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60565355

Mr. Brian Fettin
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U.S. Army Corps of Engineers
1616 Capitol Avenue
Omaha, NE 68102

Subject: **Draft Final OU1 Rebound Study Letter Report – Quarter 5 Event**
Remedial Action Operation Groundwater Treatment Facility at OU1
and Groundwater Monitoring at OU1 and OU3
Cornhusker Army Ammunition Plant, Grand Island, Nebraska
Contract W9128F-18-D-0020, Delivery Order Number F0041

Dear Mr. Fettin:

This Operable Unit (OU) 1 Rebound Study Letter Report – Quarter 5 (Q5) Event summarizes the fifth quarter of field activities completed for the OU1 Rebound Study and 2020 subsurface injections performance monitoring. The Letter Report presents the Q5 analytical results and evaluation for the OU1 Rebound Study and performance monitoring, a statistical trend evaluation for OU1 Rebound Study, and presents conclusions and recommendations for upcoming OU1 Rebound Study and performance monitoring activities at Cornhusker Army Ammunition Plant (CHAAP).

1.0 INTRODUCTION

1.1 PROJECT WORK AUTHORITY

Brice Engineering, LLC (Brice) and AECOM Technical Services (AECOM) have prepared this document as the OU1 Rebound Study Letter Report – Quarter 5 Event for CHAAP located at Grand Island, Nebraska (**Figures 1-1** and **1-2**). This work is being conducted under contract W9128F-18-D-0020, Delivery Order Number F0041 to the United States Army Corps of Engineers (USACE), Omaha District.

Conceptual basis for performing the OU1 Rebound Study was provided in the *CHAAP OU1 2018 Groundwater Monitoring Results and Program Recommendations Technical Memorandum* (Program Recommendations Tech Memo [Brice-AECOM 2019a]), the Final *2018 Annual Groundwater Monitoring Report, Remedial Action Operations (RAO), Groundwater Treatment Facility (GWTF) at OU1 and Groundwater Monitoring at OU1/OU3* (2018 Annual Groundwater Monitoring Report [Brice-AECOM 2019c]), and presented at several stakeholder meetings (April and November 2019). The approved OU1 Rebound Study work planning details are provided in the Final *Addendum 3, Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP) for RAO, GWTF at OU1 and Groundwater Monitoring at OU1/OU3 at CHAAP* (OU1 Rebound Study Work Plan) (Addendum 3, UFP-QAPP [Brice-AECOM 2019b]). The approved 2019 and

2020 OU1 subsurface injection work planning details are provided in the Final UFP-QAPP (Bay West LLC and URS Group Inc. [BW-URS] 2014), its Final Addendum 2 (Brice-AECOM 2018), and the recommendations provided in the Final 2018 Annual Groundwater Monitoring Report (Brice-AECOM 2019c) and the Final 2019 Annual Groundwater Monitoring Report (Brice-AECOM 2020b).

1.2 PROJECT PURPOSE AND OBJECTIVE

OU1 consists of explosives-contaminated groundwater plumes (explosives concentrations exceeding regulatory action levels) at CHAAP. Health Advisory Levels (HALs) for explosives compounds hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), 2,4,6-trinitrotoluene (TNT), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) were established as regulatory action levels for CHAAP in the OU1 Record of Decision (ROD) (United States Army Environmental Center [USAEC] 1994) and the subsequent OU1 ROD Amendment (URS Greiner Woodward-Clyde Federal Services [URSGWCFS] 2001). The HALs for RDX and TNT are 2 micrograms per liter (µg/L) and 400 µg/L for HMX. The primary compounds of concern (i.e., compounds with historic concentrations in groundwater exceeding their corresponding HAL) are RDX and TNT. HMX has not historically exceeded the HAL during any past groundwater monitoring events. The current OU1 RAO is on-post pump and treatment and monitored natural attenuation for off-post.

Historically, due to the reduction in on-post concentrations and/or the implementation of supplemental remediation efforts (i.e., subsurface injections), operation of extraction wells (EW) 1 through EW6 (that began operation in 1998) have been discontinued since 2009. At the former facility boundary, EW7 began operation in 2000 and has been the only operating extraction well since 2009. Historic groundwater monitoring and subsequent statistical analysis have shown that concentrations of RDX and TNT near the former facility boundary between EW6 and EW7 have significantly declined over the past 23 years due to the existing on-post RAO. Numerical groundwater modeling predictions with EW7 not pumping indicate that the on-post plume will not migrate further downgradient (Brice-AECOM 2019c). Based on these results and simulations, an OU1 Rebound Study is being performed to temporarily discontinue pumping at EW7 and monitor groundwater near the former facility boundary. Eight total groundwater sampling events (one baseline and seven quarterly events) will be completed to closely monitor potential migration of the RDX and TNT plumes and to document any increases/decreases in explosives concentrations in groundwater. The objective of the OU1 Rebound Study is to establish a sufficient data set to initiate further identified Decision Points and Contingency Actions as presented in the OU1 Rebound Study Work Plan (i.e., groundwater extraction is no longer needed, groundwater extraction should be resumed, alternative actions) (Brice-AECOM 2019b).

Concurrent with the OU1 Rebound Study, subsurface injections (a voluntary action) were completed in 2019 (in the area of highest RDX and TNT concentrations near the former facility boundary) and in 2020 (for on-post areas with remaining residual RDX and TNT concentrations above HALs) to accelerate remedial timeframes. Four total groundwater sampling events (at approximate quarterly frequency) will be completed for each injection event to closely monitor performance of the subsurface injections and remediation of the RDX and TNT plumes, and to document any increases/decreases in explosives concentrations in groundwater. The 2019 and 2020 OU1 subsurface injection details and design were included in the Final 2018 Annual Groundwater Monitoring Report (Brice-AECOM 2019c), Final 2019 Annual Groundwater Monitoring Report (Brice-AECOM 2020b), respectively; with the approved procedures outlined

in the Final UFP-QAPP (BW-URS 2014). Following the OU1 Rebound Study and the OU1 subsurface injections with associated performance monitoring activities, long-term monitoring (LTM) will continue at OU1.

2.0 FIELD ACTIVITIES

This section summarizes the Q5 OU1 Rebound Study and the 2020 subsurface injection performance monitoring field activities completed at CHAAP. All field activities were completed in accordance with field protocols and standard operating procedures (SOPs) presented in the *Groundwater Recovery and Treatment System Operation and Maintenance (O&M) Manual* (GWTF O&M Manual [Brice 2019]), the Final UFP-QAPP (BW-URS 2014) and its Final Addendum 2 (Brice-AECOM 2018), the Final OU1 Rebound Study Work Plan (Brice-AECOM 2019b), and the OU1 subsurface injection recommendations provided in the Final 2019 Annual Groundwater Monitoring Report (Brice-AECOM 2020b).

2.1 OU1 REBOUND STUDY FIELD ACTIVITIES

This section presents the Q5 OU1 Rebound Study field activities. The Q5 field activities were completed in February/March 2021 to compare and evaluate associated data to previous completed events. The most recent OU1 Rebound Study activities (Q4) are summarized in the Final OU1 Rebound Study Letter Report – Quarter 4 Event (Brice-AECOM 2021). Additionally, the baseline event, Q2, and Q3 are summarized in the Final OU1 Rebound Study Letter Report – Baseline Event (Brice-AECOM 2020a), Final OU1 Rebound Study Letter Report – Quarter 2 Event (Brice-AECOM 2020c), and Final 0U1 Rebound Study Letter Report – Quarter 3 Event (Brice-AECOM 2020d), respectively.

2.1.1 Quarter 5 Direct Push Groundwater Sampling Activities (Off-Post)

A total of nine direct push groundwater samples were collected on February 22 and 23, 2021 from three off-post locations (OS001, OS003, and NW050R) as shown on **Figure 2-1**. Off-post direct push groundwater sampling was completed to continue monitoring explosives concentrations only (as screening data) from the select OU1 off-post locations where permanent monitoring wells are not present and are not able to be installed due to private land ownership. In accordance with the OU1 Rebound Study Work Plan (Brice-AECOM 2019b), off-post location OS001 was selected to evaluate existing explosives concentrations that migrated off-post, and off-post location OS003 was selected to delineate the furthest extent off-post of explosives concentrations above HALs. Off-post location NW050R was selected for direct push groundwater sampling due to private landowner no longer allowing property access to six OU1 Rebound Study off-post monitoring wells (NW050, NW051, NW052, NW080, NW081R, NW082R) (shown on **Figure 2-1**). The six off-post monitoring wells are no longer sampled for OU1 activities and are scheduled for future abandonment. To continue monitoring groundwater in the area of these wells, direct push groundwater sampling will be conducted in the right-of-way (ROW) adjacent to off-post well cluster NW050 (with Hall County permitting) at similar depths to the three wells during each quarterly event (Q5 through Q8), following similar procedures currently completed for the area downgradient of EW7 (see **Table 2-1**).

Direct push groundwater sampling was completed for all locations at predetermined vertical intervals within the unconfined shallow aquifer (Grand Island Formation) to verify the vertical extent of the explosives plume. The OS001 and OS003 depth intervals included: shallow – screened approximately 21 to 25 feet below ground surface [bgs], shallow-intermediate – screened approximately 31 to 35 feet bgs, and intermediate – screened approximately 41 to 45 feet bgs. The NW050R depth intervals included: shallow – screened approximately 16 to 20 feet bgs, shallow-intermediate – screened approximately 31 to 35 feet bgs, and intermediate – screened approximately 56 to 60 feet bgs.

Brice-AECOM obtained utility clearances prior to the start of intrusive direct push activities. The Nebraska One Call Diggers Hotline was contacted for utility clearances, which were requested a minimum of 48 hours prior to intrusive work. All identified underground utilities were marked with flagging, stakes, and/or paint. Utility locate tasks were documented in field logbooks to aid in subsequent clearance work. No intrusive work was completed within 5 feet of a marked utility.

The direct push locations OS001 and OS003 were sited using predetermined horizontal coordinates and a global positioning system (GPS) unit to ensure completion in the planned locations. The final sampling location has been vertically surveyed and referenced to previously surveyed locations (i.e., monitoring wells). Due to proximity, the direct push location NW050R utilizes the surveyed horizontal coordinates and vertical elevations of existing well cluster NW050. The surveyed ground surface elevation and sample interval elevations are provided in **Table 2-1**.

The direct push groundwater samples were collected using a Geoprobe® rig (model 7720DT) by Plains Environmental Services (PES) of Salina, Kansas, with full-time oversight by Brice-AECOM. Nebraska well drilling contractor licenses for PES and Brice-AECOM are provided in **Appendix A**.

Direct push groundwater samples were completed using direct push technology with a Geoprobe™ stainless steel screen point sampler (SP15 with exposed screen) and collected from the screened interval using a Geotech Geopump™ peristaltic pump and a check valve. Prior to groundwater sample collection, approximately 7 liters (3 to 5 rod volumes) were purged typically at rates of 0.5 to 1.0 liter per minute (lpm) for each sampling interval. Direct push groundwater samples were analyzed for explosives only (including mono-nitroso-RDX [MNX]) (United States Environmental Protection Agency [USEPA] Method 8330A). Quality control (QC) samples (field duplicates) and matrix spike/matrix spike duplicate (MS/MSD) samples were collected at a 5-percent rate (i.e., one per 20 samples collected). Direct push groundwater sample locations, sample identification (ID) numbers, sample screened intervals, sample collection dates, QC locations, and sample parameters are provided in **Table 2-1**. Direct push groundwater sample collection field sheets (SCFSs) are provided in **Appendix B**.

2.1.2 Quarter 5 OU1 Monitoring Well Sampling Activities (Off-Post and On-Post)

During the Q5 OU1 Rebound Study sampling event, 12 off-post and 18 on-post monitoring wells were sampled from February 28 through March 3, 2021. A summary of the OU1 off-post and on-post sampling locations is presented in **Table 2-2** and shown on **Figure 2-1**.

The monitoring wells were purged and sampled with stainless steel ProActive Monsoon® submersible pumps. The ProActive Monsoon® pump with new disposable tubing was lowered to the middle of the screened interval prior to purging. Modified low-flow purging techniques were

completed at each monitoring well location, maintaining less than (<) 0.3 foot of water level drawdown at a pumping rate of 0.5 lpm or less. Field water quality parameters, including dissolved oxygen (DO), oxidation/reduction potential (ORP), temperature, pH, conductivity, and turbidity were measured at monitoring wells using an In-Situ Aqua TROLL® 500 MPS water quality probe fitted with a flow-through cell. Ferrous iron (Fe^{2+}) was measured using a Hach DR820 colorimeter. Purging continued until field water quality parameters stabilized (i.e., three consecutive readings) within criteria ranges.

After purging was completed, sample containers were filled from the discharge line at a rate of 0.5 lpm or less. Samples were collected and analyzed for explosives (including MNX) and laboratory monitored natural attenuation (MNA) parameters: alkalinity by Method 2320B, ammonia by Method 350.1, carbon dioxide (CO_2) back calculated by Method 2320B, nitrate/nitrite by Method 353.2, sulfate by Method 9056A, sulfide by Method 9034, total Kjeldahl nitrogen (TKN) by Method 351.2, dissolved organic carbon (DOC) by Method 9060A, and methane by Method Robert S. Kerr Environmental Research Laboratory 175 (RSK-175). QC samples (field duplicates) and MS/MSDs were collected at a 5-percent rate (i.e., one per 20 samples collected) for all parameters (**Table 2-2**). Off-post and on-post monitoring well SCFSs are provided in **Appendix B**.

2.2 OU1 SUBSURFACE INJECTION FIELD ACTIVITIES

This section presents the Q5 performance monitoring activities completed in February/March 2021 to monitor the results of the 2020 OU1 subsurface injections completed at LL1, LL2, the Decant Station, and at select locations between EW6 and EW7. The Q5 performance monitoring is the first monitoring event following the 2020 subsurface injection activities. The 2020 subsurface injection activities are summarized in the Final OU1 Rebound Study Letter Report – Quarter 4 Event (Brice-AECOM 2021). Performance monitoring activities completed for the 2019 subsurface injections (baseline through Q4) is additionally summarized in previous Letter Reports, most recently the Final OU1 Rebound Study Letter Report – Quarter 4 Event (Brice-AECOM 2021).

2.2.1 Quarter 5 Subsurface Injection Performance Monitoring

At LL1, LL2, the Decant Station, and between EW6 and EW7, 20 performance monitoring locations (ten LTM monitoring wells and 10 temporary wells) were sampled in February/March 2021, as shown on **Figures 2-2** through **2-4**. The Q5 event is the first of four quarterly performance monitoring events planned at these performance monitoring wells to gauge the effectiveness of the 2020 subsurface injection activities completed in October/November 2020. Groundwater samples collected from the temporary monitoring wells and LTM wells were analyzed for explosives (including MNX) and laboratory water quality parameters: alkalinity, ammonia, nitrate/nitrite, sulfate, sulfide, TKN, DOC, and methane. QC samples (field duplicates) and MS/MSDs were collected at a 5-percent rate (i.e., one per 20 samples collected) for all parameters. Performance monitoring groundwater sampling locations and parameters are listed in **Table 2-4**. Performance monitoring SCFSs are provided in **Appendix B**. The Q5 performance monitoring included:

- Ten new temporary wells (EW7-PM21A, EW7-PM24A, EW7-PM25A/B, EW7-PM26A/B, EW7-PM27B, EW7-PM28A, EW7-PM29A/B) at seven locations between EW6 and EW7
- Ten existing monitoring wells

- LL1: G0094, G0096
- LL2: G0111, G0121, G0122, G0123
- Decant Station: G0102
- Between EW6 and EW7: G0022 and piezometers PZ017R and PZ018

As completed during the baseline through Q4 events, temporary monitoring wells were used to provide a higher quality groundwater sample that has lower turbidity (compared to direct push screen point samples) and is representative of the aquifer. Temporary monitoring wells were installed using direct push technology. The temporary monitoring wells were screened at select vertical intervals based on past direct push vertical profile sampling results. Six shallow temporary wells (screened 20 to 30 feet bgs [i.e., EW7-PM25A]) and four shallow-intermediate temporary wells (screened 30 to 40 feet bgs [i.e., EW7-PM25B]) were installed within the interpreted groundwater explosives plume or within areas of historically higher concentrations identified during the Quarter 3 Event. Temporary well construction details are provided in **Table 2-3**. Surveyed ground surface elevations for both temporary wells and monitoring wells are provided in **Tables 2-3** and **2-4**.

2.2.1.1 Groundwater Sampling from Temporary Wells

The 10 temporary monitoring wells (at seven locations) were installed, developed, purged, sampled, and abandoned from February 25 through February 27, 2021. Temporary performance monitoring well development, purging, and sampling were completed using a Geotech Geopump™ peristaltic pump. Temporary wells were developed by purging approximately 10 well volumes (purge rates between 0.5 and 1.0 lpm) and samples were collected after all field water quality parameters had stabilized.

Per Nebraska Administrative Code (NAC) Title 178, Chapter 12 (NAC 2014), temporary wells (i.e., test holes) can be used in conjunction with groundwater investigations but may be retained for no more than 10 days unless a surface seal is used and a pre-notification document is submitted to Nebraska Department of Health and Human Services within 30 days prior to construction, then a temporary well may be retained for up to 90 days. Upon completion of sample collection, all temporary monitoring wells were abandoned within 10 days of installation by a Nebraska-licensed well driller. Temporary monitoring wells were abandoned by removing approximately the top 3 feet of the well casing below the ground surface and grouting from the bottom of the well up to ground surface following the procedures outlined in SOP 4, Boring and Monitoring Well Abandonment in the Final UFP-QAPP (BW-URS 2014).

2.2.1.2 Groundwater Sampling from OU1 Monitoring Wells

Ten existing monitoring wells at LL1, LL2, the Decant Station, and between EW6 and EW7 were purged and sampled on March 2 and March 3, 2021. These wells were purged and sampled in accordance with **Section 2.1.2**. Performance monitoring groundwater sampling locations and parameters are listed in **Table 2-4**. Performance monitoring SCFSs are provided in **Appendix B**.

2.3 INVESTIGATION-DERIVED WASTE DISPOSAL PROCEDURES

Investigation-derived waste (IDW) from the Q5 sampling events consisted of purge, decontamination, and development water. IDW disposal was completed in accordance with NDEE IDW procedures as outlined in the Final UFP-QAPP (BW-URS 2014), as follows:

- A visual inspection of the IDW was conducted for evidence of potential contamination (i.e., discoloration, sheen, etc.).
- All IDW water was containerized in an IDW-labeled poly tank located at the GWTF and sampled for site waste characterization analysis (Explosives [including MNX] only [Method 8330A]). All IDW analytical results were below HALs, as summarized in **Table 2-5** (included in **Appendix D**) and discharged to ground surface.

2.4 FIELD DOCUMENTATION, SAMPLE IDENTIFICATION, SAMPLE HANDLING, AND SHIPPING

The observations and data collected during field activities were recorded with waterproof ink in a permanently bound, waterproof logbook with consecutively numbered pages, and/or on field sheets (provided in **Appendix B**), if applicable. A photographic record of site activities and progress was maintained throughout the course of the OU1 Rebound Study and subsurface injection activities and is provided in **Appendix C**.

Samples were collected in laboratory-provided containers and given discrete ID codes that included the sample location number (sample depth for direct push groundwater samples) and collection date. Sample ID labels were attached to each sample container and completed using waterproof, permanent ink. The labels were completed with the sampler's name, sample ID number, date and time of sample collection, preservation type, analyses requested, and sampling matrix. Sample containers were placed into coolers, packed with wet ice (to achieve a temperature of 6 degrees Celsius [°C] or less), and made ready for shipment. Chain-of-custody (CoC) forms were included in each cooler. A copy of each CoC was maintained to document sample handling between the field and the laboratory. Sample coolers were shipped to Eurofins TestAmerica Laboratories in Arvada, Colorado during each sampling event. All samples were shipped via FedEx Priority Overnight.

2.5 FIELD REPORTING

2.5.1 Daily Quality Control Reports

Daily Quality Control Reports (DQCRs) were completed for each day of fieldwork associated with the OU1 Rebound Study and subsurface injection activities. DQCRs include a summary of daily field activities, safety activities, quality assurance/QC activities pertaining to all features of work, problems encountered in the field, and any corrective actions that were taken to correct these problems. Copies of the completed DQCRs are provided in **Appendix B**.

2.5.2 Weekly Progress Reports

Weekly progress reports were completed and submitted to the USACE Project Manager throughout the duration of the field activities. The weekly reports included a summary of the work performed in a particular week including mobilization, site preparation, site access, surveying, groundwater sampling, injection, and demobilization actions. The reports also included a summary of the problems encountered, deviations from the scope of work, percentage of work performed, and records of conversations or other correspondence among CHAAP team members. Copies of the weekly progress reports are provided in **Appendix B**.

3.0 SUMMARY OF QUARTER 5 RESULTS AND DATA QUALITY REVIEW

3.1 QUARTER 5 ANALYTICAL RESULTS

Groundwater samples for the Q5 OU1 Rebound Study and 2020 OU1 subsurface injection performance monitoring activities were analyzed in accordance with the Final Addendum 2, UFP-QAPP (Brice-AECOM 2018) for various compounds depending on sample location. Groundwater samples for the OU1 Rebound Study off-post direct push locations were analyzed for explosives (including MNX) only (see **Table 2-1**). Groundwater samples for the OU1 Rebound Study off-post and on-post monitoring wells and the 2020 subsurface injection performance monitoring activities were analyzed for explosives (including MNX) and laboratory MNA/water quality parameters: alkalinity, ammonia, nitrate/nitrite, sulfate, sulfide, TKN, DOC, and methane (see **Tables 2-2** and **2-4**). All laboratory analyses were completed by Eurofins TestAmerica. A summary of all Q5 analytical results is presented below.

Tables 3-1 (off-post direct push samples), **3-2** (off-post and on-post monitoring wells), and **3-3** (performance monitoring wells) summarize the explosives compounds detected in groundwater during the Q5 OU1 Rebound Study and 2020 OU1 subsurface injection performance monitoring sampling activities. The primary explosives compounds detected in groundwater were RDX, HMX, and TNT (only compounds having HALs). Additionally, the explosives breakdown products 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, 2-amino-4,6-dinitrotoluene (2-Am-DNT), 4-amino-2,6-dinitrotoluene (4-Am-DNT), and MNX were detected.

- One off-post direct push location (OS001) had a concentration of TNT above the HAL (2 µg/L), but no off-post direct push locations had detections above the RDX HAL (2 µg/L). Off-post direct push locations had detections of explosives breakdown products 1,3,5-trinitrobenzene, 2-Am-DNT, and 4-Am-DNT.
- Five OU1 Rebound Study on-post monitoring wells (G0086, G0077, PZ017R, PZ018, PZ020) had TNT concentrations above the HAL and one OU1 Rebound Study on-post monitoring well (PZ017R) had an RDX concentration above the HAL. No OU1 Rebound Study off-post monitoring wells had RDX or TNT concentrations above the HALs. Ten OU1 Rebound Study off-post and on-post monitoring wells had small detections of HMX but were below the HAL (400 µg/L). OU1 Rebound Study off-post and on-post monitoring wells had detections of explosives breakdown products 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, 2-Am-DNT, and 4-Am-DNT.

- Six performance monitoring wells (EW7-PM21A, EW7-PM24A, G0094, G0111, PZ017R, PZ018) had TNT concentrations above the HAL and three OU1 Rebound Study on-post monitoring well (G0094, G0096, PZ017R) had RDX concentrations above the HAL. Two performance monitoring wells had small detections of HMX but were below the HAL. Performance monitoring wells had detections of explosives breakdown products 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, 2-Am-DNT, 4-Am-DNT, and MNX.

The data collected during the Q5 OU1 Rebound Study and 2020 subsurface injection performance monitoring were used to update the explosives plume boundaries in these areas. Data for the Q5 off-post direct push groundwater sample locations and off-post and on-post monitoring wells are shown on **Figure 2-1** and data for the Q5 2020 subsurface injection performance monitoring are shown on **Figure 2-2** through **2-4**.

Tables 3-2 and **3-3** also summarize the laboratory MNA/water quality parameters detected in groundwater at off-post and on-post monitoring wells and performance monitoring wells, respectively. Field duplicate sample pairs were collected to assess both field and laboratory precision. Three field duplicate samples were collected and submitted to the laboratory for analysis. Analytical results for the Q5 OU1 Rebound Study and 2020 OU1 subsurface injection performance monitoring field duplicate sample pairs are presented in **Table 3-4**.

