TOOELE CITY
2025 TOOELE WELLS DRILLING PROJECT

ADDENDUM NO. 3
June 9, 2025

To All Plan Holders:

You are hereby notified that the following changes, clarifications, and/or corrections have been made to the Drawings, Specifications, or Contract Documents for the above-referenced project.

The bid opening date, location, and time **ARE** changed by this addendum.

ADDENDUM NO. 3 consists of the following:

1. Bid Schedule Changes
The date and time of the following bidding milestones are changed by this addendum:

Item	Deadline: Date/Time
Last Day for Questions	~~Friday, June 6th, 2025~~ **Friday, June 13th, 2025, 5:00 pm MST**
Final Addendum	~~Monday, June 9th, 2025~~ **Monday, June 16th, 2025**
Bids Due	~~Thursday, June 12th, 2025 (3 pm MST)~~ **Thursday June 19th, 2025 11:00 am MST**

2. Questions and Clarifications

a. Clarification between bid item A.14/B.14 and bid item A.19/B.19: Bid Items A.14 and B.14 will seal the annulus between the 5-inch diameter casing and borehole above the top of Gravel Pack in between test zones. The volume quantities for cement grout in Bid Items A.19 and B.19 did not include the Bentonite Plug annulus volume in its cubic yardage. Bentonite Plugs are preferred to be used, and it is assumed that cement grout will not be used in those areas.

3. Changes to the Contract Documents
a. C-200 Instruction to Bidders
    i. Section 3.01
        a. Added the following qualifications in section 3.01 of Article 3 of C-200 Instruction to Bidders.

"B. Bidder shall provide (1) qualifications of the person who will prepare and monitor the use of drilling fluids during the course of the work and (2) a fluid management plan for disposal that includes how the aquifer will be protected."

4. Changes to the Drawings
None

5. Changes to the Technical Specifications:
a. 33 00 00 Drilling, Construction, Testing, and Abandonment of Two Exploration Wells

   i. The specification is to be replaced in its entirety with the updated version attached to this addendum

b. 33 00 10 Drilling, Construction and Testing of Production Wells
   i. The specification is to be replaced in its entirety with the updated version attached to this addendum

This ADDENDUM #3 shall become a part of the Contract and all provisions of the Contract shall apply thereto. BIDDERS shall acknowledge receipt of this ADDENDUM in the space provided in the BID FORM.

Sincerely,
J-U-B ENGINEERS, INC.
Andrew Hobson, P.E.
Project Engineer

SECTION 33 00 00

TECHNICAL SPECIFICATIONS
DRILLING, CONSTRUCTION, TESTING and ABANDONMENT
OF
TWO EXPLORATION WELLS
FOR
TOOELE CITY
PUBLIC WATER SYSTEM (PWS) NO. UTAH23004
TOOELE COUNTY, UTAH

Prepared for:

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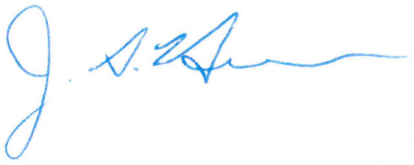

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Date: June 9, 2025

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1.0 GENERAL REQUIREMENTS

1.1 THE REQUIREMENT

The Utah-licensed water well driller (the CONTRACTOR) shall furnish all materials, labor, plant, equipment, tools, supplies, transportation, and appurtenances to drill, construct, develop, test, and abandon two exploration wells (the two exploration wells) as specified herein (the WORK).

The WORK will be performed in accordance with the current requirements of: (1) Utah Department of Natural Resources (DNR), Division of Water Rights (DWRi), sometimes referred to as the *Office of the State Engineer*, including Utah Administrative Code (UAC) Rule R655-4, *Administrative Rules for Water Wells*; (2) Utah Department of Environmental Quality (DEQ) Division of Drinking Water (DDW), including UAC, R309-515-6, *Facility Design and Operation: Source Development; Ground Water – Wells*; (3) DEQ Division of Water Quality (DWQ), *Utah Water Quality Act*, 19-5-107(1); and (4) the requirements of the Contract Documents, including these Technical Specifications.

1.2 PROJECT DESCRIPTION

Figures 1 and 2 show the locations of the WORK site, which are in Tooele City, Tooele County, Utah and include the:

- Rogers Exploration Well (Exploration Well No. 1) which is south of Rogers Street, west of 1000 West, about 1.5 miles due west of Main Street (Highway 36) and

- High School Exploration Well (Exploration Well No. 2), which has a street address of approximately 200 East, 2400 North and about 0.25 miles due west of Main Street (Highway 36).

Figure 3 shows the location of nearby Tooele City PWS wells.

The two exploration wells will be drilled through and zone tested in valley-fill deposits that consist of unconsolidated to semi-consolidated clayey sand and gravel interbedded with sand and gravel, cobbles, boulders, conglomerate, and sandy clay. The estimated total drilling depth of each exploration borehole is up to 1200 feet. However, the final design of each exploration well will be determined after each borehole is drilled, geologically and geophysically logged.

The WORK consists of drilling, constructing, testing, and abandonment of two (2) exploration wells. As part of the WORK, the CONTRACTOR shall:

- Drill for and install 14-inch diameter conductor casing to depth of approximately 40 feet and install a cement grout seal around the conductor casing.
- Drill a 12.25-inch diameter borehole to a depth of approximately 1200 feet, collect geologic samples and geophysically log the borehole.

- Collect samples for sieve analysis.
- Identify up to three potentially productive zones for testing (the three test zones).
- Plug back boring to bottom of lowest zone to be tested if required.
- Install a 5-inch diameter blank steel exploration well casing from surface to bottom of lowest test zone in boring.
- Tremie gravel pack to the three test zones with bentonite tremied between the test zones.
- Perforate the well through the lowest test zone and measure the depth to the static (unpumped) water level, develop with air, install temporary test pump, conduct a zone test, and collect a water sample.
- During each zone test the CONTRACTOR will operate the pump, measure and control pumping rate, and measure depth to water
- Remove temporary test pump and grout 5-inch diameter well casing up to bottom of the intermediate test zone.
- Perforate the well through the intermediate test zone and measure the depth to the static (unpumped) water level, develop with air, install temporary test pump, conduct a zone test, and collect a water sample.
- Remove temporary test pump and grout 5-inch diameter well casing up to bottom of the uppermost test zone.
- Perforate the well through the uppermost test zone and measure the depth to the static (unpumped) water level, develop with air, install temporary test pump, conduct a zone test, and collect a water sample.
- Remove temporary test pump and grout 5-inch diameter exploration well casing to ground surface.
- Perform other tasks as directed by the ENGINEER and described in these Technical Specifications and the Contract Documents.

Figure 4 shows the preliminary design of the two exploration wells. The CONTRACTOR shall utilize flooded reverse-circulation drilling methods to drill the boreholes below the conductor casing. The ENGINEER will specify to the CONTRACTOR the total drilling depth and the final well design including gravel pack gradation and perforation size, placement of well casing, perforations, gravel pack, cement grout well seal, and any other materials used to construct the two exploration wells.

Tooele City (the City) will be the "*OWNER*" and operator of the two exploration wells. Tooele City is Utah Public Water System (PWS) #23004.

Loughlin Water Associates, LLC (Loughlin Water) prepared these technical specifications for J-U-B and Tooele City and is designated as the "*ENGINEER*" in these Technical Specifications and the Contract Documents for the drilling, construction and testing of

the two exploration wells. J-U-B provides civil and water system engineering services to Tooele City and is designated the "*PROJECT MANAGER*" for this project.

The form and detail of the various features of the WORK are illustrated on the following drawings and documents and made part of these Technical Specifications:

Figure 1 – Regional Map
Figure 2 – Topographic Map
Figure 3 – Tooele City Wells
Figure 4 – Proposed Construction of Exploration Wells
Appendix A – Well Driller Reports
Appendix B – Utah Division of Water Quality Water Discharge Fact Sheet

1.3 WORK SITE

The Public Land Survey (PLS), State Plane, Universal Transverse Mercator (UTM), and Latitude (Lat) and Longitude (Long) coordinates of the two Exploration wells are approximately:

- Rogers Street Exploration Well (Exploration Well No. 1)
    - PLS - North 207 feet and East 908 feet from the West ¼ Corner (W4) of Section 20, Township 3 South (T3S), Range 4 West (R4W), Salt Lake Base & Meridian (SLB&M);
    - State Plane, North American Datum (NAD) 83, Utah Central – North 7,367,975.47 feet and East 1,410,317.28 feet;
    - UTM (NAD 83) – East 387,550.108 meters and North 4,488,991.808 meters; and
    - Lat 40.5440592413 degrees and Long -112.327957268 degrees.
- High School Exploration Well (Exploration Well No. 2)
    - PLS – South 193 feet and West 1,688 feet from the East ¼ Corner (E4) of Section 09, T3S, R4W, SLB&M;
    - State Plane (NAD 83), Utah Central – North 7,378,211.357 feet and East 1,418,263.089 feet;
    - UTM (NAD83) – East 389,989.538 meters and North 4,492,096.880 meters; and
    - Lat 40.5723528934 degrees and Long -112.299697421 degrees.

The ground surface elevations are estimated using the DWRi online map tool, Map, to be about

- 4800 feet at the Rogers Exploration Well and
- 4610 feet at the High School Exploration Well.

The OWNER will delineate the areas within which all of the CONTRACTOR operations shall occur. The CONTRACTOR shall not enter on or occupy with laborers, tools, equipment, or materials any ground outside the area delineated by the OWNER. Other contractors, employees, or agents of the OWNER/ENGINEER may enter the WORK site delineated by the OWNER for business purposes.

1.4 BEGINNING AND COMPLETION OF WORK

The CONTRACTOR shall begin WORK within 30 days of the Notice to Proceed. The contractor shall substantially complete the work at Roger Exploratory Well within 60 days of beginning the work. After that, the Work at other sites shall be completed within the substantial completion period as stated in the Agreement.

1.5 SERVICES FURNISHED BY THE OWNER

The OWNER will:

- Provide rights-of-way for the WORK specified in this contract.
- Allow the CONTRACTOR to use the OWNER's culinary water for the drilling operations (see Section 1.9).
- Obtain or help the CONTRACTOR obtain any required permits regarding workings hours, noise control and/or lighting restrictions (see Section 1.10).

1.6 SERVICES FURNISHED BY THE ENGINEER

The ENGINEER will:

- Specify the total depth of well drilling.
- Specify to the CONTRACTOR the depths of the zone tests, including gravel pack, bentonite, cement, and perforation intervals.
- Direct the CONTRACTOR in the collection of data during zone test operations and determine when zone testing is complete.
- During the course of the WORK, the ENGINEER, in consultation with the OWNER and the CONTRACTOR, will specify to the CONTRACTOR the total drilling depth and the final exploration well design including placement of well casing, perforated intervals, gravel pack, cement or bentonite grout well seals, and any other materials used to construct, develop and test the exploration wells.

1.7 DRILLING AND WELL CONDITIONS

The target aquifer of the two exploration wells is the principal basin-fill aquifer in Tooele Valley. The estimated total drilling depth of each borehole is up to 1200 feet. The valley-fill deposits at the proposed well sites are expected to consist of unconsolidated to semi-consolidated clayey sand and gravel interbedded with sand and gravel, cobbles, boulders, and sandy clay.

The expected subsurface geologic units are described below:

Depth (feet)	Geologic Unit	Description
0 – 30	Lacustrine gravel, Great Salt Lake and Lake Bonneville - Holocene to upper Pleistocene (Qlg)	Sandy gravel to boulders composed of locally derived rock fragments deposited in shore zones of Great Salt Lake and Lake Bonneville
30 – 90	Lacustrine and alluvial deposits, undivided (Qafy) (Holocene to upper Pleistocene)	Sand, gravel, silt, and clay; consists of alluvial deposits reworked by lakes, lacustrine deposits reworked by streams and slopewash, and alluvial and lacustrine deposits.
90 – 200	Older fan alluvium, pre-Lake Bonneville upper to middle Pleistocene (Qafo)	Poorly sorted boulders, cobbles, gravel, sand, silt, and clay that predate Lake Bonneville; includes fan surfaces of different levels.
200 – 900	Older fan and alluvial deposits-lower Pleistocene to Pliocene, (Qafo, QTaf, Tsl)	Poorly sorted boulders, cobbles, gravel, sand, silt, and clay; conglomerate, unconsolidated to semi-consolidated, may overlap in age with Tertiary Salt Lake Formation.
900 – 1200	Older fan and alluvial deposits-lower Pleistocene to Pliocene, (QTaf, Tsl)	Semi-consolidated deposits, and Tertiary Salt Lake Formation.

Figure 3 shows the location and Appendix A provides copies of the Well Driller Reports (well logs) for Tooele City PWS wells located near the two exploration wells.

It is the CONTRACTOR's responsibility to become informed about local conditions affecting this WORK. Neither the information contained in these specifications, nor gleaned from the OWNER, ENGINEER, or their agents, shall act to relieve the CONTRACTOR from any responsibility set forth in the contract.

1.8 UTILITIES AND UTILITY CLEARANCES

The CONTRACTOR shall be responsible for calling Blue Stakes and taking other actions to identify utilities present at the worksite in accordance with UAC R655-4-10.2, *Well*

Site Locations. The CONTRACTOR shall be fully responsible for identifying utilities and for any damage caused by the CONTRACTOR's negligence.

1.9 WATER, POWER, AND SITE IMPROVEMENTS

The OWNER will allow the CONTRACTOR to use the OWNER's culinary water for drilling operations. Connection to the water system must be approved by the OWNER and the removal of the connection must be inspected and approved by the OWNER.

Any water entering a well during construction shall not be contaminated and should be obtained from a chlorinated municipal system. Where this is not possible the water shall be dosed to give a free chlorine residual of 100 milligrams per liter (mg/L). Water introduced into the well shall (1) shall meet the Utah Drinking Water Standards specified in UAC R309-200, *Drinking Water Standards* and (2) conform to all laws applicable to the protection of water quality including UAC R309-515-6(6)(j), *Water Entered Into Well During Construction* and UAC R655-4-11.6.5, *Well Disinfection and Chlorination of Water*.

Costs for water conveyance facilities or transportation to the WORK site shall be borne by the CONTRACTOR. Any required permits to acquire water from other sources are the responsibility of the CONTRACTOR. This includes all necessary piping and components, but only at such locations and in a manner approved by the ENGINEER. Before final acceptance of the well, all temporary connections and piping installed by the CONTRACTOR shall be removed in a manner satisfactory to the ENGINEER.

The CONTRACTOR shall provide, at his own expense, all power required for their operations under the contract.

If desired, security and safety fencing around the WORK site may be installed by the CONTRACTOR, at his own expense.

1.10 WORKING HOURS AND NOISE AND LIGHT CONTROL

The CONTRACTOR will be authorized for 24-hour-per-day work for the drilling, construction and testing of the proposed well. The CONTRACTOR shall work on this project in a steady and diligent manner. The CONTRACTOR shall, during all work periods, provide an adequate crew of suitably qualified personnel to prevent unnecessary delays in project completion.

WORK shall be prohibited on Christmas Eve, Christmas Day, New Year's Eve and New Year's Day.

The CONTRACTOR shall make reasonable provision for noise and light control that include, at a minimum, the following measures:

- All equipment and machinery shall be in proper working order.
- All equipment and machinery shall be fitted with adequate mufflers and shall be located, operated, and maintained to minimize noise.

- Air-compressors and generators shall be housed in noise attenuation enclosures.
- The drill rig shall be equipped with a muffler system for air discharges that occur during drilling operations.

The CONTRACTOR shall abide by Tooele City code Title 11, Section 2, Noise Control, which can be viewed at:

https://files.tooelecity.gov/Document%20Center/Government/City%20code/Title11Chapter2(Dec1991).pdf

The CONTRACTOR shall be responsible for meeting all requirements of working hours, noise control, outdoor lighting and nuisance abatement.

The OWNER will obtain or help the CONTRACTOR obtain any required permits regarding workings hours, noise control and/or lighting restrictions.

The CONTRACTOR will prepare and distribute an OWNER approved flyer with a description of the project with contact information for questions and comments regarding the project.

1.11 SANITATION

The CONTRACTOR shall provide chemical toilets at the WORK site. The toilets shall conform to applicable local, State and Federal requirements. The cost for these sanitary facilities shall be borne by the CONTRACTOR.

1.12 MANAGEMENT OF DRILL CUTTINGS, DRILLING FLUIDS AND PRODUCED WATER

It will be the responsibility of the CONTRACTOR to dispose of the drill cuttings and left-over drilling fluid.

The CONTRACTOR is responsible for following *Best Management Practices* (BMP's) regarding drilling fluid and water discharges during the drilling and testing of the proposed well. It is the responsibility of the drilling CONTRACTOR to use BMPs to limit pollutant discharge to *de minimis* quantities, thereby protecting waters of the State, in accordance with Division of Water Quality Fact Sheet provided in Appendix B. Prior to the start of the WORK, the CONTRACTOR shall submit to the ENGINEER their plan to manage the drilling fluid and water discharge during the drilling and testing of the proposed well.

Drilling fluids, drill cuttings and produced water shall be contained in above-ground tanks and disposed of in a manner to prevent surface or subsurface contamination and to prevent degradation of natural or man-made water courses, impoundments, waterways, lakes, reservoirs, irrigation ditches, storm sewers, and dry stream beds. Cuttings and waste from well drilling operations shall not be discharged into a waterway, lake or reservoir.

Discharge of produced water will be allowed during development and testing provided there are no adverse impacts. Water produced during development and testing shall be discharged into a holding tank or series of tanks or basins for settling. Discharge from the tanks or basins shall pass through straw bales and/or geofabric for erosion control and further filtration. The CONTRACTOR shall provide, at their own expense, all of the tanks, hay bales, geofabric, riprap, flexible hose, PVC or other tubing, and other materials and equipment to divert and dissipate the energy of and minimize erosion from the discharged water, filter and allow for settling of the solids in the discharged water.

Control of drill cuttings, fluids, and produced water shall conform with UAC R309-515-6(6)(d), *Disposal of Cuttings*, UAC R655-4-11.6.2, *Containment of Drilling Fluids*, rules of the DWQ, and the *Utah Water Quality Act*, 19-5-107(1).

1.13 PROTECTION OF GROUNDWATER QUALITY

The CONTRACTOR shall (1) take all necessary precautions to prevent contamination of the water in the well by preventing the introduction of any foreign substance, including contaminated water, gasoline, oil, and the like and (2) conform to all laws applicable to the protection of water quality including UAC R309-515-6(6)(j), *Water Entered Into Well During Construction*, UAC R655-4-11.6.4, *Down-hole Equipment* and UAC R655-4-11.6.5, *Well Disinfection and Chlorination of Water*.

1.14 FINAL CLEANUP

The CONTRACTOR shall thoroughly clean the site after completion of the drilling, well construction, and development and test pumping operations. All drill cuttings, debris, and other materials used or generated during these operations shall be properly disposed of by the CONTRACTOR. The disposal of cuttings and drilling fluids shall conform with UAC R309-515-6(6)(d), *Disposal of Cuttings*, UAC R655-4-11.6.2, *Containment of Drilling Fluids* and the *Utah Water Quality Act*, 19-5-107(1).

Following all operations, the CONTRACTOR shall promptly remove their equipment, temporary facilities, and materials, smooth the work site surface and leave the site in a condition acceptable to the OWNER. No reseeding is to be done during the final cleanup.

2.0 WELL PRODUCTS

In accordance with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification*, all interior surfaces that may contact drinking water must consist of products complying with ANSI/NSF Standard 61. This requirement applies to drop pipes, well screens, coatings, adhesives, solders, fluxes, pumps, switches, electrical wire, sensors, and all other equipment or surfaces which may contact the drinking water.

All substances introduced into the well during construction or development shall be certified to comply with ANSI/NSF Standard 60 in accordance with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification*. This requirement applies to drilling fluids

(biocides, clay thinners, defoamers, foamers, loss circulation materials, lubricants, oxygen scavengers, viscosifiers, weighting agents) and regenerants.

CONTRACTOR shall submit to the ENGINEER Safety Data Sheets (SDSs), formerly Material Safety Data Sheets (MSDSs) for all proposed chemicals (including lost circulation materials) to be added to the borehole for approval prior to their use.

2.1 DRILLING FLUIDS

2.1.1 Material

In accordance with UAC R655-4-11.6.5 *Well Disinfection and Chlorination of Water*, potable water from a source approved by the ENGINEER shall be used as a base for drilling fluids whether used alone or in combination with drilling fluid additives.

