March 20, 2019

Mr. Jim Goddard
Expedition Water Solutions
2015 Clubhouse Drive, Suite 201
Greeley, Colorado 80634

Via E-Mail; jgoddard@expedition-water.com

Subject: Site Groundwater Monitoring Plan
Expedition Water Solutions
EWS #13 Class II Injection Facility
23360 County Road 54
Greeley, Colorado 80631
CGRS Project #: 1-12456-18304aa

Mr. Goddard:

As a result of the recent Expedition Water Solutions (EWS) acquisition of the High Plains Disposal facility in Kersey, Colorado, CGRS herein submits a Groundwater Monitoring Plan (GWMP) for the above-referenced Class II injection/disposal facility, to align the existing GWMP (May 2009) with the groundwater monitoring requirements outlined in the Weld County Department of Public Health and Environment (WCDPHE) Memorandum: Groundwater Sampling Plan Guidance (February 2015). This GWMP outlines the methods and procedures that will be employed to collect groundwater quality data, which will facilitate in the early detection of an unknown subsurface release of exploration and production fluids related to facility processing activities.

Groundwater sampling will be performed at the facility on a quarterly basis. In addition, depth to groundwater will be measured in each monitoring well and the groundwater elevation, flow direction, and hydraulic gradient will be calculated by referencing surveyed top of well casing (TOC) elevations in order to monitor groundwater flow trends. All groundwater quality results along with other monitoring details will be presented to WCDPHE within 45 days of receipt of site analytical data. Each groundwater monitoring report will include all relevant details, as described in this GWMP. A Site Location Map and Site Overview Figure are provided with this plan for your reference.

Seven existing groundwater monitoring wells (MW-1, MW-2, MW3, MW-4, MW-5, MW-6, and MW-7) will be gauged and/or sampled in accordance with this Plan. The groundwater monitoring wells are located adjacent to, upgradient, and downgradient of facility operation areas to ensure sufficient subsurface coverage required to monitor groundwater quality and conditions across the site. The groundwater monitoring wells were installed to depths ranging from the groundwater table to a maximum of 20 feet below ground surface (bgs), and constructed with 10 or more feet of 2-inch 10-slot PVC screen with a threaded bottom cap, followed by a 2-inch diameter threaded, flush-joint PVC riser pipe to approximately 3 to 4 feet above the surface. Sand pack material, consisting of 20/40 silica sand was place in the well boring annulus to approximately two feet above the screened interval, at which point the well bore was sealed with hydrated bentonite to the surface. The monitoring wells were finished with j-plug well seals and flush-mounted traffic rated manways.

The groundwater monitoring wells were installed and constructed to ensure adequate interaction with the saturated and unsaturated zones of the uppermost aquifer, and to ensure groundwater contact based on seasonal and temporal groundwater elevation fluctuations. Additional groundwater monitoring wells may be installed based on changing hydrologic conditions, potential spills, to replace damaged wells, or as conditions may necessitate a need for additional monitoring wells.

Groundwater monitoring activities will be performed on a quarterly basis. Water quality samples obtained from the groundwater monitoring wells will be analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), total dissolved solids (TDS), chloride, and sulfate. These compounds are commonly associated with the oilfield exploration and production water, which will be disposed of and treated at the EWS #13 facility. Furthermore, in-situ field parameters including dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature, pH, and specific conductance will be collected using a direct-read multi-parameter probe during each quarterly sampling event. It should be noted that during quarterly sampling visits conducted when the temperature is less than thirty-two degrees Fahrenheit (or at the discretion of the CGRS technician) in-situ field parameters may not be measured in order to prevent damage to the multi-parameter probe. Additionally, measurements of non-aqueous phase liquids (NAPLs) will be documented as applicable. A full description of CGRS' Methods and Procedures for field and reporting activities is provided in Attachment A.