3.2 FIELD WATER QUALITY PARAMETERS

Field water quality parameter measurements were taken at the time of sample collection during Q5 OU1 Rebound Study (off-post and on-post monitoring wells) and 2020 OU1 subsurface injection performance monitoring sampling activities. Field water quality parameter measurements included ORP, DO, pH, conductivity, temperature, turbidity, and Fe^{2+}. Groundwater purging stabilization was successfully accomplished using these field water quality parameter criteria. All field results were recorded on the SCFSs (included in **Appendix B**). OU1 off-post and on-post monitoring well and subsurface injection performance monitoring well field water quality parameter measurements are presented in **Tables 3-5** and **3-6**, respectively.

3.3 DATA QUALITY REVIEW/VALIDATION PROCESS

Analytical data were reviewed and verified in accordance with the Final Addendum 2, UFP-QAPP (Brice-AECOM 2018). The data review process included evaluations of the following elements, as required, including validation of raw data by an AECOM chemist. The validation software ADR.NET was used to supplement the manual validation.

- Laboratory case narrative/cooler receipt form
- Sample documentation
- Sample preservation and holding time compliance
- Instrument performance check (tuning)
- Initial calibration
- Initial calibration verification second source
- Second column confirmation

- Primary and secondary column relative percent difference (RPD)
- Continuing calibration verification (CCV)
- Internal standards
- Blank samples
- Laboratory control samples (LCS)
- Surrogate compounds
- MS/MSDs
- Field duplicates
- Sensitivity
- Additional qualifications, including professional judgment
- Completeness

3.3.1 Analytical Results Verification

The laboratory data reports, complete ADR.NET, and data verification reports are provided in **Appendix D**. Qualifications applied to the analytical results based on the data review findings are included in **Table D-1** (**Appendix D**). As previously indicated, below trends only include discussion regarding the Q5 OU1 Rebound Study and 2020 OU1 subsurface injection performance monitoring activities.

General trends regarding the data validation are as follows:

- Some explosives results for samples OS001-DP05-35, OS001-DP05-45, EW7-PM21A-5-25, EW7-PM24A-5-25, EW7-PM27B-5-35, EW7-PM29B-5-35, CA213-5, G0075-5, G0080-5, G0081-5, G0082-5, G0086-5, G0087-5, G0091-5, G0094-5, G0096-5, G0111-5, G0296-5, PZ017R-5, PZ021-5, and Water-WC-Q5-MAR21 were qualified as estimated (**J**) / estimated nondetect (**UJ**) due to relative percent differences >40% between the primary and confirmation columns.
- The sulfide result for sample G0079-5 was qualified as nondetect (**U**) due to method blank contamination.
- The 2-nitrotoluene results for samples EW7-PM25A-5-25, EW7-PM25B-5-35, and EW7-PM28A-5-35 were qualified as **UJ** due to continuing calibration verification percent differences outside of evaluation criteria.
- The 2-amino-4,6-dinitrotoluene and sulfate results for the duplicate pair G0096-5 / G0296-5 were qualified as **J/UJ** due to field duplicate relative percent differences outside of evaluation criteria.
- The methane results for the duplicate pair PZ017R-5 / PZ021-5 were qualified as **J** due to field duplicate relative percent differences outside of evaluation criteria.
- The methane result for sample EW7-PM27B-5-35 was qualified as **J** due to the presence of headspace greater than six millimeters in the VOA vials.

- The sulfate results for samples G0111-5, G0082-5, and G0070-5 and the methane results for samples EW7-PM29B-5-35 and G0082-5 were qualified as **J** due to MS/MSD recoveries above evaluation criteria.
- All detected explosives for samples EW7-PM21A-5-25, EW7-PM24A-5-25, EW7-PM26A-5-25, EW7-PM27B-5-25, G0094-5, G0096-5, G0296-5, G0086-5, and Water-WC-Q5-MAR21 were qualified as **J** due to surrogate recoveries above evaluation criteria.
- The 2-amino-4,6-dinitrotoluene result for sample EW7-PM29B-5-35 was qualified as **J** due to surrogate recovery above evaluation criteria.
- The sulfide results for the following samples were qualified as **J/UJ** due holding time exceedances: G0082-5, PZ017R-5, PZ018-5, PZ021-5, G0081-5, G0086-5, G0087-5, CA210-5, G0091-5, and G0092-5.
- The methane result for sample EW7-PM29B-5-35 was qualified as **J** due to lab duplicate relative percent difference outside of evaluation criteria.
- The 1,3-dinitrobenzene, 2,4-dinitrobenzene, 2-nitrotoluene, 3-nitrotoluene, 4-amino-2,6-dinitrotoluene, 4-nitrotoluene, and nitrobenzene results for samples NW050R-DP05-20, NW050R-DP05-35, NW050R-DP05-60, OS001-DP05-25, and OS501-DP05-25 were qualified as **J/UJ** due to LCS/LCSD recoveries below evaluation criteria.
- The 2-nitrotoluene, 3-nitrotoluene, and 4-amino-2,6-dinitrotoluene results for samples PZ017R-5, PZ018-5, PZ019-5, PZ021-5, NW020-5, NW021-5, NW022-5, G0024-5, G0077-5, G0078-5, and PZ020-5 were qualified as **J/UJ** due to LCS/LCSD recoveries below evaluation criteria.
- The explosives results for all samples in SDG 280-145816 were qualified as **J/UJ** due to temperature exceedance. During shipment, delivery of one sample cooler containing SDG 280-145816 samples was delayed and received later in the week due to severe weather.
- The explosives results for sample OS003-DP05-45 were qualified as **UJ** due to MS/MSD recoveries below evaluation criteria.
- The ammonia, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene results for EW7-PM29B-5-35 were qualified as **J/UJ** due to MS/MSD recoveries below evaluation criteria.
- The TKN results for samples G0080-5, G0086-5, and PZ020-5 were qualified as **UJ** due to MS/MSD recoveries below evaluation criteria.
- The nitrate-nitrite result for sample G0024-5 was qualified as **J** due to MS/MSD recoveries below evaluation criteria.
- The TKN and methane result for sample G0070-5 were qualified as **UJ** due to MS/MSD recoveries below evaluation criteria.
- The TKN and sulfide result for sample G0075-5 were qualified as **UJ** due to MS/MSD recoveries below evaluation criteria.
- The explosives results for samples OS001-DP05-35, OS003-DP05-25, OS003-DP05-45, NW050R-DP05-20, G0111-5, and G0122-5 were qualified as **J/UJ** due to surrogate recoveries below evaluation criteria.

3.3.2 Conclusions of Data and Quality Review

The analytical data were found to be acceptable for the intended use based on the data validation and the automated data review. Completeness, defined to be the percentage of analytical results judged to be valid, including estimated data, was 100 percent for the sampling events. No analytical data were rejected during the data validation. Generally, good precision was noted in the field duplicate samples for analytes reported above the laboratory limits of quantitation.

4.0 OU1 STATISTICAL TREND EVALUATION (OU1 REBOUND STUDY WELLS)

Following the OU1 Rebound Study Q5 event (5th sampling event for all respective wells), a statistical trend evaluation of RDX and TNT concentrations was completed. The OU1 Rebound Study statistical trend evaluation includes only the off-post and on-post OU1 Rebound Study monitoring wells (shown on **Figure 2-1**). While all OU1 Rebound Study wells are considered for trend evaluations, only the wells with detections are included in the quarterly report statistical trend figures, currently illustrated as two sets of wells (former facility boundary wells provided on **Figure 4-1** and upgradient wells provided on **Figure 4-2**).

4.1 STATISTICAL TREND EVALUATION PROCESS

OU1 Rebound Study analytical results were evaluated using Mann-Kendall analysis in Monitoring and Remediation Optimization System (MAROS) Version 3.0 (AFCEC 2012). Statistical trend analysis of RDX and TNT was completed using the Mann-Kendall analysis to assess the potential for future RDX and TNT concentration increases. Mann-Kendall is a non-parametric statistical procedure that is well suited for analyzing trends in data over time, that do not follow a normal distribution, and focus on the location of the probability distribution of the sampled population, rather than specific parameters of the population. (AFCEC 2012). The linear regression analysis, modeling, and empirical functions were not used during this evaluation.

Using the three statistical metrics for Mann-Kendall analysis (Mann-Kendall statistic [S], Confidence in Trend [CT], and Coefficient of Variation [COV]), the Mann-Kendall analyzes the trend in the data over time and is utilized in the analysis of groundwater plume stability. A concentration trend category is then determined following the Mann-Kendall Analysis Decision Matrix. Generally, positive S values indicate an increase in analyte concentrations over time and negative S values indicate a decrease in analyte concentrations over time. The CT provides a percentage value of confidence for the S validity, and the COV provides a general indicator of the degree of variability. Mann-Kendall analysis will be applied to RDX and TNT results to assess the potential for future RDX and TNT concentration increases.

Individual monitoring well concentration trends are categorized into one of seven categories based on the decision matrix:

MANN-KENDALL ANALYSIS DECISION MATRIX

Mann-Kendall Statistic (S)	Confidence in Trend (CT)	Concentration Trend
S > 0	> 95%	Increasing (I)
S > 0	90% to 95%	Probably Increasing (PI)
S > 0	< 90%	No Trend (NT)
S less than or equal (≤) 0	< 90% and COV greater than or equal (≥) 1	No Trend (NT)
S ≤ 0	< 90% and COV < 1	Stable (S)
S < 0	90% to 95%	Probably Decreasing (PD)
S < 0	> 95%	Decreasing (D)
Dataset where all values are nondetect		Nondetect (ND)

Notes:
No Trend – No statistically significant trend with more variability in concentrations over time (COV)
Stable – No statistically significant trend with less variability in concentrations over time (COV)

4.1.1 Program Input

4.1.1.1 Data Management

Groundwater monitoring data at each set of wells were tabulated into an importable format recognized by the MAROS software, as summarized and presented in **Appendix E** (**Tables E.1**, **E.2**, and **E.3**). The groundwater monitoring data set included:

- Well names
- Well location coordinates
- Chemical constituent(s)
- Sample results
- Sample dates
- Detection limits (used to estimate values for non-detects)
- Data flags (non-detect or estimated [**J**] values)

4.1.2 Program Output

Mann-Kendall Statistics Summary result sheets output for each well set are included in **Appendix E** with results discussed below.

4.2 STATISTICAL RESULTS SUMMARY

The Mann-Kendall Statistics Summary sheets lists monitoring wells used in the evaluation. General sampling information, such as the number of samples and average detected constituent concentration, is also presented. A contaminant concentration trend is determined for each well using the Mann-Kendall technique.

Data for the Mann-Kendall analysis for wells at the 'former facility boundary' (near operating EW7) were used from 12 total wells (i.e., three off-post monitoring wells, six on-post monitoring wells, and three piezometers) and shown on the Mann-Kendall Statistics Summary result sheet in **Appendix E**. Due to no RDX and TNT detections at five of the former facility boundary wells during OU1 Rebound Study sampling events (i.e., baseline through Q5), only seven wells were included for evaluation and shown on **Figure 4-1**. The Mann-Kendall trend analysis results for each of the seven wells including: detections, detection frequency, minimum, maximum, mean, median, Mann-Kendall statistic result, and concentration trend are provided on **Figure 4-1** and yielded the following summarized results for TNT and RDX:

- TNT – increasing (I) at NW020 and G0077, no trend (NT) at G0024 and PZ020, stable (S) at PZ017R and PZ018, and nondetect (ND) at G0091.
- RDX – increasing (I) at PZ017R, no trend (NT) at NW020, G0024, PZ018, and PZ020, stable (S) at G0077, and decreasing (D) at G0091.

Data for the Mann-Kendall analysis for 'upgradient wells' of EW7 were used from nine on-post monitoring wells and shown on the Mann-Kendall Statistics Summary result sheet in **Appendix E**. Due to no RDX and TNT detections at four of the upgradient wells during OU1 Rebound Study sampling events (i.e., baseline through Q5), only five wells were included for evaluation and shown on **Figure 4-2**. The Mann-Kendall trend analysis results for each of the five wells including: detections, detection frequency, minimum, maximum, mean, median, Mann-Kendall statistic result, and concentration trend are provided on **Figure 4-2** and yielded the following summarized results for TNT and RDX:

- TNT – stable (S) at G0086, probably decreasing (PD) at G0081, and nondetect (ND) at G0076, G0082, and G0087.
- RDX – increasing (I) at G0087, no trend (NT) at G0086, stable (S) at G0076 and G0082, and nondetect (ND) at G0081.

Data for the remaining OU1 Rebound Study 'downgradient' wells (i.e., 15 wells downgradient of EW7 and feedlot) are included in **Appendix E** (**Tables E.3**); however, these wells were not included in Mann-Kendall analysis, analysis figures, or summary sheets due to all having no detections of RDX or TNT during OU1 Rebound Study sampling events (i.e., baseline through Q5).

The trend analysis results for the two sets of wells (shown on **Figures 4-1** and **4-2**) indicated that four wells had an increasing trends (I), one well had a decreasing trend, and one well had a probably decreasing trend (PD). All other wells yielded no trend (NT), stable (S), or nondetect (ND) results for Mann-Kendall statistical analysis. Of the four wells with increasing trends, two 'former facility boundary' wells (NW020 and G0077) showed increasing TNT trends and one 'former facility boundary' well (PZ017R) showed an increasing RDX trend. One 'upgradient' well (G0087) had an increasing trend for RDX. During the OU1 Rebound Study sampling events, G0077 has remained slightly above the TNT HAL for all events, PZ017R concentrations have increased to slightly above the RDX HAL (only during Q5), and although increasing, NW020 and G0087 still remain below the TNT and RDX HALs, respectively. One 'former facility boundary' well (G0091) had a decreasing trend for RDX, one 'upgradient' well (G0081) had a probably decreasing trend for TNT, and both have not been above the HALs during the OU1 Rebound Study. The tabulated groundwater monitoring data for each well are included in **Appendix E**.

5.0 OU1 REBOUND STUDY AND INJECTION PERFORMANCE EVALUATION

This section presents an evaluation of the Q5 data compared to the previous four quarters of data for the OU1 Rebound Study and the subsurface injection performance monitoring for the OU1 groundwater explosives plume, as summarized in **Tables 5-1** through **5-4**. This evaluation compares RDX and TNT concentrations and key MNA/water quality parameters in groundwater and qualitatively discusses any concentration trends observed. Although baseline through Q4 performance monitoring was specifically completed for evaluating the 2019 subsurface injection event, select locations were added (or continued) in Q5 for performance monitoring of the 2020 subsurface injection event.

Previous baseline, Q2, Q3, Q4 event data are provided in the Final OU1 Rebound Study Letter Report – Baseline Event (Brice-AECOM 2020a), the Final OU1 Rebound Study Letter Report – Quarter 2 Event (Brice-AECOM 2020c), the Final OU1 Rebound Study Letter Report – Quarter 3 Event (Brice-AECOM 2020d), and the Final OU1 Rebound Study Letter Report – Quarter 4 Event (Brice-AECOM 2021), respectively. Additionally, for comparison, historic RDX and TNT plume interpretation figures from previous OU1 Rebound Study and performance monitoring events (i.e., baseline through Q4) are included in **Appendix F**.

5.1 OU1 REBOUND STUDY EVALUATION

5.1.1 RDX and TNT Concentrations

RDX and TNT concentrations for all OU1 Rebound Study locations are presented in **Table 5-1**. Of the 18 on-post wells sampled during the Q5 event, five wells (G0077, G0086, PZ017R, PZ018, and PZ020) had TNT concentrations above its HAL (2 µg/L); during the Q4 event four wells had TNT concentrations above the HAL. G0086 was nondetect for TNT in Q4; however, it was slightly above the TNT HAL from baseline through Q3 events and again in Q5 (4.9 µg/L). For the five on-post wells, the TNT concentration increased slightly at G0077, G0086, and PZ020 from Q4 to Q5, but were comparable to previous events. The TNT concentrations decreased slightly at PZ017R and PZ018 from Q4 to Q5; however, PZ017R had an increase to above the RDX HAL (2 µg/L) in Q5 (from 1.8 µg/L in Q4 to 2.2 µg/L in Q5). PZ017R is the only on-post well with RDX concentrations above the HAL in Q5 (**Figures 4-1** and **4-2**). For the 12 off-post wells, concentrations continued to be nondetect for RDX and TNT during the Q5 event, with exception of NW020 (located at the former facility boundary) which has had minor RDX and TNT detections in all events, was above the RDX HAL during Q4 (2.2 µg/L), but has decreased to below the HAL during Q5 (1.2 µg/L).

At off-post direct push location OS001 during the Q5 event, all RDX concentrations were below the HAL and one TNT concentration remained above the HAL, but TNT concentrations continued to decrease comparatively to previous events. During Q5, the shallow interval at OS001 currently has a TNT concentration greater than the HAL. At OS001, a comparison of TNT concentrations detected during the baseline through Q5 sampling events indicates concentrations have generally decreased since Q3 in the shallow interval (approximately 25 feet bgs) from 12 µg/L, to 9.2 µg/L, to 32 µg/L, to 29 µg/L, to 20 µg/L. TNT concentrations in the shallow-intermediate interval (approximately 35 feet bgs) have fluctuated during events from 11 µg/L, to 8.2 µg/L, to 11 µg/L, to 15 µg/L, to 2 µg/L. In the intermediate interval (approximately 45 feet bgs) TNT concentrations have generally remained below the HAL from nondetect, to 1.1 µg/L, to 2.2 µg/L, to nondetect,

to 0.25 µg/L. Off-post direct push locations OS003 (farther downgradient) and NW050R (downgradient of feedlot/adjacent to previous OU1 Rebound well cluster NW050) had no RDX or TNT detections during the Q5 event, with the exception of OS003 having a TNT detection of 0.2 µg/L in the shallow interval (approximately 25 feet bgs). At OS003 (sampled during baseline, Q4, and Q5 events), a comparison of TNT concentrations detected indicate TNT concentrations have decreased to below the HAL from 3 µg/L, to nondetect, to 0.2 µg/L, respectively.

Q5 data indicate that TNT concentrations >2 µg/L are present on-post slightly upgradient of the former facility boundary and extend off-post approximately 1,000 feet downgradient of the former facility boundary in a narrow and shallow plume. One small RDX plume >2 µg/L is present on-post at the former facility boundary (**Figure 2-1**).

5.1.2 MNA Parameter Measurements

MNA parameters for all OU1 Rebound Study wells are presented in **Table 5-2**. MNA occurs through both destructive (biodegradation) and non-destructive (dispersion and dilution) processes. The Q5 MNA parameter results for the OU1 Rebound Study wells were comparable to baseline through Q4 parameters at the same off-post and on-post wells. In general, the data indicate these OU1 Rebound Study off-post and on-post wells continue to have higher ORP, DO (with the exception of the lower portion of the aquifer which has low DO concentrations), nitrate/nitrite, and sulfate measurements and low ammonia, TKN, DOC, CO_2, methane, alkalinity, sulfide, and Fe^{2+} measurements. Geochemical conditions most conducive to biodegradation include negative ORP values, DO concentrations less than 0.5 mg/L, low nitrate/nitrite concentrations, low sulfate concentrations, and DOC concentrations greater than 10 mg/L. Correspondingly, higher concentrations of sulfide, Fe^{2+}, and methane can indicate an environment in which biodegradation is occurring. With the exception of the deeper portion of the aquifer, the data do not provide strong evidence that biodegradation is the primary mechanism of MNA for RDX and TNT for OU1 Rebound Study wells. Given the low and generally decreasing concentrations of RDX and TNT in the areas where the OU1 Rebound Study wells are located (generally surrounding the plume; upgradient, cross gradient, and downgradient), it is likely that dispersion and dilution play a stronger role in MNA for the OU1 Rebound Study wells than biodegradation. Overall, conditions at the OU1 Rebound Study wells continue to indicate the effectiveness of MNA at reducing RDX and TNT concentrations.

5.2 OU1 SUBSURFACE INJECTION PERFORMANCE MONITORING EVALUATION

5.2.1 RDX and TNT Concentrations

Explosives results for all OU1 subsurface injection performance monitoring locations are presented in **Table 5-3**. The Q5 performance monitoring includes locations specific for evaluating the 2020 subsurface injection event that was completed in October-November 2020 at LL1, LL2, the Decant Station, and between EW6 and EW7. Although the 2019 subsurface injection event (October-November 2019) was evaluated using baseline through Q4 performance monitoring events, select locations are again included (for Q5 through Q8 events) for performance monitoring of the 2020 subsurface injection event. The Q5 event performance monitoring results continued to verify that RDX and/or TNT concentrations >2 µg/L remain at LL1, LL2, and between EW6 and EW7; however, concentrations have been substantially reduced (including multiple locations

decreasing to below HALs) within the 2020 subsurface injection areas (shown on **Figures 2-2** through **2-4**).

At LL1, performance monitoring was completed in Q5 to evaluate the 2020 subsurface injection at two on-post monitoring wells (G0094 and G0096) which had RDX and/or TNT concentrations above the HALs (2 µg/L) during the Q3 event (annual OU1 LTM event – June 2020). Neither monitoring well was sampled during baseline, Q2, and Q4 events. During the Q5 event, both monitoring wells continue to have RDX and/or TNT concentrations above the HALs. At G0094, a comparison of RDX and TNT concentrations detected during the Q3 through Q5 sampling events indicates RDX concentrations increased from 2.7 µg/L to 16 µg/L and TNT concentrations decreased from 8.5 µg/L to 4.9 µg/L. At G0096, a comparison of RDX and TNT concentrations detected during the Q3 through Q5 sampling events indicates RDX concentrations increased from 36 µg/L to 87 µg/L and TNT concentrations decreased from 0.96 µg/L to 0.24 µg/L.

At LL2, performance monitoring was completed in Q5 to evaluate the 2020 subsurface injection at four on-post monitoring wells (G0111, G0121, G0122, and G0123) which had RDX or TNT concentrations above the HALs (2 µg/L) during the Q3 event (annual OU1 LTM event – June 2020). None of the monitoring wells were sampled during baseline, Q2, and Q4 events. During the Q5 event, only G0111 continued to have a TNT concentration above the HAL and all wells were nondetect for RDX. At G0111, a comparison of TNT concentrations detected during the Q3 through Q5 sampling events indicate the TNT concentration decreased from 12 µg/L to 3.7 µg/L.

At the Decant Station, performance monitoring was completed in Q5 to evaluate the 2020 subsurface injection at one on-post monitoring well (G0102) which had an RDX concentration above the HAL (2 µg/L) during the Q3 event (annual OU1 LTM event – June 2020). G0102 was not sampled during the baseline, Q2, and Q4 events. During the Q5 event, G0102 was nondetect for both RDX and TNT. At G0102, a comparison of RDX concentrations detected during the Q3 through Q5 sampling events indicate the RDX concentration decreased from 41 µg/L to nondetect, respectively.

Between EW6 and EW7, performance monitoring was completed in Q5 to evaluate the 2020 subsurface injection at three on-post monitoring wells (G0022, PZ017R, and PZ018) and 10 temporary wells (EW7-PM21A, PM24A, PM25A, PM25B, PM26A, PM26B, PM27B, PM28A, PM29A, and PM29B) which had RDX and/or TNT concentrations above the HALs (2 µg/L) during the Q3 event (annual OU1 LTM event – June 2020) or Q4 event. During the Q5 event, two of the three monitoring wells continued to have RDX or TNT concentrations above the HALs (PZ017R and PZ018). At PZ017R, a comparison of RDX and TNT concentrations detected during the baseline through Q5 sampling events indicates RDX concentrations increased slightly from 0.87 µg/L, to 1.4 µg/L, to 1.4 µg/L, to 1.8 µg/L, to 2.2 µg/L and TNT concentrations generally decreased from 15 µg/L, to 17 µg/L, to 11 µg/L, to 15 µg/L, to 10 µg/L. At PZ018, a comparison of RDX and TNT concentrations detected during the baseline through Q5 sampling events indicates RDX decreased from 0.88 µg/L, to nondetect, to 1 µg/L, to nondetect, to nondetect and TNT concentrations generally decreased from 15 µg/L, to 19 µg/L, to nondetect, 17 µg/L, to 6 µg/L. At the ten temporary wells, only three locations had detections of TNT during Q5 event, of which two remain above the HAL (EW7-PM21A and PM24A), and there were no detections of RDX. At PM21A, a comparison of TNT concentrations detected during the baseline through Q5 sampling events indicate TNT concentrations have decreased from 29 µg/L, to 17 µg/L, to 11 µg/L, to 11 µg/L, to 5.8 µg/L. At PM24A, a comparison of TNT concentrations detected during

the baseline through Q5 sampling events indicate TNT concentrations have decreased from 9.8 µg/L, to 0.53 µg/L, to 8.3 µg/L, to 5.4 µg/L, to 4.6 µg/L. The on-post groundwater explosives plumes at LL1, LL2, the Decant Station, and between EW6 and EW7 was refined based on the Q5 subsurface injection performance monitoring results as shown on **Figures 2-2** through **2-4**.