The drilling fluid shall conform with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification* and UAC R655-4-11.6.1, *Protection of Aquifer - Drilling Fluids and LCMs.* The drilling fluid may consist of air and/or water mixed with a foaming surfactant, polymer, high-grade bentonite or other ENGINEER-approved materials. If there should be a conflict between the drilling fluid requirements for ease of drilling and drilling fluid requirements for aquifer protection, then the ruling requirements shall be those for aquifer protection. The drilling fluid shall possess characteristics required to: (1) prevent caving as drilling progresses; (2) permit recovery of representative drill cutting samples; (3) allow for geophysical logging, if required, and (4) maintain the structural integrity of the borehole during casing installation. Any contaminants or pollutants introduced into the borehole or well by the CONTRACTOR shall be removed, eliminated or remediated from the well by the CONTRACTOR.

2.1.2 Lost Circulation Materials

In the event of lost circulation conditions, the CONTRACTOR shall use material in accordance with UAC R655-4-11.6.1, *Protection of Aquifer - Drilling Fluids and LCMs* [lost circulation materials]. CONTRACTOR shall only use inert, non-organic materials to regain drilling fluid circulation that are approved by the State of Utah.

2.2 CASING

All casing shall be steel and be of adequate size, strength, and wall thickness to facilitate subsequent drilling and construction and must meet the requirements of UAC R309-515-6(6)(b), *Permanent Steel Casing Pipe* and R655-4-11.2.3, *Well Casing – General – Steel Casing*. All steel casing shall be in new condition that meets AWWA Standard A-100, ASTM or API standards for steel pipe and have a minimum wall thickness for the designed depth as specified in R655-4-11.2.3, *Well Casing – General – Steel Casing*. Casing joints shall be welded in accordance with UAC R655-4-11.3.2, *Casing Joints – Steel Casing*. Spot welding of joints is prohibited.

Steel casing shall meet the following requirements:

Conductor Casing:	14-inch diameter, minimum 0.250-inch wall thickness, low carbon steel casing
Exploratory Well Casing:	5-inch diameter, 0.250-inch wall thickness, low-carbon steel casing

Prior to installing casing, CONTRACTOR shall submit to the ENGINEER delivery tickets that show that the casing meets the specifications of Section 2.2.

2.3 CENTRALIZERS

Centralizers shall be used for the installation of all permanent casings in the borehole. Centralizers shall consist of the same material as the casing that the centralizers are attached to. Centralizers shall be placed at intervals of 60 feet or less. Centralizers manufactured to fit the casing may be used. Other types of centralizers may be utilized if the ENGINEER approves the method and materials in advance.

2.4 GRAVEL PACK

Gravel pack (also called filter pack) size and gradation will be 1/4-inch x 1/8-inch gravel.

Gravel pack material shall be a product of a commercial sand and gravel supplier. It shall (1) be properly sized and graded, (2) be clean, smooth and uniform, 95 percent siliceous material, (3) no more than 5 percent acid solubility, (4) be free of flat or elongated pieces, organic matter, or other foreign matter, and (5) meet the requirements of AWWA specification B-100 for Granular Filter Material. The gravel pack material shall conform to UAC R309-515-6(6)(k), *Gravel Pack Wells*, and UAC R655-4-11.5.2, *Gravel Pack or Filter Material*.

Prior to installing the gravel pack, the CONTRACTOR shall submit to the ENGINEER both a sample of the material and the results of a gradation (sieve) analysis of a representative sample of the material that is shipped to the well site to confirm that the selected material is of appropriate size and gradation.

The gravel pack material shall be (1) thoroughly sterilized with 100 parts per million (ppm) chlorine or hypochlorite solution immediately before being installed in the borehole or (2) dry chlorine should be mixed with the gravel pack at the surface before it is installed in the borehole.

2.5 GROUT AND SEAL MATERIAL

Grout and seal material shall meet the requirements of UAC R655-4-2 *Definitions*, and UAC R655-4-11.4.2 *Seal Material*. Grout and seal material shall conform to the following specifications.

2.5.1 Bentonite Plugs

The bentonite plug, intended to keep grout from entering the filter pack and sealing the pitless adaptor seal interval, shall consist of coated sodium montmorillonite pellets or unhydrated bentonite. The bentonite shall be furnished in sacks or buckets from a commercial source and shall be free of impurities that adversely impact the water quality. Pellet size shall be 1/4 to 3/8-inch. The pellet coating should be such that it retards the swelling of the pellets for a minimum period of about 60 minutes.

2.5.2 Unhydrated Bentonite

Dry bentonite consisting primarily of granules, tablets, pellets, or chips that may be placed in a well or borehole in the dry state and hydrated in place by either formation water or by the addition of potable water into the well or borehole containing the dry bentonite. Unhydrated bentonite can be used for other seals and the abandonment of the wells.

2.5.3 Neat Cement Grout

Cement (Types I, II, III, V, high alumina, or a combination thereof) conforming to the ASTM Standard C150 (standard specification of Portland cement), with no more than six (6) gallons of water per 94-pound sack (1 cubic foot) of sufficient weight density of not less than 15 lbs/gallon. Once cubic yard of neat cement grout contains 1993 pounds of Portland cement and not more than 127 gallons of clean water. Bentonite, controlled density fill (CDF), or fly ash shall not be added to neat cement grout unless State Engineer approval is received.

2.5.4 Sand Cement Grout

A grout consisting of equal parts by volume of cement conforming to ASTM Standard C150 and clean sand/aggregate with no more than six (6) gallons of water per 94-pound sack (one cubic foot) of cement. Sand cement grout may be used for annular openings of larger than 2-inches.

2.6 DISPERSANTS

Dispersants may be utilized during prior to zone testing to break down drilling fluids and to remove sediment from the gravel pack. Dispersants shall conform with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification* and UAC R655-4-11.6.1, *Protection of Aquifer - Drilling Fluids and LCMs.* Use of dispersing agents shall conform to UAC R309-515-6(7)(c), *Well Development* and the manufacturer's instructions for mixing, application, and disposal.

Manufacturer's literature indicates that the following products meet the specifications for dispersants:

- "*Johnson Screens NuWell 220 Dispersant Polymer*" and

- *"Bariod Aqua-Clear RFD Polymer Dispersant".*

2.7 ABANDONMENT

Upon completion of well construction and testing, the two exploration wells will be abandoned. Grout and seal material shall meet the requirements of UAC R655-4-2 Definitions, and UAC R655-4-11.4.2 Seal Material. Before well or borehole abandonment, all pump equipment, piping, and other debris shall be removed to the extent possible.

3.0 EXECUTION

Figure 4 presents the preliminary design for the two exploration wells. The ENGINEER will specify to the CONTRACTOR the total drilling depth and the final well design including placement of well casing, gravel pack intervals, grout well seal intervals, perforation intervals, and any other materials used to construct the well.

3.1 MOBILIZATION AND DEMOBILIZATION

Upon receiving the "*Notice to Proceed*", the CONTRACTOR shall notify the DWRi in accordance with UAC R655-4-4.2, *Start Cards.* The CONTRACTOR shall then move in all tools, equipment, and supplies necessary for the WORK and upon completion of the WORK, shall remove all such items from the premises promptly and leave the site in a clean, smoothed, and orderly condition. Site preparation and restoration shall be the responsibility of the CONTRACTOR.

3.2 BOREHOLE DRILLING - GENERAL

The CONTRACTOR shall collect representative formation samples as directed by the ENGINEER, at a minimum of 5-foot intervals and at major geologic formation changes. Each sample shall be stored in insect- and mildew-proof oil-well-sand sample bags. Plastic bags will not be accepted. Each sample bag shall be labeled with the well name, depth interval, date and time of collection. Sample bags containing the drill cuttings shall be stored in order and in an area at the well site that is covered. The drill cuttings samples shall not be directly exposed to precipitation. Chip trays for drill cutting samples shall be made available to the ENGINEER.

The CONTRACTOR shall maintain a daily drilling log of the well. Information that shall be listed on the drilling log includes: (1) any drilling fluids and additives, including quantity of materials used; (2) any drilling fluid properties, including weight, viscosity, and sand content; (3) type and diameter of bits used for drilling and total footage for each bit; (4) any remarks or comments concerning the drilling characteristics of the borehole(s); (5) description of formation materials encountered during drilling, and (6) any remarks or comments regarding water encountered in the borehole(s). The CONTRACTOR shall keep the forms at the site for inspection by the ENGINEER or OWNER.

The CONTRACTOR shall complete and file a Well Driller's Report with the DWRi as required by UAC R655-4-4.5, *Official Well Drillers Report* (well log). Copies of all logs and forms shall be furnished to the ENGINEER following completion of all operations.

The CONTRACTOR shall drill and construct the exploration well sufficiently straight and plumb to meet the requirements stated in Section 3.2.

The CONTRACTOR shall manage drilling fluids and produced water and shall protect groundwater quality and the waters of the State, as specified in Section 1.12.

3.3 LOST CIRCULATION

In the event of lost circulation conditions, the CONTRACTOR shall contact the ENGINEER prior to the use of lost circulation materials. Use of lost circulation materials must be approved by the ENGINEER and shall conform to the requirements of UAC R655-11.6.1, *Protection of Aquifer – Drilling Fluids and LCMs*.

3.4 CONDUCTOR CASING

The CONTRACTOR shall drill for, install and grout in place 14-inch diameter steel conductor casing. The CONTRACTOR shall drill a borehole for the conductor casing that is at least 4 inches in diameter larger than the outside diameter of the conductor casing. Drilling shall conform to the specifications provided in Section 3.2.

The conductor casing shall be lowered into the borehole by a method which will always allow for the control of the rate of fall of the casing into the borehole. The casing shall not be dropped or allowed to fall uncontrolled into the borehole.

Individual lengths of casing shall be joined by welding in accordance with UAC R655-4-11.3.2, *Casing Joints – Steel Casing*. Welding of the well casing shall be performed by properly qualified persons. Conductor casing shall conform to the specifications provided in Section 2.2, UAC R309-515-6(6)(b), *Permanent Steel Casing Pipe* and R655-4-11.3.2, *Steel Casing*. The conductor casing shall be unperforated in accordance with R655-4-11.5.5, *Permanent Conductor Casing Used.*

Centralizers shall be installed as directed by the ENGINEER.

The CONTRACTOR shall measure and record the lengths of each section of casing in the order of installation in the borehole for submittal to the ENGINEER.

The conductor casing shall be cemented in place in accordance with the specifications provided in Section 3.10.

3.5 GEOPHYSICAL LOGGING

The CONTRACTOR shall perform or subcontract the geophysical logging of the entire surface casing and exploration boreholes. Two printed copies plus an electronic copy

(USB flash drive with data files of logs and pdf file of logs) shall be provided in the field at the conclusion of the logging runs. Geophysical logging shall be completed in accordance with accepted industry standards.

The following geophysical logs shall be run:

- Spontaneous-potential
- Short and long normal electrical resistance (16- and 64-inch spacing)
- Single point resistivity
- Natural-gamma
- 3-arm caliper
- Temperature
- Deviation (gyroscopic)
- Neutron-density (if requested by the ENGINEER)

3.6 RECEIPT OF FINAL WELL DESIGN

At the conclusion of geophysical logging of the exploration borehole, the ENGINEER shall have 72 hours to submit the exploration well design to the CONTRACTOR under which no standby time or rig time rates shall apply. In the final well design, the ENGINEER shall specify the total well depth, zone test intervals, gravel pack intervals, intervening sealed intervals, bentonite seals and cement grout seals. The ENGINEER may modify the design if new information becomes available.

3.7 INSTALLATION OF EXPLORATION WELL CASING ASSEMBLY

The anticipated total drilling depth for the two exploration wells is approximately up to 1200, but the ENGINEER reserves the right to drill lesser footage if hydrogeologic conditions warrant. The preliminary design anticipates utilizing a maximum of 1200 feet per well of exploration well casing.

The ENGINEER shall determine the exact drilled depth, depths and lengths of exploration well casing and placement of other materials based on the results of lithologic and geophysical logging the borehole. Following receipt of the final well design from the ENGINEER, the CONTRACTOR shall install the exploration well casing.

Individual lengths of casing shall be joined by welding in accordance with UAC R655-4-11.3.2, *Casing Joints – Steel Casing*. Welding of the well casing shall be performed by properly qualified persons. Casing shall conform to the requirements of UAC R309-515-6(6)(b), *Permanent Steel Casing Pipe* and R655-4-11.3.2, *Steel Casing*.

Centralizers shall be installed on the zone test casing. Centralizers shall be placed at intervals of 60 feet or less.

The exploration well casing shall be lowered into the borehole by a method which will allow for control of the rate of fall of the assembly at all times. The assembly shall not be dropped or allowed to fall uncontrolled into the borehole.

The exploration well casing shall be suspended in the borehole at all times during installation and shall not be supported from the bottom of the borehole at any time.

3.8 INSTALLATION OF GRAVEL PACK

Gravel pack shall (1) be installed in the annulus between the outside of the 5-inch diameter casing and the borehole wall in each of the three zone test intervals and (2) extend from the bottom of the borehole upward to a depth determined by the ENGINEER, which shall be a minimum of about 10 feet above the top of each zone test interval. The exploration well casing assembly shall be suspended in the borehole while the gravel packed is installed. The exploration well casing assembly shall not be supported from the bottom of the borehole at any time during gravel pack installation.

The gravel pack shall be installed in accordance with AWWA Standard A100-15, *Water Wells, Appendix B*. Other installation methods may be considered by the ENGINEER as long as the gravel pack is placed in one uniform continuous operation using a method that through common usage has been shown to minimize (1) bridging of the material between the borehole and the casing, and (2) excessive segregation of the material after it has been introduced into the annulus and before it settles in place from bottom to top. This includes actions made by the CONTRACTOR to surge the well with a bailer during installation of the gravel pack.

The gravel pack material shall be (1) thoroughly sterilized with 100 parts per million (ppm) chlorine or hypochlorite solution immediately before being installed in the borehole or (2) dry chlorine should be mixed with the gravel pack at the surface before it is installed in the borehole.

The gravel pack material shall conform to the specifications provided in Section 2.4, UAC R309-515-6(6)(k), *Gravel Pack Wells*, and UAC R655-4-11.5.2, *Gravel Pack or Filter Material*. Installation of gravel pack material shall conform to UAC R309-515-6(6)(k), *Gravel Pack Wells*, and UAC R655-4-11.5.3, *Placement of Filter Material*.

3.9 BENTONITE PLUG

In accordance with UAC R309-515-6(6)(k)(v), *Gravel Pack Wells,* after the exploration well casing, and gravel pack have been installed in the borehole, the annular space above the gravel pack shall be sealed using unhydrated bentonite pellets. The plug shall be a minimum of 10 feet in thickness. The bentonite pellets shall be placed on top of the gravel pack in a manner that prevents bridging of the bentonite in the annulus. The depth to the top of the bentonite plug shall be directly measured and recorded immediately after placement, without allowance for swelling. A minimum of 60 minutes should be allowed for the bentonite plug to hydrate and form a low permeability seal

before 3 feet of gravel pack is placed in the annular space above the bentonite plug. The bentonite plug shall conform to the specifications provided in Section 2.5.

3.10 INSTALLATION OF GROUT WELL SEAL

The CONTRACTOR shall a cement grout well seal around the conductor casing and well casing that meets the requirements of UAC R309-515-6(6)(i), Well Sealing Techniques and Requirements and R655-4-11.4, Surface Seals and Interval Seals. The cement grout well seal shall be installed around the exploration well casing and extend to a depth determined by the ENGINEER between each zone test interval.

Installation of the cement grout seal shall conform to the requirements of UAC R655-4-11.4, Surface Seals and Interval Seals, R655-4-11.7.1, Special Requirements - Explosives and R655-4-12.1.2, and R655-4-12.1.2, Public Water Supply Wells. The cement grout shall be allowed to cure for a period of 24 hours before well drilling, construction, or testing may be resumed.

3.11 ZONE TESTING

At the direction of the ENGINEER and after geophysically logging the exploration boreholes and well construction, the CONTRACTOR shall zone test the exploration borehole using a temporary test pump. The CONTRACTOR shall furnish the pump model and performance curve and shall install all materials and equipment to conduct multiple zone tests in each well. The CONTRACTOR shall manage drilling fluids and produced water and shall protect groundwater quality and the waters of the State, as specified in Section 1.13.

Zone testing shall conform to the following:

1. The depth intervals of three zone tests shall be specified by the ENGINEER.
2. Prior to installing the exploration well casing, ENGINEER will determine whether boring should be plugged back from total drilled depth and place cement grout as required.
3. Weld bottom plate to 5-inch diameter steel exploration well casing and set to depth specified by the ENGINEER.
4. Sterilized gravel pack shall be tremied in the annular space between the borehole wall and the 5-inch diameter exploration well casing to depths specified by the ENGINEER that are at least 10 feet above the top and 5 feet below the bottom of each interval to be tested.
5. A minimum 10-foot bentonite plug shall be tremied on top of the gravel pack to seal the zone test interval in the borehole.
6. Perforate the bottom (lowermost) zone for testing using a 1/8-inch perforator. The CONTRACTOR shall airlift from the bottom of the well until produced water is relatively clear and sand free. The CONTRACTOR shall measure the static (unpumped) depth to the water level after airlifting.

7. A temporary submersible test pump shall then be installed to a depth that is at least 100 feet below the measured water level. The pump must be capable of delivering 30 to 50 gallons per minute (gpm) from depths of 450 to 650 feet.
8. Measure and control and record pumping rate, measure and record depth to water during and after zone test.
9. Allow ENGINEER to monitor water quality during and collect water quality sample at the end of each zone test.
10. Following completion of each zone testing, remove pumping equipment and grout back 5-inch diameter casing to bottom of next higher zone test and repeat steps 6 through 9.
11. Following completion of last (uppermost) zone test, remove pumping equipment and grout back to ground surface.

As directed by the ENGINEER, the CONTRACTOR shall measure and record the following for each zone test for submittal to the ENGINEER:

- Depth of perforated interval, gravel pack, and bentonite seal;
- Depth of air line or air turn-around sub;
- Air pressure required to begin air-lifting (unload pressure);
- Running air pressure while air-lifting (running pressure);
- Rate at which water is being produced during air-lifting;
- Water level after air-lifting;
- Submersible pump intake depth;
- Static water level prior to zone testing;
- Pumping rate during zone testing;
- Pumping water levels during zone testing; and
- Recovery water levels after shutting down the pump.

Pumping rate measurements shall be made and recorded every 5 minutes for the first 30 minutes of pumping and then decreased to once every 10 minutes for the remaining 3.5 hours of each zone test, or as directed by ENGINEER. Water level measurements shall be made and recorded once every 10 minutes during both pumping and recovery periods to estimate aquifer parameters. Zone testing production rates shall be measured using an in-line totalizing flow meter or volumetrically by discharging into a tank of known volume while measuring the time to fill the tank of known volume. Water levels shall be measured "*by hand*" (in feet to nearest tenth and from the same datum throughout recovery) using a battery powered water level sounder or other suitable device approved by the ENGINEER.

Near the conclusion of the zone test, the CONTRACTOR shall aid the ENGINEER in collecting a water sample for submittal to an approved analytical laboratory within

analytical hold-times (generally the same day as the sample is collected and several hours before the laboratory closes for the day).

3.12 PLUGGING AND ABANDONMENT

Well abandonment shall be accomplished under the direct supervision of a currently Utah-Licensed Water Well Driller who shall be responsible for verification of the procedures and materials used. The CONTRACTOR shall plug and abandon each well in accordance with UAC R309-515-6(9) *Well Abandonment* and R655-4-14 *Abandonment of Wells* or as approved by the DWRi.

After testing is completed, neat cement or sand cement grout shall be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The sealing material shall be placed by the use of a grout pipe, tremie line, dump bailer or equivalent to avoid freefall, bridging, or dilution of the sealing materials or separation of aggregates from sealants. Sealing material shall not be installed by freefall or gravity unless the interval to be sealed is dry and no deeper than 30 feet below ground surface.

Within 30 days of the completion of abandonment work on each well, the CONTRACTOR shall file an abandonment log with the DWRi. The blank abandonment log will be mailed to the licensed well driller upon notice to the DWRi of the start of abandonment work as described in UAC R655-4-4(4.2.5).4.6.3. The water right number or non-production well number, owner name and address, and the well location, if available, will be preprinted on the blank abandonment log provided to the well driller. The driller shall verify this information and make any necessary changes on the abandonment log before submitting the log.