In the event of groundwater analyses that show any measured organic contaminants (BTEX) to be above the Colorado Oil & Gas Conservation Comission (COGCC) Maximum Allowable Concentration (MAC), all future laboratory analysis requests will also include Total Volatile Petroleum Hydrocarbons (TVPH) and Total Extractable Petroleum Hydrocarbons (TEPH) until remediation is complete and monitoring results show below MAC values for a minimum of one year of regularly scheduled monitoring events.

In order to maintain a complete and relevant GWMP, updates may be required in order to provide adequate coverage based on facility changes or changes in groundwater flow, elevation, or other hydrologic conditions. Additionally, water quality analytes included in the sampling program may be updated based on facility changes or as directed by regulatory authorities.

Should you have any questions or require additional information, please contact me at dkinnaird@cgrs.com.

Sincerely,
CGRS, Inc.

Drezden Kinnaird
Project Manager
Environmental Scientist

Reviewed by,

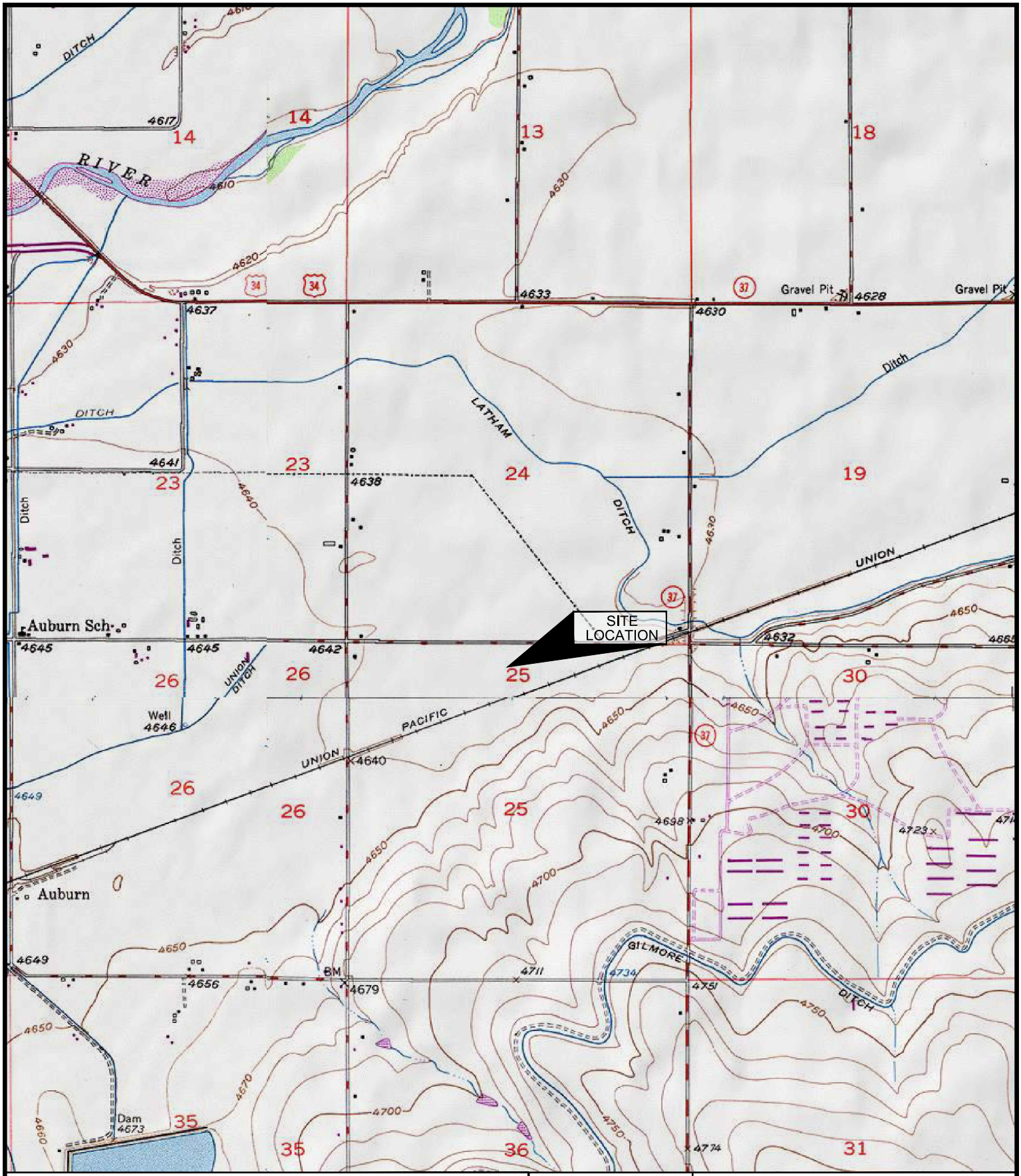
Glen Vallance
Environmental Services Director