5.2.2 Water Quality Parameter Measurements

Water quality parameters for all OU1 subsurface injection performance monitoring locations are presented in **Table 5-4**. The Q5 water quality parameters for the performance monitoring wells indicate a continued anaerobic environment is present due to the 2020 subsurface injections. ORP and DO measurements continued to be low and decreasing during the Q5 event when compared to previous events. At all locations directly impacted by the 2020 injections (i.e., temporary wells and select monitoring wells), significant anaerobic conditions are present (e.g., ORP/DO measurements at shallow temporary wells and monitoring wells averaged from -10.3 mV/1.22 mg/L during baseline events to -118.9 mV/0.38 mg/L during Q5 event). In comparison to baseline events for each location, Q5 results show decreases in nitrate and sulfate and increases in DOC, methane, and Fe^{2+} which indicate that anaerobic conditions are present within the treatment zone.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents the conclusions for the Q5 OU1 Rebound Study and the 2020 OU1 subsurface injection performance monitoring activities, and recommendations for the next sampling event (Quarter 6 [Q6] – May/June 2021). For comparison, historic RDX and TNT plume interpretation figures from previous OU1 Rebound Study and performance monitoring events (i.e., baseline through Q4) are included in **Appendix F**.

6.1 CONCLUSIONS

6.1.1 OU1 Rebound Study

All Q5 OU1 Rebound Study sampling activities were completed successfully, 16 months after EW7 shutdown (October 2019). The Q5 analytical results indicate the OU1 on-post TNT plume generally maintains a similar shape and extent from previous sampling events, with detections below HALs to the north and south extent of EW7 (i.e., well cluster NW020 and PZ019). During Q5, all RDX detections at OU1 Rebound Study monitoring wells and off-post direct push locations were below the HAL (2 µg/L), with the exception of on-post piezometer PZ017R (2.2 µg/L) which is its first exceedance of the RDX HAL since 2017. The slight increase in the RDX concentration at PZ017R is likely a small, isolated pulse migrating from upgradient, as evidenced by no RDX detections above the HAL at surrounding wells. As PZ017R is also utilized for performance monitoring of upgradient subsurface injection activities (2019 and 2020), this RDX concentrations above the HAL, which was not identified during baseline through Q4 events, are likely the result of the 2019 and 2020 injection activities causing mobilization of dissolved RDX. Previous injection events at OU1 have shown that RDX concentrations will likely decrease as the compound is biodegraded within the established anaerobic conditions.

During Q5, TNT concentrations >2 µg/L were identified at five OU1 Rebound Study on-post wells. These results are similar to previous events, with the exception of the TNT concentration at upgradient well G0086 increasing to above the HAL and the noteworthy decreases in TNT

concentrations at PZ017R and PZ018. TNT concentrations at well G0086 have been above the HAL since its installation in 2010, except for 2016 and Q4. At PZ017R (and generally at PZ018), TNT concentrations are lowest since well installations in 2001.

During Q5, TNT concentrations >2 µg/L were identified at off-post direct push location OS001. TNT concentrations decreased at the shallow interval (25 feet bgs) and the shallow-intermediate interval (35 feet bgs) with only the shallow interval having a TNT concentration above the HAL. At off-post direct push location OS003 and newly sampled location NW050R, all sample depth intervals were nondetect for TNT and only minor detections of RDX below the HALwere observed at off-post direct push location OS003. The Q5 off-post direct push sample results indicate that the interpreted TNT plume is similar in size to Q4 (approximately 1,000 feet downgradient of former facility boundary), stable, and likely naturally attenuating. Additionally, off-post monitoring wells downgradient of the feedlot (which have been below HALs since 2012 or longer) continue to remain nondetect for both RDX and TNT.

Based on the observation of concentrations above HALs at off-post direct push locations and monitoring wells, the criteria were met to evaluate Decision Points #1 and #2 as outlined in the OU1 Rebound Study Work Plan. Continuation of the OU1 Rebound Study is recommended for Contingency Action #1 based on the following Decision Point #1 inputs:

- The current extent of off-post TNT concentrations above the HAL are defined by the Q5 off-post direct-push sample results.
- Based on the results of the previous rebound study off-post direct push sample locations, TNT concentrations above the HAL are unlikely to migrate beyond the feedlot (i.e., plume is attenuating).
- Existing institutional controls (ICs) (i.e., off-post City Ordinance extending to facility boundary [maintained by City of Grand Island and Central Platte Natural Resources District (CPNRD)], on-post deed restrictions) remain protective.

Continuation of the OU1 Rebound Study is recommended for Contingency Action #2 based on the following Decision Point #2 inputs:

- The current extent of on-post and off-post RDX concentrations are defined and RDX concentrations above the HAL are unlikely to migrate beyond the feedlot.
- Existing ICs (i.e., off-post City Ordinance extending to facility boundary [maintained by City of Grand Island and CPNRD], on-post deed restrictions) remain protective.

6.1.2 OU1 Subsurface Injection Performance Monitoring

All Q5 OU1 subsurface injection performance monitoring sampling was completed successfully approximately three months after the 2020 subsurface injection event (October/November 2020). Decreases in explosives concentrations were identified at LL1, LL2, the Decant Station, and between EW6 and EW7 during the Q5 event due to the establishment of a highly anaerobic subsurface environment conducive to explosives biodegradation.

During Q5, six of 20 performance monitoring locations (G0094 – LL1, G0111 – LL2, and PZ017R, PZ018, EW7-PM21A, PM24A – between EW6 and EW7) had TNT concentrations above the HAL (seven prior to the 2020 injection event), but TNT concentrations have decreased at all locations.

The largest decrease in TNT concentrations at Q5 performance monitoring wells, from prior to 2020 subsurface injections to Q5 event, was at PZ018 (17 µg/L to 6 µg/L, respectively), and monitoring well G0022 decreased to below the HAL.

During Q5, three of the 20 performance monitoring locations (G0094 and G0096 – LL1, and PZ017R – between EW6 and EW7) had RDX concentrations above the HAL (six prior to the 2020 injection event); however, RDX concentrations increased at all three locations and PZ017R was previously below the HAL in Q4. These increases in RDX concentrations were likely due to the injection activities causing mobilization of dissolved RDX (as previously identified during Q2 and Q3 sampling events following the 2019 injection activities). As similarly shown during the Q4 event, the concentrations of RDX are expected to quickly biodegrade within the established anaerobic treatment zone. Additionally, four other performance monitoring wells (G0121, G0122, G0123 – LL2 and G0102 – Decant Station) had decreases in RDX concentrations to below the HAL in Q5. The largest decrease in RDX concentrations at Q5 performance monitoring wells, from prior to 2020 subsurface injections to Q5, was at G0123 (48 µg/L to nondetect, respectively).

6.2 RECOMMENDATIONS

6.2.1 OU1 Rebound Study

Proceed with the Q6 sampling event for the OU1 Rebound Study (May/June 2021) per the OU1 Rebound Study Work Plan (Brice-AECOM 2019b) and continue to evaluate based on Decision Points, Contingency Actions, and Inputs #1 and #2 (Brice-AECOM 2019b). As completed during the Q5 OU1 Rebound Study sampling event, and as detailed/shown on **Table 2-1** and **Figure 2-1**, off-post direct push locations OS001 (location of highest explosives concentrations off-post), and OS003, NW050R (locations identified with explosives below HALs) will be sampled during Q6 field activities. As completed in Q5, location NW050R will continue to be sampled for explosives data within Hall County ROW to supplement for adjacent OU1 Rebound Study off-post well clusters NW050 and NW080 no longer being accessible (private landowner). In accordance with the OU1 Rebound Study Work Plan, these locations will continue to verify the current horizontal and vertical extent of explosives concentrations above HALs and to evaluate any potential explosives migration further downgradient off-post. Following future off-post data analysis, explosives concentrations and migration trends will continue to be evaluated, and if necessary, additional off-post direct push sampling will be completed to verify the off-post extent of explosives concentrations above HALs.

In accordance with OU1 Rebound Study Work Plan and Final Addendum 2 (Brice-AECOM 2018), groundwater samples will be collected at the remaining 30 on- and off-post monitoring wells (detailed/shown on **Table 2-2** and **Figure 2-1**) during Q6 field activities.

6.2.2 OU1 Subsurface Injection Performance Monitoring

Proceed with Q6 OU1 subsurface injection performance monitoring event (May/June 2021), which is the 2nd event evaluating the 2020 subsurface injections per the Final 2019 Annual Groundwater Monitoring Report (Brice-AECOM 2020b) and the recommendations detailed in the Final OU1 Rebound Study Letter Report – Quarter 4 Event (Brice-AECOM 2021). As completed during the Q5 OU1 subsurface injection performance monitoring event, and as detailed/shown on **Table 2-4**

and **Figures 2-2** through **2-4**, 20 performance monitoring locations at LL1, LL2, the Decant Station, and between EW6 and EW7 will be sampled during the Q6 field activities.

7.0 REFERENCES

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United States Army Environmental Center (USAEC). 1994. Interim Record of Decision for Cornhusker Army Ammunition Plant Operable Unit 1 – Groundwater. November.

We appreciate the opportunity to provide services for this project. If you have any questions, please contact the undersigned.

Sincerely,

Corey Schwabenlander
Project Manager
Brice Engineering, LLC
(801) 558-6032

Dean Converse
Project Manager
AECOM
(402) 952-2560

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TABLE 2-1
DIRECT PUSH GROUNDWATER SAMPLES COLLECTED (OFF-POST)
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Sample Location ID	Coordinates[1]		Ground Elevation (feet amsl)[1]	Screened Interval (feet bgs)	Sample Elevation (feet amsl)[1]	Sample ID	Sample Date	Parameters		
	Northing	Easting						Explosives[2]	Field Duplicate Samples[3]	MS/MSD Samples[4]
OU1 Rebound Study - Off-post Direct Push Samples[5]										
OS001	403802.28	2067828.63	1890.06	21 - 25	1865	OS001-DP05-25	2/23/2021	X	X	
				31 - 35	1855	OS001-DP05-35	2/23/2021	X		
				41 - 45	1845	OS001-DP05-45	2/23/2021	X		
OS003	403834.73	2069322.13	1886.57	21 - 25	1862	OS003-DP05-25	2/23/2021	X		
				31 - 35	1852	OS003-DP05-35	2/23/2021	X		
				41 - 45	1842	OS003-DP05-45	2/23/2021	X		X
NW050R	406567.11	2072396.24	1887.50	16 - 20	1868	NW050R-DP05-20	2/22/2021	X		
				31 - 35	1853	NW050R-DP05-35	2/22/2021	X		
				56 - 60	1828	NW050R-DP05-60	2/22/2021	X		
							Totals	**9**	**1**	**1**

Notes:

[1]Horizontal coordinates are in Nebraska State Plane, North American Datum of 1983. Elevation datum based on National Geodetic Vertical Datum of 1929. Coordinates and elevations for NW050R based upon adjacent well coordiantes and elevations (i.e., NW050, NW051, NW052).

[2]Explosives (+MNX) analysis (SW846 Method 8330A) only completed.

[3]Field duplicate samples were collected at a rate of 5% (1 per 20 samples collected) for explosives only. The 21-25 foot depth interval was chosen for a field duplicate sample because, if the explosives plume does extend to that location, it will most likely be observed at that depth.

[4]MS/MSD samples were collected at a rate of 5% (1 per 20 samples collected) for explosives only. The 41-45 foot depth interval was chosen for an MS/MSD sample since that interval is likely clean.

[5]OU1 Rebound Study off-post direct push groundwater samples will be collected over eight total sampling events (one baseline, seven follow-up) at an approximate quarterly frequency, over approximately 2 years. The follow-up direct push sampling events (seven events at approximate quarterly frequency) will be collected from the established baseline locations (i.e., OS001 and OS003), with selective sample depths based on the baseline and/or follow-up events sample results. Beginning Quater 5, due to no longer having property access at OU1 Rebound Study monitoing well clusters NW050 and NW080, off-post direct push groundwater samples will be collected from adjacent ROW location (i.e., NW050R) with comparable sample depth intervals (i.e., NW050, NW051, and NW052).

% = percent
amsl = above mean sea level
bgs = below ground surface
DP = direct push
ID = identification number
MNX = mono-nitroso-RDX
MS/MSD = matrix spike/matrix spike duplicate
OS = off-post sample
ROW = right-of-way (ditch)
OU = Operable Unit
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TABLE 2-2
OFF-POST AND ON-POST GROUNDWATER MONITORING WELLS SAMPLED
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	Sample Date	Explosives[1]	Laboratory MNA Parameters[2]	Field MNA Parameters[3]	Field Duplicate Sample ID[4]	Field MS/MSD Sample ID[5]
OU1 Off-Post Monitoring Wells						
CA210	3/2/2021	X	X	X		
CA211	3/2/2021	X	X	X		
CA212	3/2/2021	X	X	X		
CA213	3/2/2021	X	X	X		
NW020	3/3/2021	X	X	X		
NW021	3/3/2021	X	X	X		
NW022	3/3/2021	X	X	X		
NW060	3/1/2021	X	X	X		
NW061	3/1/2021	X	X	X		
NW062	3/1/2021	X	X	X		
NW070	3/1/2021	X	X	X		
NW071	3/1/2021	X	X	X		
	Off-Post Totals	**12**	**12**	**12**	**0**	**0**
OU1 On-Post Monitoring Wells						
G0024	3/3/2021	X	X	X		
G0070	3/1/2021	X	X	X		G0070-5 MS/MSD
G0075	3/1/2021	X	X	X		
G0076	3/1/2021	X	X	X		
G0077	3/3/2021	X	X	X		
G0078	3/3/2021	X	X	X		
G0079	3/1/2021	X	X	X		
G0080	2/28/2021	X	X	X		
G0081	3/2/2021	X	X	X		
G0082	3/2/2021	X	X	X		
G0086	3/2/2021	X	X	X		
G0087	3/2/2021	X	X	X		
G0091	3/2/2021	X	X	X		
G0092	3/2/2021	X	X	X		
PZ017R	3/3/2021	X	X	X	PZ021-5	
PZ018	3/3/2021	X	X	X		
PZ019	3/3/2021	X	X	X		
PZ020	3/3/2021	X	X	X		
	On-Post Totals	**18**	**18**	**18**	**1**	**1**
	Overall Totals	**30**	**30**	**30**	**1**	**1**

TABLE 2-2
OFF-POST AND ON-POST GROUNDWATER MONITORING WELLS SAMPLED
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	Sample Date	Explosives[1]	Laboratory MNA Parameters[2]	Field MNA Parameters[3]	Field Duplicate Sample ID[4]	Field MS/MSD Sample ID[5]

Notes:

[1]Explosives (+MNX) analysis (SW846 Method 8330A).

[2]Laboratory MNA parameters for OU1 (on- and off-post) include: methane (Method RSK 175), total Kjeldahl nitrogen (Method 351.2), nitrate/nitrite (Method 353.2), sulfate (Method 9056A), sulfide (Method 9034), ammonia (Method 350.1), dissolved organic carbon (Method 9060A), alkalinity (Method 2320B), and carbon dioxide (back calculated Method 2320B).

[3]Field MNA parameters include: dissolved oxygen, oxidation/reduction potential, ferrous iron, specific conductance, turbidity, pH, and temperature.

[4]Field duplicate samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. PZ017R was chosen for field duplicate samples based on presence of historic explosives concentrations at those locations.

[5]MS/MSD samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. G0070 was chosen for MS/MSD samples based on the lack of historic explosives concentrations at this location.

% = percent

ID = identification number

MNX = mono-nitroso-RDX

MS/MSD = matrix spike/matrix spike duplicate

MNA = monitored natural attenuation

OU = Operable Unit

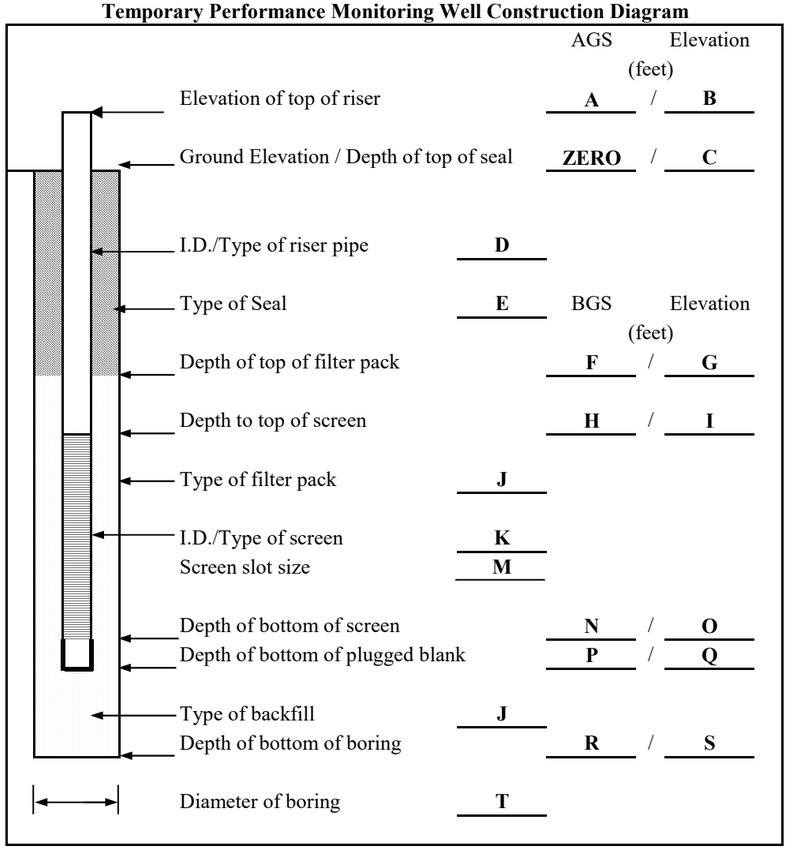
PZ = piezometer

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

RSK = Robert S. Kerr Environmental Research Laboratory

TABLE 2-3
SUMMARY OF TEMPORARY PERFORMANCE MONITORING WELL CONSTRUCTION
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Temporary Performance Monitoring Well Construction Diagram



Well	Date Installed	Time	A	B	C	F	G	H	I	N	O	P	Q	R	S
EW7-PM21A	2/25/2021	0915	2.0	1899.12	1897.12	14.0	1883.1	20.0	1877.1	30.0	1867.1	30.1	1867.0	31.0	1866.1
EW7-PM24A	2/25/2021	0850	2.0	1899.72	1897.72	15.0	1882.7	20.0	1877.7	30.0	1867.7	30.1	1867.6	31.0	1866.7
EW7-PM25A	2/24/2021	1620	2.0	1895.73	1893.73	14.0	1879.7	20.0	1873.7	30.0	1863.7	30.1	1863.6	31.0	1862.7
EW7-PM25B	2/24/2021	1545	2.0	1895.73	1893.73	27.0	1866.7	30.0	1863.7	40.0	1853.7	40.1	1853.6	41.0	1852.7
EW7-PM26A	2/24/2021	1430	2.0	1899.73	1897.73	17.5	1880.2	20.0	1877.7	30.0	1867.7	30.1	1867.6	31.0	1866.7
EW7-PM26B	2/24/2021	1355	2.0	1899.73	1897.73	26.5	1871.2	30.0	1867.7	40.0	1857.7	40.1	1857.6	41.0	1856.7
EW7-PM27B	2/24/2021	1230	2.0	1897.55	1895.55	27.5	1868.1	30.0	1865.6	40.0	1855.6	40.1	1855.5	41.0	1854.6
EW7-PM28A	2/25/2021	0755	2.0	1894.82	1892.82	13.0	1879.8	20.0	1872.8	30.0	1862.8	30.1	1862.7	31.0	1861.8
EW7-PM29A	2/24/2021	1045	2.0	1895.35	1893.35	12.4	1881.0	20.0	1873.4	30.0	1863.4	30.1	1863.3	31.0	1862.4
EW7-PM29B	2/24/2021	0940	2.0	1895.35	1893.35	28.1	1865.3	30.0	1863.4	40.0	1853.4	40.1	1853.3	41.0	1852.4

Notes:

All temporary wells were installed by direct push methods (installation by Plains Environmental Services).
All temporary well installation activities were directed by AECOM.
Elevation datum based on National Geodetic Vertical Datum of 1929.

AGS = above ground surface
BGS = below ground surface
EW = extraction well
I.D. = inside diameter
OU = Operable Unit
PM = performance monitoring

The following information is the same for all temporary wells installed:
D = 1-inch inside diameter, Schedule 80, flush-threaded polyvinyl chloride
E = High-solids bentonite grout
J = Number 30-60, clean, washed, silica sand
K = 1-inch inside diameter, schedule 80, flush threaded, factory slotted polyvinyl chloride
M = Screen slot size standard 0.010-inch
T = 3.125-inch diameter

TABLE 2-4
PERFORMANCE MONITORING LOCATIONS SAMPLED
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Sample Location ID	Well Type	Coordinates[1]		Top of Casing Elevation (feet amsl)[1]	Screened Interval (feet bgs)	Sample Depth (feet bgs)	Sample Elevation (feet amsl)[1]	Sample ID	Sample Date	Analytical Parameters				
		Northing	Easting							Explosives[2]	Laboratory Water Quality Parameters[3]	Field Water Quality Parameters[4]	Field Duplicate Samples[5]	MS/MSD Samples[6]
Between EW6 and EW7														
G0022	Monitoring Well	403241.74	2064370.31	1899.16	18 - 33	25	1874	G0022-5	3/2/2021	X	X	X		
PZ017R	Piezometer	403469.08	2067255.25	1895.17	10 - 30	25	1870	PZ017R-5	3/3/2021	X	X	X	X	
PZ018	Piezometer	403293.15	2067256.61	1896.88	10 - 30	25	1872	PZ018-5	3/3/2021	X	X	X		
EW7-PM21A	Temp. Well	403407.45	2066429.65	1899.12	20 - 30	25	1874	EW7-PM21A-5-25	2/27/2021	X	X	X		
EW7-PM24A	Temp. Well	403412.74	2066751.85	1899.72	20 - 30	25	1875	EW7-PM24A-5-25	2/27/2021	X	X	X		
EW7-PM25A	Temp. Well	403432.36	2066962.17	1895.73	20 - 30	25	1871	EW7-PM25A-5-25	2/25/2021	X	X	X		
EW7-PM25B	Temp. Well				30 - 40	35	1861	EW7-PM25B-5-35	2/25/2021	X	X	X		
EW7-PM26A	Temp. Well	403248.72	2066662.06	1899.73	20 - 30	25	1875	EW7-PM26A-5-25	2/27/2021	X	X	X		
EW7-PM26B	Temp. Well				30 - 40	35	1865	EW7-PM26B-5-35	2/26/2021	X	X	X		
EW7-PM27B	Temp. Well	403170.77	2066860.69	1897.55	30 - 40	35	1863	EW7-PM27B-5-35	2/27/2021	X	X	X		
EW7-PM28A	Temp. Well	403302.80	2067019.15	1894.82	20 - 30	25	1870	EW7-PM28A-5-25	2/25/2021	X	X	X		

Notes:

[1]Horizontal coordinates are in Nebraska State Plane, North American Datum of 1983. Elevation datum based on National Geodetic Vertical Datum of 1929.

[2]Explosives (+MNX) analysis (SW846 Method 8330A).

[3]Laboratory water quality parameters for OU1 include: methane (Method RSK 175), total Kjeldahl nitrogen (Method 351.2), nitrate/nitrite (Method 353.2), sulfate (Method 9056A), sulfide (Method 9034), ammonia (Method 350.1), dissolved organic carbon (Method 9060A), alkalinity (Method 2320B), and carbon dioxide (back calculated Method 2320B).

[4]Field water quality parameters include: dissolved oxygen, oxidation/reduction potential, ferrous iron, turbidity, specific conductance, pH, and temperature.

[5]Field duplicate samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. PZ017R and G0096 were chosen for field duplicate samples based on presence of historic explosives concentrations at those locations.

[6]MS/MSD samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. EW7-PM29B was chosen for MS/MSD samples based on the lack of historic explosives concentrations at this location.

