - STAINLESS STEEL WIRE
  - WRAPPED WELL SCREEN

NO.	DATE	DESCRIPTION

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JORDAN VALLEY WATER CONSERVANCY DISTRICT  
98TH & 23RD PUMP DEVELOPMENT AND PUMP TESTING  
WELL LOG DIAGRAM

9800 S 2300 E

SANDY, UTAH

STAMP

PROJECT NUMBER 2019-0113	
SHEET 3	OF 3
SHEET NUMBER CU100	