The driller must provide the following information on the abandonment log:

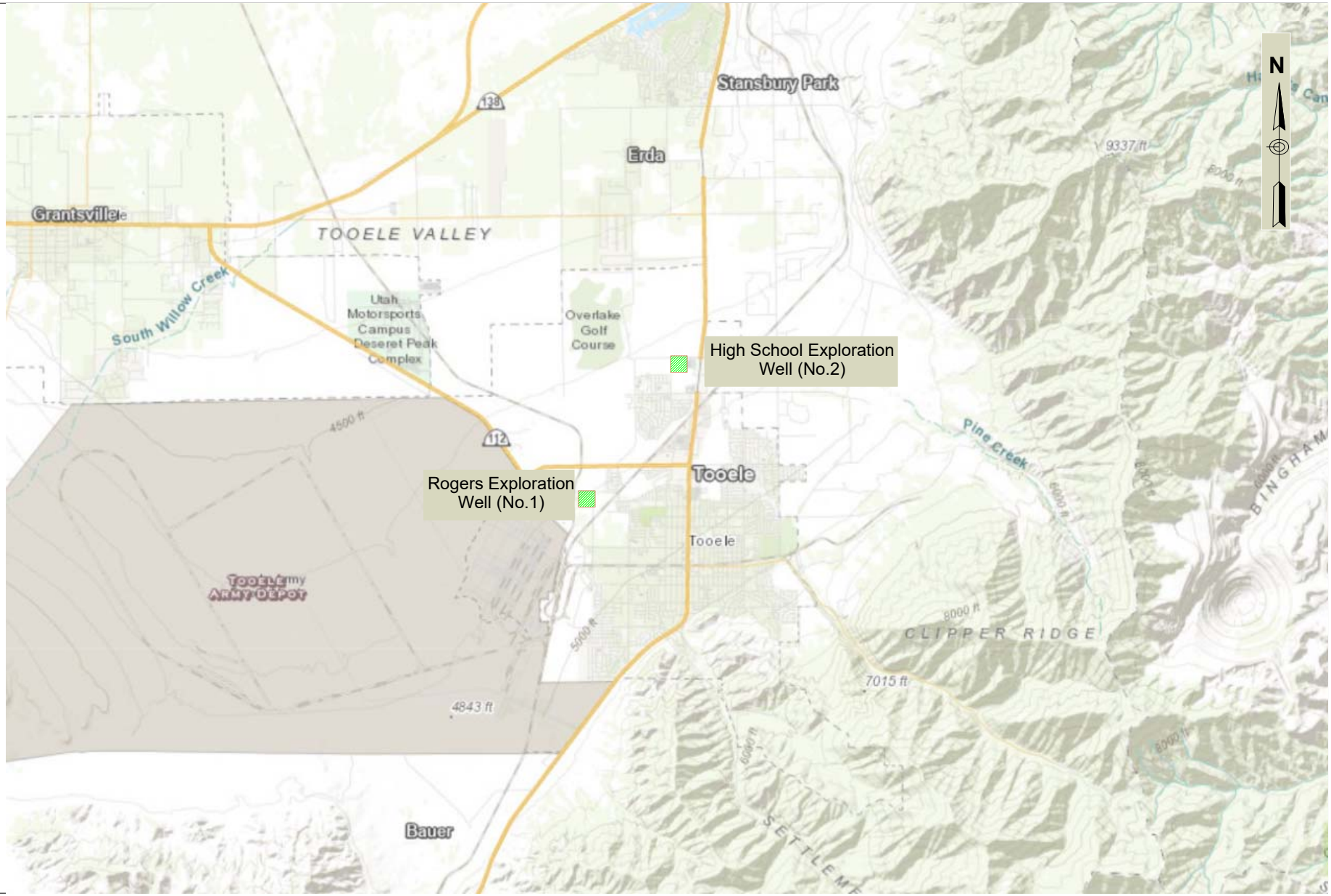
- Existing well construction information;
- Date of abandonment;
- Reason for abandonment;
- A description of the abandonment method;
- A description of the abandonment materials including depth intervals, material type, quantity, and mix ratio;
- The Well Driller statement includes the driller name, license number, signature, and date.

3.13 SUBMITTALS

The CONTRACTOR shall submit documentation to the ENGINEER that shall include, but is not limited to, the following:

Submittal	Section Reference	When Due
Drilling fluid and water discharge plan	1.12	Prior to the start of the WORK
SDS sheets	2.0	For approval prior to using chemicals
Well casing delivery tickets	2.2	Prior to installation
Gravel pack gradation (sieve) analysis results	2.4	Prior to installation
Driller's daily reports	3.2	Following each day of work
Well Driller's Report	3.2	Within 30 days of well completion
Geophysical logs	3.5	At the conclusion of logging
Pump Curve - Zone testing data	3.11	Prior to testing – At conclusion of each zone test

FIGURES



Reference: Division of Water Rights Mapping Database 2025

LOUGHLIN WATER ASSOCIATES LLC

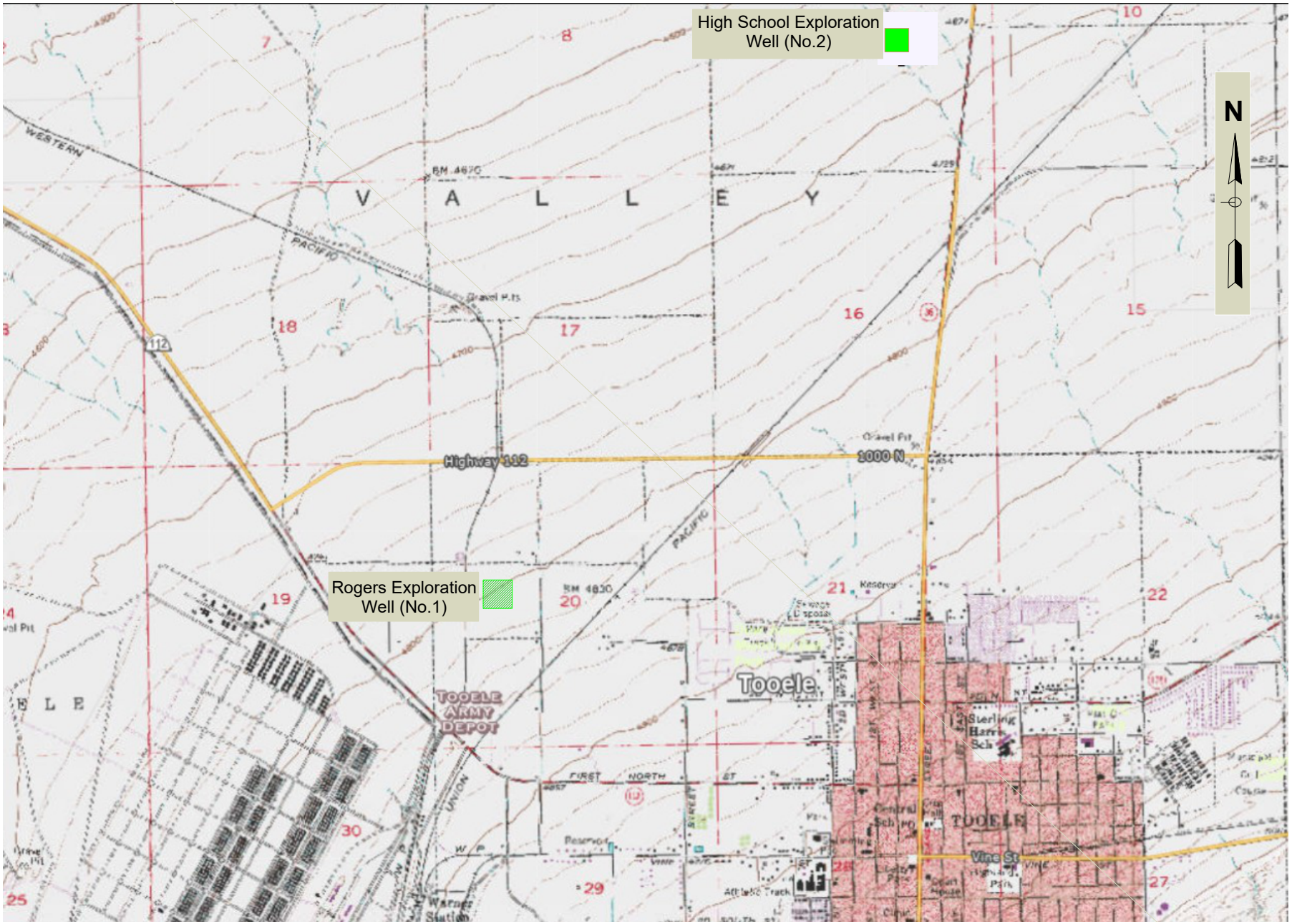
0 1.0 2.0

Approximate Scale in Miles

Tooele City

Regional Map

Figure 1



Reference: Division of Water Rights Mapping Database 2025

LOUGHLIN WATER ASSOCIATES LLC

0 1/4 1/2

Approximate Scale in Miles

Tooele City

Topographic Map

Figure 2

LOUGHLIN WATER ASSOCIATES LLC

0 1/4 1/2

Approximate Scale in Miles

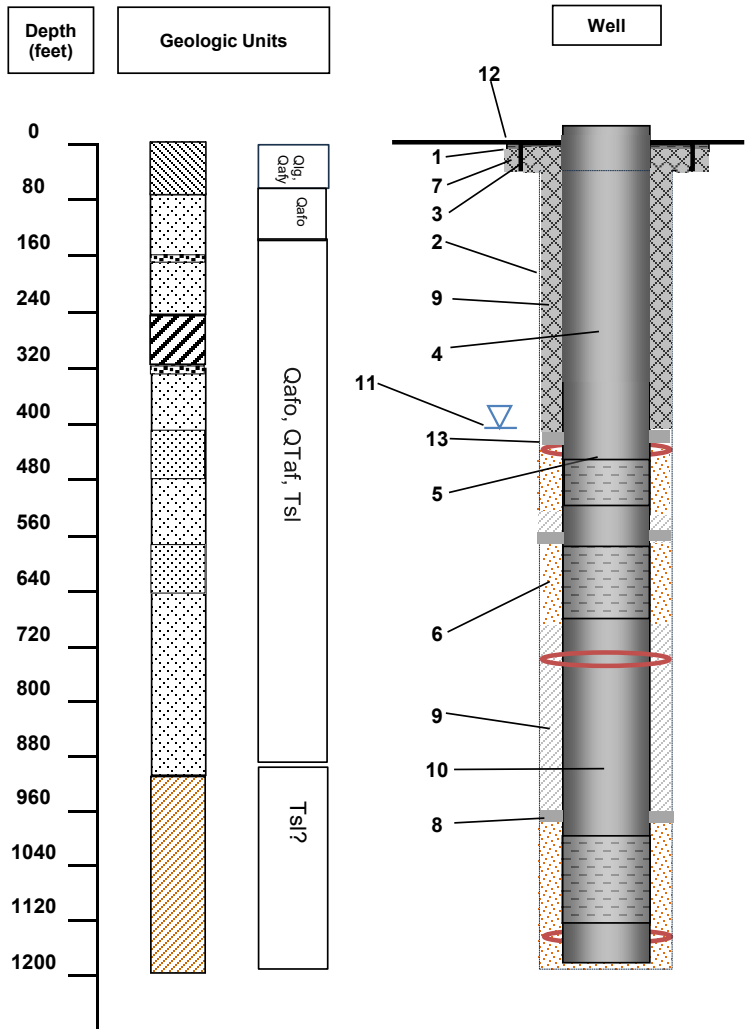
Red Del Papa Well #18 (WIN 443468)

See Appendix A for Drillers Logs

Tooele City

Tooele City Wells

Figure 3



DRAWING NOT TO SCALE

Explanation

Borehole Diameters

1 - 18-inch diameter borehole (0 to 40 feet)

2 - 12.25-inch diameter borehole (40 to 1200 feet)

Blank Casing

3 - 14-inch diameter low carbon steel conductor casing; 0.25-inch wall thickness (0 to 40 feet)

4 - 5-inch diameter low carbon steel exploration well casing; 0.250-inch wall thickness (0 to 1200 feet)

Perforation

5 - 1/8-inch perforation zone minimum two perforations per foot

Gravel Pack

6- 1/4" x 1/8 " Clean washed silica gravel tremied to depth based on subsurface conditions specified by the ENGINEER that are at least 10 feet above the top and 5 feet below the bottom of each interval to be tested.

Well Seals

7 - 14-inch casing sealed between 40 feet to surface with neat cement grout

8 - A minimum 10-foot bentonite plug tremied on top of the gravel pack to seal the zone test interval in the borehole.

9 - Cement grout well seal around 5-inch diameter casing above the uppermost test zone (0 to 450 feet).

10 - Inside of 5-inch casing sealed with neat cement grout between each test zone and to surface above uppermost test zone.

Static Water Level

11 - Estimated between 440 and 490 feet

12 - Ground elevations approximately 4800 feet at Rogers Street and 4660 feet at High School Exploration Well

Other

13 - Centralizers approximately every 60 feet.

Notes:

Key to geologic units:

- Undifferentiated gravel, sand, clayey sand, clayey gravel
- Clayey formations with differing amounts sand, gravel, conglomerate, cobbles, boulders
- Tertiary Formation including Salt Lake Formation

1. Designed by John S. Brown, P.G., L.P.I;
2. Subsurface conditions at well site are uncertain;
3. All work shall be in accordance with: (1) Utah Division of Water Rights Utah Administrative Code (UAC) Rule R655-4 Administrative Rules for Water Wells; (2) Utah Department of Environmental Quality (DEQ) Division of Drinking Water UAC Rule R309-515 Source Development Rule, Ground Water - Wells; (3) DEQ Division of Water Quality, Utah Water Quality Act, 19-5-107(1); and (4) the Technical Specifications. ENGINEER shall specify the exact drill depth, depths and lengths of casing, perforations and placement of other materials based on the results of lithologic and geophysical logging the borehole.

LOUGHLIN WATER ASSOCIATES LLC

Tooele City
Preliminary Design
Exploration Wells
Figure 4

APPENDIX A

WELL DRILLER REPORTS

Berra Well #19 - WIN 443466

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 1915001M00 WIN: 443466

Owner *Note any changes*

TOOELE CITY CORPORATION
C/O PAUL HANSEN
90 NORTH MAIN
TOOELE, UT 84074

Contact Person/Engineer: PAUL HANSON

Well Location *Note any changes*

N 2410 E 120 from the S4 corner of section 16, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 10/27/2019 Completion Date: 10/7/2020

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use: MUNICIPAL

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	40	40	AUGER	GEL / POLYMER
0	912	14 3/4	REVERSE CIRCULATION	GEL / POLYMER
0	861	28	REVERSE CIRCULATION	GEL / POLYMER

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
														SEE ATTACHED

RECEIVED
NOV 03 2020 LI
WATER RIGHTS
SALT LAKE

Static Water Level

SCANNED LP

Date 10/5/2020 Water Level 418.28 feet Flowing? [ ] Yes [X] No
Method of Water Level Measurement TRANSDUCER If Flowing, Capped Pressure N/A PSI
Point to Which Water Level Measurement was Referenced TOP OF CASING Elevation UNKNOWN
Height of Water Level reference point above ground surface 3.6 feet Temperature 15.93 degrees [X] C [ ] F

Well Log

Berra Well #19 - WIN 443466

Construction Information

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☑ SCREEN ☐ PERFORATIONS ☐ OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	40	A-53 GRADE B	.375	32'	525	580	.080	20	SS WIRE WRAP
+3	525	A-53 GRADE B	.375	20	600	660	.080	20	SS WIRE WRAP
580	600	A-53 GRADE B	.375	20	670	740	.080	20	SS WIRE WRAP
660	670	A-53 GRADE B	.375	20	760	850	.080	20	SS WIRE WRAP
740	760	A-53 GRADE B	.375	20					

Well Head Configuration: DOUGHNUT BETWEEN CASINGS Access Port Provided? ☒ Yes ☐ No

Casing Joint Type: WELDED Perforator Used: N/A

Was a Surface Seal Installed? ☒ Yes ☐ No Depth of Surface Seal: 40' feet Drive Shoe? ☐ Yes ☒ No

Surface Seal Material Placement Method: PUMPED VIA TREMMIE

Was a temporary surface casing used? ☐ Yes ☒ No If yes, depth of casing: N/A feet diameter: N/A inches

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	40	50/50 SAND CEMENT SLURRY	7 YDS^3	17/GAL 15 BAG 5GAL/SACK
0	110	50/50 SAND CEMENT SLURRY	18 YDS^3	17/GAL 15 BAG 5GAL/SACK
110	661	SRI SUPREME 6X9	67 YDS^3	N/A

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
9/12/20	DUAL SWAB AIRLIFT	350	X		UNKNOWN	123
	DUAL SWAB PUMP	200	X		UNKNOWN	200
	TEST PUMP/SURGE	2010	X		98'	117

Pump (Permanent)

Pump Description: Horsepower: Pump Intake Depth: feet

Approximate Maximum Pumping Rate: Well Disinfected upon Completion? ☐ Yes ☐ No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name HYDRO RESOURCES WEST, INC. (Person, Firm, or Corporation - Print or Type) License No. 815

Signature (Licensed Well Driller) Date 10/27/2020

WELL DRILLER'S REPORT ADDTIONAL DATA FORM
State of Utah
Division of Water Rights

Well Identification

Non-Production Well: 1915001M00

Owner *Note any changes*

TOOELE CITY CORPORATION
C/O PAUL HANSEN
90 NORTH MAIN
TOOELE, UT 84074

Contact Person/Engineer: _____

Well Location *Note any changes*

N 2410 E 120 from the S4 corner of section 16, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)

Berra Well #19 - WIN 443466

Construction Information (con't)

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)
+3	900	A-53 GRADE B	2	1.54
+3	120	A-53 GRADE B	3	.216

DEPTH (feet) FROM	TO	☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)

Comments (con't)

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name HYDRO RESOURCES WEST, INC. (Person, Firm, or Corporation - Print or Type)

License No. 815

Signature _____ (Licensed Well Driller)

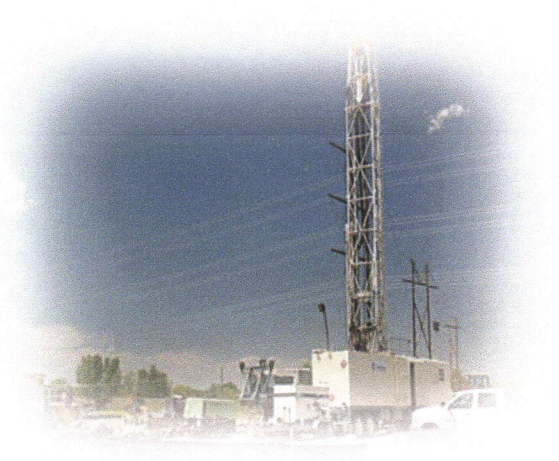
Date 10/27/2020

Cuttings Log

start date

Berra Well #19 - WIN 443466

Hydro resources



From	to					RIG	10023					
0	40	⟷	Clay sand & gravel									
40	65	⟷	sand and gravel									
65	75	⟷	Clay & gravel									
75	80	⟷	Gravel									
80	85	⟷	Gravel small cobbles									
85	125	⟷	Gravel									
125	140	⟷	clay									
140	145	⟷	Sandy clay									
145	155	⟷	Fine sand									
155	190	⟷	gravel									
190	200	⟷	sand & gravel									
200	210	⟷	Gravel									
210	220	⟷	sand & gravel									
220	235	⟷	gravel									
235	240	⟷	Red clay and gravel									
240	265	⟷	Gravel									
265	290	⟷	Red clay and gravel									
290	355	⟷	gravel									
355	360	⟷	sand & gravel									
360	365	⟷	sand gravel & clay									
365	390	⟷	sand & gravel									
390	445	⟷	Gravel									
445	455	⟷	clay & gravel									
455	475	⟷	gravel									
475	490	⟷	clay some gravel									

Cuttings Log

start date

Berra Well #19 - WIN 443466

490	500	⟷	clay & gravel
500	510	⟷	clay
510	580	⟷	sand & gravel
580	610	⟷	Clay & gravel
610	630	⟷	Gravel
630	655	⟷	Clay & gravel
655	660	⟷	gravel
660	670	⟷	clay & gravel
670	680	⟷	sand & gravel
680	685	⟷	sand clay & gravel
685	690	⟷	clay & sand
690	745	⟷	sand & gravel
745	760	⟷	Clay & gravel
760	770	⟷	sand 7 gravel
770	835	⟷	Gravel
835	850	⟷	Sand & gravel
850	860	⟷	Clay
860	865	⟷	clay & sand
865	870	⟷	clay sand & gravel
870	880	⟷	clay
880	885	⟷	Sand & clay
885	912	⟷	clay & gravel
		⟷	
		⟷	
		⟷	
		⟷	
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		⟷	