% = percent
amsl = above mean sea level
bgs = below ground surface
EW = extraction well
ID = identification
MNX = mono-nitroso-RDX
MS/MSD = matrix spike/matrix spike duplicate
OU = Operable Unit
PM = performance monitoring
PZ = piezometer
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory

TABLE 2-4
PERFORMANCE MONITORING LOCATIONS SAMPLED
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Sample Location ID	Well Type	Coordinates[1]		Top of Casing Elevation (feet amsl)[1]	Screened Interval (feet bgs)	Sample Depth (feet bgs)	Sample Elevation (feet amsl)[1]	Sample ID	Sample Date	Analytical Parameters				
		Northing	Easting							Explosives[2]	Laboratory Water Quality Parameters[3]	Field Water Quality Parameters[4]	Field Duplicate Samples[5]	MS/MSD Samples[6]
EW7-PM29A	Temp. Well	403108.54	2067050.13	1895.35	20 - 30	25	1870	EW7-PM29A-5-25	2/26/2021	X	X	X		
EW7-PM29B	Temp. Well				30 - 40	35	1860	EW7-PM29B-5-35	2/26/2021	X	X	X		X
								Between EW6 and EW7 Totals		**13**	**13**	**13**	**1**	**1**
Load Line 1														
G0094	Monitoring Well	401758.07	2063084.23	1903.72	15 - 25	20	1884	G0094-5	3/1/2021	X	X	X		
G0096	Monitoring Well	402127.49	2062746.66	1905.94	15 - 25	20	1886	G0096-5	3/1/2021	X	X	X	X	
								Load Line 1 Totals		**2**	**2**	**2**	**1**	**0**
Load Line 2														
G0111	Monitoring Well	401840.27	2059126.43	1911.94	15 - 25	20	1892	G0111-5	2/28/2021	X	X	X		
G0121	Monitoring Well	401466.39	2058974.24	1909.10	20 - 30	25	1884	G0121-5	2/28/2021	X	X	X		
G0122	Monitoring Well	401983.89	2058976.45	1909.68	20 - 30	25	1885	G0122-5	2/28/2021	X	X	X		
G0123	Monitoring Well	401358.55	2059055.22	1908.65	20 - 30	25	1884	G0123-5	2/28/2021	X	X	X		
								Load Line 2 Totals		**4**	**4**	**4**	**0**	**0**

Notes:

[1]Horizontal coordinates are in Nebraska State Plane, North American Datum of 1983. Elevation datum based on National Geodetic Vertical Datum of 1929.

[2]Explosives (+MNX) analysis (SW846 Method 8330A).

[3]Laboratory water quality parameters for OU1 include: methane (Method RSK 175), total Kjeldahl nitrogen (Method 351.2), nitrate/nitrite (Method 353.2), sulfate (Method 9056A), sulfide (Method 9034), ammonia (Method 350.1), dissolved organic carbon (Method 9060A), alkalinity (Method 2320B), and carbon dioxide (back calculated Method 2320B).

[4]Field water quality parameters include: dissolved oxygen, oxidation/reduction potential, ferrous iron, turbidity, specific conductance, pH, and temperature.

[5]Field duplicate samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. PZ017R and G0096 were chosen for field duplicate samples based on presence of historic explosives concentrations at those locations.

[6]MS/MSD samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. EW7-PM29B was chosen for MS/MSD samples based on the lack of historic explosives concentrations at this location.

% = percent
amsl = above mean sea level
bgs = below ground surface
EW = extraction well
ID = identification
MNX = mono-nitroso-RDX
MS/MSD = matrix spike/matrix spike duplicate
OU = Operable Unit
PM = performance monitoring
PZ = piezometer
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory

TABLE 2-4
PERFORMANCE MONITORING LOCATIONS SAMPLED
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Sample Location ID	Well Type	Coordinates[1] Northing	Coordinates[1] Easting	Top of Casing Elevation (feet amsl)[1]	Screened Interval (feet bgs)	Sample Depth (feet bgs)	Sample Elevation (feet amsl)[1]	Sample ID	Sample Date	Analytical Parameters: Explosives[2]	Laboratory Water Quality Parameters[3]	Field Water Quality Parameters[4]	Field Duplicate Samples[5]	MS/MSD Samples[6]
Decant Station														
G0102	Monitoring Well	404235.26	2048906.45	1912.20	14 - 24	20	1892	G0102-5	3/2/2021	X	X	X		
									Decant Station Totals	**1**	**1**	**1**	**0**	**0**
									Overall Totals	**20**	**20**	**20**	**2**	**1**

Notes:

[1]Horizontal coordinates are in Nebraska State Plane, North American Datum of 1983. Elevation datum based on National Geodetic Vertical Datum of 1929.

[2]Explosives (+MNX) analysis (SW846 Method 8330A).

[3]Laboratory water quality parameters for OU1 include: methane (Method RSK 175), total Kjeldahl nitrogen (Method 351.2), nitrate/nitrite (Method 353.2), sulfate (Method 9056A), sulfide (Method 9034), ammonia (Method 350.1), dissolved organic carbon (Method 9060A), alkalinity (Method 2320B), and carbon dioxide (back calculated Method 2320B).

[4]Field water quality parameters include: dissolved oxygen, oxidation/reduction potential, ferrous iron, turbidity, specific conductance, pH, and temperature.

[5]Field duplicate samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. PZ017R and G0096 were chosen for field duplicate samples based on presence of historic explosives concentrations at those locations.

[6]MS/MSD samples were collected at a rate of 5% (1 per 20 samples collected) for the full suite of laboratory parameters. EW7-PM29B was chosen for MS/MSD samples based on the lack of historic explosives concentrations at this location.

% = percent
amsl = above mean sea level
bgs = below ground surface
EW = extraction well
ID = identification
MNX = mono-nitroso-RDX
MS/MSD = matrix spike/matrix spike duplicate
OU = Operable Unit
PM = performance monitoring
PZ = piezometer
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory

TABLE 2-5
SUMMARY OF EXPLOSIVES DETECTED, IDW - WATER
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID SAMPLE DATE	CHAAP HALs (µg/L)	WATER-WC-Q5-MAR21 3/4/2021				
		Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)						
1,3,5-Trinitrobenzene	NA	<	U	0.11	0.26	0.28
1,3-Dinitrobenzene	NA	<	U	0.05	0.13	0.14
TNT	2	<	U	0.06	0.13	0.14
2,4-Dinitrotoluene	NA	<	U	0.04	0.11	0.13
2,6-Dinitrotoluene	NA	<	U	0.05	0.11	0.13
2-Amino-4,6-dinitrotoluene	NA	<	U	0.07	0.13	0.14
2-Nitrotoluene	NA	<	UJ	0.11	0.26	0.28
3-Nitrotoluene	NA	<	UJ	0.26	0.53	0.53
4-Amino-2,6-dinitrotoluene	NA	<	UJ	0.08	0.16	0.2
4-Nitrotoluene	NA	0.8	J	0.13	0.53	0.54
HMX	400	<	U	0.12	0.26	0.28
MNX	NA	<	U	0.2	0.53	2.6
Nitrobenzene	NA	<	U	0.12	0.26	0.28
RDX	2	<	U	0.07	0.26	0.28
Tetryl	NA	<	U	0.04	0.13	0.14

Notes:

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
IDW = investigation-derived waste
J = estimated
LOD = limit of detection
LOQ = limit of quantification
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency
WC = waste characterization (water)

TABLE 3-1
SUMMARY OF EXPLOSIVES DETECTED, DIRECT PUSH GROUNDWATER LOCATIONS (OFF-POST)
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID	CHAAP	OS001-DP05-25					OS001-DP05-35					OS001-DP05-45					OS003-DP05-25					OS003-DP05-35					OS003-DP05-45				
SAMPLE DATE	HALs	2/23/2021					2/23/2021					2/23/2021					2/23/2021					2/23/2021					2/23/2021				
	(µg/L)	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																														
1,3,5-Trinitrobenzene	NA	0.56	J	0.088	0.21	0.22	5.8	J	0.089	0.21	0.22	4.3	J	0.087	0.21	0.22	<	UJ	0.093	0.22	0.23	<	U	0.09	0.21	0.22	<	UJ	0.095	0.23	0.24
1,3-Dinitrobenzene	NA	<	UJ	0.038	0.1	0.11	<	UJ	0.039	0.11	0.12	<	UJ	0.038	0.1	0.11	<	UJ	0.041	0.11	0.12	<	U	0.039	0.11	0.12	<	UJ	0.042	0.11	0.12
TNT	2	20	J	0.047	0.1	0.11	2	J	0.047	0.11	0.12	0.25	J	0.047	0.1	0.11	0.2	J	0.05	0.11	0.12	<	U	0.048	0.11	0.12	<	UJ	0.051	0.11	0.12
2,4-Dinitrotoluene	NA	<	UJ	0.029	0.083	0.1	<	UJ	0.029	0.084	0.11	<	UJ	0.028	0.083	0.1	<	UJ	0.03	0.088	0.11	<	U	0.029	0.085	0.11	<	UJ	0.031	0.091	0.11
2,6-Dinitrotoluene	NA	<	UJ	0.042	0.083	0.1	<	UJ	0.042	0.084	0.11	<	UJ	0.042	0.083	0.1	<	UJ	0.044	0.088	0.11	<	U	0.043	0.085	0.11	<	UJ	0.045	0.091	0.11
2-Amino-4,6-dinitrotoluene	NA	2.1	J	0.053	0.1	0.11	0.22	J	0.053	0.11	0.12	0.65	J	0.053	0.1	0.11	<	UJ	0.056	0.11	0.12	<	U	0.054	0.11	0.12	<	UJ	0.058	0.11	0.12
2-Nitrotoluene	NA	<	UJ	0.089	0.21	0.22	<	UJ	0.09	0.21	0.22	<	UJ	0.089	0.21	0.22	<	UJ	0.094	0.22	0.23	<	U	0.091	0.21	0.22	<	UJ	0.097	0.23	0.24
3-Nitrotoluene	NA	<	UJ	0.2	0.42	0.42	<	UJ	0.21	0.42	0.42	<	UJ	0.2	0.41	0.41	<	UJ	0.21	0.44	0.44	<	U	0.21	0.43	0.43	<	UJ	0.22	0.45	0.45
4-Amino-2,6-dinitrotoluene	NA	1.8	J	0.06	0.12	0.16	0.39	J	0.061	0.13	0.16	0.22	J	0.06	0.12	0.16	<	UJ	0.064	0.13	0.17	<	U	0.062	0.13	0.16	<	UJ	0.065	0.14	0.17
4-Nitrotoluene	NA	<	J	0.1	0.42	0.43	<	UJ	0.11	0.42	0.43	<	UJ	0.1	0.41	0.43	<	UJ	0.11	0.44	0.46	<	U	0.11	0.43	0.44	<	UJ	0.11	0.45	0.47
HMX	400	<	J	0.091	0.21	0.22	<	UJ	0.092	0.21	0.22	<	UJ	0.091	0.21	0.22	<	UJ	0.096	0.22	0.23	<	U	0.093	0.21	0.22	<	UJ	0.099	0.23	0.24
MNX	NA	<	J	0.16	0.42	2.1	<	UJ	0.16	0.42	2.1	<	UJ	0.16	0.41	2.1	<	UJ	0.17	0.44	2.2	<	U	0.16	0.43	2.1	<	UJ	0.17	0.45	2.3
Nitrobenzene	NA	<	J	0.095	0.21	0.22	<	UJ	0.096	0.21	0.22	<	UJ	0.094	0.21	0.22	<	UJ	0.1	0.22	0.23	<	U	0.097	0.21	0.22	<	UJ	0.1	0.23	0.24
RDX	2	<	J	0.054	0.21	0.22	0.82	J	0.054	0.21	0.22	<	UJ	0.053	0.21	0.22	<	UJ	0.057	0.22	0.23	<	U	0.055	0.21	0.22	<	UJ	0.058	0.23	0.24
Tetryl	NA	<	J	0.033	0.1	0.11	<	UJ	0.034	0.11	0.12	<	UJ	0.033	0.1	0.11	<	UJ	0.035	0.11	0.12	<	U	0.034	0.11	0.12	<	UJ	0.036	0.11	0.12

Notes:

Concentrations exceed HALs

< = less than LOQ

µg/L = micrograms per liter

CHAAP = Cornhusker Army Ammunition Plant

DL = detection limit

DP = direct push

HAL = health advisory level

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

ID = identification number

J = estimated

LOD = limit of detection

LOQ = limit of quantification

MNX = mono-nitroso-RDX

NA = not available

OS = off-post sample

OU = Operable Unit

Qual = qualifier

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

U = nondetect

USEPA = United States Environmental Protection Agency

TABLE 3-1
SUMMARY OF EXPLOSIVES DETECTED, DIRECT PUSH GROUNDWATER LOCATIONS (OFF-POST)
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID	CHAAP	NW050R-DP05-20					NW050R-DP05-35					NW050R-DP05-60				
SAMPLE DATE	HALs	2/22/2021					2/22/2021					2/22/2021				
	(µg/L)	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																
1,3,5-Trinitrobenzene	NA	<	UJ	0.09	0.21	0.23	<	UJ	0.086	0.21	0.22	<	UJ	0.087	0.21	0.22
1,3-Dinitrobenzene	NA	<	UJ	0.04	0.11	0.12	<	UJ	0.038	0.1	0.11	<	UJ	0.038	0.1	0.11
TNT	2	<	UJ	0.048	0.11	0.12	<	UJ	0.046	0.1	0.11	<	UJ	0.047	0.1	0.11
2,4-Dinitrotoluene	NA	<	UJ	0.029	0.086	0.11	<	UJ	0.028	0.082	0.1	<	UJ	0.029	0.083	0.1
2,6-Dinitrotoluene	NA	<	UJ	0.043	0.086	0.11	<	UJ	0.041	0.082	0.1	<	UJ	0.042	0.083	0.1
2-Amino-4,6-dinitrotoluene	NA	<	UJ	0.054	0.11	0.12	<	UJ	0.052	0.1	0.11	<	UJ	0.053	0.1	0.11
2-Nitrotoluene	NA	<	UJ	0.092	0.21	0.23	<	UJ	0.088	0.21	0.22	<	UJ	0.089	0.21	0.22
3-Nitrotoluene	NA	<	UJ	0.21	0.43	0.43	<	UJ	0.2	0.41	0.41	<	UJ	0.2	0.42	0.42
4-Amino-2,6-dinitrotoluene	NA	<	UJ	0.062	0.13	0.16	<	UJ	0.059	0.12	0.15	<	UJ	0.06	0.12	0.16
4-Nitrotoluene	NA	<	UJ	0.11	0.43	0.44	<	UJ	0.1	0.41	0.42	<	UJ	0.1	0.42	0.43
HMX	400	<	UJ	0.094	0.43	2.1	<	UJ	0.09	0.21	0.22	<	UJ	0.091	0.21	0.22
MNX	NA	<	UJ	0.17	0.21	0.23	<	UJ	0.16	0.41	2.1	<	UJ	0.16	0.42	2.1
Nitrobenzene	NA	<	UJ	0.098	0.21	0.23	<	UJ	0.094	0.21	0.22	<	UJ	0.095	0.21	0.22
RDX	2	<	UJ	0.055	0.21	0.23	<	UJ	0.053	0.21	0.22	<	UJ	0.054	0.21	0.22
Tetryl	NA	<	UJ	0.034	0.11	0.12	<	UJ	0.033	0.1	0.11	<	UJ	0.033	0.1	0.11

Notes:

Concentrations exceed HALs

< = less than LOQ

µg/L = micrograms per liter

CHAAP = Cornhusker Army Ammunition Plant

DL = detection limit

DP = direct push

HAL = health advisory level

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

ID = identification number

J = estimated

LOD = limit of detection

LOQ = limit of quantification

MNX = mono-nitroso-RDX

NA = not available

OS = off-post sample

OU = Operable Unit

Qual = qualifier

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

U = nondetect

USEPA = United States Environmental Protection Agency

TABLE 3-2
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID / SAMPLE DATE	CHAAP HALs (µg/L)	OFF-POST																															
		CA210-5 3/2/2021					CA211-5 3/2/2021					CA212-5 3/2/2021					CA213-5 3/2/2021					NW020-5 3/3/2021					NW021-5 3/3/2021						
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ			
EXPLOSIVES (USEPA Method 8330A) (µg/L)																																	
1,3,5-Trinitrobenzene	NA	<	U	0.08	0.19	0.2	<	U	0.079	0.19	0.2	0.22		0.079	0.19	0.2	0.084	J	0.08	0.19	0.2	<	U	0.079	0.19	0.2	<	U	0.08	0.19	0.2			
1,3-Dinitrobenzene	NA	<	U	0.035	0.095	0.1	<	U	0.035	0.095	0.1	<	U	0.035	0.094	0.1	<	U	0.035	0.095	0.1	<	U	0.035	0.094	0.1	<	U	0.035	0.095	0.1			
TNT	2	<	U	0.043	0.095	0.1	<	U	0.043	0.095	0.1	<	U	0.042	0.094	0.1	<	U	0.043	0.095	0.1	0.8		0.042	0.094	0.1	<	U	0.043	0.095	0.1			
2,4-Dinitrotoluene	NA	<	U	0.026	0.076	0.095	<	U	0.026	0.076	0.095	<	U	0.026	0.075	0.094	<	U	0.026	0.076	0.095	0.062	J	0.026	0.075	0.094	<	U	0.026	0.076	0.095			
2,6-Dinitrotoluene	NA	<	U	0.038	0.076	0.095	<	U	0.038	0.076	0.095	<	U	0.038	0.075	0.094	<	U	0.038	0.076	0.095	<	U	0.038	0.075	0.094	<	U	0.038	0.076	0.095			
2-Amino-4,6-dinitrotoluene	NA	<	U	0.048	0.095	0.1	<	U	0.048	0.095	0.1	<	U	0.048	0.094	0.1	<	U	0.048	0.095	0.1	1.5		0.048	0.094	0.1	0.95		0.048	0.095	0.1			
2-Nitrotoluene	NA	<	U	0.082	0.19	0.2	<	U	0.081	0.19	0.2	<	U	0.081	0.19	0.2	<	U	0.081	0.19	0.2	<	UJ	0.08	0.19	0.2	<	UJ	0.081	0.19	0.2			
3-Nitrotoluene	NA	<	U	0.19	0.38	0.38	<	U	0.18	0.38	0.38	<	U	0.18	0.38	0.38	<	U	0.19	0.38	0.38	<	UJ	0.18	0.38	0.38	<	UJ	0.19	0.38	0.38			
4-Amino-2,6-dinitrotoluene	NA	<	U	0.055	0.11	0.14	<	U	0.055	0.11	0.14	<	U	0.054	0.11	0.14	<	U	0.055	0.11	0.14	1.7	J	0.054	0.11	0.14	0.78	J	0.055	0.11	0.14			
4-Nitrotoluene	NA	<	U	0.095	0.38	0.39	<	U	0.095	0.38	0.39	<	U	0.094	0.38	0.39	<	U	0.095	0.38	0.39	<	U	0.094	0.38	0.39	<	U	0.095	0.38	0.39			
HMX	400	<	U	0.084	0.19	0.2	<	U	0.083	0.19	0.2	<	U	0.083	0.19	0.2	<	U	0.083	0.19	0.2	1		0.082	0.19	0.2	<	U	0.083	0.19	0.2			
MNX	NA	<	U	0.15	0.38	1.9	<	U	0.15	0.38	1.9	<	U	0.15	0.38	1.9	<	U	0.15	0.38	1.9	<	U	0.14	0.38	1.9	<	U	0.15	0.38	1.9			
Nitrobenzene	NA	<	U	0.087	0.19	0.2	<	U	0.086	0.19	0.2	<	U	0.086	0.19	0.2	<	U	0.086	0.19	0.2	<	U	0.085	0.19	0.2	<	U	0.087	0.19	0.2			
RDX	2	<	U	0.049	0.19	0.2	<	U	0.049	0.19	0.2	<	U	0.049	0.19	0.2	<	U	0.049	0.19	0.2	1.2		0.048	0.19	0.2	<	U	0.049	0.19	0.2			
Tetryl	NA	<	U	0.03	0.095	0.1	<	U	0.03	0.095	0.1	<	U	0.03	0.094	0.1	<	U	0.03	0.095	0.1	<	U	0.03	0.094	0.1	<	U	0.03	0.095	0.1			
LABORATORY MNA PARAMETERS																																	
Ammonia USEPA 350.1 (mg/L)		0.062	J	0.022	0.05	0.1	<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1	1.4		0.022	0.05	0.1			
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		<	U	0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1	1.7		0.69	1	1			
Nitrate/Nitrite USEPA 353.2 (mg/L)		42		0.19	0.5	1	40		0.19	0.5	1	15		0.19	0.5	1	1.3		0.019	0.05	0.1	68		0.38	1	2	1.3		0.019	0.05	0.1			
Sulfide SM 9034 (mg/L)		<	UJ	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	0.8	J	0.79	1.9	4	0.8	J	0.79	1.9	4			
Sulfate USEPA 9056A (mg/L)		190		1	2.5	5	120		1	2.5	5	78		1	2.5	5	64		1	2.5	5	230		5.2	13	25	200		5.2	13	25			
Dissolved Organic Carbon SM 9060A (mg/L)		7.8		0.35	0.8	1	4.8		0.35	0.8	1	2.1		0.35	0.8	1	1.7		0.35	0.8	1	6.2		0.35	0.8	1	2.6		0.35	0.8	1			
Alkalinity SM 2320B (mg/L)		370		3.1	6.4	10	230		3.1	6.4	10	180		3.1	6.4	10	130		3.1	6.4	10	360		3.1	6.4	10	370		3.1	6.4	10			
Methane RSK-175 (µg/L)		1.7	J	0.63	2	5	<	U	0.63	2	5	<	U	0.63	2	5	<	U	0.63	2	5	<	U	0.63	2	5	8.5		0.63	2	5			
Carbon Dioxide SM 2320B (mg/L)[1]		164		3.1	6.4	10	102		3.1	6.4	10	80		3.1	6.4	10	58		3.1	6.4	10	160		3.1	6.4	10	164		3.1	6.4	10			

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNA = monitored natural attenuation
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PZ = piezometer
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-2
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID / SAMPLE DATE	CHAAP HALs (µg/L)	OFF-POST																															
		NW022-5 3/3/2021					NW060-5 3/1/2021					NW061-5 3/1/2021					NW062-5 3/1/2021					NW070-5 3/1/2021					NW071-5 3/1/2021						
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ			
EXPLOSIVES (USEPA Method 8330A) (µg/L)																																	
1,3,5-Trinitrobenzene	NA	<	U	0.079	0.19	0.2	<	U	0.079	0.19	0.2	<	U	0.078	0.19	0.2	<	U	0.079	0.19	0.2	<	U	0.077	0.18	0.19	<	U	0.08	0.19	0.2			
1,3-Dinitrobenzene	NA	<	U	0.035	0.094	0.1	<	U	0.034	0.093	0.1	<	U	0.034	0.093	0.1	<	U	0.035	0.094	0.1	<	U	0.034	0.092	0.1	<	U	0.035	0.095	0.1			
TNT	2	<	U	0.042	0.094	0.1	<	U	0.042	0.093	0.1	<	U	0.042	0.093	0.1	<	U	0.042	0.094	0.1	<	U	0.041	0.092	0.1	<	U	0.043	0.095	0.1			
2,4-Dinitrotoluene	NA	<	U	0.026	0.075	0.094	<	U	0.026	0.075	0.093	<	U	0.026	0.075	0.093	<	U	0.026	0.075	0.094	<	U	0.025	0.073	0.092	<	U	0.026	0.076	0.095			
2,6-Dinitrotoluene	NA	<	U	0.038	0.075	0.094	<	U	0.037	0.075	0.093	<	U	0.037	0.075	0.093	<	U	0.038	0.075	0.094	<	U	0.037	0.073	0.092	<	U	0.038	0.076	0.095			
2-Amino-4,6-dinitrotoluene	NA	<	U	0.048	0.094	0.1	<	U	0.047	0.093	0.1	<	U	0.047	0.093	0.1	<	U	0.048	0.094	0.1	<	U	0.047	0.092	0.1	<	U	0.048	0.095	0.1			
2-Nitrotoluene	NA	<	UJ	0.081	0.19	0.2	<	U	0.08	0.19	0.2	<	U	0.08	0.19	0.2	<	U	0.081	0.19	0.2	<	U	0.078	0.18	0.19	<	U	0.081	0.19	0.2			
3-Nitrotoluene	NA	<	UJ	0.18	0.38	0.38	<	U	0.18	0.37	0.37	<	U	0.18	0.37	0.37	<	U	0.18	0.38	0.38	<	U	0.18	0.37	0.37	<	U	0.19	0.38	0.38			
4-Amino-2,6-dinitrotoluene	NA	<	UJ	0.054	0.11	0.14	<	U	0.054	0.11	0.14	<	U	0.054	0.11	0.14	<	U	0.054	0.11	0.14	<	U	0.053	0.11	0.14	<	U	0.055	0.11	0.14			
4-Nitrotoluene	NA	<	U	0.094	0.38	0.39	<	U	0.093	0.37	0.38	<	U	0.093	0.37	0.38	<	U	0.094	0.38	0.39	<	U	0.092	0.37	0.38	<	U	0.095	0.38	0.39			
HMX	400	<	U	0.083	0.19	0.2	<	U	0.082	0.19	0.2	<	U	0.082	0.19	0.2	<	U	0.083	0.19	0.2	<	U	0.08	0.18	0.19	<	U	0.083	0.19	0.2			
MNX	NA	<	U	0.15	0.38	1.9	<	U	0.14	0.37	1.9	<	U	0.14	0.37	1.9	<	U	0.15	0.38	1.9	<	U	0.14	0.37	1.8	<	U	0.15	0.38	1.9			
Nitrobenzene	NA	<	U	0.086	0.19	0.2	<	U	0.085	0.19	0.2	<	U	0.085	0.19	0.2	<	U	0.086	0.19	0.2	<	U	0.084	0.18	0.19	<	U	0.086	0.19	0.2			
RDX	2	<	U	0.049	0.19	0.2	<	U	0.048	0.19	0.2	<	U	0.048	0.19	0.2	<	U	0.049	0.19	0.2	<	U	0.047	0.18	0.19	<	U	0.049	0.19	0.2			
Tetryl	NA	<	U	0.03	0.094	0.1	<	U	0.03	0.093	0.1	<	U	0.03	0.093	0.1	<	U	0.03	0.094	0.1	<	U	0.029	0.092	0.1	<	U	0.03	0.095	0.1			
LABORATORY MNA PARAMETERS																																	
Ammonia USEPA 350.1 (mg/L)		1.2		0.022	0.05	0.1	<	U	0.022	0.05	0.1	3.6		0.022	0.05	0.1	0.86		0.022	0.05	0.1	<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1			
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		1.5		0.69	1	1	<	U	0.69	1	1	3.4		0.69	1	1	1.1		0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1			
Nitrate/Nitrite USEPA 353.2 (mg/L)		<	U	0.019	0.05	0.1	4.1		0.019	0.05	0.1	8.3		0.019	0.05	0.1	<	U	0.019	0.05	0.1	29		0.19	0.5	1	36		0.19	0.5	1			
Sulfide SM 9034 (mg/L)		<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	0.8	J	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4			
Sulfate USEPA 9056A (mg/L)		260		5.2	13	25	30		1	2.5	5	140		1	2.5	5	190		1	2.5	5	98		1	2.5	5	63		1	2.5	5			
Dissolved Organic Carbon SM 9060A (mg/L)		2.8		0.35	0.8	1	2.2		0.35	0.8	1	4.7		0.35	0.8	1	2.6		0.35	0.8	1	6.4		0.35	0.8	1	2.8		0.35	0.8	1			
Alkalinity SM 2320B (mg/L)		460		3.1	6.4	10	41		3.1	6.4	10	290		3.1	6.4	10	270		3.1	6.4	10	210		3.1	6.4	10	98		3.1	6.4	10			
Methane RSK-175 (µg/L)		350		0.63	2	5	20		0.63	2	5	62		0.63	2	5	<	U	0.63	2	5	<	U	0.63	2	5	<	U	0.63	2	5			
Carbon Dioxide SM 2320B (mg/L)[1]		204		3.1	6.4	10	18		3.1	6.4	10	129		3.1	6.4	10	120		3.1	6.4	10	93		3.1	6.4	10	44		3.1	6.4	10			