Enclosures:

- Site Location Map
- Site Overview Figure
- Attachment A – Methods and Procedures for Field and Reporting Activities

Ec:

- Ben Frissell – Weld County Department of Public Health & Environment; bfrissell-durley@weldgov.com
- Danielle Serna – Weld County Department of Public Health & Environment; dserna@weldgov.com
- Zach Neal – Expedition Water Solutions; zneal@expedition-water.com



COLORADO

■ QUADRANGLE LOCATION

0 1000 2000

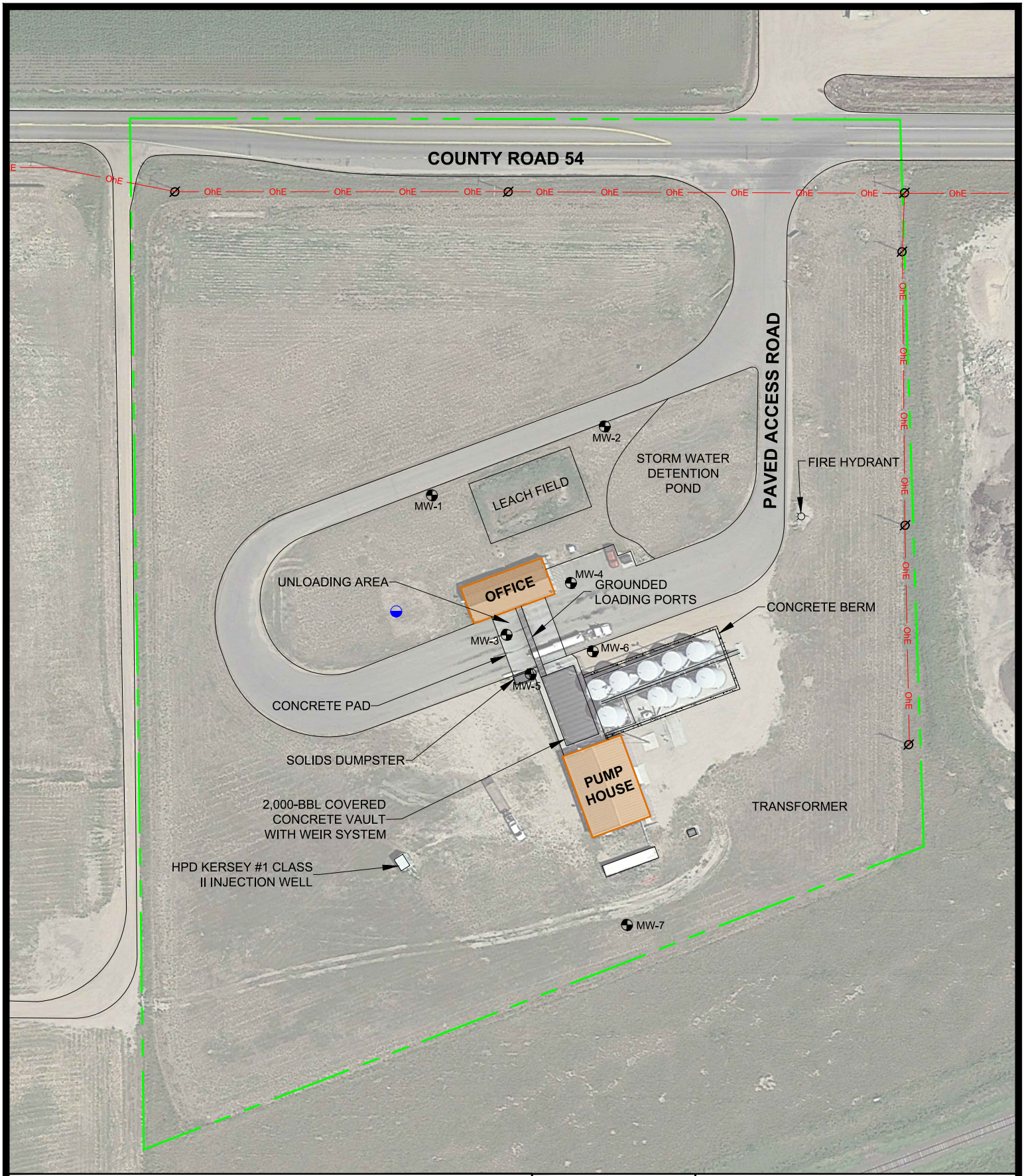
SCALE IN FEET

SITE LOCATION MAP

EXPEDITION WATER SOLUTIONS
EWS #13
23360 COUNTY ROAD 54
GREELEY, COLORADO 80631

PROJECT:	DRAFT:
1-12456-18304aa	CLB
DATE: 01/28/2020	REVIEW:

CGRS SOLUTIONS DELIVERED



LEGEND

- MW-1 MONITORING WELL
- DOMESTIC WATER WELL
- UTILITY POLE
- OhE OVERHEAD ELECTRIC
- APPROXIMATE PROPERTY BOUNDARY

0 20 40 60 80 100

SCALE IN FEET

SITE OVERVIEW MAP

EXPEDITION WATER SOLUTIONS
EWS #13
23360 COUNTY ROAD 54
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PROJECT:	DRAFT:
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CGRS SOLUTIONS DELIVERED

Attachment A

Methods and Procedures for Field and Reporting Activities

www.cgrs.com
800.288.2657
1301 Academy Ct.
Fort Collins, CO 80524

METHODS AND PROCEDURES

Expedition Water Solutions
EWS 13 Class II Injection Facility
23360 County Road 54
Greeley, CO 80631
CGRS Project #: 1-12456-18304aa

Soil Borings

Soil sampling will be conducted in accordance with ASTM D1586-08a. Using this procedure, a 2 inch outside diameter (O.D.) split-spoon sampler will be driven into the soil by a 140 pound weight falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sample an additional 12 inches, known as the penetration resistance (N-value), will be recorded. The N-value is an index of the relative density of cohesionless soils and the consistency of cohesive soils. Based on site conditions and soil sampling requirements, a direct push probe rig may also be utilized to collect soil samples.

Soil Classification/Characterization

As samples are obtained in the field, they will be visually inspected and classified in accordance with ASTM D2487-17. Representative portions of the samples will then be retained for further examination and for verification of the lithology and water level data. Figures illustrating the soil classification procedure, descriptive terminology, and symbols used on the logs will be provided. As samples are collected, they will be examined for evidence of petroleum hydrocarbons and organic vapors using visual appearance and by screening with portable photoionization (PID) detection equipment.

Soil Sampling Decontamination

To avoid potential transport of contaminated materials to the project site, all drilling equipment and down-hole tools will be decontaminated prior to mobilization. To prevent cross contamination between soil borings or monitoring wells, all down-hole equipment will also be decontaminated and rinsed with water between soil borings as necessary.