Rollo Grounds Well (#16)

AMENDED WELL LOG

WELL DRILLER'S REPORT

State of Utah
Division of Water Rights

WIN 436568

For additional space, use "Additional Well Data Form" and attach

Well Identification

Change Application: a37675 (15-3417) WIN: 436568

Owner *Note any changes*

Tooele City Water Special Service District
90 North Main Street
Tooele, UT 84074

Well #16

Contact Person/Engineer: PAUL HANSON

Well Location *Note any changes*

N 2065 E 2030 from the SW corner of section 21, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 8-22-13 Completion Date: 12-22-13

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Drinking water

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0'	93'	48"	Auger	Dry
93'	488	32"	Reverse CIRC	WATER
488'	1000'	26"	Reverse CIRC	WATER

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
0	93				X		X						Brown	
93	200							X	X	X				
200	210				X		X	X	X					
210	320						X	X	X					
320	340				X		X	X	X					
340	415				X		X	X	X					
415	445				X		X	X	X			Rock		
445	545						X	X	X					
445	548				X		X	X	'					
545	795'						X	X	X					

RECEIVED JAN 30 2014 WATER RIGHTS SALT LAKE

RECEIVED JAN 21 2014 WATER RIGHTS SALT LAKE

Static Water Level

Date 8-22-13 Water Level 441' feet Flowing? ☐ Yes ☑ No

Method of Water Level Measurement Sounder If Flowing, Capped Pressure _____ PSI

Point to Which Water Level Measurement was Referenced Ground Level Elevation _____

Height of Water Level reference point above ground surface 441' feet Temperature _____ degrees ☐ C ☐ F

[redacted] *Well Log* [redacted]

Rodeo Grounds Well (#16)

WIN 436568

Construction Information

DEPTH (feet) FROM	DEPTH (feet) TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	DEPTH (feet) TO	☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
+3'	370'	mild steel	.375	18"	370'	610'	.70	18"	55
610'	640'		.375	18"	640'	660'	.70	18"	55
660'	670'		.375	18"	670'	810'	.70	18"	55
810'	830'		.375	18"	830'	1000'	.70	18"	55

Well Head Configuration: CAP

Access Port Provided? ☐Yes ☑No

Casing Joint Type: Butt weld

Perforator Used:

Was a Surface Seal Installed? ☑Yes ☐No

Depth of Surface Seal: 488 feet

Drive Shoe? ☐Yes ☑No

Surface Seal Material Placement Method: TRIMMIC

Was a temporary surface casing used? ☑Yes ☐No If yes, depth of casing: 93' feet diameter: 36 inches

DEPTH (feet) FROM	DEPTH (feet) TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
100'	470 488'	15 SK SAND SLURY	79 yds	
470'	1000	6 x 9 COLORADO CILICA	110 BAGS	

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)

Pump (Permanent)

Pump Description: Horsepower: Pump Intake Depth: feet

Approximate Maximum Pumping Rate: Well Disinfected upon Completion? ☐Yes ☐No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name ZIM INDUSTRIES INC (Person, Firm, or Corporation - Print or Type)

License No. 697

Signature Mark J Jemmett (Licensed Well Driller)

Date 1/2/14

WELL DRILLER'S REPORT ADDTIONAL DATA FORM

State of Utah
Division of Water Rights

WIN 436568

Well Identification

Change Application: a37675 (15-3417)

Owner *Note any changes*

Tooele City Water Special Service District
90 North Main Street
Tooele, UT 84074

Contact Person/Engineer: PAUL HANSON

Well Location *Note any changes*

N 2065 E 2030 from the SW corner of section 21, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
795	810				X		X	X	X				Brown	
810	880						X	X	X				Brown	
880	885				X		X	X	X				Brown	
885	1000						X	X	X				Brown	

Rodeo Grounds Well (#16)

Construction Information (con't)

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0'	488'	mild Steel (Intermediate)	375	28"					
0'	93'	mild Steel (conductor)	375	36"					

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)

Comments (con't)

Well Driller Statement This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name ZIM INDUSTRIES INC (Person, Firm, or Corporation - Print or Type) **License No.** 697

Signature Robert J Zimmer (Licensed Well Driller) **Date** 1/2/14

Red Del Papa Well (WIN 443468)

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 1915001M00 WIN: 443468

Owner *Note any changes*

TOOELE CITY CORPORATION
C/O PAUL HANSEN
90 NORTH MAIN
TOOELE, UT 84074

Contact Person/Engineer: PAUL HANSON (435) 843-2132

Well Location *Note any changes*

S 90 E 250 from the W4 corner of section 27, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 1/3/2020 Completion Date: 9/14/2020

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use: MUNICIPAL

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	40	40	AUGER	POLYMER - GEL
40	1200	14 3/4	REVERSE CIRCULATION	POLYMER - GEL
40	1200	28	REVERSE CIRCULATION	POLYMER - GEL

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
														SEE ATTACHED

RECEIVED
SEP 29 2020 LI
WATER RIGHTS
SALT LAKE

SCANNED LP

Static Water Level

Date 9/12/2020 Water Level 464 feet Flowing? [ ] Yes [X] No
Method of Water Level Measurement SOUNDER If Flowing, Capped Pressure N/A PSI
Point to Which Water Level Measurement was Referenced TOP OF CASING Elevation UNKNOWN
Height of Water Level reference point above ground surface 20' feet Temperature 69 degrees [ ] C [ ] F

Red Del Papa Well (WIN 443468)

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☒SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	40	A-53 GRADE B	.375	32	605	865	.060"	20"	SS WIRE WRAP
0	605	A-53 GRADE B	.375	20	915	1,045	.080"	20"	SS WIRE WRAP
865	915	A-53 GRADE B	.375	20	1,075'	1,200'	.080"	20"	SS WIRE WRAP
1,045	1,075	A-53 GRADE B	.375	20					
0	900	STEEL SCH 40	.154	2"					

Well Head Configuration: 20" STICK UP & DOUGHNUT BETWEEN CASINGS Access Port Provided? ☒Yes ☐No

Casing Joint Type: WELDED Perforator Used: NO

Was a Surface Seal Installed? ☒Yes ☐No Depth of Surface Seal: 100 feet Drive Shoe? ☐Yes ☒No

Surface Seal Material Placement Method: CEMENT

Was a temporary surface casing used? ☐Yes ☒No If yes, depth of casing: _____ feet diameter: _____ inches

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	40	SAND CEMENT SLURRY	10 YDS^3	19/6AL 15SACK 6/6AL
0	100	SAND CEMENT SLURRY	11 YDS^3	19/6AL 15 SACK 6/6AL
100	1200	SRI SUPREME #6	101 YDS^3	N/A

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
6/24/2020	DUAL SWAB AIRLIFT	300	X		4'	96 HOURS
9/12/2020	PUMP DEVELOPMENT & TEST	1,600	X		115'	51 HOURS

Pump (Permanent)

Pump Description: _____ Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? ☐Yes ☐No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

ZONE SAMPLED 1045 - 1055 1060 - 1070 880 - 890

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name HYDRO RESOURCES WEST, INC. License No. 815
(Person, Firm, or Corporation - Print or Type)

Signature _____ Date 9/19/2020
(Licensed Well Driller)

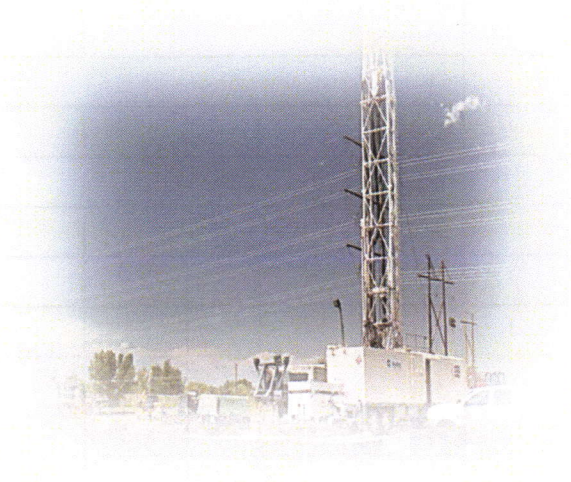
Cuttings Log

start date

Red Del Papa Well (WIN 443468)

Hydro resources

Dec-19

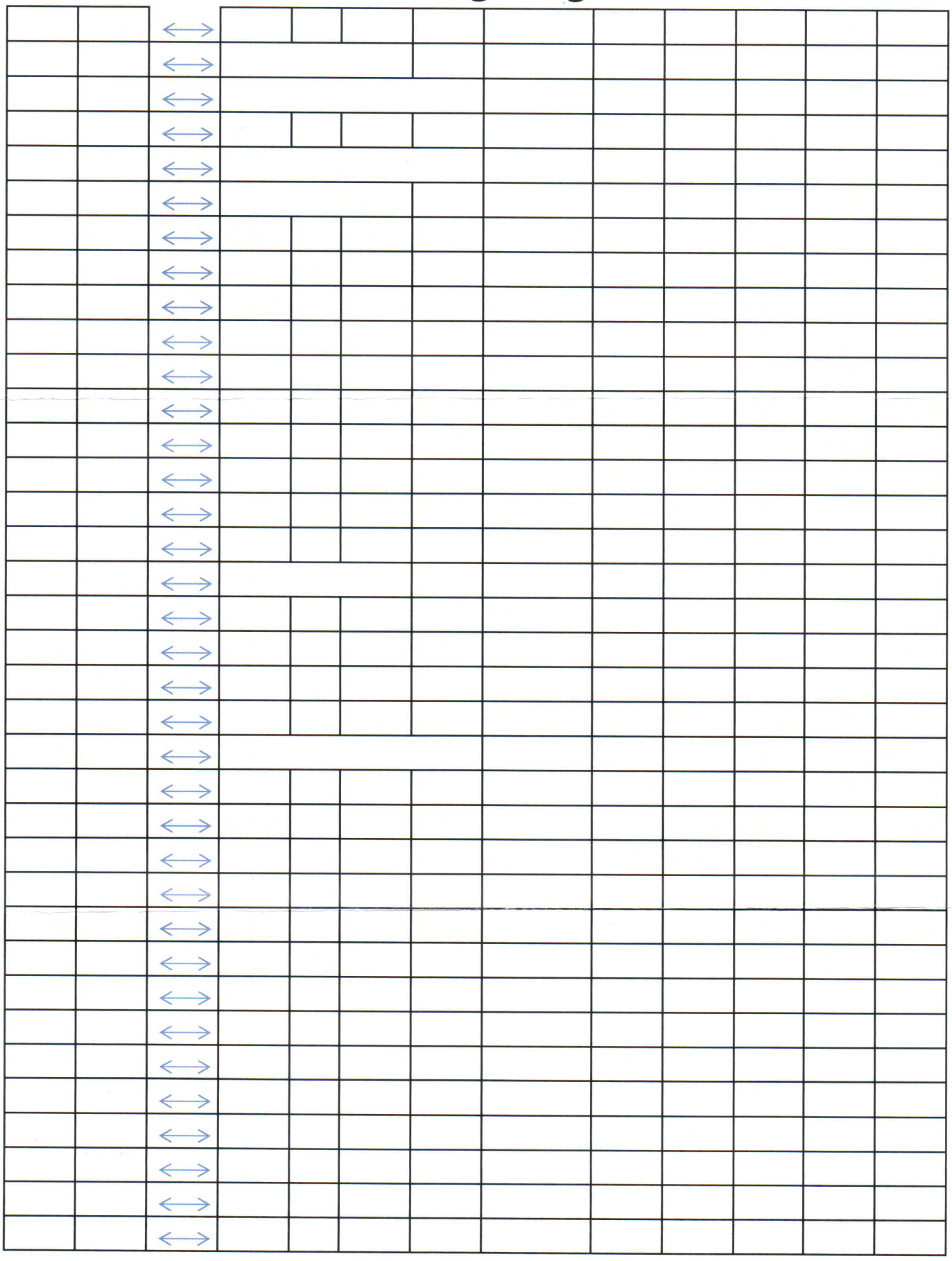


From	to			RIG	10024
0	40	⟷	Clay sand & gravel		
40	80	⟷	Gravel		
80	90	⟷	Clay & gravel		
90	175	⟷	Rock gravel & clay		
175	295	⟷	Sand & gravel		
295	300	⟷	Sand Clay & gravel		
300	380	⟷	Sand & gravel		
380	400	⟷	Clay		
400	*405*	⟷	clay & sand		
405	425	⟷	Gravel		
425	450	⟷	Clay & gravel		
450	475	⟷	Clay sand & gravel		
475	495	⟷	Sand & gravel		
495	560	⟷	Gravel		
560	900	⟷	Gravel & sand		
900	1075	⟷	Clay sand & gravel		
1075	1110	⟷	Gravel & sand		
1110	1200	⟷	Bed rock		
		⟷			
		⟷			
		⟷			
		⟷			
		⟷			
		⟷			

Cuttings Log

Red Del Papa Well (WIN 443468)

start date



APPENDIX B

UTAH DIVISION OF WATER QUALITY WATER DISHCARGE FACT SHEET

Fact Sheet Regarding Water Discharges From Water Well Drilling and Operation

Prepared by: Utah Division of Water Quality

Updated July 2002

Background:

Utah Administrative Code (UAC) R317-8-2 requires a UPDES discharge permit for the discharge of pollutants from any point source into waters of the State. A point source is defined as "any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, from which pollutants are or may be discharged."

Through the use of various drilling methods and reasonable best management practices, water well drilling generally can be conducted such that no discharge occurs or that only de minimis (insignificant) amounts of pollutants would be released into waters of the State. As such, it has been the policy of the Division of Water Quality to not require water well drilling operations to obtain a discharge permit as long as they do not discharge or discharge de minimis amounts of pollutants.

There may be circumstances where a discharge permit is necessary or desired by the well driller or owner. However, because a discharge permit can take several months to issue, requires payment of a permit fee, and because the permit would contain specific enforceable effluent quality limits and frequent self-monitoring and reporting requirements, it is highly recommended that all options to avoid discharge or attain the de minimis discharge be explored before pursuing an individual discharge permit.

Best Management Practices (BMP's)

The goal of BMP implementation is to avoid discharge or, if this is not practicable, to obtain a de minimis pollutant discharge during any phase of well development. The primary pollutants of concern are total suspended solids and turbidity in the form of drill cuttings and muds. Occasionally chemicals such as surfactants are used during the drilling operation. It is the responsibility of the operator and/or owner to assure that BMP's are properly installed and operated in order to contain all fluids or to produce a de minimis pollutant discharge to waters of the State. Some BMP's are indicated below:

1. Drill pits or ponds of adequate size for total containment of all fluids containing drill cuttings, surfactants and associated chemicals.

2. Pits or ponds used for settling; followed by filter cloth and/or straw bales which can be used for filtration prior to fluids entering surface waters of the state.

3. Land application of produced waters during drilling, pump testing, and well development where no discharge would occur to waters of the State.

4. Land application where sufficient filtration through vegetation removes solids and turbidity before water is diffused and enters any surface waters.

5. Other sediment and turbidity reduction treatment such as frac tanks, cyclone separators, etc.

Pollution of waters of the state is a violation of the Water Quality Act, UCA 19-5, which provides for significant monetary penalties, and additional penalties for violations that are willful or caused by gross negligence.

If you have any concerns not covered in this fact sheet or any further questions, please contact:

Mike Herkimer
(801) 536-4386
Division of Water Quality
195 North 1950 West
P.O. Box 144870
Salt Lake City, Utah 84114-4870

Jim Goddard
(801) 538-7314
Division of Water Rights
1594 West North Temple, Suite 220
Salt Lake City, Utah 84114-6300

SECTION 33 00 10

TECHNICAL SPECIFICATIONS
DRILL, CONSTRUCT AND TEST THE
PROPOSED PUBLIC WATER SYSTEM (PWS) WELL
FOR
TOOELE CITY
PUBLIC WATER SYSTEM (PWS) NO. UTAH23004
TOOELE COUNTY, UTAH

Prepared for:

J-U-B Engineering
Attn: Brandon Nielsen, P.E.
466 North 900 West
Kaysville, UT 84037

Prepared by:

William D. Loughlin, P.G.
Principal Hydrogeologist, Manager

Loughlin Water Associates, LLC
3100 Pinebrook Road, Suite 1100
Park City, Utah 84098
(435) 649-4005
www.LoughlinWater.com

Date: June 9, 2025

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1 Regional Map
2 Topographic Map
3 Location Map
4 Preliminary Design of Proposed PWS Well

APPENDIX

A Well Driller Reports
B Utah Division of Water Quality Water Discharge Fact Sheet

1.0 GENERAL REQUIREMENTS

1.1 THE REQUIREMENT

The Utah-licensed water well driller (the CONTRACTOR) shall furnish all materials, labor, plant, equipment, tools, supplies, transportation, and appurtenances to drill, construct, develop, and test the Proposed Public Water System (PWS) Well (the proposed PWS well) as specified herein (the WORK).

The WORK will be performed in accordance with the current requirements of: (1) Utah Department of Natural Resources (DNR), Division of Water Rights (DWRi), sometimes referred to as the *Office of the State Engineer*, including Utah Administrative Code (UAC) Rule R655-4, *Administrative Rules for Water Wells*; (2) Utah Department of Environmental Quality (DEQ) Division of Drinking Water (DDW), including UAC, R309-515-6, *Facility Design and Operation: Source Development; Ground Water – Wells*; (3) DEQ Division of Water Quality (DWQ), *Utah Water Quality Act*, 19-5-107(1); and (4) the requirements of the Contract Documents, including these Technical Specifications.

1.2 PROJECT DESCRIPTION

The location of the WORK site for the proposed PWS Well has not been determined but will be at either the Rogers Exploration Well or High School Exploration Well (the two exploration wells). Figures 1 and 2 show that the:

- Rogers Exploration Well (Exploration Well No. 1) is south of Rogers Street, west of 1000 West, about 1.5 miles due west of Main Street (Highway 36) and

- High School Exploration Well (Exploration Well No. 2), has a street address of approximately 200 East, 2400 North and about 0.25 miles due west of Main Street (Highway 36).

Figure 3 shows the location of nearby Tooele City PWS wells.

The desired yield of the proposed PWS well is 3000 gallons per minute (gpm).

The proposed PWS well will be drilled through and completed in valley-fill deposits that consist of unconsolidated to semi-consolidated clayey sand and gravel interbedded with sand and gravel, cobbles, boulders, conglomerate, and sandy clay. The estimated total drilling depth is up to 1210 feet. However, the final design of the proposed PWS well will be determined after the borehole is drilled and geologically and geophysically logged.

The WORK consists of drilling, constructing, developing, and testing proposed PWS well. As part of the WORK, the CONTRACTOR shall:

- Drill for and install 32-inch diameter conductor casing to depth of approximately 40 feet and install a certified cement grout seal.

- Drill 28-inch diameter and geophysically log production boring to depth of approximately 1205 feet.
- Install 20-inch diameter production casing and well screen assembly.
- Install filter pack and develop the proposed PWS well with the drill rig.
- Install a certified cement grout well seal around the production casing.
- Develop the proposed PWS well with the drilling rig
- Develop the proposed well with a dual-swab cable tool rig.
- Install a test pump and conduct development and pump testing of the proposed PWS well.
- Perform other tasks as directed by the ENGINEER and described in these Technical Specifications and the Contract Documents.

Figure 4 shows the preliminary design of the proposed PWS well. The CONTRACTOR shall use flooded reverse-circulation drilling methods to drill the borehole below the conductor casing. The ENGINEER will specify to the CONTRACTOR the total drilling depth and the final well design including filter pack gradation and well screen slot size, placement of well casing, screen, filter pack, cement grout well seal, and any other materials used to construct the proposed PWS well.

Tooele City is designated as the "*OWNER*" in these Technical Specifications and Contract Documents for the proposed PWS well. Tooele City is DDW Public Water System (PWS) No. UTAH23004. The DDW classifies Tooele City as a community water system.

Loughlin Water Associates, LLC (Loughlin Water) prepared these Technical Specifications for J-U-B Engineers and Tooele City and (2) is designated as the "*ENGINEER*" in these Technical Specifications.