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNA = monitored natural attenuation
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PZ = piezometer
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-2
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID / SAMPLE DATE	CHAAP HALs (µg/L)	ON-POST																														
		G0024-5 3/3/2021					G0070-5 3/1/2021					G0075-5 3/1/2021					G0076-5 3/1/2021					G0077-5 3/3/2021					G0078-5 3/3/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																																
1,3,5-Trinitrobenzene	NA	<	U	0.079	0.19	0.2	<	U	0.086	0.21	0.22	<	U	0.091	0.22	0.23	<	U	0.088	0.21	0.22	3.6		0.078	0.19	0.2	<	U	0.079	0.19	0.2
1,3-Dinitrobenzene	NA	<	U	0.035	0.094	0.1	<	U	0.038	0.1	0.11	<	U	0.04	0.11	0.12	<	U	0.039	0.11	0.12	<	U	0.034	0.093	0.1	<	U	0.035	0.094	0.1
TNT	2	0.48		0.042	0.094	0.1	<	U	0.046	0.1	0.11	<	U	0.049	0.11	0.12	<	U	0.047	0.11	0.12	3.6		0.042	0.093	0.1	<	U	0.042	0.094	0.1
2,4-Dinitrotoluene	NA	<	U	0.026	0.075	0.094	<	U	0.028	0.082	0.1	<	U	0.03	0.087	0.11	<	U	0.029	0.084	0.11	<	U	0.026	0.075	0.093	<	U	0.026	0.075	0.094
2,6-Dinitrotoluene	NA	<	U	0.038	0.075	0.094	<	U	0.041	0.082	0.1	<	U	0.043	0.087	0.11	<	U	0.042	0.084	0.11	<	U	0.037	0.075	0.093	<	U	0.038	0.075	0.094
2-Amino-4,6-dinitrotoluene	NA	1.5		0.048	0.094	0.1	<	U	0.052	0.1	0.11	0.66	J	0.055	0.11	0.12	<	U	0.053	0.11	0.12	2.2		0.047	0.093	0.1	<	U	0.048	0.094	0.1
2-Nitrotoluene	NA	<	UJ	0.08	0.19	0.2	<	U	0.088	0.21	0.22	<	U	0.092	0.22	0.23	<	U	0.09	0.21	0.22	<	UJ	0.08	0.19	0.2	<	UJ	0.08	0.19	0.2
3-Nitrotoluene	NA	<	UJ	0.18	0.37	0.37	<	U	0.2	0.41	0.41	<	U	0.21	0.43	0.43	<	U	0.2	0.42	0.42	<	UJ	0.18	0.37	0.37	<	UJ	0.18	0.38	0.38
4-Amino-2,6-dinitrotoluene	NA	1.2	J	0.054	0.11	0.14	<	U	0.059	0.12	0.15	0.93		0.062	0.13	0.16	<	U	0.061	0.13	0.16	2.4	J	0.054	0.11	0.14	<	UJ	0.054	0.11	0.14
4-Nitrotoluene	NA	<	U	0.094	0.37	0.38	<	U	0.1	0.41	0.42	<	U	0.11	0.43	0.44	<	U	0.11	0.42	0.43	<	U	0.093	0.37	0.38	<	U	0.094	0.38	0.38
HMX	400	<	U	0.082	0.19	0.2	<	U	0.09	0.21	0.22	0.27		0.095	0.22	0.23	<	U	0.092	0.21	0.22	0.58		0.082	0.19	0.2	<	U	0.082	0.19	0.2
MNX	NA	<	U	0.14	0.37	1.9	<	U	0.16	0.41	2.1	<	U	0.17	0.43	2.2	<	U	0.16	0.42	2.1	<	U	0.14	0.37	1.9	<	U	0.14	0.38	1.9
Nitrobenzene	NA	<	U	0.085	0.19	0.2	<	U	0.093	0.21	0.22	<	U	0.098	0.22	0.23	<	U	0.096	0.21	0.22	<	U	0.085	0.19	0.2	<	U	0.085	0.19	0.2
RDX	2	<	U	0.048	0.19	0.2	<	U	0.053	0.21	0.22	<	U	0.056	0.22	0.23	<	U	0.054	0.21	0.22	0.82		0.048	0.19	0.2	<	U	0.048	0.19	0.2
Tetryl	NA	<	U	0.03	0.094	0.1	<	U	0.033	0.1	0.11	<	U	0.034	0.11	0.12	<	U	0.033	0.11	0.12	<	U	0.03	0.093	0.1	<	U	0.03	0.094	0.1
LABORATORY MNA PARAMETERS																																
Ammonia USEPA 350.1 (mg/L)		<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1	0.055	J	0.022	0.05	0.1	1.3		0.022	0.05	0.1	<	U	0.022	0.05	0.1	0.3		0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		<	U	0.69	1	1	<	UJ	0.69	1	1	<	UJ	0.69	1	1	1.1		0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1
Nitrate/Nitrite USEPA 353.2 (mg/L)		12	J	0.038	0.1	0.2	<	U	0.019	0.05	0.1	4.7		0.019	0.05	0.1	<	U	0.019	0.05	0.1	10		0.038	0.1	0.2	<	U	0.019	0.05	0.1
Sulfide SM 9034 (mg/L)		0.8	J	0.79	1.9	4	<	UJ	0.79	1.9	4	0.8	J	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		65		1	2.5	5	43	J	1	2.5	5	160		1	2.5	5	320		5.2	13	25	140		1	2.5	5	270		5.2	13	25
Dissolved Organic Carbon SM 9060A (mg/L)		4		0.35	0.8	1	0.89	J	0.35	0.8	1	2.4		0.35	0.8	1	2.7		0.35	0.8	1	2.8		0.35	0.8	1	2.3		0.35	0.8	1
Alkalinity SM 2320B (mg/L)		240		3.1	6.4	10	210		3.1	6.4	10	290		3.1	6.4	10	350		3.1	6.4	10	280		3.1	6.4	10	320		3.1	6.4	10
Methane RSK-175 (µg/L)		<	U	0.63	2	5	<	UJ	0.63	2	5	0.75	J	0.63	2	5	310		0.63	2	5	47		0.63	2	5	<	U	0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		107		3.1	6.4	10	93		3.1	6.4	10	129		3.1	6.4	10	156		3.1	6.4	10	124		3.1	6.4	10	142		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNA = monitored natural attenuation
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PZ = piezometer
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-2
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID / SAMPLE DATE	CHAAP HALs (µg/L)	ON-POST																														
		G0079-5 3/1/2021					G0080-5 2/28/2021					G0081-5 3/2/2021					G0082-5 3/2/2021					G0086-5 3/2/2021					G0087-5 3/2/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																																
1,3,5-Trinitrobenzene	NA	<	U	0.088	0.21	0.22	<	U	0.082	0.2	0.21	0.42		0.088	0.21	0.22	<	U	0.088	0.21	0.22	13	J	0.088	0.21	0.22	<	U	0.09	0.21	0.22
1,3-Dinitrobenzene	NA	<	U	0.039	0.11	0.12	<	U	0.036	0.098	0.11	<	U	0.039	0.1	0.12	<	U	0.039	0.1	0.12	<	U	0.039	0.11	0.12	<	U	0.039	0.11	0.12
TNT	2	<	U	0.047	0.11	0.12	<	U	0.044	0.098	0.11	<	U	0.047	0.1	0.12	<	U	0.047	0.1	0.12	4.9	J	0.047	0.11	0.12	<	U	0.048	0.11	0.12
2,4-Dinitrotoluene	NA	<	U	0.029	0.084	0.11	<	U	0.027	0.078	0.098	<	U	0.029	0.084	0.1	<	U	0.029	0.084	0.1	0.047	J	0.029	0.084	0.11	<	U	0.029	0.085	0.11
2,6-Dinitrotoluene	NA	<	U	0.042	0.084	0.11	<	U	0.039	0.078	0.098	<	U	0.042	0.084	0.1	<	U	0.042	0.084	0.1	<	U	0.042	0.084	0.11	<	U	0.043	0.085	0.11
2-Amino-4,6-dinitrotoluene	NA	<	U	0.053	0.11	0.12	<	U	0.05	0.098	0.11	0.092	J	0.053	0.1	0.12	0.14	J	0.053	0.1	0.12	1.8	J	0.053	0.11	0.12	0.11	J	0.054	0.11	0.12
2-Nitrotoluene	NA	<	U	0.09	0.21	0.22	<	U	0.084	0.2	0.21	<	U	0.09	0.21	0.22	<	U	0.089	0.21	0.22	<	U	0.09	0.21	0.22	<	U	0.091	0.21	0.22
3-Nitrotoluene	NA	<	U	0.2	0.42	0.42	<	U	0.19	0.39	0.39	<	U	0.2	0.42	0.42	<	U	0.2	0.42	0.42	<	U	0.2	0.42	0.42	<	U	0.21	0.43	0.43
4-Amino-2,6-dinitrotoluene	NA	<	U	0.061	0.13	0.16	0.12	J	0.057	0.12	0.15	0.1	J	0.06	0.13	0.16	0.18	J	0.06	0.13	0.16	1.2	J	0.061	0.13	0.16	0.62		0.062	0.13	0.16
4-Nitrotoluene	NA	<	U	0.11	0.42	0.43	<	U	0.098	0.39	0.4	<	U	0.1	0.42	0.43	<	U	0.1	0.42	0.43	<	U	0.11	0.42	0.43	<	U	0.11	0.43	0.44
HMX	400	<	U	0.092	0.21	0.22	0.26		0.086	0.2	0.21	<	U	0.092	0.21	0.22	0.64		0.092	0.21	0.22	0.47	J	0.092	0.21	0.22	0.69		0.094	0.21	0.22
MNX	NA	<	U	0.16	0.42	2.1	<	U	0.15	0.39	2	<	U	0.16	0.42	2.1	<	U	0.16	0.42	2.1	<	U	0.16	0.42	2.1	<	U	0.16	0.43	2.1
Nitrobenzene	NA	<	U	0.096	0.21	0.22	<	U	0.089	0.2	0.21	<	U	0.095	0.21	0.22	<	U	0.095	0.21	0.22	<	U	0.096	0.21	0.22	<	U	0.097	0.21	0.22
RDX	2	<	U	0.054	0.21	0.22	<	U	0.051	0.2	0.21	<	U	0.054	0.21	0.22	0.53		0.054	0.21	0.22	0.59	J	0.054	0.21	0.22	0.17	J	0.055	0.21	0.22
Tetryl	NA	<	U	0.033	0.11	0.12	<	U	0.031	0.098	0.11	<	U	0.033	0.1	0.12	<	U	0.033	0.1	0.12	<	U	0.033	0.11	0.12	<	U	0.034	0.11	0.12
LABORATORY MNA PARAMETERS																																
Ammonia USEPA 350.1 (mg/L)		<	U	0.022	0.05	0.1	0.55		0.022	0.05	0.1	0.35		0.022	0.05	0.1	0.027	J	0.022	0.05	0.1	<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		<	U	0.69	1	1	<	UJ	0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1	<	UJ	0.69	1	1	<	U	0.69	1	1
Nitrate/Nitrite USEPA 353.2 (mg/L)		3.8		0.019	0.05	0.1	3.2		0.019	0.05	0.1	<	U	0.019	0.05	0.1	2.4		0.019	0.05	0.1	3		0.019	0.05	0.1	9.9		0.038	0.1	0.2
Sulfide SM 9034 (mg/L)		<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	UJ	0.79	1.9	4	<	UJ	0.79	1.9	4	<	UJ	0.79	1.9	4	0.8	J	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		68		1	2.5	5	100		1	2.5	5	170		1	2.5	5	170	J	1	2.5	5	200		1	2.5	5	99		1	2.5	5
Dissolved Organic Carbon SM 9060A (mg/L)		3.6		0.35	0.8	1	2.7		0.35	0.8	1	5.3		0.35	0.8	1	3.2		0.35	0.8	1	2.3		0.35	0.8	1	2.4		0.35	0.8	1
Alkalinity SM 2320B (mg/L)		280		3.1	6.4	10	350		3.1	6.4	10	340		3.1	6.4	10	290		3.1	6.4	10	310		3.1	6.4	10	300		3.1	6.4	10
Methane RSK-175 (µg/L)		2.6	J	0.63	2	5	5		0.63	2	5	1000		0.63	2	5	230	J	0.63	2	5	44		0.63	2	5	<	U	0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		124		3.1	6.4	10	156		3.1	6.4	10	151		3.1	6.4	10	129		3.1	6.4	10	138		3.1	6.4	10	133		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
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RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
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TABLE 3-2
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID / SAMPLE DATE	CHAAP HALs (µg/L)	ON-POST																													
		G0091-5 3/2/2021					G0092-5 3/2/2021					PZ017R-5 3/3/2021					PZ018-5 3/3/2021					PZ019-5 3/3/2021					PZ020-5 3/3/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																															
1,3,5-Trinitrobenzene	NA	<	U	0.08	0.19	0.2	<	U	0.079	0.19	0.2	2.4		0.089	0.21	0.22	1		0.087	0.21	0.22	<	U	0.09	0.21	0.22	2.3		0.089	0.21	0.22
1,3-Dinitrobenzene	NA	<	U	0.035	0.095	0.1	<	U	0.035	0.094	0.1	<	U	0.039	0.11	0.12	<	U	0.038	0.1	0.11	<	U	0.039	0.11	0.12	<	U	0.039	0.11	0.12
TNT	2	<	U	0.043	0.095	0.1	<	U	0.042	0.094	0.1	10		0.048	0.11	0.12	6		0.047	0.1	0.11	<	U	0.048	0.11	0.12	3.9		0.048	0.11	0.12
2,4-Dinitrotoluene	NA	<	U	0.026	0.076	0.095	<	U	0.026	0.075	0.094	0.046	J	0.029	0.085	0.11	<	U	0.028	0.083	0.1	<	U	0.029	0.086	0.11	<	U	0.029	0.085	0.11
2,6-Dinitrotoluene	NA	<	U	0.038	0.076	0.095	<	U	0.038	0.075	0.094	<	U	0.043	0.085	0.11	<	U	0.042	0.083	0.1	<	U	0.043	0.086	0.11	<	U	0.042	0.085	0.11
2-Amino-4,6-dinitrotoluene	NA	0.17	J	0.048	0.095	0.1	<	U	0.048	0.094	0.1	4.7		0.054	0.11	0.12	2.8		0.053	0.1	0.11	<	U	0.054	0.11	0.12	2.9		0.054	0.11	0.12
2-Nitrotoluene	NA	<	U	0.081	0.19	0.2	<	U	0.08	0.19	0.2	<	UJ	0.091	0.21	0.22	<	UJ	0.089	0.21	0.22	<	J	0.091	0.21	0.22	<	UJ	0.09	0.21	0.22
3-Nitrotoluene	NA	<	U	0.19	0.38	0.38	<	U	0.18	0.38	0.38	<	UJ	0.21	0.42	0.42	<	UJ	0.2	0.42	0.42	<	UJ	0.21	0.43	0.43	<	UJ	0.21	0.42	0.42
4-Amino-2,6-dinitrotoluene	NA	0.16	J	0.055	0.11	0.14	<	U	0.054	0.11	0.14	7.4	J	0.061	0.13	0.16	5.2	J	0.06	0.12	0.16	<	UJ	0.062	0.13	0.16	3.4	J	0.061	0.13	0.16
4-Nitrotoluene	NA	<	U	0.095	0.38	0.39	<	U	0.094	0.38	0.39	<	U	0.11	0.42	0.44	<	U	0.1	0.42	0.43	<	U	0.11	0.43	0.44	<	U	0.11	0.42	0.43
HMX	400	0.3		0.083	0.19	0.2	<	U	0.082	0.19	0.2	1.4	J	0.093	0.21	0.22	<	U	0.091	0.21	0.22	<	U	0.094	0.21	0.22	0.79		0.093	0.21	0.22
MNX	NA	<	U	0.15	0.38	1.9	<	U	0.14	0.38	1.9	<	U	0.16	0.42	2.1	<	U	0.16	0.42	2.1	<	U	0.16	0.43	2.1	<	U	0.16	0.42	2.1
Nitrobenzene	NA	<	U	0.087	0.19	0.2	<	U	0.086	0.19	0.2	<	U	0.097	0.21	0.22	<	U	0.094	0.21	0.22	<	U	0.097	0.21	0.22	<	U	0.096	0.21	0.22
RDX	2	0.27	J	0.049	0.19	0.2	<	U	0.048	0.19	0.2	2.2		0.055	0.21	0.22	<	U	0.053	0.21	0.22	<	U	0.055	0.21	0.22	0.57		0.054	0.21	0.22
Tetryl	NA	<	U	0.03	0.095	0.1	<	U	0.03	0.094	0.1	<	U	0.034	0.11	0.12	<	U	0.033	0.1	0.11	<	U	0.034	0.11	0.12	<	U	0.034	0.11	0.12
LABORATORY MNA PARAMETERS																															
Ammonia USEPA 350.1 (mg/L)		<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1	0.041	J	0.022	0.05	0.1	0.055	J	0.022	0.05	0.1	<	U	0.022	0.05	0.1	<	U	0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		<	U	0.69	1	1	<	U	0.69	1	1	<	U	0.69	1	1	14		1.4	2	2	<	U	0.69	1	1	<	UJ	0.69	1	1
Nitrate/Nitrite USEPA 353.2 (mg/L)		40		0.19	0.5	1	<	U	0.019	0.05	0.1	10		0.038	0.1	0.2	8.1		0.019	0.05	0.1	37		0.19	0.5	1	14		0.038	0.1	0.2
Sulfide SM 9034 (mg/L)		<	UJ	0.79	1.9	4	<	UJ	0.79	1.9	4	<	UJ	0.79	1.9	4	<	UJ	0.79	1.9	4	0.8	J	0.79	1.9	4	<	U	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		210		5.2	13	25	370		5.2	13	25	53		1	2.5	5	49		1	2.5	5	71		1	2.5	5	160		1	2.5	5
Dissolved Organic Carbon SM 9060A (mg/L)		2.8		0.35	0.8	1	2.5		0.35	0.8	1	6.8		0.35	0.8	1	7.9		0.35	0.8	1	1.8		0.35	0.8	1	3.4		0.35	0.8	1
Alkalinity SM 2320B (mg/L)		260		3.1	6.4	10	370		3.1	6.4	10	440		3.1	6.4	10	320		3.1	6.4	10	120		3.1	6.4	10	340		3.1	6.4	10
Methane RSK-175 (µg/L)		<	U	0.63	2	5	11		0.63	2	5	120	J	0.63	2	5	8600		0.63	2	5	15000		0.63	2	5	0.78	J	0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		116		3.1	6.4	10	164		3.1	6.4	10	196		3.1	6.4	10	142		3.1	6.4	10	53		3.1	6.4	10	151		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNA = monitored natural attenuation
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PZ = piezometer
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-3
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY WATER QUALITY PARAMETERS, PERFORMANCE MONITORING WELLS
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID	CHAAP HALs (µg/L)	BETWEEN EW6 AND EW7																													
		G0022-5					PZ017R-5					PZ018-5					EW7-PM21A-5-25					EW7-PM24A-5-25					EW7-PM25A-5-25				
SAMPLE DATE		3/2/2021					3/3/2021					3/3/2021					2/27/2021					2/27/2021					2/25/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																															
1,3,5-Trinitrobenzene	NA	0.41		0.089	0.21	0.22	2.4		0.089	0.21	0.22	1		0.087	0.21	0.22	7.3	J	0.083	0.2	0.21	2.2	J	0.084	0.2	0.21	<	U	0.087	0.21	0.22
1,3-Dinitrobenzene	NA	<	U	0.039	0.11	0.12	<	U	0.039	0.11	0.12	<	U	0.038	0.1	0.11	<	U	0.036	0.098	0.11	<	U	0.037	0.1	0.11	<	U	0.038	0.1	0.11
TNT	2	1.1		0.047	0.11	0.12	10		0.048	0.11	0.12	6		0.047	0.1	0.11	5.8	J	0.044	0.098	0.11	4.6	J	0.045	0.1	0.11	<	U	0.047	0.1	0.11
2,4-Dinitrotoluene	NA	<	U	0.029	0.084	0.11	0.046	J	0.029	0.085	0.11	<	U	0.028	0.083	0.1	0.47	J	0.027	0.079	0.098	<	U	0.027	0.08	0.1	<	U	0.028	0.083	0.1
2,6-Dinitrotoluene	NA	<	U	0.042	0.084	0.11	<	U	0.043	0.085	0.11	<	U	0.042	0.083	0.1	<	U	0.039	0.079	0.098	<	U	0.04	0.08	0.1	<	U	0.042	0.083	0.1
2-Amino-4,6-dinitrotoluene	NA	1.1		0.053	0.11	0.12	4.7		0.054	0.11	0.12	2.8		0.053	0.1	0.11	3.5	J	0.05	0.098	0.11	1.4	J	0.051	0.1	0.11	<	U	0.053	0.1	0.11
2-Nitrotoluene	NA	<	U	0.09	0.21	0.22	<	UJ	0.091	0.21	0.22	<	UJ	0.089	0.21	0.22	<	U	0.084	0.2	0.21	<	U	0.086	0.2	0.21	<	UJ	0.089	0.21	0.22
3-Nitrotoluene	NA	<	U	0.21	0.42	0.42	<	UJ	0.21	0.42	0.42	<	UJ	0.2	0.42	0.42	<	U	0.19	0.39	0.39	<	U	0.2	0.4	0.4	<	U	0.2	0.41	0.41
4-Amino-2,6-dinitrotoluene	NA	0.89		0.061	0.13	0.16	7.4	J	0.061	0.13	0.16	5.2	J	0.06	0.12	0.16	<	U	0.057	0.12	0.15	2.1	J	0.058	0.12	0.15	<	U	0.06	0.12	0.16
4-Nitrotoluene	NA	<	U	0.11	0.42	0.43	<	U	0.11	0.42	0.44	<	U	0.1	0.42	0.43	<	U	0.098	0.39	0.4	<	U	0.1	0.4	0.41	<	U	0.1	0.41	0.42
HMX	400	<	U	0.092	0.21	0.22	1.4	J	0.093	0.21	0.22	<	U	0.091	0.21	0.22	<	U	0.086	0.2	0.21	<	UJ	0.088	0.2	0.21	<	U	0.091	0.21	0.22
MNX	NA	<	U	0.16	0.42	2.1	<	U	0.16	0.42	2.1	<	U	0.16	0.42	2.1	<	U	0.15	0.39	2	<	U	0.15	0.4	2	<	U	0.16	0.41	2.1
Nitrobenzene	NA	<	U	0.096	0.21	0.22	<	U	0.097	0.21	0.22	<	U	0.094	0.21	0.22	<	U	0.089	0.2	0.21	<	U	0.091	0.2	0.21	<	U	0.094	0.21	0.22
RDX	2	<	U	0.054	0.21	0.22	2.2		0.055	0.21	0.22	<	U	0.053	0.21	0.22	<	U	0.051	0.2	0.21	<	U	0.052	0.2	0.21	<	U	0.053	0.21	0.22
Tetryl	NA	<	U	0.034	0.11	0.12	<	U	0.034	0.11	0.12	<	U	0.033	0.1	0.11	<	U	0.031	0.098	0.11	<	U	0.032	0.1	0.11	<	U	0.033	0.1	0.11
LABORATORY WATER QUALITY PARAMETERS																															
Ammonia USEPA 350.1 (mg/L)		<	U	0.022	0.05	0.1	0.041	J	0.022	0.05	0.1	0.055	J	0.022	0.05	0.1	0.95		0.022	0.05	0.1	1.1		0.022	0.05	0.1	1.9		0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		<	U	0.69	1	1	<	U	0.69	1	1	14		1.4	2	2	<	U	0.69	1	1	3.6		0.69	1	1	6.3		3.4	5	5
Nitrate/Nitrite USEPA 353.2 (mg/L)		9.8		0.038	0.1	0.2	10		0.038	0.1	0.2	8.1		0.019	0.05	0.1	16		0.095	0.25	0.5	2.8		0.019	0.05	0.1	0.1		0.019	0.05	0.1
Sulfide SM 9034 (mg/L)		<	U	0.79	1.9	4	<	UJ	0.79	1.9	4	<	UJ	0.79	1.9	4	<	U	0.79	1.9	4	0.8	J	0.79	1.9	4	0.8	J	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		120		1	2.5	5	53		1	2.5	5	49		1	2.5	5	72		1	2.5	5	16		1	2.5	5	2.4	J	1	2.5	5
Dissolved Organic Carbon SM 9060A (mg/L)		3		0.35	0.8	1	6.8		0.35	0.8	1	7.9		0.35	0.8	1	23		0.35	0.8	1	17		0.35	0.8	1	35		0.35	0.8	1
Alkalinity SM 2320B (mg/L)		350		3.1	6.4	10	440		3.1	6.4	10	320		3.1	6.4	10	460		3.1	6.4	10	620		3.1	6.4	10	630		3.1	6.4	10
Methane RSK-175 (µg/L)		22		0.63	2	5	120	J	0.63	2	5	8600		0.63	2	5	15000		0.63	2	5	13000		0.63	2	5	17000		0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		156		3.1	6.4	10	196		3.1	6.4	10	142		3.1	6.4	10	204		3.1	6.4	10	276		3.1	6.4	10	280		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
EW = extraction well
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PM = performance monitoring
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-3
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY WATER QUALITY PARAMETERS, PERFORMANCE MONITORING WELLS
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID / SAMPLE DATE	CHAAP HALs (µg/L)	BETWEEN EW6 AND EW7																													
		EW7-PM25B-5-35 2/25/2021					EW7-PM26A-5-25 2/27/2021					EW7-PM26B-5-35 2/26/2021					EW7-PM27B-5-35 2/27/2021					EW7-PM28A-5-35 2/25/2021					EW7-PM29A-5-25 2/26/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																															
1,3,5-Trinitrobenzene	NA	<	U	0.086	0.21	0.22	0.35	J	0.083	0.2	0.21	<	U	0.081	0.19	0.2	<	U	0.082	0.19	0.2	<	U	0.087	0.21	0.22	<	U	0.081	0.19	0.2
1,3-Dinitrobenzene	NA	<	U	0.038	0.1	0.11	<	U	0.036	0.098	0.11	<	U	0.035	0.096	0.11	<	U	0.036	0.097	0.11	<	U	0.038	0.1	0.11	<	U	0.036	0.097	0.11
TNT	2	<	U	0.046	0.1	0.11	0.66	J	0.044	0.098	0.11	<	U	0.043	0.096	0.11	<	U	0.044	0.097	0.11	<	U	0.046	0.1	0.11	<	U	0.043	0.097	0.11
2,4-Dinitrotoluene	NA	<	U	0.028	0.082	0.1	<	U	0.027	0.079	0.098	<	U	0.026	0.077	0.096	<	U	0.027	0.078	0.097	<	U	0.028	0.083	0.1	<	U	0.026	0.077	0.097
2,6-Dinitrotoluene	NA	<	U	0.041	0.082	0.1	<	U	0.039	0.079	0.098	<	U	0.039	0.077	0.096	<	U	0.039	0.078	0.097	<	U	0.041	0.083	0.1	<	U	0.039	0.077	0.097
2-Amino-4,6-dinitrotoluene	NA	<	U	0.052	0.1	0.11	0.84	J	0.05	0.098	0.11	<	U	0.049	0.096	0.11	<	U	0.049	0.097	0.11	<	U	0.052	0.1	0.11	<	U	0.049	0.097	0.11
2-Nitrotoluene	NA	<	UJ	0.088	0.21	0.22	<	U	0.084	0.2	0.21	<	U	0.082	0.19	0.2	<	U	0.083	0.19	0.2	<	UJ	0.088	0.21	0.22	<	U	0.083	0.19	0.2
3-Nitrotoluene	NA	<	U	0.2	0.41	0.41	<	U	0.19	0.39	0.39	<	U	0.19	0.38	0.38	<	U	0.19	0.39	0.39	<	U	0.2	0.41	0.41	<	U	0.19	0.39	0.39
4-Amino-2,6-dinitrotoluene	NA	<	U	0.059	0.12	0.15	1.5	J	0.057	0.12	0.15	<	U	0.055	0.12	0.14	<	U	0.056	0.12	0.15	<	U	0.06	0.12	0.15	<	U	0.056	0.12	0.14
4-Nitrotoluene	NA	<	U	0.1	0.41	0.42	<	U	0.098	0.39	0.4	<	U	0.096	0.38	0.39	<	U	0.097	0.39	0.4	<	U	0.1	0.41	0.42	<	U	0.097	0.39	0.4
HMX	400	<	U	0.09	0.21	0.22	<	U	0.086	0.2	0.21	<	U	0.084	0.19	0.2	<	U	0.085	0.19	0.2	<	U	0.09	0.21	0.22	<	U	0.085	0.19	0.2
MNX	NA	<	U	0.16	0.41	2.1	<	U	0.15	0.39	2	<	U	0.15	0.38	1.9	27	J	0.15	0.39	1.9	<	U	0.16	0.41	2.1	<	U	0.15	0.39	1.9
Nitrobenzene	NA	<	U	0.094	0.21	0.22	<	U	0.09	0.2	0.21	<	U	0.087	0.19	0.2	<	U	0.088	0.19	0.2	<	U	0.094	0.21	0.22	<	U	0.088	0.19	0.2
RDX	2	<	U	0.053	0.21	0.22	<	U	0.051	0.2	0.21	<	U	0.049	0.19	0.2	<	U	0.05	0.19	0.2	<	U	0.053	0.21	0.22	<	U	0.05	0.19	0.2
Tetryl	NA	<	U	0.033	0.1	0.11	<	U	0.031	0.098	0.11	<	U	0.031	0.096	0.11	<	U	0.031	0.097	0.11	<	U	0.033	0.1	0.11	<	U	0.031	0.097	0.11
LABORATORY WATER QUALITY PARAMETERS																															
Ammonia USEPA 350.1 (mg/L)		3.5		0.022	0.05	0.1	0.15		0.022	0.05	0.1	1.5		0.022	0.05	0.1	6.5		0.044	0.1	0.2	0.99		0.022	0.05	0.1	1.3		0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		8.5		3.4	5	5	0.99	J	0.69	1	1	3.9		1.7	2.5	2.5	8.2	J	6.9	10	10	3.1		1.7	2.5	2.5	2.6		0.69	1	1
Nitrate/Nitrite USEPA 353.2 (mg/L)		0.09	J	0.019	0.05	0.1	4.9		0.019	0.05	0.1	0.1		0.019	0.05	0.1	<	U	0.019	0.05	0.1	0.077	J	0.019	0.05	0.1	0.1		0.019	0.05	0.1
Sulfide SM 9034 (mg/L)		<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	0.8	J	0.79	1.9	4	0.8	J	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		<	U	1	2.5	5	48		1	2.5	5	46		1	2.5	5	<	U	1	2.5	5	2.5	J	1	2.5	5	5		1	2.5	5
Dissolved Organic Carbon SM 9060A (mg/L)		35		0.35	0.8	1	7.7		0.35	0.8	1	39		0.35	0.8	1	47		0.35	0.8	1	28		0.35	0.8	1	12		0.35	0.8	1
Alkalinity SM 2320B (mg/L)		560		3.1	6.4	10	490		3.1	6.4	10	430		3.1	6.4	10	570		3.1	6.4	10	550		3.1	6.4	10	420		3.1	6.4	10
Methane RSK-175 (µg/L)		19000		0.63	2	5	13000		0.63	2	5	11000		0.63	2	5	16000	J	1.9	6	15	<	U	0.63	2	5	16000		0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		249		3.1	6.4	10	218		3.1	6.4	10	191		3.1	6.4	10	253		3.1	6.4	10	244		3.1	6.4	10	187		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
EW = extraction well
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PM = performance monitoring
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-3
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY WATER QUALITY PARAMETERS, PERFORMANCE MONITORING WELLS
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID	CHAAP HALs (µg/L)	BETWEEN EW6 AND EW7					LOAD LINE 1										LOAD LINE 2														
		EW7-PM29B-5-35					G0094-5					G0096-5					G0111-5					G0121-5					G0122-5				
SAMPLE DATE		2/26/2021					3/1/2021					3/1/2021					2/28/2021					2/28/2021					2/28/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)																															
1,3,5-Trinitrobenzene	NA	<	U	0.087	0.21	0.22	<	U	0.088	0.21	0.22	1.1	J	0.092	0.22	0.23	2.6	J	0.084	0.2	0.21	<	U	8.5	20	21	<	UJ	0.086	0.21	0.22
1,3-Dinitrobenzene	NA	<	U	0.038	0.1	0.11	<	U	0.039	0.1	0.12	<	U	0.04	0.11	0.12	<	UJ	0.037	0.1	0.11	<	U	3.7	10	11	<	UJ	0.038	0.1	0.11
TNT	2	<	U	0.047	0.1	0.11	4.9	J	0.047	0.1	0.12	0.24	J	0.049	0.11	0.12	3.7	J	0.045	0.1	0.11	<	U	4.5	10	11	<	UJ	0.046	0.1	0.11
2,4-Dinitrotoluene	NA	<	U	0.028	0.083	0.1	0.29	J	0.029	0.084	0.1	<	U	0.03	0.087	0.11	0.28	J	0.027	0.08	0.1	<	U	2.8	8.1	10	<	UJ	0.028	0.082	0.1
2,6-Dinitrotoluene	NA	<	UJ	0.042	0.083	0.1	<	U	0.042	0.084	0.1	<	U	0.044	0.087	0.11	<	UJ	0.04	0.08	0.1	<	U	4	8.1	10	<	UJ	0.041	0.082	0.1
2-Amino-4,6-dinitrotoluene	NA	0.32	J	0.053	0.1	0.11	36	J	0.53	1	1.2	1.4	J	0.055	0.11	0.12	3.8	J	0.051	0.1	0.11	<	U	5.1	10	11	<	UJ	0.052	0.1	0.11
2-Nitrotoluene	NA	<	U	0.089	0.21	0.22	<	U	0.09	0.21	0.22	<	U	0.093	0.22	0.23	<	UJ	0.086	0.2	0.21	<	U	8.6	20	21	<	UJ	0.088	0.21	0.22
3-Nitrotoluene	NA	<	U	0.2	0.42	0.42	<	U	0.2	0.42	0.42	<	U	0.21	0.44	0.44	<	UJ	0.2	0.4	0.4	<	U	20	40	40	<	UJ	0.2	0.41	0.41
4-Amino-2,6-dinitrotoluene	NA	<	UJ	0.06	0.12	0.16	43	J	0.6	1.3	1.6	<	U	0.063	0.13	0.16	4.8	J	0.058	0.12	0.15	<	U	5.8	12	15	<	UJ	0.059	0.12	0.15
4-Nitrotoluene	NA	<	U	0.1	0.42	0.43	<	U	0.1	0.42	0.43	<	U	0.11	0.44	0.45	<	UJ	0.1	0.4	0.41	<	U	10	40	41	<	UJ	0.1	0.41	0.42
HMX	400	<	U	0.091	0.21	0.22	<	UJ	0.092	0.21	0.22	26	J	0.096	0.22	0.23	<	UJ	0.088	0.2	0.21	<	U	8.8	20	21	<	UJ	0.09	0.21	0.22
MNX	NA	<	U	0.16	0.42	2.1	<	U	0.16	0.42	2.1	2	J	0.17	0.44	2.2	<	UJ	0.15	0.4	2	<	U	16	40	200	<	UJ	0.16	0.41	2.1
Nitrobenzene	NA	<	U	0.094	0.21	0.22	<	U	0.095	0.21	0.22	<	U	0.099	0.22	0.23	<	UJ	0.091	0.2	0.21	<	U	9.2	20	21	<	UJ	0.094	0.21	0.22
RDX	2	<	U	0.053	0.21	0.22	16	J	0.054	0.21	0.22	87	J	1.1	4.4	4.6	<	UJ	0.052	0.2	0.21	<	U	5.2	20	21	<	UJ	0.053	0.21	0.22
Tetryl	NA	<	U	0.033	0.1	0.11	<	U	0.033	0.1	0.12	<	U	0.035	0.11	0.12	<	UJ	0.032	0.1	0.11	<	U	3.2	10	11	<	UJ	0.033	0.1	0.11
LABORATORY WATER QUALITY PARAMETERS																															
Ammonia USEPA 350.1 (mg/L)		7.9	J	0.044	0.1	0.2	3.6		0.022	0.05	0.1	2.9		0.022	0.05	0.1	0.58		0.022	0.05	0.1	31		0.22	0.5	1	4.8		0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		6.7		0.69	1	1	3.3		0.69	1	1	5		0.86	1.3	1.3	1.3		0.69	1	1	77		34	50	50	10		6.9	10	10
Nitrate/Nitrite USEPA 353.2 (mg/L)		0.09	J	0.019	0.05	0.1	11		0.038	0.1	0.2	14		0.038	0.1	0.2	7.8		0.019	0.05	0.1	<	U	0.019	0.05	0.1	0.021	J	0.019	0.05	0.1
Sulfide SM 9034 (mg/L)		0.8	J	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	<	U	0.79	1.9	4	4.8		0.79	1.9	4	1.6	J	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		<	U	1	2.5	5	82		1	2.5	5	120	J	1	2.5	5	320	J	5.2	13	25	110		1	2.5	5	45		1	2.5	5
Dissolved Organic Carbon SM 9060A (mg/L)		21		0.35	0.8	1	5.5		0.35	0.8	1	120		1.2	2.7	3.3	9.5		0.35	0.8	1	69	J	13	30	38	150		1.4	3.3	4.2
Alkalinity SM 2320B (mg/L)		450		3.1	6.4	10	380		3.1	6.4	10	450		3.1	6.4	10	790		3.1	6.4	10	800		3.1	6.4	10	1400		3.1	6.4	10
Methane RSK-175 (µg/L)		16000	J	0.63	2	5	12000		0.63	2	5	2200		0.63	2	5	6400		0.63	2	5	5200		0.63	2	5	14000		0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		200		3.1	6.4	10	169		3.1	6.4	10	200		3.1	6.4	10	351		3.1	6.4	10	356		3.1	6.4	10	622		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
EW = extraction well
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PM = performance monitoring
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-3
SUMMARY OF EXPLOSIVES DETECTED AND LABORATORY WATER QUALITY PARAMETERS, PERFORMANCE MONITORING WELLS
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