Monitoring Well Construction

Monitoring wells will be installed utilizing the following general construction criteria:

- Borehole diameter: 8.25 inch conventional boring
- Well diameter: 2 inches for conventional boring
- Estimated depth: ≥ 5 feet below static groundwater table
- Casing material: schedule 40, flush thread PVC
- Well screen: 2 inch I.D. for conventional boring, #0.01 slot PVC
- Estimated screened interval: 10 feet above and 10 feet below the groundwater table (may be adjusted based on total depth and water table position)
- Annular pack: 10-20 silica sand
- Protective casing: 4 inch above grade stick-up mount, locking cap
- Annular seal: bentonite chips

Groundwater Sampling

All borings where groundwater is encountered will be sampled from the suspected cleanest to the most impacted according to the protocols listed below. All pertinent information will be recorded on a sampling information form.

Field Standard Operating Procedures (SOP)

1. Gauge the water level inside the well using a water level indicator. Water levels will be collected off the marked location on the casing, the north side of the casing, or the highest point of the casing.

2. Gauge total depth of monitoring well. Total depth will be collected off the marked location on the casing, the north side of the casing, or the highest point of the casing.

3. A disposable polyethylene bailer will be used to develop each well, by surging the well and purging ten times the saturated volume of the well, using the below referenced equation. Note, a well may only need to be developed one time and this step may be skipped.

4. To determine well volume, use the table that displays the casing volume per foot factor for the appropriate diameter well. The water level is subtracted from the total depth, providing the length of the water column. This length is multiplied by the factor in the Table 1 which corresponds to the appropriate well diameter, providing the amount of water, in gallons, contained in the well. Once the volume has been calculated multiply that value by three in order to calculate three bore volumes required for purging before collecting a representative water sample.

TABLE 1
WELL CASING DIAMETER vs. VOLUME

WELL CASING DIAMETER (inches) vs. VOLUME (gals.)/FEET of WATER	
CASING Diameter	GALLONS / FT
1	0.041
2	0.163
3	0.367
4	0.653

**Table 1 from U.S.EPA Region 9 Laboratory, Richmond, California; Field Sampling Guidance Document #1220, page 14*

5. Collect water quality samples. Water samples will be collected using a polyethylene bailer, after purging approximately three saturated well volumes from the well.

6. Samples will be stored in a cooler (~4° Celsius) for transport to the laboratory. Follow all documentation and chain-of-custody procedures.

7. Cleaning of field equipment. Water level and multi-parameter measurement equipment will be cleaned with either, depending on the equipment, ethanol or water mixed with a biodegradable soap (Alconox) followed by a fresh water rinse.

Upon completion of soil or groundwater quality sampling, a chain-of-custody log will be initiated. A copy of the chain-of-custody will be returned to the project manager and included within the monitoring report.

Chemical Analysis

An approved contract laboratory will provide stationary laboratory analysis. The following analyses will be performed:

Soil Analyses: Initial Well Installation & Soil Sampling

Chemical Parameters	Method Used
Benzene/Toluene/Ethylbenzene/Total Xylenes (BTEX)	EPA – 8260D
Total Petroleum Hydrocarbons (TPH)	EPA – 8015D

Water Analyses (Groundwater Quality Sampling)

Chemical Parameters	Method Used
Benzene/Toluene/Ethylbenzene/Total Xylenes (BTEX)	EPA – 8260D
Total Dissolved Solids (TDS)	EPA – 160.1
Chloride	EPA – 300.0
Sulfate	EPA – 300.0

In the event of groundwater analyses that show any measured organic contaminants (BTEX) to be above the Colorado Oil & Gas Conservation Comission (COGCC) Maximum Allowable Concentration (MAC), all future laboratory analysis requests will also Total Petroleum Hydrocarbons (TPH), which includes Gasoline Range Organics (GRO), Diesel Range Organics (DRO) and Risudual Range Orgaincs (RRO) until remediation is complete and monitoring results show below MAC values for a minimum of one year of regularly scheduled monitoring events.