The form and detail of the various features of the WORK are illustrated on the following drawings and documents and made part of these Technical Specifications:

Figure 1 – Regional Map
Figure 2 – Topographic Map
Figure 3 – Location Map
Figure 4 – Preliminary Design Proposed PWS Well
Appendix A – Well Driller Reports
Appendix B – Utah Division of Water Quality Water Discharge Fact Sheet

1.3 WORK SITE AND LOCATION

The location of the WORK site for the proposed PWS Well has not been determined but will be at either the Rogers Exploration Well or High School Exploration Well; see Figures 1, 2, and 3.

The OWNER will delineate the areas within which all of the CONTRACTOR operations shall occur. The CONTRACTOR shall not enter on or occupy with laborers, tools, equipment, or materials any ground outside the area delineated by the OWNER. Other contractors, employees, or agents of the OWNER/ENGINEER may enter the WORK site delineated by the OWNER for business purposes.

1.4 BEGINNING AND COMPLETION OF WORK

The CONTRACTOR shall begin WORK within 30 days of the Notice to Proceed. The CONTRACTOR shall substantially complete the WORK within 90 days of beginning the WORK.

1.5 SERVICES FURNISHED BY THE OWNER

The OWNER will:

- As conditions require, provide reasonable road access capable of handling heavy equipment;
- Provide rights-of-way for the WORK specified in this contract.
- Obtain a Plan Approval for the proposed PWS well from the DDW prior to the start of drilling, which includes DDW approval of the Preliminary Evaluation Report (PER) as outlined in UAC R655-4-12.1.2, *Public Water Supply Wells*;
- Allow the CONTRACTOR to use the OWNER's culinary water for the drilling operations (see Section 1.9).
- Obtain or help the CONTRACTOR obtain any required permits regarding workings hours, noise control and/or lighting restrictions (see Section 1.10).
- Allow the CONTRACTOR to dispose of drill cuttings and solid wastes at a location specified by the OWNER (see Section 1.12).

1.6 SERVICES FURNISHED BY THE ENGINEER

The ENGINEER will:

- Inform the CONTRACTOR about the collection of subsurface data during drilling operations.
- During the course of the WORK, the ENGINEER, in consultation with the OWNER and the CONTRACTOR, will specify to the CONTRACTOR the total drilling depth and the final well design including placement of well casing, screen, filter pack, cement grout well seal, and any other materials used to construct the proposed PWS well.
- Determine when well development is complete.
- Help plan and monitor pumping tests.

1.7 DRILLING AND WELL CONDITIONS

The target aquifer of the proposed PWS well is the principal basin-fill aquifer in Tooele Valley. The estimated total drilling depth is up to about 1200 feet. The valley-fill deposits at the proposed well sites are expected to consist of unconsolidated to semi-consolidated clayey sand and gravel interbedded with sand and gravel, cobbles, boulders, and sandy clay.

Figure 3 shows the locations and Appendix A provides copies of Well Driller Reports (well logs) for nearby Tooele City PWS wells. The following summarizes expected subsurface conditions based on the well logs in Appendix A:

Depth (feet)	Geologic Unit	Description
0 – 30	Lacustrine gravel, Great Salt Lake and Lake Bonneville - Holocene to upper Pleistocene (Qlg)	Sandy gravel to boulders composed of locally derived rock fragments deposited in shore zones of Great Salt Lake and Lake Bonneville
30 – 90	Lacustrine and alluvial deposits, undivided (Qafy) (Holocene to upper Pleistocene)	Sand, gravel, silt, and clay; consists of alluvial deposits reworked by lakes, lacustrine deposits reworked by streams and slopewash, and alluvial and lacustrine deposits.
90 – 200	Older fan alluvium, pre-Lake Bonneville upper to middle Pleistocene (Qafo)	Poorly sorted boulders, cobbles, gravel, sand, silt, and clay that predate Lake Bonneville; includes fan surfaces of different levels.
200 – 1100	Older fan and alluvial deposits- lower Pleistocene to Pliocene, (Qafo, QTaf, Tsl)	Poorly sorted boulders, cobbles, gravel, sand, silt, and clay; conglomerate, unconsolidated to semi-consolidated, may overlap in age with Tertiary Salt Lake Formation.
1100 – 1210	Older fan and alluvial deposits- lower Pleistocene to Pliocene, (QTaf, Tsl)	Semi-consolidated deposits, and Tertiary Salt Lake Formation (Tsl).

We expect the aquifer to be unconfined and the depth to the static water level to be within about 440 to 490 feet below ground surface.

It is the CONTRACTOR's responsibility to become informed about local conditions affecting this WORK. Neither the information contained in these specifications, nor gleaned from the OWNER, ENGINEER, or their agents, shall act to relieve the CONTRACTOR from any responsibility set forth in the contract.

1.8 UTILITIES AND UTILITY CLEARANCES

The CONTRACTOR shall be responsible for calling Blue Stakes and taking other actions to identify utilities present at the worksite in accordance with UAC R655-4-10.2, *Well Site Locations*. The CONTRACTOR shall be fully responsible for identifying utilities and for any damage caused by the CONTRACTOR's negligence.

1.9 WATER, POWER, AND SITE IMPROVEMENTS

The CONTRACTOR may obtain water for drilling operations from Tooele City.

Any water entering a well during construction shall not be contaminated and should be obtained from a chlorinated municipal system. Where this is not possible the water shall be dosed to give a free chlorine residual of 100 milligrams per liter (mg/L). Water introduced into the proposed PWS well shall (1) shall meet the Utah Drinking Water Standards specified in UAC R309-200, *Drinking Water Standards* and (2) conform to all laws applicable to the protection of water quality including UAC R309-515-6(6)(j), *Water Entered Into Well During Construction* and UAC R655-4-11.6.5, *Well Disinfection and Chlorination of Water*.

Costs for water conveyance facilities or transportation to the WORK site shall be borne by the CONTRACTOR. Any required permits to acquire water from other sources are the responsibility of the CONTRACTOR. This includes all necessary piping and components, but only at such locations and in a manner approved by the ENGINEER. Before final acceptance of the proposed PWS well, all temporary connections and piping installed by the CONTRACTOR shall be removed in a manner satisfactory to the ENGINEER.

The CONTRACTOR shall provide, at his own expense, all power required for their operations under the contract.

If desired, security and safety fencing around the WORK site may be installed by the CONTRACTOR, at his own expense.

1.10 WORKING HOURS AND NOISE AND LIGHT CONTROL

The CONTRACTOR will be authorized for 24-hour-per-day work for the drilling, construction and testing of the proposed well. The CONTRACTOR shall work on this project in a steady and diligent manner. The CONTRACTOR shall, during all work periods, provide an adequate crew of suitably qualified personnel to prevent unnecessary delays in project completion.

WORK shall be prohibited on Christmas Eve, Christmas Day, New Year's Eve and New Year's Day.

The CONTRACTOR shall make reasonable provision for noise and light control that include, at a minimum, the following measures:

- All equipment and machinery shall be in proper working order.
- All equipment and machinery shall be fitted with adequate mufflers and shall be located, operated, and maintained to minimize noise.
- Air-compressors and generators shall be housed in noise attenuation enclosures.
- The drill rig shall be equipped with a muffler system for air discharges that occur during drilling operations.

The CONTRACTOR shall abide by Tooele City code Title 11, Section 2, Noise Control, which can be viewed at:

https://files.tooelecity.gov/Document%20Center/Government/City%20code/Title11Chapter2(Dec1991).pdf

The CONTRACTOR shall be responsible for meeting all requirements of working hours, noise control, outdoor lighting and nuisance abatement.

The OWNER will obtain or help the CONTRACTOR obtain any required permits regarding workings hours, noise control and/or lighting restrictions.

The CONTRACTOR will prepare and distribute an OWNER approved flyer with a description of the project with contact information for questions and comments regarding the project.

1.11 SANITATION

The CONTRACTOR shall provide chemical toilets at the WORK site. The toilets shall conform to applicable local, State and Federal requirements. The cost for these sanitary facilities shall be borne by the CONTRACTOR.

1.12 MANAGEMENT OF DRILL CUTTINGS, DRILLING FLUIDS AND PRODUCED WATER

It will be the responsibility of the CONTRACTOR to dispose of the drill cuttings and left-over drilling fluid.

The CONTRACTOR is responsible for following *Best Management Practices* (BMP's) regarding drilling fluid and water discharges during the drilling and testing of the proposed well. It is the responsibility of the drilling CONTRACTOR to use BMPs to limit pollutant discharge to *de minimis* quantities, thereby protecting waters of the State, in accordance with Division of Water Quality Fact Sheet provided in Appendix B. Prior to the start of the WORK, the CONTRACTOR shall submit to the ENGINEER their plan to manage the drilling fluid and water discharge during the drilling and testing of the proposed well.
Drilling fluids, drill cuttings and produced water shall be contained in above-ground tanks and disposed of in a manner to prevent surface or subsurface contamination and to prevent degradation of natural or man-made water courses, impoundments, waterways, lakes, reservoirs, irrigation ditches, storm sewers, and dry stream beds. Cuttings and waste from well drilling operations shall not be discharged into a waterway, lake or reservoir.

Discharge of produced water will be allowed during development and testing provided there are no adverse impacts. Water produced during development and testing shall be discharged into a holding tank or series of tanks or basins for settling. Discharge from the tanks or basins shall pass through straw bales and/or geofabric for erosion control and further filtration. The CONTRACTOR shall provide, at their own expense, all of the

tanks, hay bales, geofabric, riprap, flexible hose, PVC or other tubing, and other materials and equipment to divert and dissipate the energy of and minimize erosion from the discharged water, filter and allow for settling of the solids in the discharged water.

Control of drill cuttings, fluids, and produced water shall conform with UAC R309-515-6(6)(d), *Disposal of Cuttings*, UAC R655-4-11.6.2, *Containment of Drilling Fluids*, rules of the DWQ, and the *Utah Water Quality Act*, 19-5-107(1).

1.13 PROTECTION OF GROUNDWATER QUALITY

The CONTRACTOR shall (1) take all necessary precautions to prevent contamination of the water in the proposed PWS well by preventing the introduction of any foreign substance, including contaminated water, gasoline, oil, and the like and (2) conform to all laws applicable to the protection of water quality including UAC R309-515-6(6)(j), *Water Entered Into Well During Construction*, UAC R655-4-11.6.4, *Down-hole Equipment* and UAC R655-4-11.6.5, *Well Disinfection and Chlorination of Water*.

1.14 FINAL CLEANUP

The CONTRACTOR shall thoroughly clean the site after completion of the drilling, well construction, and development and test pumping operations. All drill cuttings, debris, and other materials used or generated during these operations shall be properly disposed of by the CONTRACTOR. The disposal of cuttings and drilling fluids shall conform with UAC R309-515-6(6)(d), *Disposal of Cuttings*, UAC R655-4-11.6.2, *Containment of Drilling Fluids* and the *Utah Water Quality Act*, 19-5-107(1).

Following all operations, the CONTRACTOR shall promptly remove their equipment, temporary facilities, and materials, smooth the work site surface, and leave the site in a condition acceptable to the OWNER. No reseeding is to be done during the final cleanup.

2.0 WELL PRODUCTS

In accordance with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification*, all interior surfaces that may contact well water must consist of products complying with ANSI/NSF Standard 61. This requirement applies to drop pipes, interior casing and slotted casing, well screens, coatings, adhesives, solders, fluxes, pumps, switches, electrical wire, sensors, and all other equipment or surfaces which may contact the drinking water.

All substances introduced into the proposed PWS well during construction or development shall be certified to comply with ANSI/NSF Standard 60 in accordance with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification*. This requirement applies to drilling fluids (biocides, clay thinners, defoamers, foamers, loss circulation materials, lubricants, oxygen scavengers, viscosifiers, weighting agents) and

regenerants. This requirement also applies to well grouting and sealing materials which may come in direct contact with the drinking water.

CONTRACTOR shall submit to the ENGINEER Safety Data Sheets (SDSs), formerly Material Safety Data Sheets (MSDSs) for all proposed chemicals (including lost circulation materials) to be added to the borehole for approval prior to their use.

2.1 DRILLING FLUIDS

2.1.1 General

In accordance with UAC R655-4-11.6.5 *Well Disinfection and Chlorination of Water*, potable water from a source approved by the ENGINEER shall be used as a base for drilling fluids whether used alone or in combination with drilling fluid additives.

The drilling fluid shall conform with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification* and UAC R655-4-11.6.1, *Protection of Aquifer - Drilling Fluids and LCMs.* The drilling fluid may consist of air and/or water mixed with a foaming surfactant, polymer, high-grade bentonite, or other ENGINEER-approved materials. If there should be a conflict between the drilling fluid requirements for ease of drilling and drilling fluid requirements for aquifer protection, then the ruling requirements shall be those for aquifer protection. The drilling fluid shall possess characteristics required to: (1) prevent caving as drilling progresses; (2) permit recovery of representative drill cutting samples; (3) allow for geophysical logging, if required, and (4) maintain the structural integrity of the borehole during casing and screen installation. Any contaminants or pollutants introduced into the borehole or well by the CONTRACTOR shall be removed, eliminated, or remediated from the proposed PWS well by the CONTRACTOR.

2.1.2 Lost Circulation

In the event of lost circulation conditions, the CONTRACTOR shall use material in accordance with UAC R655-4-11.6.1, *Protection of Aquifer - Drilling Fluids and LCMs* [lost circulation materials]. CONTRACTOR shall only use inert, non-organic materials to regain drilling fluid circulation that are approved by the State of Utah.

2.2 CASING

All casing shall be steel and be of adequate size, strength, and wall thickness to facilitate subsequent drilling and construction and must meet the requirements of UAC R309-515-6(6)(b), *Permanent Steel Casing Pipe* and R655-4-11.2.3, *Well Casing – General – Steel Casing*. All steel casing shall be in new condition that meets AWWA Standard A-100, ASTM or API standards for steel pipe and have a minimum wall thickness for the designed depth as specified in R655-4-11.2.3, *Well Casing – General – Steel Casing*. Casing joints shall be welded in accordance with UAC R655-4-11.3.2, *Casing Joints – Steel Casing*. Spot welding of joints is prohibited.

Steel casing shall meet the following requirements:

Conductor Casing:	32-inch diameter, minimum 0.375-inch wall thickness, low carbon steel casing
Production Casing:	Nominal 20-inch diameter, 0.375-inch wall thickness, low carbon steel casing

Casing that does not meet the above requirements must be approved by the ENGINEER prior to use as casing in the proposed well.

Prior to installing casing, CONTRACTOR shall submit to the ENGINEER delivery tickets that show that the casing meets the specifications of Section 2.2.

2.3 WELL SCREEN

The well screen shall be constructed of 20-inch diameter 304 stainless steel wire-wrapped well screen that meets the requirements of Section 2.2 *Casing* and UAC R309-515-6(6)(f) *Screens* and R655-4-11.7.9 *Screen*.

The screen openings shall be continuous Vee wire wrapped machine made stainless steel screens with the "V" facing inward. Slot size will be based on results of sieve analyses of cuttings samples collected by the CONTRACTOR for the ENGINEER. For preliminary bidding purposes, a continuous wrapped screen meeting this requirement is 0.080-inch with a maximum setting depth of 1200 feet, and a collapse strength of 350 psi.

Manufacturer's literature indicates that the following product meets this specification: "*Johnson Free-Flow – Size 20P 304 Stainless Steel Screen*". Any other product must be approved by the ENGINEER for use as the well screen in the proposed well. Other products may be considered by the ENGINEER as long as the above specifications are met.

Casing "*blanks*" between sections of the proposed PWS well screen may be required by the ENGINEER and shall meet the requirements of Section 2.2. The ENGINEER will specify the arrangement of well screen and blank casing that shall make up the assembly. Centralizers, described below, shall be placed on the proposed PWS well screen. The bottom of the production casing and well screen assembly shall be sealed with a bullnose end cap.

Prior to installing the proposed PWS well screen, CONTRACTOR shall submit to the ENGINEER delivery tickets that show that the proposed PWS well screen meets the specifications of Section 2.3.

2.4 CENTRALIZERS

Centralizers are not expected to be installed on the proposed well. If centralizers are used, they shall be installed as directed by the ENGINEER. Centralizers shall consist of the same material as the casing or well screen that the centralizers are attached to. Centralizers shall be placed at intervals of 60 feet or less. Centralizers manufactured to

fit the casing may be used. Other types of centralizers may be utilized if the ENGINEER approves the method and materials in advance.

2.5 FILTER PACK

Filter pack (also called gravel pack) size and gradation will be determined by the ENGINEER following evaluation of sieve (gradation) analyses of formation lithologic samples from the borehole.

Filter pack material shall be sand and a product of commercial sand and gravel supplier. It shall (1) be properly sized and graded, (2) be composed of rounded, clean, smooth and uniform, 95 percent siliceous material, (3) no more than 5 percent acid solubility, (4) be free of flat or elongated pieces, organic matter, or other foreign matter, and (5) meet the requirements of AWWA specification B-100 for Granular Filter Material. The filter pack material shall conform to UAC R309-515-6(6)(k), *Filter pack Wells*, and UAC R655-4-11.5.2, *Filter pack or Filter Material*.

Prior to installing the filter pack, the CONTRACTOR shall submit to the ENGINEER the results of a gradation (sieve) analysis of a representative sample of the material that is shipped to the proposed PWS well site to confirm that the selected material is of appropriate size and gradation.
The filter pack material shall be (1) thoroughly sterilized with 100 parts per million (ppm) chlorine or hypochlorite solution immediately before being installed in the borehole or (2) dry chlorine should be mixed with the filter pack at the surface before it is installed in the borehole.

2.6 GROUT AND SEAL MATERIAL

Grout and seal material shall meet the requirements of UAC R655-4-2 *Definitions*, and UAC R655-4-11.4.2 *Seal Material*. Grout and seal material shall conform to the following specifications.

2.6.1 Bentonite Plugs

The bentonite plug, intended to keep grout from entering the filter pack and sealing the pitless adaptor seal interval, shall consist of coated sodium montmorillonite pellets or unhydrated bentonite. The bentonite shall be furnished in sacks or buckets from a commercial source and shall be free of impurities that adversely impact the water quality. Pellet size shall be 1/4 to 3/8-inch. The pellet coating should be such that it retards the swelling of the pellets for a minimum period of about 60 minutes.

2.6.2 Unhydrated Bentonite

Dry bentonite consisting primarily of granules, tablets, pellets, or chips that may be placed in a well or borehole in the dry state and hydrated in place by either formation water or by the addition of potable water into the proposed PWS well or borehole containing the dry bentonite. Unhydrated bentonite shall be used for sealing the pitless adapter seal interval and can be used for other seals and the abandonment of wells.

2.6.3 Neat Cement Grout

Cement (Types I, II, III, V, high alumina, or a combination thereof) conforming to the ASTM Standard C150 (standard specification of Portland cement), with no more than six (6) gallons of water per 94-pound sack (1 cubic foot) of sufficient weight density of not less than 15 pounds per gallon (lbs/gal). Once cubic yard of neat cement grout contains 1993 pounds of Portland cement and not more than 127 gallons of clean water. Bentonite, controlled density fill (CDF), or fly ash shall not be added to neat cement grout unless State Engineer approval is received.

2.6.4 Sand Cement Grout

A grout consisting of equal parts by volume of cement conforming to ASTM Standard C150 and clean sand/aggregate with no more than six (6) gallons of water per 94-pound sack (one cubic foot) of cement. Sand cement grout may be used for annular openings of larger than 2-inches.

2.7 DISPERSANTS

Dispersants shall be utilized during well development to break down drilling fluids and to remove sediment from the filter pack. Dispersants shall conform with R309-515-6(6)(a), *ANSI/NSF Standards 60 and 61 Certification* and UAC R655-4-11.6.1, *Protection of Aquifer - Drilling Fluids and LCMs.* Use of dispersing agents shall conform to UAC R309-515-6(7)(c), *Well Development* and the manufacturer's instructions for mixing, application, and disposal.

Manufacturer's literature indicates that the following products meet the specifications for dispersants:

- "*Johnson Screens NuWell 220 Dispersant Polymer*" and
- *"Bariod Aqua-Clear RFD Polymer Dispersant".*

2.8 WELL CAP

Upon completion of well construction and testing, the top of the proposed PWS well casing shall be equipped with a water-tight, tamper-resistant, locking steel casing cap in accordance with UAC R655-4-11.7.3 *Completion or Abandonment,* R655-4-14.1 *Temporary Abandonment* and R309-515-6(8) *Capping Requirements*. The proposed PWS well cap shall have an access port to permit installation of a well sounder probe. The access port shall be a minimum of 1-inch diameter and have a watertight plug. The temporary well cap will be removed and replaced for installation of the permanent pump later under separate specifications.