FIELD ID SAMPLE DATE	CHAAP HALs (µg/L)	LOAD LINE 2 G0123-5 2/28/2021					DECANT STATION G0102-5 3/2/2021				
		Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ
EXPLOSIVES (USEPA Method 8330A) (µg/L)											
1,3,5-Trinitrobenzene	NA	<	U	0.083	0.2	0.21	<	U	0.091	0.22	0.23
1,3-Dinitrobenzene	NA	<	U	0.037	0.099	0.11	<	U	0.04	0.11	0.12
TNT	2	<	U	0.045	0.099	0.11	<	U	0.048	0.11	0.12
2,4-Dinitrotoluene	NA	<	U	0.027	0.079	0.099	<	U	0.029	0.086	0.11
2,6-Dinitrotoluene	NA	<	U	0.04	0.079	0.099	<	U	0.043	0.086	0.11
2-Amino-4,6-dinitrotoluene	NA	<	U	0.05	0.099	0.11	<	U	0.055	0.11	0.12
2-Nitrotoluene	NA	<	U	0.085	0.2	0.21	<	U	0.092	0.22	0.23
3-Nitrotoluene	NA	<	U	0.19	0.4	0.4	<	U	0.21	0.43	0.43
4-Amino-2,6-dinitrotoluene	NA	<	U	0.057	0.12	0.15	<	U	0.062	0.13	0.16
4-Nitrotoluene	NA	<	U	0.099	0.4	0.41	<	U	0.11	0.43	0.44
HMX	400	<	U	0.087	0.2	0.21	<	U	0.094	0.22	0.23
MNX	NA	<	U	0.15	0.4	2	<	U	0.17	0.43	2.2
Nitrobenzene	NA	<	U	0.09	0.2	0.21	<	U	0.098	0.22	0.23
RDX	2	<	U	0.051	0.2	0.21	<	U	0.055	0.22	0.23
Tetryl	NA	<	U	0.032	0.099	0.11	<	U	0.034	0.11	0.12
LABORATORY WATER QUALITY PARAMETERS											
Ammonia USEPA 350.1 (mg/L)		0.86		0.022	0.05	0.1	0.088	J	0.022	0.05	0.1
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)		13		6.9	10	10	<	U	0.69	1	1
Nitrate/Nitrite USEPA 353.2 (mg/L)		0.02	J	0.019	0.05	0.1	<	U	0.019	0.05	0.1
Sulfide SM 9034 (mg/L)		0.8	J	0.79	1.9	4	2.4	J	0.79	1.9	4
Sulfate USEPA 9056A (mg/L)		5.6	J	2.1	5	10	870		5.2	13	25
Dissolved Organic Carbon SM 9060A (mg/L)		580		5.4	13	16	22		0.35	0.8	1
Alkalinity SM 2320B (mg/L)		810		3.1	6.4	10	660		3.1	6.4	10
Methane RSK-175 (µg/L)		12000		0.63	2	5	57		0.63	2	5
Carbon Dioxide SM 2320B (mg/L)[1]		360		3.1	6.4	10	293		3.1	6.4	10

Notes:

Concentrations exceed HALs

[1]Carbon dioxide back calculated from alkalinity SM 2320B.

< = less than LOQ
µg/L = micrograms per liter
CHAAP = Cornhusker Army Ammunition Plant
DL = detection limit
EW = extraction well
HAL = health advisory level
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNX = mono-nitroso-RDX
NA = not available
OU = Operable Unit
PM = performance monitoring
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency

TABLE 3-4
SUMMARY OF OU1 FIELD DUPLICATE SAMPLE PAIRS
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

WELL NUMBER	OS001-DP05-25											G0096										PZ017R									
FIELD ID	OS001-DP05-25					OS501-DP05-25						G0096-5					G0296-5						PZ017R-5					PZ021-5					
SAMPLE DATE	2/23/2021					2/23/2021						3/1/2021					3/1/2021						3/3/2021					3/3/2021					
	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	RPD	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	RPD	Result	Qual	DL	LOD	LOQ	Result	Qual	DL	LOD	LOQ	RPD
EXPLOSIVES (USEPA Method 8330A) (µg/L)																																	
1,3,5-Trinitrobenzene	0.56	J	0.088	0.21	0.22	0.57	J	0.089	0.21	0.22	2	1.1	J	0.092	0.22	0.23	1.2	J	0.091	0.22	0.23	9	2.4		0.089	0.21	0.22	2.2		0.086	0.2	0.22	9
1,3-Dinitrobenzene	<	UJ	0.038	0.1	0.11	<	UJ	0.039	0.11	0.12		<	U	0.04	0.11	0.12	<	U	0.04	0.11	0.12		<	U	0.039	0.11	0.12	<	U	0.038	0.1	0.11	
TNT	20	J	0.047	0.1	0.11	21	J	0.048	0.11	0.12	5	0.24	J	0.049	0.11	0.12	<	U	0.049	0.11	0.12	<2x	10		0.048	0.11	0.12	10		0.046	0.1	0.11	0
2,4-Dinitrotoluene	<	UJ	0.029	0.083	0.1	<	UJ	0.029	0.085	0.11		<	U	0.03	0.087	0.11	<	U	0.03	0.086	0.11		0.046	J	0.029	0.085	0.11	<	U	0.028	0.082	0.1	<2x
2,6-Dinitrotoluene	<	UJ	0.042	0.083	0.1	<	UJ	0.043	0.085	0.11		<	U	0.044	0.087	0.11	<	U	0.043	0.086	0.11		<	U	0.043	0.085	0.11	<	U	0.041	0.082	0.1	
2-Amino-4,6-dinitrotoluene	2.1	J	0.053	0.1	0.11	2	J	0.054	0.11	0.12	5	1.4	J	0.055	0.11	0.12	<	UJ	0.055	0.11	0.12	>2x	4.7		0.054	0.11	0.12	4.7		0.052	0.1	0.11	0
2-Nitrotoluene	<	UJ	0.089	0.21	0.22	<	UJ	0.091	0.21	0.22		<	U	0.093	0.22	0.23	<	U	0.092	0.22	0.23		<	UJ	0.091	0.21	0.22	<	UJ	0.088	0.2	0.22	
3-Nitrotoluene	<	UJ	0.2	0.42	0.42	<	UJ	0.21	0.42	0.42		<	U	0.21	0.44	0.44	<	U	0.21	0.43	0.43		<	UJ	0.21	0.42	0.42	<	UJ	0.2	0.41	0.41	
4-Amino-2,6-dinitrotoluene	1.8	J	0.06	0.12	0.16	1.7	J	0.061	0.13	0.16	6	<	U	0.063	0.13	0.16	<	UJ	0.062	0.13	0.16		7.4	J	0.061	0.13	0.16	7.6	J	0.059	0.12	0.15	3
4-Nitrotoluene	<	J	0.1	0.42	0.43	<	UJ	0.11	0.42	0.44		<	U	0.11	0.44	0.45	<	U	0.11	0.43	0.44		<	U	0.11	0.42	0.44	<	U	0.1	0.41	0.42	
HMX	<	J	0.091	0.21	0.22	0.16	J	0.093	0.21	0.22	<2x	26	J	0.096	0.22	0.23	24	J	0.095	0.22	0.23	8	1.4	J	0.093	0.21	0.22	1.4	J	0.09	0.2	0.22	0
MNX	<	J	0.16	0.42	2.1	<	UJ	0.16	0.42	2.1		2	J	0.17	0.44	2.2	<	UJ	0.17	0.43	2.2	<2x	<	U	0.16	0.42	2.1	<	U	0.16	0.41	2	
Nitrobenzene	<	J	0.095	0.21	0.22	<	UJ	0.097	0.21	0.22		<	U	0.099	0.22	0.23	<	U	0.098	0.22	0.23		<	U	0.097	0.21	0.22	<	U	0.093	0.2	0.22	
RDX	<	J	0.054	0.21	0.22	<	UJ	0.055	0.21	0.22		87	J	1.1	4.4	4.6	81	J	1.1	4.3	4.5	7	2.2		0.055	0.21	0.22	2.3		0.053	0.2	0.22	4
Tetryl	<	J	0.033	0.1	0.11	<	UJ	0.034	0.11	0.12		<	U	0.035	0.11	0.12	<	U	0.034	0.11	0.12		<	U	0.034	0.11	0.12	<	U	0.033	0.1	0.11	
LABORATORY MNA PARAMETERS																																	
Ammonia USEPA 350.1 (mg/L)	No Analysis					No Analysis						2.9		0.022	0.05	0.1	2.9		0.022	0.05	0.1	0	0.041	J	0.022	0.05	0.1	0.044	J	0.022	0.05	0.1	<2x
Total Kjeldahl Nitrogen USEPA 351.2 (mg/L)												5		0.86	1.3	1.3	5.7		0.86	1.3	1.3	13	<	U	0.69	1	1	<	U	0.69	1	1	
Nitrate/Nitrite USEPA 353.2 (mg/L)												14		0.038	0.1	0.2	15		0.095	0.25	0.5	7	10		0.038	0.1	0.2	9.9		0.038	0.1	0.2	1
Sulfide SM 9034 (mg/L)												<	U	0.79	1.9	4	<	U	0.79	1.9	4		<	UJ	0.79	1.9	4	0.8	J	0.79	1.9	4	<2x
Sulfate USEPA 9056A (mg/L)												120	J	1	2.5	5	72	J	1	2.5	5	50	53		1	2.5	5	47		1	2.5	5	12
Dissolved Organic Carbon SM 9060A (mg/L)												120		1.2	2.7	3.3	130		1.2	2.7	3.3	8	6.8		0.35	0.8	1	6.6		0.35	0.8	1	3
Alkalinity SM 2320B (mg/L)												450		3.1	6.4	10	450		3.1	6.4	10	0	440		3.1	6.4	10	450		3.1	6.4	10	2
Methane RSK-175 (µg/L)												2200		0.63	2	5	2200		0.63	2	5	0	120	J	0.63	2	5	16000	J	0.63	2	5	197
Carbon Dioxide SM 2320B (mg/L)[1]												200		3.1	6.4	10	200		3.1	6.4	10	0	196		3.1	6.4	10	200		3.1	6.4	10	2