In-situ Field Parameters

Dissolved Oxygen (mg/L)
Oxidation Reduction Potential (mV)
Temperature (Deg. C)
pH
Specific Conductance (mS/cm)

All in-situ field parameters will be collected in each monitoring well using an InSitu Smart-Troll multi-parameter or similar type direct read probe.

Groundwater Trend Analyses

Groundwater concentrations are measured in site monitoring wells on a quarterly basis. Upon receiving groundwater analytical data from the laboratory, the data is inserted into a historical groundwater analytical data table. TDS, chloride, and sulfate concentrations will be evaluated to ensure that the current concentrations in each well do not exceed 1.25 times the average background conditions based on statistical analysis. If results indicate that a sample exceeds maximum allowable concentrations (MACs), laboratory re-analysis and/or confirmation water quality samples will be collected in order to confirm data. If subsequent data concludes impacts, EWS will coordinate

with COGCC and Weld County Department of Public Health and Environment (WCDPHE) as soon as practicable to develop an acceptable root cause investigation, assessment and remediation program, as necessary. The presence of BTEX above MACs will prompt a complete evaluation of site operations since the last sampling event, and prompt further subsurface investigation, if warranted.

Groundwater Elevation Measurements

The following outlines our standard groundwater quality sampling methodology. Before purging any temporary or monitoring well, water level measurements must be collected.

Measuring Point

Establish the measuring point for the well. Water levels will be collected off the marked location on the casing, the north side of the casing, or the highest point of the casing.

Access

Wells have limited access to the public ensured by a locking J-plug and/or a locking manway.

Measurement

Groundwater levels will be collected using a clean decontaminated water level probe/indicator, by carefully lowering the probe down the well until the probe illuminates or has an audible indication of water. Measurements will be collected to the nearest 0.01 ft and recorded on the groundwater monitoring data sheet or field notes.

Decontamination

The electronic probe shall be decontaminated immediately after use by wiping with isopropyl alcohol-soaked paper towels and rinsed with fresh water. Groundwater level collection will always proceed in order from the suspected cleanest monitoring well or temporary well to the suspected most impacted.

Purge Volume Computation

All soil test borings, monitoring wells, and temporary monitoring wells will be purged prior to sample collection. Depending upon the rate of recovery, approximately three volumes of groundwater present in a well or borehole shall be withdrawn prior to sample collection. If a well or borehole bails dry, the well or borehole should be allowed to recharge and a sample taken as soon as there is sufficient volume for the intended analysis. The volume of water present in each well or borehole shall be computed using the two measurable variables; length of water column in soil boring or monitoring well depth and diameter. Table 1, as referenced above, may be used to compute purge volumes.

Purging and Sample Collection Procedures

Bailing

- New disposable bailers and cord will be used for purging and collection of groundwater samples.
- Care will be taken to ensure that sampling bailers and cord will not come into contact with the ground or any other potential source of contamination.
- Lower the bailer carefully into the well casing to collect the groundwater sample from the top of the water column, taking care not to agitate the water in the well.

Sampling

- Sample container requirements will be discussed with the lab prior to sampling.
- Samples collected by bailing will be poured directly into sample containers from bailers. The sample should be poured slowly to minimize air entrapment into the sample bottle.
- Appropriate sample containers will be obtained from the contract laboratory for each individual analyses requested. After samples are collected, they will be put on ice in coolers (4°C). Care will be taken to prevent breakage during transportation or shipment.
- Upon completion of sampling a chain-of-custody (COC) log will be initiated. COC records will include the following information: project name and number, location, field ID number, date, time, sample type, number of containers, analysis required, and sample relinquishment details. The samples and COC will be delivered to the laboratory. Upon arrival at the laboratory, the appropriate laboratory personnel will check in the samples. Laboratory identification numbers will be noted on the chain-of-custody record. Upon completion of the laboratory analysis, the completed COC record will be returned to the project manager.