3.0 EXECUTION

Figure 4 presents the preliminary design for the proposed PWS well. The ENGINEER will specify to the CONTRACTOR the total drilling depth and the final well design including

placement of well casing, perforations, cement grout well seal, and any other materials used to construct the proposed PWS well.

3.1 MOBILIZATION AND DEMOBILIZATION

Upon receiving the "*Notice to Proceed*", the CONTRACTOR shall notify the DWRi in accordance with UAC R655-4-4.2, *Start Cards.* The CONTRACTOR shall then move in all tools, equipment, and supplies necessary for the WORK and upon completion of the WORK, shall remove all such items from the premises promptly and leave the site in a clean, smoothed, and orderly condition. Site preparation and restoration shall be the responsibility of the CONTRACTOR.

3.2 BOREHOLE DRILLING - GENERAL

The CONTRACTOR shall collect representative formation samples as directed by the ENGINEER, at a minimum of 5-foot intervals and at major geologic formation changes. Each sample shall be stored in insect- and mildew-proof oil-well-sand sample bags. Plastic bags will not be accepted. Each sample bag shall be labeled with the proposed PWS well name, depth interval, date, and time of collection. Sample bags containing the drill cuttings shall be stored in order and in an area at the proposed PWS well site that is covered. The drill cuttings samples shall not be directly exposed to precipitation. Chip trays for drill cutting samples shall be made available to the ENGINEER.

The CONTRACTOR shall maintain a daily drilling log of the proposed PWS well. Information that shall be listed on the drilling log includes: (1) any drilling fluids and additives, including quantity of materials used; (2) any drilling fluid properties, including weight, viscosity, and sand content; (3) type and diameter of bits used for drilling and total footage for each bit; (4) any remarks or comments concerning the drilling characteristics of the borehole(s); (5) description of formation materials encountered during drilling, and (6) any remarks or comments regarding water encountered in the borehole(s). The CONTRACTOR shall keep the forms at the site for inspection by the ENGINEER or OWNER.

The CONTRACTOR shall complete and file a Well Driller's Report with the DWRi as required by UAC R655-4-4.5, *Official Well Drillers Report* (well log). Copies of all logs and forms shall be furnished to the ENGINEER following completion of all operations.

The CONTRACTOR shall drill and construct the production well sufficiently straight and plumb to meet the requirements stated in Section 3.16.

The CONTRACTOR shall manage drilling fluids and produced water and shall protect groundwater quality and the waters of the State, as specified in Section 1.12.

3.3 LOST CIRCULATION

In the event of lost circulation conditions, the CONTRACTOR shall contact the ENGINEER prior to the use of lost circulation materials. Use of lost circulation materials

shall conform to the requirements of UAC R655-11.6.1, *Protection of Aquifer – Drilling Fluids and LCMs*.

3.4 CONDUCTOR CASING

The CONTRACTOR shall drill for, install, and grout in place minimum 32-inch diameter steel conductor casing. The CONTRACTOR shall drill a borehole for the conductor casing that is at least 4 inches in diameter larger than the outside diameter of the conductor casing. Drilling shall conform to the specifications provided in Section 3.2.

The casing shall be lowered into the borehole by a method which will always allow for the control of the rate of fall of the casing into the borehole. The casing shall not be dropped or allowed to fall uncontrolled into the borehole.

Individual lengths of casing shall be joined by welding in accordance with UAC R655-4-11.3.2, *Casing Joints – Steel Casing*. Welding of the proposed PWS well casing shall be performed by properly qualified persons. Conductor casing shall conform to the specifications provided in Section 2.2, UAC R309-515-6(6)(b), *Permanent Steel Casing Pipe* and R655-4-11.3.2, *Steel Casing*. The conductor casing shall be unperforated in accordance with R655-4-11.5.5, *Permanent Conductor Casing Used.*

Centralizers shall be installed as directed by the ENGINEER.

The CONTRACTOR shall measure and record the lengths of each section of casing in the order of installation in the borehole for submittal to the ENGINEER.

The conductor casing shall be suspended in the borehole and cemented in place in accordance with the specifications provided in Section 3.16.

3.5 PRODUCTION BOREHOLE

The CONTRACTOR shall drill a 28-inch diameter production borehole to total depth (estimated to be 1210 feet), maintain a drilling log, and collect representative formation samples. The ENGINEER shall determine the exact drill depth based on the lithology and other information collected from the borehole. Drilling shall conform to the specifications provided in Section 3.2.

3.7 GEOPHYSICAL LOGGING

If directed by the ENGINEER, the CONTRACTOR shall perform or subcontract the geophysical logging of the entire production borehole. Two printed copies plus an electronic copy (USB flash drive with data files of logs and pdf file of logs) shall be provided in the field at the conclusion of the logging runs. Geophysical logging shall be completed in accordance with accepted industry standards.

The following geophysical logs shall be run:

- Spontaneous-potential

- Short and long normal electrical resistance (16- and 64-inch spacing)
- Single point resistivity
- Natural-gamma
- 3-arm caliper
- Temperature
- Deviation (gyroscopic)
- Neutron-density (if requested by the ENGINEER)

3.8 RECEIPT OF FINAL WELL DESIGN

At the conclusion of geophysical logging, the ENGINEER shall have 72 hours to submit the final well design to the CONTRACTOR under which no standby time or rig time rates shall apply. In the final well design, the ENGINEER shall specify the total drill depth, filter pack gradation and well screen slot size, placement intervals of the production casing, well screen, filter pack, bentonite seals and cement grout seals. The ENGINEER may modify the design if new information becomes available.

3.9 PRODUCTION CASING AND WELL SCREEN

Individual lengths of casing shall be joined by welding in accordance with UAC R655-4-11.3.2, *Casing Joints – Steel Casing*. Welding of the proposed PWS well casing shall be performed by properly qualified persons. Production casing shall conform to the specifications provided in Section 2.2, UAC R309-515-6(6)(b), *Permanent Steel Casing Pipe* and R655-4-11.3.2, *Steel Casing*. The proposed PWS well screen shall conform with the specifications provided in Section 2.3, UAC R309-515-6(6)(f) *Screens* and R655-4-11.7.9 *Screen*.

The bottom of the production casing and well screen assembly shall be sealed with a bullnose end cap.

Centralizers shall be installed on the production casing and well screen. Centralizers shall be placed at intervals of 60 feet or less.

The production casing and screen assembly shall be lowered into the borehole by a method which will always allow for control of the rate of fall of the assembly. The assembly shall not be dropped or allowed to fall uncontrolled into the borehole.

The production casing and well screen assembly shall be always suspended in the borehole during installation and shall not be supported from the bottom of the borehole at any time.

The CONTRACTOR shall measure and record the lengths of each section of casing and well screen in the order of installation in the borehole for submittal to the ENGINEER.

3.10 FILTER PACK

The filter pack shall extend from the bottom of the borehole upward to a depth determined by the ENGINEER, which shall be to a depth of about 120 feet below ground surface. The production casing and well screen assembly shall be suspended in the borehole while the filter packed is installed. The production casing and well screen assembly shall not be supported from the bottom of the borehole at any time during filter pack installation.

The filter pack shall be installed in accordance with AWWA Standard A100-15, *Water Wells*, Appendix B. Other installation methods may be considered by the ENGINEER as long as the filter pack shall is placed in one uniform continuous operation using a method that through common usage has been shown to minimize (1) bridging of the material between the borehole and the casing, and (2) excessive segregation of the material after it has been introduced into the annulus and before it settles in place from bottom to top.

The filter pack material shall be (1) thoroughly sterilized with 100 parts per million (ppm) chlorine or hypochlorite solution immediately before being installed in the borehole or (2) dry chlorine should be mixed with the filter pack at the surface before it is installed in the borehole.

The filter pack material shall conform to the specifications provided in Section 2.5, UAC R309-515-6(6)(k), *Filter pack Wells*, and UAC R655-4-11.5.2, *Filter pack or Filter Material*. Installation of filter pack material shall conform to UAC R309-515-6(6)(k), *Filter pack Wells*, and UAC R655-4-11.5.3, *Placement of Filter Material*.

No permanent gravel feed pipes shall be installed in the proposed PWS well or borehole.

3.11 WELL DEVELOPMENT WITH DRILL RIG

The proposed PWS well shall be initially developed with the drill rig to remove residual drilling fluids from the proposed PWS well and borehole. The proposed PWS well shall be developed by airlifting, swabbing, surging, and/or bailing, as required by the ENGINEER. This development may also include hydraulic jetting and flushing. The CONTRACTOR shall have a reasonably close-fitting swab tool or bailer with sufficient line to reach the total depth of the proposed PWS well. The CONTRACTOR shall have a compressor capable of airlifting from the bottom of the borehole and shall also have sufficient tubing of adequate diameter to reach the total depth of the proposed PWS well. It is anticipated that air-lift development will take place in a staged manner throughout the lower portion of the proposed PWS well and thus may include considerable addition and subtraction of pipe.

If requested by the ENGINEER, a dispersing agent shall be utilized to break down residual drilling fluid in the borehole and formation. Dispersing agents shall conform to the specifications provided in Section 2.7 and use of dispersing agents shall conform to UAC R309-515-6(7)(c), *Well Development* and the manufacturer's instructions for mixing, application, and disposal. Blasting procedures shall be prohibited during well

development. Well development shall conform to the requirements of UAC R309-515-6(7), *Well Development*.

Development shall continue until the water produced from the proposed PWS well is clear to the unaided eye, is reasonably sand-free and all materials pulled into the proposed PWS well by the development process have been removed and until the maximum specific capacity is obtained from the proposed PWS well in accordance with UAC R309-515-6(7), *Well Development*. The ENGINEER shall determine when development is complete.

All drill cuttings, drilling fluids and produced water shall be managed and disposed of in accordance with Section 1.12. Costs for management and disposal of drill cuttings, drilling fluids and produced water shall be borne by the CONTRACTOR.

3.12 WELL DEVELOPMENT WITH DUAL-SWAB RIG

The proposed PWS well screen shall be extensively developed with a dual-swab cable tool rig. The CONTRACTOR shall mobilize the dual-swab cable tool rig to the WORK site within 21 days after completion of development with the drill rig.

The CONTRACTOR shall have a reasonably close-fitting dual-swab tool with sufficient line to reach the total depth of the proposed PWS well. The dual-swab tool shall be minimum 10 feet in length and be equipped with a submersible pump with a minimum capacity of 200 gpm. The CONTRACTOR shall have sufficient pump column (tubing) of adequate diameter to reach the total depth of the proposed PWS well and have sufficient electrical wire to reach the bottom of the proposed PWS well.

Dual-swab development shall continue until the water produced from each swab zone in the proposed PWS well is clear with a sand content of 50 parts per million (ppm) or less as measured with a Rossum sand tester, or as specified by the ENGINEER. Development shall continue until maximum specific capacity is obtained from the proposed PWS well in accordance with UAC R309-515-6(7), *Well Development*. The ENGINEER shall determine when dual-swab development is complete.

The CONTRACTOR shall measure and record the following during dual-swab development for submittal to the ENGINEER:

- Dual-swab development interval (measured in feet below ground surface);
- Pumping rate; and
- Sand content as measured with a Rossum sand tester at each dual-swab development interval at the end of each development period.

As required by the ENGINEER, filter pack shall be installed in the borehole as it settles during dual-swab development operations. The filter pack shall be installed up to a depth specified by the ENGINNER. Filter pack installation shall be in accordance with Section 3.10.

All drill cuttings, drilling fluids and produced water shall be managed and disposed of in accordance with Section 1.12. Costs for management and disposal of drill cuttings, drilling fluids and produced water shall be borne by the CONTRACTOR.

3.13 BENTONITE PLUG

In accordance with UAC R309-515-6(6)(k)(v), *Filter pack Wells,* after the production casing, well screen, and filter pack have been installed in the borehole, and the proposed PWS well developed with the drill rig, the annular space above the filter pack shall be sealed using unhydrated bentonite pellets. The plug shall be a minimum of 10 feet in thickness. The bentonite pellets shall be placed on top of the filter pack in a manner that prevents bridging of the bentonite in the annulus. The depth to the top of the bentonite plug shall be directly measured and recorded immediately after placement, without allowance for swelling. A minimum of 60 minutes should be allowed for the bentonite plug to hydrate and form a low permeability seal before grout is placed in the annular space above the bentonite plug. The bentonite plug shall conform to the specifications provided in Section 2.6.

3.14 CERTIFIED CEMENT GROUT WELL SEAL

The CONTRACTOR shall install a certified cement grout well seal that meets the requirements of UAC R309-515-6(6)(i), *Well Sealing Techniques and Requirements* and R655-4-11.4, *Surface Seals and Interval Seals*. The cement grout well seal shall be installed around any permanent conductor or conductor casing (if installed) and the production casing and extend to a depth determined by the ENGINEER which shall be a minimum depth of 110 feet below ground surface.

The cement grout surface seal(s) shall be installed by pressure circulation of cement grout from bottom to top in accordance with UAC R309-515-6(6)(i)(iii)(A), *Application*. The cement grout shall conform to the specifications provided in Section 2.6.

To accommodate a pitless adaptor unit, the cement grout shall extend up to a depth determined by the ENGINEER, but the cement grout shall not be allowed within the pitless unit sealing interval in accordance with UAC R655-4.11.7.5, *Pitless Adapters/Units*. The pitless adaptor sealing interval shall be sealed with unhydrated bentonite. The unhydrated bentonite shall conform to the specifications provided in Section 2.6.

The grouting procedure(s) shall be witnessed and certified by an engineer or geologist from the DDW, or the appropriate district engineer of the DEQ, or an authorized representative of the DWRi (also known as the State Engineer's Office), or an individual having authorization from the Executive Secretary of the Utah Drinking Water Board, in accordance with UAC R309-515-6(5)(b)(i), *Authorized Individuals*. The CONTRACTOR shall request that the authorized grout witness inspector present a copy of the letter that authorizes the inspector to witness a well sealing on behalf of the DDW, in accordance with UAC R309-515-6(5)(b)(i), *Authorized Individuals*. The CONTRACTOR shall provide a copy of the grout seal certificate to the ENGINEER.

Installation of the cement grout seal shall conform to the requirements of UAC R309-515-6(5)(b), *Grouting Inspection during Well Construction*, UAC R309-515-6(6)(i), *Well Sealing Techniques and Requirements*, UAC R655-4-11.4, *Surface Seals and Interval Seals*, R655-4-11.7.1, *Special Requirements - Explosives* and R655-4-12.1.2, and R655-4-12.1.2, *Public Water Supply Wells*. The cement grout shall be allowed to cure a minimum of 72 hours before well drilling, construction, or testing may be resumed as outlined in UAC R309-515-6(6)(i)(iii)(E), *Surface Seals and Interval Seals.*

3.15 DEVELOPMENT AND TEST PUMPING

As required by the ENGINEER, following well development with the drill rig, the proposed PWS well shall be further developed by pumping and backwashing prior to performing the aquifer pumping tests.

Prior to the start of test pumping, the aquifer shall be allowed to recover for a period of at least 12 hours, or as determined by the ENGINEER. The CONTRACTOR, with assistance from the ENGINEER, shall: (1) conduct a step-test lasting up to about 10 hours, which will consist of pumping the proposed PWS well at various rates; (2) allow the proposed PWS well to recover overnight or for an adequate period of time as determined by the ENGINEER; and (3) conduct a constant-rate pumping test lasting a minimum of 24 hours. Pumping test procedures shall conform to UAC 309-515-6(10), *Well Assessment*.

The test pump shall be capable of delivering up to about 3000 gpm with a minimum total dynamic head of 800 feet below ground level. The CONTRACTOR shall provide to the ENGINEER the pump curve for the test pump prior to installation of the test pump.

The CONTRACTOR shall furnish and install all necessary equipment for development and test pumping, including the following:

- Test pump and drop pipe (pump column).
- Valve system to control flow.
- Smooth nosed sampling tap to collect water samples from discharge piping.
- Rossum sand tester.
- Totalizing meter with instantaneous flow rate indicator and/or an orifice weir for accurately measuring the discharge from the proposed PWS well.
- 0.75-inch inside diameter tube (installed to within 10 feet of the pump) for measuring water levels during the pumping test.
- Pressure transducer (with a data logger) acceptable to the ENGINEER that is rated at a minimum of 200 psi and capable of measuring water levels from a depth of 800 feet. The pressure transducer shall be strapped to the entire length of the drop pipe or installed in a dedicated drop tube. The transducer shall be set to record water levels every minute during the step-rate and constant-rate pumping and recovery periods.

- Piping to discharge point and necessary materials to manage produced water in accordance with Section 1.12.

During the step-rate-test, the proposed PWS well shall be pumped at rates that range from about 1000 to 3000 gpm, as directed by the ENGINEER; each step shall be of a uniform duration ranging up to about 120 minutes each, and rates shall be held constant during each step. During the constant-rate test, the pumping rate shall be held constant at a rate specified by the ENGINEER after completion of the step-rate test.

The CONTRACTOR shall measure water levels "*by hand*" (in feet to nearest tenth and from the same datum throughout aquifer testing) using a battery powered water level sounder. The CONTRACTOR shall measure:

- The water level prior to starting the step-rate test;
- During the step-rate test, water level during each step at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, and 60 minutes after start of each pumping step;
- The water level prior to starting the constant-rate test;
- During the constant-rate test, the water level during pumping at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, and 60 minutes after start of pumping, and every 30 minutes thereafter; and
- Water level during recovery at 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, and 60 minutes after ceasing to pump, and every 30 minutes thereafter. Continue recovery water level measurements for minimum of 12 hours following cessation of pumping, or until there are no changes in depth to water for at least six hours.

The CONTRACTOR shall also record the following information during the pumping tests:

- The depth of the test pump intake;
- The time and date of starting and ending of pumping tests and recovery periods; and
- The actual pumping rate.

During the step-rate and constant rate pumping periods, the CONTRACTOR shall have a person assigned full-time to keeping the rate constant during first 30 minutes of pumping, then at least every 30 minutes thereafter. The CONTRACTOR shall measure and record the pumping rate at least every 30 minutes, even if the rate is constant; record fluctuations in pumping rate; record when adjustments are made to valves that control the pumping rate.

The CONTRACTOR shall be responsible for providing power for the test pump. The CONTRACTOR shall provide a means for safe refueling during pumping operations to prevent even brief shutdowns. Power shutdowns before the end of the testing procedure

will require the CONTRACTOR to allow the water level to recover to pre-pumping conditions and initiate the test again.

CONTRACTOR shall have at least one person at all times during the pumping test to operate the pump, power supply, monitor and control the pumping rate, and to make and record frequent water level and flow rate measurements.

If required by the ENGINEER, the CONTRACTOR shall monitor and record specific conductance, temperature, turbidity and sand content during the step-rate and constant-rate pumping tests. Measurements shall be performed at about one-hour intervals while pumping.

If requested by the ENGINEER, the CONTRACTOR shall aid the ENGINEER in collecting water samples for submittal to an approved analytical laboratory within analytical hold-times (generally the same day as the sample is collected and several hours before the laboratory closes for the day).

After the constant rate test is completed, CONTRACTOR shall not disinfect the proposed PWS well or remove the pump for a minimum period of 24 hours while water level recovery measurements are being made.

All drill cuttings, drilling fluids and produced water shall be managed and disposed of in accordance with Section 1.12.

3.16 PLUMBNESS AND ALIGNMENT

The CONTRACTOR shall construct the proposed PWS well sufficiently straight and plumb to permit free installation of the production casing and well screen assembly, filter pack, bentonite plug, grout, test pump, production pump, and as specified below. It shall be the responsibility of the CONTRACTOR to see that the proposed PWS well is being constructed straight and plumb within these limits at all times.

The CONTRACTOR shall test the proposed PWS well for plumbness and alignment in accordance with the requirements of UAC R309-515-6(6)(g) and in accordance with AWWA Standard A100-15, Water Wells, Appendix D.

Plumbness Tolerance. The maximum allowable horizontal deviation of the production borehole and casing from the vertical shall not exceed 1.75 feet per 100 feet of depth.

Alignment Tolerance. The alignment of the proposed PWS well shall be deemed acceptable if the test pump and production pump can be freely installed and operated in the production casing.

If the proposed PWS well fails to meet the above plumbness and alignment tolerances, the proposed PWS well may be accepted at the sole discretion of the ENGINEER if, in their judgment, the proposed PWS well is still suitable for its intended use and that

misalignment does not interfere with the installation or operation of the pump or uniform placement of filter pack or grout.