Notes:

[1]Carbon dioxide back calculated from alkalinity SM 2320.

field duplicate RPD > 30 or >2X the LOQ

< = less than LOQ
µg/L = micrograms per liter
DL = detection limit
DP = direct push
HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ID = identification number
J = estimated
LOD = limit of detection
LOQ = limit of quantification
mg/L = milligrams per liter
MNA = monitored natural attenuation
MNX = mono-nitroso-RDX
OS = off-post sample
OU = Operable Unit
Qual = qualifier
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RPD = relative percent difference
RSK = Robert S. Kerr Environmental Research Laboratory
SM = Standard Method
TNT = 2,4,6-trinitrotoluene
U = nondetect
USEPA = United States Environmental Protection Agency
X = times

TABLE 3-5
FIELD WATER QUALITY PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	Sample Date	pH	Temperature (°C)	Specific Conductance (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Ferrous Iron (mg/L)
OU1 Off-Post Monitoring Wells								
CA210	3/2/2021	6.75	13.17	1.545	0.21	177.6	0.41	0.18
CA211	3/2/2021	6.72	12.88	1.026	0.75	162.3	0.05	0.08
CA212	3/2/2021	6.97	11.17	0.621	0.05	161.4	2.64	0.16
CA213	3/2/2021	7.63	5.25	0.447	0.66	172.3	42.94	0.00
NW020	3/3/2021	6.90	11.81	1.504	5.54	138.9	6.57	0.15
NW021	3/3/2021	6.79	12.51	0.982	0.04	-110.2	15.22	0.18
NW022	3/3/2021	6.97	13.58	1.257	0.08	-19.9	20.04	1.00
NW060	3/1/2021	6.56	11.43	0.203	10.23	196.7	0.05	0.00
NW061	3/1/2021	7.13	11.70	0.941	0.03	35.3	8.27	0.00
NW062	3/1/2021	7.41	12.35	0.883	0.05	-100.6	30.26	0.73
NW070	3/1/2021	7.24	13.59	0.926	0.07	163.2	1.01	0.00
NW071	3/1/2021	6.61	11.55	0.686	1.94	107.8	12.84	0.18
OU1 On-Post Monitoring Wells								
G0024	3/3/2021	6.64	13.64	0.654	5.31	175.4	5.52	0.10
G0070	3/1/2021	7.02	11.97	0.427	1.80	84.2	0.37	0.00
G0075	3/1/2021	6.98	13.15	0.809	2.09	88.2	0.44	0.14
G0076	3/1/2021	6.81	13.15	1.135	0.05	-49.0	0.35	2.11
G0077	3/3/2021	6.61	14.25	0.795	2.34	194.5	0.27	0.16
G0078	3/3/2021	6.78	14.44	0.957	0.10	-10.9	5.93	1.41
G0079	3/1/2021	6.67	12.81	0.575	2.51	81.8	5.00	0.30
G0080	2/28/2021	6.82	12.18	0.703	0.09	48.7	0.00	0.21
G0081	3/2/2021	6.51	15.11	0.891	0.05	-25.1	3.50	1.16
G0082	3/2/2021	6.62	14.83	0.790	0.13	-21.0	17.40	0.20
G0086	3/2/2021	6.92	14.54	0.808	0.06	70.7	0.11	0.00
G0087	3/2/2021	6.82	14.95	0.731	0.05	100.1	3.12	0.06
G0091	3/2/2021	6.93	13.83	1.170	5.53	170.1	2.26	0.14
G0092	3/2/2021	7.28	13.04	1.297	0.04	43.8	0.06	0.10
PZ017R	3/3/2021	6.38	13.31	0.902	0.01	6.8	2.30	1.25
PZ018	3/3/2021	6.28	12.60	0.713	0.36	-9.9	3.36	2.62
PZ019	3/3/2021	6.32	12.54	0.663	7.35	162.2	3.60	0.23
PZ020	3/3/2021	6.87	14.22	0.916	2.65	104.1	2.90	0.05

Notes:

Field water quality parameters for all wells were measured using a In-Situ Aqua TROLL 500 MPS equipped with a flow-through cell with the exception of ferrous iron. Ferrous iron was measured using a Hach colorimeter (DR/820).

°C = degrees Celsius

DO = dissolved oxygen

mg/L = milligrams per liter

MPS = multiprobe system

mS/cm = milliSiemens per centimeter

mV = millivolts

NTU = nephelometric turbidity units

ORP = oxidation/reduction potential

OU = Operable Unit

PZ = piezometer

TABLE 3-6
FIELD WATER QUALITY PARAMETERS, PERFORMANCE MONITORING WELLS
OU1 SUBSURFACE INJECTION, QUARTER 5
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	Sample Date	pH	Temperature (°C)	Specific Conductance (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Ferrous Iron (mg/L)
Between EW6 and EW7								
G0022	3/2/2021	6.87	10.52	0.850	3.32	-94.9	0.04	0.11
PZ017R	3/3/2021	6.38	13.31	0.902	0.01	6.8	2.30	1.25
PZ018	3/3/2021	6.28	12.60	0.713	0.36	-9.9	3.36	2.62
EW7-PM21A	2/27/21	6.35	10.80	0.925	0.05	-146.6	54.00	2.67
EW7-PM24A	2/27/2021	6.52	10.71	1.071	0.07	-129.6	9.10	2.10
EW7-PM25A	2/25/2021	6.32	11.12	1.243	0.01	-184.5	73.04	6.52
EW7-PM25B	2/25/2021	6.42	11.35	0.746	0.64	-99.8	46.30	6.48
EW7-PM26A	2/27/2021	6.56	10.67	0.925	0.03	-75.4	26.50	5.92
EW7-PM26B	2/26/2021	6.46	10.10	0.820	0.01	-104.6	35.00	7.32
EW7-PM27B	2/27/2021	6.29	11.57	0.974	0.01	-135.3	47.00	6.54
EW7-PM28A	2/25/2021	6.34	11.59	0.106	1.78	-58.1	30.00	5.00
EW7-PM29A	2/26/2021	6.52	10.67	0.817	0.01	-97.7	9.30	6.12
EW7-PM29B	2/26/2021	6.49	10.66	0.953	0.02	119.7	90.00	2.73
Load Line 1								
G0094	3/1/2021	6.30	12.93	0.887	0.03	-12.1	18.00	1.67
G0096	3/1/2021	6.19	10.69	1.138	0.03	-102.0	4.20	3.22
Load Line 2								
G0111	2/28/2021	6.69	11.78	1.762	0.22	-198.4	0.17	2.24
G0121	2/28/2021	5.02	11.55	3.539	0.04	-127.9	185.82	3.09
G0122	2/28/2021	6.48	9.00	2.339	0.06	-266.4	35.32	2.64
G0123	2/28/2021	6.00	11.97	1.673	0.03	-126.2	18.89	6.54
Decant Station								
G0102	3/2/2021	6.68	9.62	2.271	0.03	-279.2	20.10	2.20

Notes:

Field water quality parameters for all wells were measured using a In-Situ Aqua TROLL 500 MPS equipped with a flow-through cell with the exception of ferrous iron. Ferrous iron was measured using a Hach colorimeter (DR/820).

> = greater than

°C = degrees Celsius

DO = dissolved oxygen

EW = extraction well

mg/L = milligrams per liter

MPS = multiprobe system

mS/cm = milliSiemens per centimeter

mV = millivolts

NTU = nephelometric turbidity units

ORP = oxidation/reduction potential

OU = Operable Unit

PM = performance monitoring

TABLE 5-1
SUMMARY OF RDX AND TNT CONCENTRATIONS
OU1 REBOUND STUDY LOCATIONS
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

	BASELINE		QUARTER 2		QUARTER 3		QUARTER 4		QUARTER 5	
Well Number / Sample Interval	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**
OU1 Off-Post Wells										
CA210	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CA211	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CA212	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CA213	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW020	0.2	ND	0.94	0.6	1.5	0.59	2.3	0.62	1.2	0.8
NW021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW022	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW050*	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
NW051*	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
NW052*	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
NW060	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW061	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW062	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW070	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW071	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW080*	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
NW081R*	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
NW082R*	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
OU1 On-Post Wells										
G0024	ND	ND	ND	ND	0.59	0.63	ND	0.2	ND	0.48
G0070	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G0075	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G0076	ND	ND	ND	ND	0.2	ND	0.2	ND	ND	ND
G0077	0.91	3.2	0.19	2.7	0.46	3.3	0.34	3.4	0.82	3.6
G0078	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G0079	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G0080	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
G0081	ND	0.29	ND	ND	ND	ND	ND	ND	ND	ND
G0082	0.63	ND	ND	ND	0.68	ND	0.41	ND	0.53	ND
G0086	ND	3.8	ND	5.9	0.21	3.6	0.17	ND	0.59	4.9
G0087	ND	ND	ND	ND	0.15	ND	0.15	ND	0.17	ND
G0091	0.81	ND	0.83	ND	0.59	ND	0.46	ND	0.27	ND
G0092	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PZ017R	0.87	15	1.4	17	1.4	11	1.8	15	2.2	10
PZ018	0.88	8	ND	19	1	ND	ND	17	ND	6
PZ019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PZ020	0.42	3.7	0.62	3.2	0.58	2.2	0.67	3.5	0.57	3.9

Notes:

Concentrations exceed HALs

*Beginning Quarter 5, wells are no longer accessed/sampled due to private property restrictions.

µg/L = micrograms per liter
ND = nondetect
NS = not sampled
OS = off-post sample
OU = Operable Unit
PZ = piezometer
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene

TABLE 5-1
SUMMARY OF RDX AND TNT CONCENTRATIONS
OU1 REBOUND STUDY LOCATIONS
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

	BASELINE		QUARTER 2		QUARTER 3		QUARTER 4		QUARTER 5	
Well Number / Sample Interval	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**
Direct Push Samples (Off-Post)										
OS001-25	ND	12	ND	9.2	0.19	32	ND	29	ND	20
OS001-35	ND	11	ND	8.2	0.21	11	1.8	15	0.82	2
OS001-45	ND	ND	ND	1.1	0.17	2.2	ND	ND	ND	0.25
OS002-25	0.63	1.3	NS	NS	NS	NS	NS	NS	NS	NS
OS002-35	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS
OS002-45	ND	3.3	NS	NS	NS	NS	NS	NS	NS	NS
OS003-25	ND	ND	NS	NS	NS	NS	ND	ND	ND	0.2
OS003-35	ND	3	NS	NS	NS	NS	ND	ND	ND	ND
OS003-45	ND	ND	NS	NS	NS	NS	ND	ND	ND	ND
OS004-25	NS	NS	NS	NS	NS	NS	ND	ND	NS	NS
OS004-35	NS	NS	NS	NS	NS	NS	ND	ND	NS	NS
OS004-45	NS	NS	NS	NS	NS	NS	ND	ND	NS	NS
NW050R-20	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
NW050R-35	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
NW050R-60	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND

Notes:

Concentrations exceed HALs

*Beginning Quarter 5, wells are no longer accessed/sampled due to private property restrictions

µg/L = micrograms per liter
ND = nondetect
NS = not sampled
OS = off-post sample
OU = Operable Unit
PZ = piezometer
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene

TABLE 5-2
SUMMARY OF MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	ORP (mV)					DO (mg/L)					Nitrate/Nitrite (mg/L)					Ammonia (mg/L)					TKN (mg/L)				
	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21
Shallow Wells																									
CA210	165.5	61.3	70	210.0	177.6	0.45	1.99	0.48	0.17	0.21	22	13	19	2.7	42	ND	ND	0.052	0.098	0.06	ND	1.5	0.72	ND	ND
NW020	113.9	41.1	153	118.2	138.9	3.30	6.04	6.30	5.41	5.54	62	49	42	56	68	0.46	0.025	ND	ND	ND	ND	ND	ND	ND	ND
NW050*	112.8	140.3	130	118.6	NS	0.24	0.37	0.40	0.02	NS	62	79	78	87	NS	4.8	0.72	0.98	ND	NS	ND	ND	ND	ND	NS
NW060	171.6	29.2	130	156.7	196.7	10.75	10.20	10.63	9.26	10.23	1.8	3.0	2.4	4.9	4.1	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW070	127.0	-307.4	-7	107.0	163.2	0.38	1.59	0.40	0.12	0.07	0.03	ND	ND	39	29	0.024	0.059	0.087	ND	ND	ND	1.1	1.3	ND	ND
NW080*	197.0	146.2	186	133.8	NS	7.28	8.38	7.66	7.38	NS	47	32	26	40	NS	0.029	ND	ND	ND	NS	ND	ND	ND	ND	NS
G0024	156.5	22.5	119	155.4	175.4	4.88	5.57	7.26	5.01	5.31	40	32	26	23	12	ND	0.025	ND	ND	ND	ND	ND	ND	ND	ND
G0079	144.0	170.4	69	18.5	81.8	3.82	5.13	5.90	1.03	2.51	0.21	0.36	0.83	0.03	3.8	ND	0.058	0.065	ND	ND	0.76	ND	ND	1.3	ND
G0091	156.8	27.4	105	196.8	170.1	2.79	3.13	6.55	6.99	5.53	32	27	40	4.1	40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PZ017R	173.9	154.3	111	68.6	6.8	5.68	2.63	3.44	0.65	0.01	41	26	30	20	10	0.060	0.13	ND	0.032	0.041	ND	ND	ND	ND	ND
PZ018	167.4	177.2	127	136.6	-9.9	1.34	9.09	9.26	5.99	0.36	24	31	26	26	8.1	0.21	0.023	ND	ND	0.055	ND	ND	ND	ND	14
PZ019	77.3	-4.3	112	166.3	162.2	6.44	9.44	10.83	9.36	7.35	34	31	34	36	37	ND	ND	ND	0.08	ND	ND	ND	ND	ND	ND
PZ020	160.2	166.3	104	114.1	104.1	2.54	4.17	7.07	4.06	2.65	29	28	38	27	14	ND	ND	0.032	ND	ND	ND	ND	ND	ND	ND
Shallow-Intermediate Wells																									
CA211	161.2	33.6	94	188.2	162.3	0.44	0.93	0.78	0.10	0.75	30	34	33	5.7	40	0.11	ND	ND	0.032	ND	ND	ND	ND	ND	ND
NW021	112.2	26.7	150	137.5	-110.2	0.26	0.83	0.34	0.06	0.04	0.84	0.43	1.5	1.5	1.3	3.8	2.7	1.4	1.6	1.4	3.5	2.8	1.8	1.9	1.7
NW051*	132.3	157.2	126	159.1	NS	0.32	7.01	0.37	0.56	NS	27	36	24	45	NS	ND	0.033	ND	ND	NS	ND	ND	ND	ND	NS
NW061	137.4	0.1	180	196.8	35.3	0.18	0.68	0.38	0.22	0.03	4.6	10	5.7	26	8.3	5.7	3.8	4.5	4.1	3.6	4.9	2.6	2.5	1.2	3.4
NW071	158.1	-151.2	88	130.0	107.8	2.18	3.43	3.00	0.46	1.94	2.9	32	30	26	36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW081R*	171.2	144.8	161	129.5	NS	0.65	0.62	1.46	0.14	NS	29	29	26	29	NS	ND	ND	ND	ND	NS	ND	ND	ND	ND	NS
G0075	132.7	154.9	73	257.3	88.2	6.86	1.05	0.71	0.03	2.09	1.2	0.94	2.4	0.76	4.7	0.056	ND	0.062	0.059	0.055	0.92	ND	ND	ND	ND
G0077	144.8	20.4	115	115.5	194.5	1.86	5.43	2.67	2.62	2.34	20	16	13	14	10	ND	ND	0.052	ND	ND	ND	ND	ND	ND	ND
G0080	-16.4	32.0	36	148.6	48.7	1.23	1.02	0.39	0.2	0.09	2.7	2.8	2.9	3.1	3.2	0.064	0.41	0.83	ND	0.55	ND	0.70	0.97	ND	ND
G0081	14.9	24.2	52	32.7	-25.1	0.18	0.75	0.59	0.07	0.05	0.36	0.051	ND	0.02	ND	0.26	0.26	0.31	0.34	0.35	ND	0.69	1.1	1.1	ND
G0082	32.9	14.4	-12	104.1	-21.0	0.20	0.51	0.23	0.23	0.13	3.4	0.31	0.46	0.69	2.4	ND	ND	0.11	0.30	0.027	ND	ND	ND	ND	ND
G0086	156.2	12.2	111	193.8	70.7	0.52	0.69	1.14	0.05	0.06	4.8	2.6	6.5	3.8	3.0	ND	0.039	0.025	ND	ND	ND	ND	ND	ND	ND
G0087	164.9	14.3	111	115.9	100.1	0.39	0.80	0.40	0.09	0.05	1.3	2.0	2.7	7.8	9.9	ND	ND	0.032	ND	ND	ND	ND	1.1	ND	ND
G0092	122.9	14.7	103	56.4	43.8	0.26	0.74	0.41	0.11	0.04	0.45	0.19	0.18	ND	ND	ND	ND	0.031	ND	ND	ND	ND	ND	ND	ND
Intermediate Wells																									
CA212	149.6	22.3	98	167.4	161.4	0.46	0.89	0.41	0.13	0.05	14	17	18	14	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NW022	26.7	15.4	85	-34.9	-19.9	0.19	0.72	0.33	0.05	0.08	53	ND	ND	ND	ND	0.42	0.47	1.4	1.3	1.2	ND	0.70	1.7	1.5	1.5
NW052*	134.5	87.4	27	20.1	NS	0.66	0.31	0.36	0.63	NS	0.12	0.022	0.052	ND	NS	0.027	0.039	0.031	0.029	NS	0.80	0.80	1.0	1.6	NS
NW062	38.6	-15.8	-67	-62.2	-100.6	0.26	0.65	0.33	0.15	0.05	ND	ND	ND	ND	ND	0.59	0.63	0.91	0.35	0.86	1.0	1.3	1.5	1.1	1.1
NW082R*	153.8	144.8	153	151.9	NS	0.50	0.51	0.49	0.01	NS	20	18	17	25	NS	ND	ND	0.024	ND	NS	ND	ND	ND	ND	NS
G0076	-36.2	83.2	-27	-13.1	-49.0	1.91	0.23	0.56	0.09	0.05	ND	ND	ND	ND	ND	1.1	1.1	1.4	1.4	1.3	1.3	1.2	1.3	1.8	1.1
G0078	28.1	9.9	68	-21.2	-10.9	0.25	0.45	0.31	0.09	0.10	ND	ND	ND	ND	ND	0.53	0.48	0.46	0.42	0.3	ND	ND	ND	0.8	ND
Deep Wells																									
CA213	118.3	17.4	95	97.9	172.3	0.22	1.51	0.48	0.09	0.66	1.3	1.4	1.0	0.81	1.3	ND	ND	ND	1.0	ND	0.97	ND	ND	ND	ND
G0070	16.5	87.3	120	68.5	84.2	3.29	0.58	1.40	0.54	1.80	0.025	ND	ND	ND	ND	ND	0.023	0.039	0.025	ND	ND	ND	ND	ND	ND

Notes:

*Beginning Quarter 5, wells are no longer accessed/sampled due to private property restrictions.