Field Cleaning Procedures

For all equipment to be reused in the field, the following cleaning procedures must be followed:

- Disassemble the equipment to the extent practical.
- Clean the equipment with fresh water mixed with Alconox, or isopropyl alcohol (whichever is appropriate for the equipment).
- Rinse with fresh water until all Alconox or alcohol is removed.

Laboratory Selection

The project manager should consider the following factors when selecting a laboratory:

- Capabilities (facilities, personnel, instrumentation), including:
  - Participation in inter-laboratory studies (e.g. EPA or other Federal or State agency sponsored analytical programs);
  - Certifications (e.g. Federal or State);
  - References (e.g. other clients); and
  - Experience (UST, RCRA and other environmentally related projects).
- Service;
- Turnaround time; and
- Technical input (e.g. recommendations on analytical procedures).

The project manager is encouraged to gather pertinent laboratory-selection information prior to extensively defining analytical requirements under the project. A request may be made to a laboratory to provide a qualifications package that should address the points listed above. Once the project manager has reviewed the various laboratory qualifications, further specific discussions with the laboratory or laboratories should take place. In addition, more than one laboratory should be considered. For large-scale investigations, selection of one laboratory as a primary candidate and one or two laboratories as alternate candidates should be considered.

The quality of the laboratory service provided is dependent on various factors. The project manager should be able to control the quality of the information (e.g. samples) provided to the laboratory. It is extremely important that the project manager communicate to the laboratory all the requirements relevant to the project. This includes the number of samples and their matrices, sampling schedule, parameters and constituents of interest, required

analytical methodologies, detection limits, holding times, deliverables, level of quality assurance/quality control (QA/QC), and required turnaround of analytical results.

Field and Laboratory Quality Control

General

Quality control checks are performed to ensure that the data collected is representative and valid data. Quality control checks are the mechanisms whereby the components of QA objectives are monitored.

Examples of items to be considered are as follows:

1. Field Activities:
   - Use of standardized checklists and field notebooks;
   - Verification of checklist information by an independent person;
   - Strict adherence to chain-of-custody procedures;
   - Calibration of field devices;
   - Collection of duplicate samples where applicable; and
   - Submission of field blanks, where appropriate.

2. Analytical Activities:
   - Method blanks;
   - Laboratory control samples;
   - Calibration check samples;
   - Replicate samples;
   - Matrix-spiked samples;
   - “Blind” quality control samplers;
   - Control charts;
   - Surrogate samples;
   - Zero and span gases; and
   - Reagent quality control checks.

Management of Waste Material

During the advancement of soil borings, decontamination of field equipment and development of soil borings or temporary monitoring wells, waste materials will be generated. This section addresses both the management of solid waste (soils) and the liquid wastes generated.

Soil generated during remedial activities will be containerized in 55 gallon drums or stockpiled on an impermeable membrane and covered with plastic, whichever is most appropriate. The waste characteristics of the soil will be determined by appropriate analytical methods and the soil disposed of in accordance with State and Federal regulations. Impacted water generated during field activities will be containerized in storage vessels that are compatible with the suspected or identified contaminant(s). The wastewater generated will be disposed of at a State or Federally regulated facility.

Reporting

After data has been compiled and analyzed, CGRS will submit a summary report to the following EWS representative:

Mr. Jim Goddard – Expedition Water Solutions; jgoddard@expedition-water.com

Furthermore, CGRS will submit an electronic copy to the following recipients and email addresses:

Mr. Ben Frissell – Weld County Department of Public Health & Environment; bfrissell-durley@weldgov.com
Ms. Danielle Serna – Weld County Department of Public Health & Environment; dserna@weldgov.com

Additional reports may be submitted upon the request of, or permission from, EWS. This includes the anticipated submittal of quarterly reports to WCDPHE.