If the proposed PWS well is of unacceptable plumbness and alignment, the CONTRACTOR shall undertake remedial measures. Any alignment work required by the CONTRACTOR in redrilling or straightening the proposed PWS well shall be at their sole expense. If the proposed PWS well is deemed unacceptable following remedial measures, then the proposed PWS well shall be abandoned in accordance with Section 3.20 at the CONTRACTOR's expense. All costs incurred for construction of the abandoned well shall be applied to construction of the replacement well.

3.17 DOWNHOLE VIDEO CAMERA INSPECTION

If so directed by the ENGINEER, the CONTRACTOR shall use a downhole video camera to inspect the casing and screen and to observe the condition of the proposed PWS well. The video camera shall have both downward and side viewing capability. The video log shall be made in color, shall record and show the depth of the camera at all times during logging and shall be of sufficient quality that is acceptable to the ENGINEER. The CONTRACTOR shall provide one copy of the completed video log to the ENGINEER on a DVD or USB flash drive.

3.18 WELL DISINFECTION

Following the pumping test and recovery period (a minimum of 24 hours following the completion of the constant rate pumping test) and prior to demobilizing from the site, the proposed PWS well shall be disinfected in accordance with UAC R309-515-6(11) *Well Disinfection* and UAC R655-4-11.6.5 *Well Disinfection and Chlorination of Water*, using a solution of high-test sodium hypochlorite sufficient to establish a concentration of 100 parts per million (ppm) chlorine residual throughout the proposed PWS well.

The sodium hypochlorite shall be delivered to the site in original closed containers bearing the original label indicating the percentage of available chlorine and date of manufacture. The sodium hypochlorite shall not be more than 2 weeks old.

The CONTRACTOR shall prepare the disinfectant by mixing a concentrated solution of hypochlorite and water in suitable tanks. Unlined steel tanks shall not be used for mixing. The CONTRACTOR shall provide suitable transfer pumps and agitators necessary to accurately prepare the chemicals.

After adding the disinfectant to the proposed PWS well, the test pump in the proposed PWS well should be used to recirculate the water such that the pumped water is returned to the proposed PWS well and allowed to wet the portion of the casing above the water level in the proposed PWS well. After recirculation of the chlorinated well water, the CONTRACTOR shall allow 24 hours of contact time for disinfection prior to collecting coliform samples, if additional coliform samples are required. The disinfection process shall be repeated until water quality samples test negative for the presence of coliform bacteria.

Other well disinfection procedures may be approved by the ENGINEER, as long as they conform to UAC R309-515-6(11) *Well Disinfection* and UAC R655-4-11.6.5 *Well Disinfection and Chlorination of Water*.

The CONTRACTOR shall not demobilize from the work site until water quality samples test negative for the presence of coliform bacteria, unless approved by the ENGINEER.

3.19 WELL CAP CONSTRUCTION

The CONTRACTOR shall extend the steel conductor casing a minimum of 18 inches above the ground surface and install a water-tight locking security cover after all WORK associated with well construction, development, and testing is complete. Wellhead construction shall conform to the requirements of UAC R309-515-6(6)(b) *Permanent Steel Casing Pipe*, R309-515-6(8) *Capping Requirements*, R655-4-11.7.3 *Completion or Abandonment*, and R655-4-14.1 *Temporary Abandonment*. All exposed above-ground metal shall be painted with a brightly-colored rust-resistant paint.

No casing vents shall be installed on the proposed PWS well head.

3.20 PLUGGING AND ABANDONMENT

If so directed by the ENGINEER, the borehole shall be plugged and abandoned, or in the event that the CONTRACTOR fails to complete the proposed PWS well to the designed depth, or because of loss of their tools or equipment downhole, failure to meet plumbness and alignment requirements, or for any other cause related to deficiencies in their equipment or performance, the CONTRACTOR shall plug and abandon the proposed PWS well/borehole in accordance with UAC R309-515-6(9) *Well Abandonment* and R655-4-14 *Abandonment of Wells* or as approved by the DWRi. The CONTRACTOR shall remove as much casing as can be salvaged. All salvaged materials furnished by the CONTRACTOR shall remain their property.

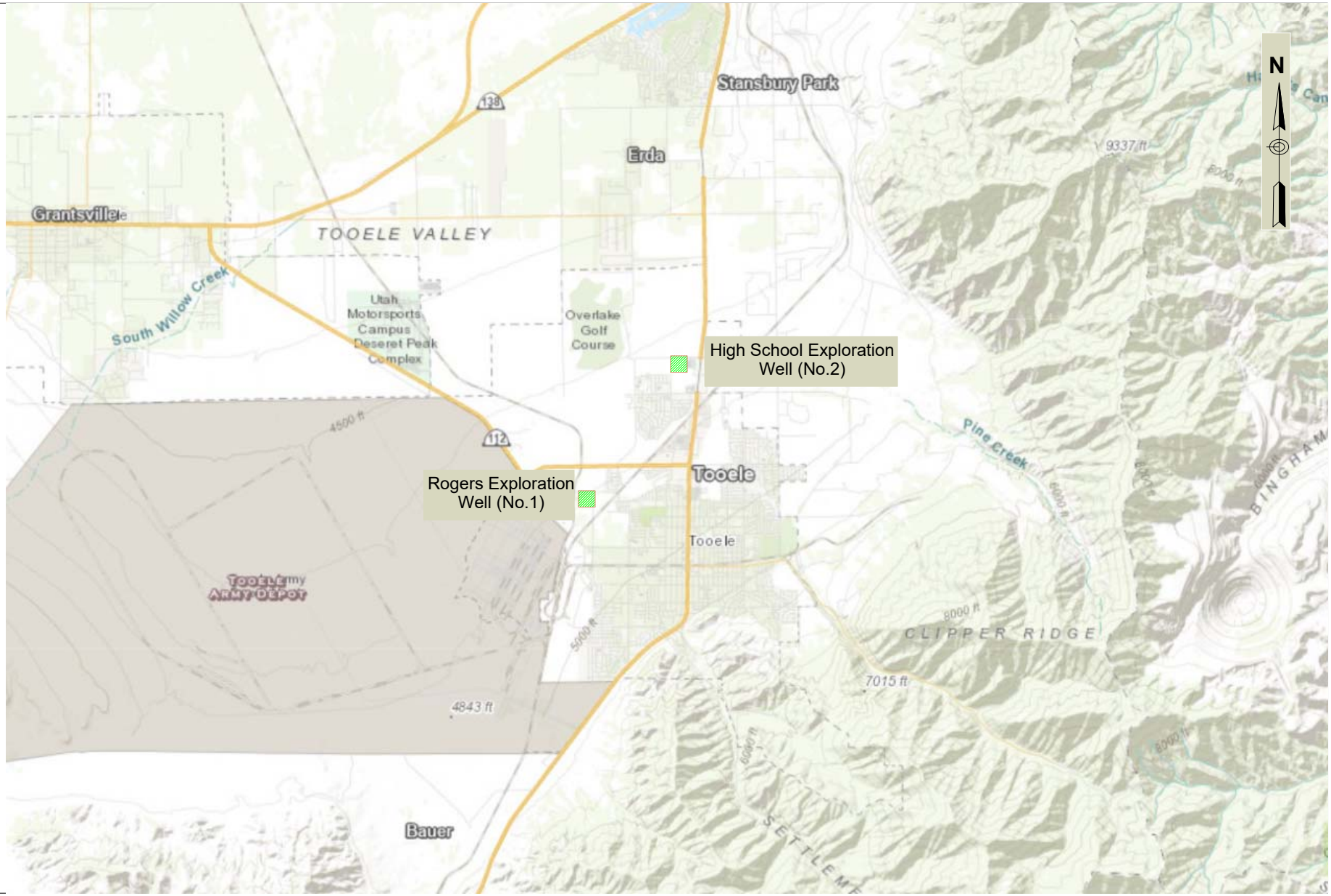
3.21 SUBMITTALS

The CONTRACTOR shall submit documentation to the ENGINEER that shall include, but is not limited to, the following:

Submittal	Section Reference	When Due
Drilling fluid and water discharge plan	1.12	Prior to the start of the WORK
SDS sheets	2.0	For approval prior to using chemicals
Well casing delivery tickets	2.2	Prior to installation
Well screen delivery tickets	2.3	Prior to installation
Filter pack gradation (sieve) analysis	2.5	Prior to installation
Driller's daily reports	3.2	Following each day of work

Submittal	Section Reference	When Due
Well Driller's Report	3.2	Within 30 days of well completion
Geophysical logs	3.7	At the conclusion of logging
Well seal certification	3.14	Within 30 days of well completion
Pump curve for test pump	3.15	Prior to installation
Pumping test data	3.15	Immediately following pumping test
Plumbness and alignment data and results	3.16	Prior to well disinfection
Down-hole video log	3.17	At the conclusion of video logging

FIGURES



Reference: Division of Water Rights Mapping Database 2025

LOUGHLIN WATER ASSOCIATES LLC

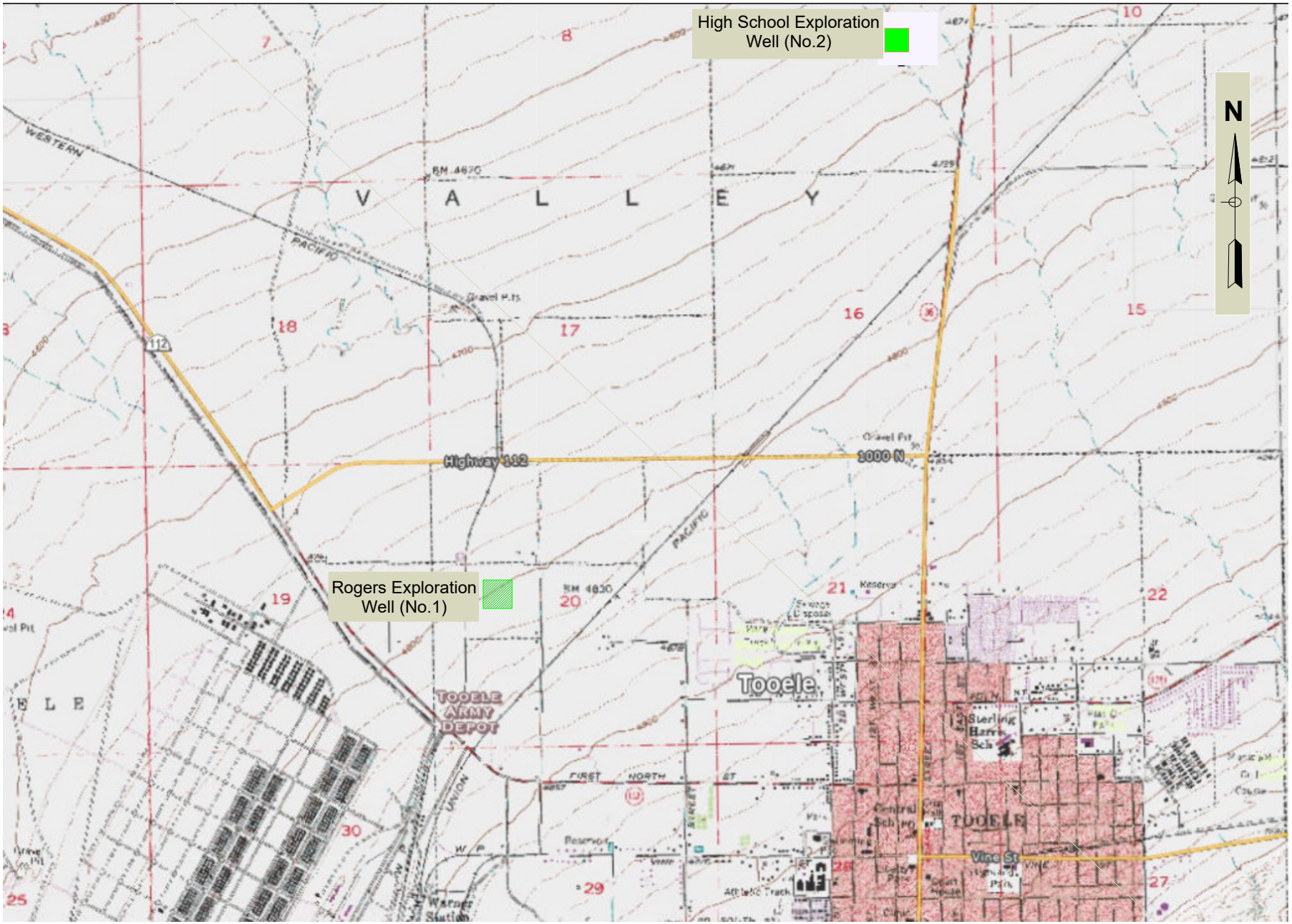
0 1.0 2.0

Approximate Scale in Miles

Tooele City

Regional Map

Figure 1



Reference: Division of Water Rights Mapping Database 2025

LOUGHLIN WATER ASSOCIATES LLC

0 1/4 1/2

Approximate Scale in Miles

Tooele City

Topographic Map

Figure 2

LOUGHLIN WATER ASSOCIATES LLC

0 1/4 1/2

Approximate Scale in Miles

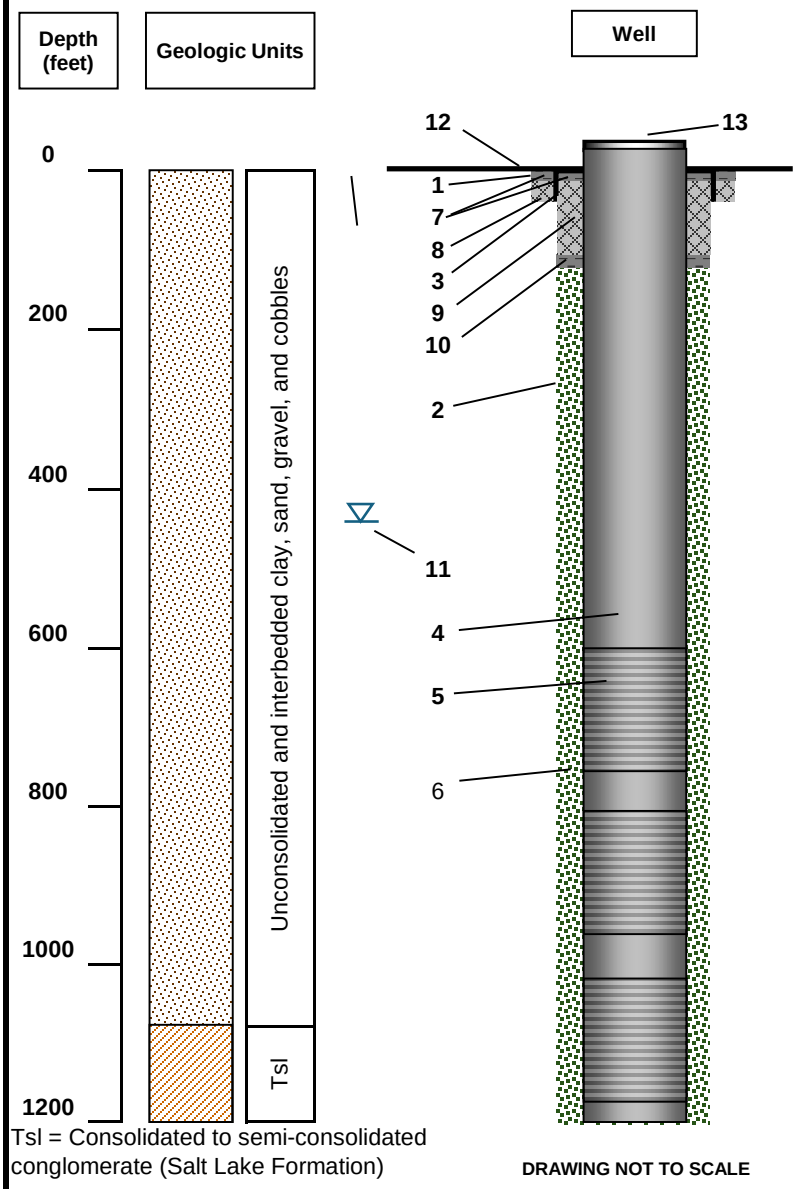
Red Del Papa Well #18 (WIN 443468)

See Appendix A for Drillers Logs

Tooele City

Tooele City Wells

Figure 3



Tsl = Consolidated to semi-consolidated conglomerate (Salt Lake Formation)

DRAWING NOT TO SCALE

Notes:

1. Preliminary well design by William D. Loughlin, P.G.
2. Subsurface conditions at well site are uncertain.
3. All work shall be in accordance with: (1) Utah Division of Water Rights UAC R655-4 Rules for Water Wells; (2) Utah Division of Drinking Water UAC Rule R309-515 Source Development Rule, Ground Water - Wells; (3) Utah Division of Water Quality, Utah Water Quality Act, 19-5-107(1); and (4) the Technical Specifications.
4. ENGINEER will specify the total drilling depth and the final well design including gravel pack gradation and well screen slot size, placement of well casing, screen, gravel pack, cement grout well seal, and any other materials used to construct the well.

Explanation

Borehole Diameters

1 - Minimum 40-inch diameter borehole (0 to 0 feet).
2 - 28-inch diameter borehole (40 to 1210 feet).

Blank Casing

3 - 32-inch diameter, minimum 0.375-inch wall thickness, low carbon steel conductor casing (0 to 40 feet).
4 - 20-inch diameter, minimum 0.375-inch wall thickness, low carbon steel production blank casing with a bull nose end cap (700 feet total) interspersed with well screen below about 600 feet.

Well Screen

5 - 20-inch diameter, 0.080-inch slotted stainless steel wire wrap well screen (500 feet total) interspersed with blank casing below about 600 feet).

Filter Pack

6 - Filter pack; gradation to be determined (120 to 1210 feet).

Well Seals

7 - Pitless adaptor seal interval shall be sealed with unhydrated benonite (0 to 10 feet).
8 - Certified cement grout well seal around conductor casing (10 to 40 feet).
9 - Certified cement grout well seal around production casing (10 to 110 feet).
10 - Bentonite plug (110 to 120 feet).

Static Water Level

11 - Static water level expected to be within about 440 to 490 feet below the ground surface.
12 - Ground elevation approximately 4660 to 4800 feet.

Other

13 - Well head shall extend at least 18 inches above ground surface and have locking well cap.

LOUGHLIN WATER ASSOCIATES LLC

Tooele City
Preliminary Design
Proposed PWS Well
Figure 4

APPENDIX A

WELL DRILLER REPORTS

Berra Well #19 - WIN 443466

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 1915001M00 WIN: 443466

Owner *Note any changes*

TOOELE CITY CORPORATION
C/O PAUL HANSEN
90 NORTH MAIN
TOOELE, UT 84074

Contact Person/Engineer: PAUL HANSON

Well Location *Note any changes*

N 2410 E 120 from the S4 corner of section 16, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 10/27/2019 Completion Date: 10/7/2020

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use: MUNICIPAL

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	40	40	AUGER	GEL / POLYMER
0	912	14 3/4	REVERSE CIRCULATION	GEL / POLYMER
0	861	28	REVERSE CIRCULATION	GEL / POLYMER

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
														SEE ATTACHED

RECEIVED
NOV 03 2020 LI
WATER RIGHTS
SALT LAKE

Static Water Level

SCANNED LP

Date 10/5/2020 Water Level 418.28 feet Flowing? [ ] Yes [X] No
Method of Water Level Measurement TRANSDUCER If Flowing, Capped Pressure N/A PSI
Point to Which Water Level Measurement was Referenced TOP OF CASING Elevation UNKNOWN
Height of Water Level reference point above ground surface 3.6 feet Temperature 15.93 degrees [X] C [ ] F

Well Log

Berra Well #19 - WIN 443466

Construction Information

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☑ SCREEN ☐ PERFORATIONS ☐ OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	40	A-53 GRADE B	.375	32'	525	580	.080	20	SS WIRE WRAP
+3	525	A-53 GRADE B	.375	20	600	660	.080	20	SS WIRE WRAP
580	600	A-53 GRADE B	.375	20	670	740	.080	20	SS WIRE WRAP
660	670	A-53 GRADE B	.375	20	760	850	.080	20	SS WIRE WRAP
740	760	A-53 GRADE B	.375	20					

Well Head Configuration: DOUGHNUT BETWEEN CASINGS Access Port Provided? ☒ Yes ☐ No

Casing Joint Type: WELDED Perforator Used: N/A

Was a Surface Seal Installed? ☒ Yes ☐ No Depth of Surface Seal: 40' feet Drive Shoe? ☐ Yes ☒ No

Surface Seal Material Placement Method: PUMPED VIA TREMMIE

Was a temporary surface casing used? ☐ Yes ☒ No If yes, depth of casing: N/A feet diameter: N/A inches

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	40	50/50 SAND CEMENT SLURRY	7 YDS^3	17/GAL 15 BAG 5GAL/SACK
0	110	50/50 SAND CEMENT SLURRY	18 YDS^3	17/GAL 15 BAG 5GAL/SACK
110	661	SRI SUPREME 6X9	67 YDS^3	N/A

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
9/12/20	DUAL SWAB AIRLIFT	350	X		UNKNOWN	123
	DUAL SWAB PUMP	200	X		UNKNOWN	200
	TEST PUMP/SURGE	2010	X		98'	117

Pump (Permanent)

Pump Description: Horsepower: Pump Intake Depth: feet

Approximate Maximum Pumping Rate: Well Disinfected upon Completion? ☐ Yes ☐ No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name HYDRO RESOURCES WEST, INC. (Person, Firm, or Corporation - Print or Type) License No. 815

Signature (Licensed Well Driller) Date 10/27/2020

WELL DRILLER'S REPORT ADDTIONAL DATA FORM
State of Utah
Division of Water Rights

Well Identification

Non-Production Well: 1915001M00

Owner *Note any changes*

TOOELE CITY CORPORATION
C/O PAUL HANSEN
90 NORTH MAIN
TOOELE, UT 84074

Contact Person/Engineer: _____

Well Location *Note any changes*

N 2410 E 120 from the S4 corner of section 16, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)

Berra Well #19 - WIN 443466

Construction Information (con't)

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)
+3	900	A-53 GRADE B	2	1.54
+3	120	A-53 GRADE B	3	.216

DEPTH (feet) FROM	TO	☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)

Comments (con't)

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name HYDRO RESOURCES WEST, INC. (Person, Firm, or Corporation - Print or Type)

License No. 815

Signature _____ (Licensed Well Driller)

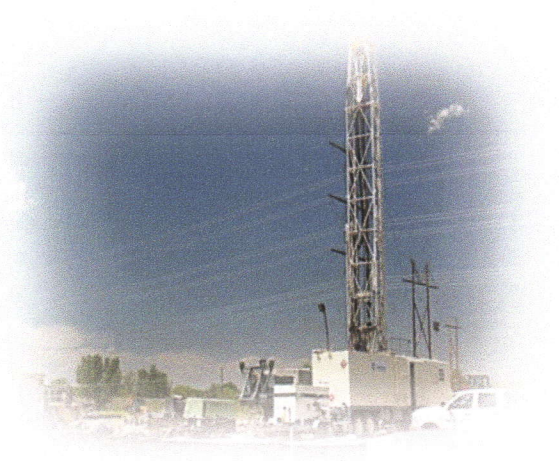
Date 10/27/2020

Cuttings Log

start date

Berra Well #19 - WIN 443466

Hydro resources



From	to					RIG	10023					
0	40	⟷	Clay sand & gravel									
40	65	⟷	sand and gravel									
65	75	⟷	Clay & gravel									
75	80	⟷	Gravel									
80	85	⟷	Gravel small cobbles									
85	125	⟷	Gravel									
125	140	⟷	clay									
140	145	⟷	Sandy clay									
145	155	⟷	Fine sand									
155	190	⟷	gravel									
190	200	⟷	sand & gravel									
200	210	⟷	Gravel									
210	220	⟷	sand & gravel									
220	235	⟷	gravel									
235	240	⟷	Red clay and gravel									
240	265	⟷	Gravel									
265	290	⟷	Red clay and gravel									
290	355	⟷	gravel									
355	360	⟷	sand & gravel									
360	365	⟷	sand gravel & clay									
365	390	⟷	sand & gravel									
390	445	⟷	Gravel									
445	455	⟷	clay & gravel									
455	475	⟷	gravel									
475	490	⟷	clay some gravel									

Cuttings Log

start date

Berra Well #19 - WIN 443466

490	500	⟷	clay & gravel
500	510	⟷	clay
510	580	⟷	sand & gravel
580	610	⟷	Clay & gravel
610	630	⟷	Gravel
630	655	⟷	Clay & gravel
655	660	⟷	gravel
660	670	⟷	clay & gravel
670	680	⟷	sand & gravel
680	685	⟷	sand clay & gravel
685	690	⟷	clay & sand
690	745	⟷	sand & gravel
745	760	⟷	Clay & gravel
760	770	⟷	sand 7 gravel
770	835	⟷	Gravel
835	850	⟷	Sand & gravel
850	860	⟷	Clay
860	865	⟷	clay & sand
865	870	⟷	clay sand & gravel
870	880	⟷	clay
880	885	⟷	Sand & clay
885	912	⟷	clay & gravel
		⟷	
		⟷	
		⟷	
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Rollo Grounds Well (#16)

AMENDED WELL LOG

WELL DRILLER'S REPORT

State of Utah
Division of Water Rights

WIN 436568

For additional space, use "Additional Well Data Form" and attach

Well Identification

Change Application: a37675 (15-3417) WIN: 436568

Owner *Note any changes*

Tooele City Water Special Service District
90 North Main Street
Tooele, UT 84074

Well #16

Contact Person/Engineer: PAUL HANSON

Well Location *Note any changes*

N 2065 E 2030 from the SW corner of section 21, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 8-22-13 Completion Date: 12-22-13

Check all that apply: ☒ New ☐ Repair ☐ Deepen ☐ Clean ☐ Replace ☐ Public Nature of Use: Drinking water

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0'	93'	48"	Auger	Dry
93'	488	32"	Reverse CIRC	WATER
488'	1000'	26"	Reverse CIRC	WATER

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
0	93				X		X						Brown	
93	200							X	X	X				
200	210				X		X	X	X					
210	320						X	X	X					
320	340				X		X	X	X					
340	415				X		X	X	X					
415	445				X		X	X	X			Rock		
445	545						X	X	X					
445	548				X		X	X	'					
545	795'						X	X	X					

RECEIVED JAN 30 2014 WATER RIGHTS SALT LAKE

RECEIVED JAN 21 2014 WATER RIGHTS SALT LAKE

Static Water Level

Date 8-22-13 Water Level 441' feet Flowing? ☐ Yes ☑ No

Method of Water Level Measurement Sounder If Flowing, Capped Pressure _____ PSI

Point to Which Water Level Measurement was Referenced Ground Level Elevation _____

Height of Water Level reference point above ground surface 441' feet Temperature _____ degrees ☐ C ☐ F

[redacted] *Well Log* [redacted]

Rodeo Grounds Well (#16)

WIN 436568

Construction Information

DEPTH (feet) FROM	DEPTH (feet) TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	DEPTH (feet) TO	☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
+3'	370'	mild steel	.375	18"	370'	610'	.70	18"	55
610'	640'		.375	18"	640'	660'	.70	18"	55
660'	670'		.375	18"	670'	810'	.70	18"	55
810'	830'		.375	18"	830'	1000'	.70	18"	55

Well Head Configuration: CAP

Access Port Provided? ☐Yes ☑No

Casing Joint Type: Butt weld

Perforator Used:

Was a Surface Seal Installed? ☑Yes ☐No

Depth of Surface Seal: 488 feet

Drive Shoe? ☐Yes ☑No

Surface Seal Material Placement Method: TRIMMIC

Was a temporary surface casing used? ☑Yes ☐No If yes, depth of casing: 93' feet diameter: 36 inches

DEPTH (feet) FROM	DEPTH (feet) TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
100'	470 488'	15 SK SAND SLURY	79 yds	
470'	1000	6 x 9 COLORADO CILICA	110 BAGS	

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)

Pump (Permanent)

Pump Description: Horsepower: Pump Intake Depth: feet

Approximate Maximum Pumping Rate: Well Disinfected upon Completion? ☐Yes ☐No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name ZIM INDUSTRIES INC (Person, Firm, or Corporation - Print or Type)

License No. 697

Signature Mark J Jemmett (Licensed Well Driller)

Date 1/2/14

WELL DRILLER'S REPORT ADDTIONAL DATA FORM

State of Utah
Division of Water Rights

WIN 436568

Well Identification

Change Application: a37675 (15-3417)

Owner *Note any changes*

Tooele City Water Special Service District
90 North Main Street
Tooele, UT 84074

Contact Person/Engineer: PAUL HANSON

Well Location *Note any changes*

N 2065 E 2030 from the SW corner of section 21, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
795	810				X		X	X	X				Brown	
810	880						X	X	X				Brown	
880	885				X		X	X	X				Brown	
885	1000						X	X	X				Brown	

Rodeo Grounds Well (#16)

Construction Information (con't)

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0'	488'	mild Steel (Intermediate)	375	28"					
0'	93'	mild Steel (conductor)	375	36"					

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)

Comments (con't)

Well Driller Statement This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name ZIM INDUSTRIES INC (Person, Firm, or Corporation - Print or Type) **License No.** 697

Signature Robert J Zimmer (Licensed Well Driller) **Date** 1/2/14

Red Del Papa Well (WIN 443468)

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification

Non-Production Well: 1915001M00 WIN: 443468

Owner *Note any changes*

TOOELE CITY CORPORATION
C/O PAUL HANSEN
90 NORTH MAIN
TOOELE, UT 84074

Contact Person/Engineer: PAUL HANSON (435) 843-2132

Well Location *Note any changes*

S 90 E 250 from the W4 corner of section 27, Township 3S, Range 4W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 1/3/2020 Completion Date: 9/14/2020

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use: MUNICIPAL

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	40	40	AUGER	POLYMER - GEL
40	1200	14 3/4	REVERSE CIRCULATION	POLYMER - GEL
40	1200	28	REVERSE CIRCULATION	POLYMER - GEL

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, odor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
														SEE ATTACHED

RECEIVED
SEP 29 2020 LI
WATER RIGHTS
SALT LAKE

SCANNED LP

Static Water Level

Date 9/12/2020 Water Level 464 feet Flowing? [ ] Yes [X] No
Method of Water Level Measurement SOUNDER If Flowing, Capped Pressure N/A PSI
Point to Which Water Level Measurement was Referenced TOP OF CASING Elevation UNKNOWN
Height of Water Level reference point above ground surface 20' feet Temperature 69 degrees [ ] C [ ] F

Red Del Papa Well (WIN 443468)

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	DEPTH (feet) FROM	TO	☒SCREEN ☐PERFORATIONS ☐OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0	40	A-53 GRADE B	.375	32	605	865	.060"	20"	SS WIRE WRAP
0	605	A-53 GRADE B	.375	20	915	1,045	.080"	20"	SS WIRE WRAP
865	915	A-53 GRADE B	.375	20	1,075'	1,200'	.080"	20"	SS WIRE WRAP
1,045	1,075	A-53 GRADE B	.375	20					
0	900	STEEL SCH 40	.154	2"					

Well Head Configuration: 20" STICK UP & DOUGHNUT BETWEEN CASINGS Access Port Provided? ☒Yes ☐No

Casing Joint Type: WELDED Perforator Used: NO

Was a Surface Seal Installed? ☒Yes ☐No Depth of Surface Seal: 100 feet Drive Shoe? ☐Yes ☒No

Surface Seal Material Placement Method: CEMENT

Was a temporary surface casing used? ☐Yes ☒No If yes, depth of casing: _____ feet diameter: _____ inches

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	40	SAND CEMENT SLURRY	10 YDS^3	19/6AL 15SACK 6/6AL
0	100	SAND CEMENT SLURRY	11 YDS^3	19/6AL 15 SACK 6/6AL
100	1200	SRI SUPREME #6	101 YDS^3	N/A

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
6/24/2020	DUAL SWAB AIRLIFT	300	X		4'	96 HOURS
9/12/2020	PUMP DEVELOPMENT & TEST	1,600	X		115'	51 HOURS

Pump (Permanent)

Pump Description: _____ Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? ☐Yes ☐No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary Circumstances, abandonment procedures. *Use additional well data form for more space.*

ZONE SAMPLED 1045 - 1055 1060 - 1070 880 - 890

Well Driller Statement

This well was drilled and constructed under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name HYDRO RESOURCES WEST, INC. License No. 815
(Person, Firm, or Corporation - Print or Type)

Signature _____ Date 9/19/2020
(Licensed Well Driller)

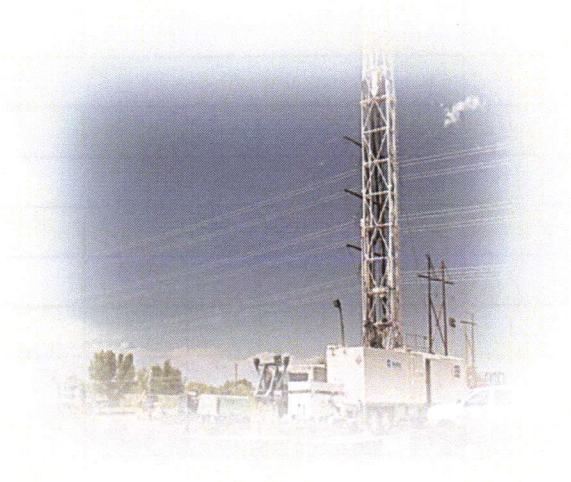
Cuttings Log

start date

Red Del Papa Well (WIN 443468)

Hydro resources

Dec-19



From	to			RIG	10024
0	40	⟷	Clay sand & gravel		
40	80	⟷	Gravel		
80	90	⟷	Clay & gravel		
90	175	⟷	Rock gravel & clay		
175	295	⟷	Sand & gravel		
295	300	⟷	Sand Clay & gravel		
300	380	⟷	Sand & gravel		
380	400	⟷	Clay		
400	*405*	⟷	clay & sand		
405	425	⟷	Gravel		
425	450	⟷	Clay & gravel		
450	475	⟷	Clay sand & gravel		
475	495	⟷	Sand & gravel		
495	560	⟷	Gravel		
560	900	⟷	Gravel & sand		
900	1075	⟷	Clay sand & gravel		
1075	1110	⟷	Gravel & sand		
1110	1200	⟷	Bed rock		
		⟷			
		⟷			
		⟷			
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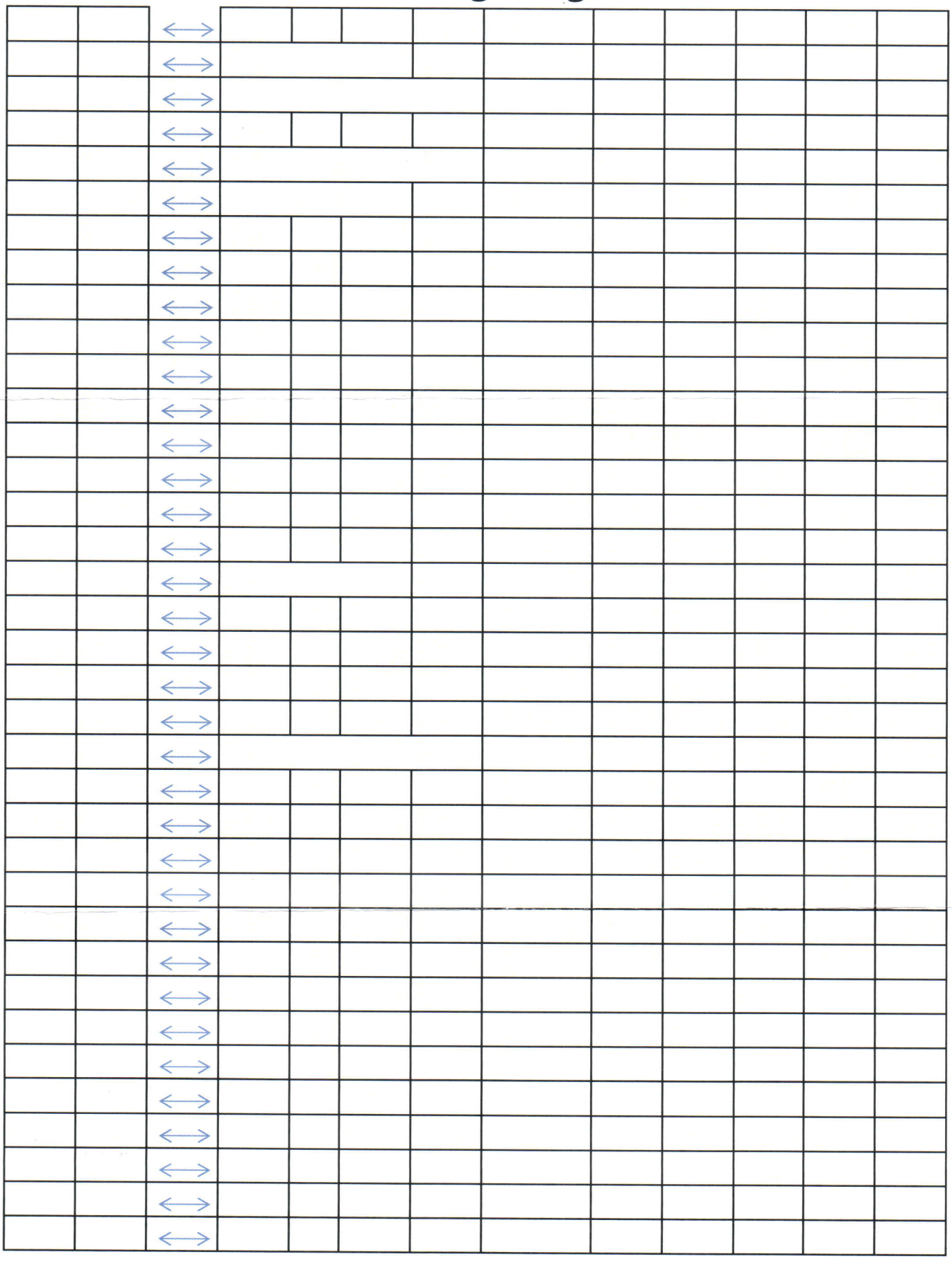
Cuttings Log

Red Del Papa Well (WIN 443468)

start date



APPENDIX B

UTAH DIVISION OF WATER QUALITY WATER DISHCARGE FACT SHEET

Fact Sheet Regarding Water Discharges From Water Well Drilling and Operation

Prepared by: Utah Division of Water Quality

Updated July 2002

Background:

Utah Administrative Code (UAC) R317-8-2 requires a UPDES discharge permit for the discharge of pollutants from any point source into waters of the State. A point source is defined as "any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, from which pollutants are or may be discharged."

Through the use of various drilling methods and reasonable best management practices, water well drilling generally can be conducted such that no discharge occurs or that only de minimis (insignificant) amounts of pollutants would be released into waters of the State. As such, it has been the policy of the Division of Water Quality to not require water well drilling operations to obtain a discharge permit as long as they do not discharge or discharge de minimis amounts of pollutants.

There may be circumstances where a discharge permit is necessary or desired by the well driller or owner. However, because a discharge permit can take several months to issue, requires payment of a permit fee, and because the permit would contain specific enforceable effluent quality limits and frequent self-monitoring and reporting requirements, it is highly recommended that all options to avoid discharge or attain the de minimis discharge be explored before pursuing an individual discharge permit.

Best Management Practices (BMP's)

The goal of BMP implementation is to avoid discharge or, if this is not practicable, to obtain a de minimis pollutant discharge during any phase of well development. The primary pollutants of concern are total suspended solids and turbidity in the form of drill cuttings and muds. Occasionally chemicals such as surfactants are used during the drilling operation. It is the responsibility of the operator and/or owner to assure that BMP's are properly installed and operated in order to contain all fluids or to produce a de minimis pollutant discharge to waters of the State. Some BMP's are indicated below:

1. Drill pits or ponds of adequate size for total containment of all fluids containing drill cuttings, surfactants and associated chemicals.

2. Pits or ponds used for settling; followed by filter cloth and/or straw bales which can be used for filtration prior to fluids entering surface waters of the state.

3. Land application of produced waters during drilling, pump testing, and well development where no discharge would occur to waters of the State.

4. Land application where sufficient filtration through vegetation removes solids and turbidity before water is diffused and enters any surface waters.

5. Other sediment and turbidity reduction treatment such as frac tanks, cyclone separators, etc.

Pollution of waters of the state is a violation of the Water Quality Act, UCA 19-5, which provides for significant monetary penalties, and additional penalties for violations that are willful or caused by gross negligence.

If you have any concerns not covered in this fact sheet or any further questions, please contact:

Mike Herkimer
(801) 536-4386
Division of Water Quality
195 North 1950 West
P.O. Box 144870
Salt Lake City, Utah 84114-4870

Jim Goddard
(801) 538-7314
Division of Water Rights
1594 West North Temple, Suite 220
Salt Lake City, Utah 84114-6300