µg/L = micrograms per liter
CO_2 = carbon dioxide
DO = dissolved oxygen
DOC = dissolved organic carbon
mg/L = milligrams per liter
MNA = monitored natural attenuation
mS/cm = milliSiemens per centimeter
mV = millivolts
NA = no analysis
ND = nondetect
NS = no sample/measurement collected
NS* = Specific Conductance not measured due to instrument error.
ORP = oxidation/reduction potential
OU = Operable Unit
PZ = piezometer
TKN = total Kjeldahl nitrogen

TABLE 5-2
SUMMARY OF MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	DOC (mg/L)					CO_2 (mg/L)					Methane (µg/L)					Alkalinity (mg/L)					Ferrous Iron (mg/L)				
	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21
Shallow Wells																									
CA210	9.7	14	14	9.2	7.8	138	156	151	142	164	23	6.6	2.3	1.6	1.7	310	350	340	320	370	ND	0.44	1.13	ND	0.18
NW020	3.6	6.1	5.9	6.7	6.2	129	138	142	151	160	ND	ND	ND	ND	ND	290	310	320	340	360	0.07	0.14	0.96	ND	0.15
NW050*	8.1	8.7	6.5	6.5	NS	107	116	98	80	NS	1.4	ND	ND	2.1	NS	240	260	220	180	NS	ND	0.02	0.30	ND	NS
NW060	1.8	1.6	0.96	2.5	2.2	15	14	12	28	18	ND	ND	ND	ND	20	33	31	28	64	41	ND	ND	0.10	ND	ND
NW070	7.2	9.3	10	5.9	6.4	23	49	32	67	93	18	630	3900	ND	ND	51	110	72	150	210	ND	0.35	1.21	ND	ND
NW080*	4.7	3.9	3.9	4.0	NS	111	116	93	84	NS	ND	ND	ND	ND	NS	250	260	210	190	NS	ND	0.02	0.26	ND	NS
G0024	4.9	5.8	5.5	5.3	4.0	49	89	129	89	107	ND	ND	ND	ND	ND	110	200	290	200	240	ND	0.07	1.26	ND	0.10
G0079	3.2	2.6	6.0	8.8	3.6	58	58	138	67	124	ND	ND	ND	ND	2.6	130	130	310	150	280	0.06	ND	0.25	ND	0.30
G0091	3.6	3.4	3.8	3.7	2.8	160	160	124	111	116	ND	ND	ND	ND	ND	360	360	280	250	260	ND	ND	0.28	ND	0.14
PZ017R	3.5	4.5	5.1	5.4	6.8	62	116	84	120	196	140	520	1800	7800	120	140	260	190	270	440	ND	0.04	0.42	ND	1.25
PZ018	3.3	3.3	4.0	3.9	7.9	89	32	43	44	142	240	ND	ND	60	8600	200	73	96	100	320	ND	0.02	0.42	ND	2.62
PZ019	2.2	2.1	2.0	ND	1.8	39	32	33	30	53	ND	ND	ND	ND	15000	88	73	75	68	120	0.07	0.06	0.23	ND	0.23
PZ020	3.8	4.6	6.4	5.7	3.4	124	142	138	147	151	ND	ND	ND	ND	0.78	280	320	310	330	340	0.11	0.06	0.91	ND	0.05
Shallow-Intermediate Wells																									
CA211	4.3	4.9	6.0	4.2	4.8	89	93	93	84	102	ND	ND	ND	ND	ND	200	210	210	190	230	ND	ND	0.91	ND	0.08
NW021	2.9	2.8	2.8	3.3	2.6	182	178	151	147	164	55	1.2	5.7	4.2	8.5	410	400	340	330	370	ND	0.06	1.09	ND	0.18
NW051*	9.0	9.4	9.2	9.1	NS	156	156	147	124	NS	8.3	4.9	1.9	0.9	NS	350	350	330	280	NS	ND	0.08	0.41	ND	NS
NW061	4.4	4.2	4.1	3.5	4.7	133	124	120	93	129	21	14	19	13	62	300	280	270	210	290	ND	NS	0.20	ND	ND
NW071	ND	3.3	3.7	4.1	2.8	49	44	43	42	44	ND	ND	ND	140	ND	110	100	96	95	98	ND	0.12	0.95	ND	0.18
NW081R*	4.5	4.6	5.0	4.3	NS	111	111	98	98	NS	ND	ND	ND	ND	NS	250	250	220	220	NS	ND	ND	0.62	ND	NS
G0075	3.4	3.1	3.4	2.7	2.4	173	164	160	142	129	12	ND	ND	ND	0.75	390	370	360	320	290	ND	ND	0.25	ND	0.14
G0077	4.5	4.0	3.6	3.9	2.8	138	111	116	102	124	26	ND	ND	ND	47	310	250	260	230	280	ND	0.06	1.28	ND	0.16
G0080	2.9	2.7	2.8	2.6	2.7	156	151	138	133	156	1.1	4.6	8.8	2.0	5.0	350	340	310	300	350	0.45	ND	0.78	ND	0.21
G0081	7.8	6.5	6.6	5.1	5.3	164	156	124	138	151	3500	2400	1100	2100	1000	370	350	280	310	340	0.68	0.62	0.71	0.51	1.16
G0082	ND	4.5	4.0	3.0	3.2	111	138	116	120	129	1100	2700	460	2200	230	250	310	260	270	290	0.04	1.35	0.10	ND	0.20
G0086	2.6	2.7	3.6	3.1	2.3	138	151	124	124	138	110	150	22	31	44	310	340	280	280	310	ND	0.04	0.16	ND	ND
G0087	2.9	2.8	2.9	2.8	2.4	138	142	138	120	133	ND	ND	ND	ND	ND	310	320	310	270	300	0.06	0.23	0.16	ND	0.06
G0092	2.9	2.8	2.9	3.3	2.5	182	169	156	142	164	1.1	1.4	18	9.3	11	410	380	350	320	370	ND	ND	0.22	ND	0.10
Intermediate Wells																									
CA212	2.6	2.7	3.1	2.5	2.1	84	102	76	84	80	ND	ND	ND	ND	ND	190	230	170	190	180	ND	2.98	0.93	ND	0.16
NW022	2.9	2.7	2.6	3.4	2.8	182	191	178	178	204	290	250	440	420	350	410	430	400	400	460	0.27	1.02	1.94	0.34	1.00
NW052*	6.3	6.7	6.6	9.7	NS	169	160	142	164	NS	150	240	450	630	NS	380	360	320	370	NS	ND	0.39	0.96	0.62	NS
NW062	2.8	2.5	2.3	2.3	2.6	120	120	107	107	120	18	21	21	20	ND	270	270	240	240	270	0.18	0.94	0.84	0.47	0.73
NW082R*	ND	4.0	4.2	3.6	NS	107	107	102	93	NS	ND	0.66	2.0	ND	NS	240	240	230	210	NS	0.34	ND	0.33	ND	NS
G0076	ND	2.9	3.3	2.6	2.7	156	156	142	138	156	330	200	180	190	310	350	350	320	310	350	1.68	1.21	0.25	1.33	2.11
G0078	2.8	2.8	3.8	3.2	2.3	187	182	151	133	142	350	240	130	71	ND	420	410	340	300	320	0.48	0.79	1.11	0.11	1.41
Deep Wells																									
CA213	2.2	2.0	1.7	1.8	1.7	58	53	53	53	58	ND	ND	ND	ND	ND	130	120	120	120	130	ND	0.09	1.02	ND	ND
G0070	1.0	0.89	1.0	0.75	0.9	98	102	89	89	93	ND	ND	ND	ND	ND	220	230	200	200	210	ND	ND	0.32	ND	ND

Notes:

*Beginning Quarter 5, wells are no longer accessed/sampled due to private property restrictions.

µg/L = micrograms per liter
CO_2 = carbon dioxide
DO = dissolved oxygen
DOC = dissolved organic carbon
mg/L = milligrams per liter
MNA = monitored natural attenuation
mS/cm = milliSiemens per centimeter
mV = millivolts
NA = no analysis
ND = nondetect
NS = no sample/measurement collected
NS* = Specific Conductance not measured due to instrument error
ORP = oxidation/reduction potential
OU = Operable Unit
PZ = piezometer
TKN = total Kjeldahl nitrogen

TABLE 5-2
SUMMARY OF MNA PARAMETERS, OFF-POST AND ON-POST MONITORING WELLS
OU1 REBOUND STUDY
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Well Number	Sulfate (mg/L)					Sulfide (mg/L)					pH					Conductance (mS/cm)				
	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21	Oct-19	Mar-20	Jun-20	Oct-20	Mar-21
Shallow Wells																				
CA210	120	99	150	190	190	ND	ND	ND	ND	ND	6.55	5.83	6.40	6.66	6.75	0.977	0.708	1.550	1.560	1.545
NW020	150	200	230	190	230	ND	NA	ND	ND	0.80	6.53	6.45	6.57	6.81	6.90	1.118	0.994	1.450	1.510	1.504
NW050*	120	210	200	190	NS	ND	NA	ND	ND	NS	6.71	6.50	5.97	6.56	NS	1.178	1.916	0.567	1.560	NS
NW060	3.8	7.5	5.2	20	30	ND	0.80	ND	ND	ND	6.01	5.82	5.88	6.46	6.56	0.075	0.077	0.065	0.200	0.203
NW070	3.9	6.4	5.9	93	98	ND	0.80	ND	ND	ND	7.10	6.59	6.51	7.25	7.24	0.096	0.184	0.195	0.910	0.926
NW080*	200	160	130	130	NS	ND	ND	ND	ND	NS	6.23	6.12	6.26	6.60	NS	1.161	0.991	1.070	1.050	NS
G0024	50	110	150	98	65	ND	NA	ND	ND	0.80	6.36	6.60	6.71	6.70	6.64	0.670	0.729	1.170	0.740	0.654
G0079	17	12	48	53	68	ND	ND	ND	ND	ND	6.34	5.73	6.63	6.13	6.67	0.278	0.273	0.706	0.502	0.575
G0091	190	200	190	190	210	ND	ND	ND	ND	ND	6.83	6.65	7.29	6.98	6.93	1.325	0.973	1.300	1.140	1.170
PZ017R	74	83	62	64	53	ND	NA	ND	1.6	ND	6.34	6.16	6.90	6.07	6.38	0.652	0.797	0.788	0.840	0.902
PZ018	100	62	67	65	49	ND	NA	ND	ND	ND	6.57	5.52	6.46	5.99	6.28	0.664	0.520	0.590	0.550	0.713
PZ019	67	57	58	62	71	ND	0.80	ND	ND	0.80	6.16	6.03	6.49	6.22	6.32	0.602	0.377	0.616	0.570	0.663
PZ020	160	160	190	170	160	ND	NA	ND	ND	ND	6.67	6.54	6.86	6.85	6.87	1.061	1.049	1.350	1.160	0.916
Shallow-Intermediate Wells																				
CA211	93	99	110	97	120	ND	ND	0.80	ND	ND	6.49	6.45	6.46	6.72	6.72	0.662	0.705	1.110	0.860	1.026
NW021	210	210	220	200	200	ND	NA	ND	ND	0.80	6.77	6.69	6.84	6.93	6.79	1.154	0.825	1.180	1.070	0.982
NW051*	170	180	190	190	NS	ND	NA	ND	ND	NS	6.47	6.32	6.14	6.75	NS	1.088	1.451	0.442	1.520	NS
NW061	170	160	170	160	140	ND	ND	ND	ND	ND	7.00	7.01	6.59	7.00	7.13	0.790	0.685	0.308	1.070	0.941
NW071	60	54	64	61	63	ND	ND	ND	ND	ND	6.32	6.32	6.40	6.62	6.61	0.563	0.519	0.745	0.610	0.686
NW081R*	98	91	95	97	NS	ND	ND	0.80	ND	NS	6.51	6.48	6.42	6.55	NS	0.797	0.925	1.050	0.990	NS
G0075	150	170	150	200	160	ND	ND	ND	ND	0.80	6.57	6.44	6.83	6.72	6.98	0.995	0.926	0.987	0.730	0.809
G0077	150	100	99	110	140	ND	NA	0.80	ND	ND	6.63	6.65	6.68	6.71	6.61	1.012	0.620	0.874	0.780	0.795
G0080	ND	72	87	98	100	2.9	ND	ND	ND	ND	6.64	6.48	6.70	6.54	6.82	0.795	0.557	0.884	0.840	0.703
G0081	120	140	190	130	170	ND	0.80	ND	ND	ND	6.19	6.22	6.43	6.31	6.51	0.910	0.664	1.020	0.550	0.891
G0082	76	130	130	140	170	ND	ND	ND	ND	ND	6.28	6.29	6.47	6.45	6.62	0.652	0.637	0.858	0.820	0.790
G0086	140	150	130	160	200	ND	NA	ND	ND	ND	6.84	6.69	7.03	6.91	6.92	0.684	0.725	0.923	0.880	0.808
G0087	120	120	110	100	99	ND	NA	ND	ND	0.80	6.70	6.75	7.03	6.79	6.82	0.808	0.663	0.851	0.710	0.731
G0092	300	290	330	340	370	ND	ND	0.80	ND	ND	7.14	7.06	7.54	7.36	7.28	1.269	0.940	1.240	1.290	1.297
Intermediate Wells																				
CA212	72	73	79	79	78	ND	ND	ND	ND	ND	6.70	6.88	6.64	7.05	6.97	0.496	0.573	0.732	0.660	0.621
NW022	360	260	290	250	260	ND	NA	ND	ND	ND	6.96	7.02	7.05	7.14	6.97	1.270	1.019	1.390	1.280	1.257
NW052*	130	130	140	150	NS	ND	NA	ND	ND	NS	7.24	6.15	6.26	7.00	NS	0.738	0.920	0.312	1.140	NS
NW062	180	180	190	180	190	ND	ND	ND	ND	0.80	8.11	6.97	6.71	7.38	7.41	0.701	0.584	0.270	0.850	0.883
NW082R*	86	88	85	88	NS	ND	NA	ND	ND	NS	6.84	6.48	6.64	6.58	NS	0.687	0.884	0.916	0.890	NS
G0076	280	280	310	300	320	ND	ND	ND	ND	ND	6.66	6.62	6.93	6.74	6.81	1.189	1.116	1.260	NS*	1.135
G0078	250	260	250	250	270	ND	NA	ND	ND	ND	6.90	6.94	6.91	6.78	6.78	1.213	0.972	1.280	1.070	0.957
Deep Wells																				
CA213	63	60	57	61	64	ND	NA	ND	ND	ND	7.47	7.64	7.56	7.82	7.63	0.373	0.378	0.501	0.450	0.447
G0070	34	33	39	40	43	ND	ND	ND	ND	ND	7.12	6.88	7.01	6.88	7.02	0.461	0.452	0.511	NS*	0.427

Notes:

*Beginning Quarter 5, wells are no longer accessed/sampled due to private property restrictions.

µg/L = micrograms per liter
CO_2 = carbon dioxide
DO = dissolved oxygen
DOC = dissolved organic carbon
mg/L = milligrams per liter
MNA = monitored natural attenuation
mS/cm = milliSiemens per centimeter
mV = millivolts
NA = no analysis
ND = nondetect
NS = no sample/measurement collected
NS* = Specific Conductance not measured due to instrument error
ORP = oxidation/reduction potential
OU = Operable Unit
PZ = piezometer
TKN = total Kjeldahl nitrogen

TABLE 5-3
SUMMARY OF RDX AND TNT CONCENTRATIONS
OU1 PERFORMANCE MONITORING LOCATIONS
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

	BASELINE		QUARTER 2		QUARTER 3		QUARTER 4		QUARTER 5	
Performance Monitoring Location	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**	**RDX (µg/L)**	**TNT (µg/L)**
Between EW6 and EW7										
G0022	NS	NS	NS	NS	ND	2.3	NS	NS	ND	1.1
PZ017R	0.87	15	1.4	17	1.4	11	1.8	15	2.2	10
PZ018	0.88	8	ND	19	1	ND	ND	17	ND	6
EW7-PM21A-25	1	29	6.2	17	7.3	11	ND	11	ND	5.8
EW7-PM21B-35	0.39	5.7	ND	ND	ND	ND	ND	ND	NS	NS
EW7-PM22A-25	0.47	27	ND	1.1	ND	ND	ND	ND	NS	NS
EW7-PM22B-35	0.28	5.7	ND	ND	ND	ND	ND	ND	NS	NS
EW7-PM23A-25	1	28	2.2	38	ND	ND	ND	0.39	NS	NS
EW7-PM23B-35	0.32	5.2	ND	ND	ND	ND	ND	ND	NS	NS
EW7-PM24A-25	1.4	9.8	0.19	0.53	ND	8.3	ND	5.4	ND	4.6
EW7-PM24B-35	0.41	11	ND	ND	ND	ND	ND	ND	NS	NS
EW7-PM25A-25	1.6	13	ND	2.3	ND	ND	ND	ND	ND	ND
EW7-PM25B-35	ND	4.1	ND	ND	57	ND	ND	ND	ND	ND
EW7-PM26A-25	0.97	14	ND	0.73	0.46	0.87	ND	ND	ND	0.66
EW7-PM26B-35	0.38	7.2	37	ND	34	ND	ND	ND	ND	ND
EW7-PM27A-25	1.7	9.5	2.2	9.8	ND	0.45	ND	ND	NS	NS
EW7-PM27B-35	0.62	4.9	ND	0.26	17	ND	ND	ND	ND	ND
EW7-PM28A-25	1.1	13	1.1	8.2	15	ND	ND	ND	ND	ND
EW7-PM28B-35	0.22	5.6	ND	ND	ND	ND	ND	ND	NS	NS
EW7-PM29A-25	1.2	5.9	ND	ND	26	ND	ND	ND	ND	ND
EW7-PM29B-35	ND	3.6	ND	ND	44	ND	ND	ND	ND	ND
Load Line 1										
G0094	NS	NS	NS	NS	2.7	8.5	NS	NS	16	4.9
G0096	NS	NS	NS	NS	36	0.96	NS	NS	87	0.24
Load Line 2										
G0111	NS	NS	NS	NS	ND	12	NS	NS	ND	3.7
G0121	NS	NS	NS	NS	13	ND	NS	NS	ND	ND
G0122	NS	NS	NS	NS	12	ND	NS	NS	ND	ND
G0123	NS	NS	NS	NS	48	ND	NS	NS	ND	ND
Decant Station										
G0102	NS	NS	NS	NS	41	ND	NS	NS	ND	ND

Notes:

Concentrations exceed HALs

µg/L = micrograms per liter

EW = extraction well

ND = nondetect

NS = not sampled

OU = Operable Unit

PM = performance monitoring

PZ = piezometer

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

TABLE 5-4
SUMMARY OF WATER QUALITY PARAMETERS, PERFORMANCE MONITORING LOCATIONS
OU1 SUBSURFACE INJECTION
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Performance Monitroing Well Number	ORP (mV)					DO (mg/L)					Nitrate/Nitrite (mg/L)					Ammonia (mg/L)					TKN (mg/L)				
	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21
Shallow Wells																									
G0022	NS	NS	64	NS	-94.9	NS	NS	2.07	NS	3.32	NS	NS	8.8	NS	9.8	NS	NS	ND	NS	ND	NS	NS	ND	NS	ND
PZ017R	173.9	159.3	111	68.6	6.8	5.68	2.63	3.44	0.65	0.01	41	26	30	20	10	0.06	0.13	ND	0.032	0.041	ND	ND	ND	ND	ND
PZ018	167.4	177.2	127	156.6	-9.9	1.34	9.09	9.26	5.99	0.40	24	31	26	26	8.1	0.21	0.023	ND	ND	0.055	ND	ND	ND	ND	14
EW7-PM21A	-36.9	-307.7	-235	-81.2	-146.6	0.57	1.45	0.69	0.07	0.05	23	11	8.0	7.2	16	1.1	0.77	0.8	0.93	0.95	ND	1.3	1.8	1.0	ND
EW7-PM22A	-10.3	-326.1	-148	-101.5	NS	0.32	1.04	0.53	0.06	NS	13	2.3	5.4	2.1	NS	1.8	0.59	2.3	2.1	NS	ND	3.9	7.5	4.9	NS
EW7-PM23A	-26.7	-325.2	-91	-81.8	NS	0.36	1.18	0.41	0.00	NS	24	24	0.26	22	NS	1.8	1.3	1.6	ND	NS	ND	ND	3.7	2.3	NS
EW7-PM24A	-28.7	-288.4	-68	-85.6	-129.6	1.49	0.35	0.54	0.03	0.07	51	10	6.9	7.2	2.8	0.33	0.34	0.20	0.42	1.10	ND	1.3	2.1	3.5	3.6
EW7-PM25A	17.9	-331.9	7	-111.1	-184.5	3.48	0.33	8.07	0.00	0.01	25	6.8	3.0	ND	0.10	0.13	1.2	1.4	0.20	1.90	ND	3.8	6.8	6.2	6.3
EW7-PM26A	-39.0	-321.4	-53	-71.1	-75.4	0.83	0.16	0.49	0.06	0.03	11	2.1	1.9	3.4	4.9	0.086	1.0	0.09	0.39	0.15	ND	2.0	1.5	2.0	0.99
EW7-PM27A	-6.6	222.5	-99	-306.2	NS	2.02	2.95	0.31	0.02	NS	26	22	4.2	5.9	NS	0.15	0.21	1.1	1.4	NS	ND	ND	3.6	4.3	NS
EW7-PM28A	-28.2	-211.3	-53	-335.5	-58.1	0.12	0.40	0.35	0.03	1.78	16	3.9	0.15	ND	0.077	0.53	2.4	3.0	0.9	1.0	ND	3.9	5.6	4.4	3.1
EW7-PM29A	-20.7	-137.6	-62	-287.5	-97.7	0.35	0.61	0.37	0.01	0.01	12	0.13	0.06	ND	0.10	0.12	0.19	0.35	1.1	1.3	ND	2.4	5.3	2.7	2.6
Shallow-Intermediate Wells																									
EW7-PM21B	-121.5	-160.7	-122	-84.2	NS	0.16	0.25	0.39	0.07	NS	2.5	0.18	ND	ND	NS	1.5	0.68	1.5	1.7	NS	1.4	2.3	4.6	2.8	NS
EW7-PM22B	-36.6	-33.1	-123	-106.7	NS	0.20	0.32	0.34	0.06	NS	1.9	ND	ND	ND	NS	1.3	4.4	1.0	2.8	NS	1.2	21	6.4	5.7	NS
EW7-PM23B	-51.6	-20.1	-91	-135.4	NS	0.18	0.52	0.40	0.00	NS	4.4	ND	0.032	ND	NS	1.2	1.5	2.4	0.09	NS	1.6	7.4	8.0	6.5	NS
EW7-PM24B	-92.2	-321.0	-135	-109.0	NS	0.30	0.67	0.34	0.02	NS	11	0.053	ND	ND	NS	1.3	0.27	1.70	0.28	NS	ND	5.0	8.2	6.7	NS
EW7-PM25B	4.6	-330.7	-79	-123.3	-99.8	0.15	0.34	0.42	0.00	0.64	1.7	ND	0.053	ND	0.09	1.5	3.1	3.1	100	3.5	1.5	1.0	6.8	5.1	8.5
EW7-PM26B	-108.3	-318.6	-82	97.2	-104.6	0.28	1.07	0.41	0.03	0.01	7.5	ND	0.055	ND	0.10	0.57	1.3	1.8	1.8	1.5	0.7	11	7.2	4.5	3.9
EW7-PM27B	-86.3	-297.6	-107	-112.1	-135.3	0.24	0.50	0.36	0.05	0.01	8.3	0.056	0.16	ND	ND	1.1	1.8	1.8	4.8	6.5	1.1	3.9	5.7	10	8.2
EW7-PM28B	-12.2	-240.9	-141	-125.4	NS	0.23	0.29	0.29	0.05	NS	2.7	0.031	0.035	ND	NS	1.0	9.9	5.8	4.9	NS	5.2	12	9.2	7.4	NS
EW7-PM29B	-55.6	-300.9	-105	-119.1	-119.7	0.20	0.54	0.29	0.02	0.02	2.5	0.037	0.049	ND	0.09	2.4	0.33	1.6	3.1	7.9	2.4	8.1	7.2	5.1	6.7
Load Line 1																									
G0094	NS	NS	-28.0	NS	-12.1	NS	NS	0.64	NS	0.03	NS	NS	1.00	NS	11	NS	NS	6.1	NS	3.6	NS	NS	6.90	NS	3.3
G0096	NS	NS	65.0	NS	-102.0	NS	NS	0.61	NS	0.03	NS	NS	25	NS	14	NS	NS	0.19	NS	2.9	NS	NS	ND	NS	5.0
Load Line 2																									
G0111	NS	NS	14.0	NS	-198.4	NS	NS	0.86	NS	0.22	NS	NS	14	NS	7.8	NS	NS	0.39	NS	0.58	NS	NS	ND	NS	1.3
G0121	NS	NS	-80.0	NS	-127.9	NS	NS	0.50	NS	0.04	NS	NS	0.40	NS	ND	NS	NS	3.7	NS	31	NS	NS	4.4	NS	77
G0122	NS	NS	-61.0	NS	-266.4	NS	NS	0.30	NS	0.06	NS	NS	0.82	NS	0.021	NS	NS	1.9	NS	4.8	NS	NS	3.0	NS	10
G0123	NS	NS	45.0	NS	-126.2	NS	NS	0.31	NS	0.03	NS	NS	0.31	NS	0.02	NS	NS	0.24	NS	0.86	NS	NS	0.84	NS	13
Decant Station																									
G0102	NS	NS	-60.0	NS	-279.2	NS	NS	0.43	NS	0.03	NS	NS	3.9	NS	ND	NS	NS	0.072	NS	0.088	NS	NS	ND	NS	ND

Notes:

µg/L = micrograms per liter
CO_2 = carbon dioxide
DO = dissolved oxygen
DOC = dissolved organic carbon
EW = extraction well
mg/L = milligrams per liter
mS/cm = milliSiemens per centimeter
mV = millivolts
ND = nondetect
NS = no sample/measurement collected
NS* = Specific Conductance not measured due to instrument error.
ORP = oxidation/reduction potential
OU = Operable Unit
PM = performance monitoring
PZ = piezometer
TKN = total Kjeldahl nitrogen

TABLE 5-4
SUMMARY OF WATER QUALITY PARAMETERS, PERFORMANCE MONITORING LOCATIONS
OU1 SUBSURFACE INJECTION
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Performance Monitroing Well Number	DOC (mg/L)					CO_2 (mg/L)					Methane (µg/L)					Alkalinity (mg/L)					Ferrous Iron (mg/L)				
	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21
Shallow Wells																									
G0022	NS	NS	3.0	NS	3.0	NS	NS	182	NS	156	NS	NS	ND	NS	22	NS	NS	330	NS	350	NS	NS	0.26	NS	0.11
PZ017R	3.5	4.5	5.1	5.4	6.8	62	116	84	120	196	140	520	1800	7800	120	140	260	190	270	440	ND	0.04	0.42	ND	1.25
PZ018	3.3	3.3	4.0	3.9	7.9	89	32	43	44	142	240	ND	ND	60	8600	200	73	96	100	320	ND	0.02	0.42	ND	2.62
EW7-PM21A	3.7	7.6	11	6.3	23	142	173	173	156	204	340	320	4700	9400	15000	320	390	390	350	460	0.99	2.62	5.73	3.14	2.67
EW7-PM22A	3.5	84	68	18	NS	147	227	209	209	NS	800	2700	13000	12000	NS	330	510	470	470	NS	2.89	3.06	>15	8.76	NS
EW7-PM23A	3.6	3.8	12	22	NS	147	147	187	213	NS	420	460	8400	13000	NS	330	330	420	480	NS	2.73	0.90	10.28	5.80	NS
EW7-PM24A	3.8	14	20	16	17	151	178	213	200	276	380	760	9000	12000	13000	340	400	480	450	620	2.62	3.30	>15	5.96	2.10
EW7-PM25A	4.4	100	130	23	35	142	182	231	271	280	590	1600	5000	17000	17000	320	410	520	610	630	1.56	7.68	3.30	5.78	6.52
EW7-PM26A	3.9	27	9.6	9.3	7.7	147	196	222	178	218	1600	1300	2600	7400	13000	330	440	500	400	490	2.89	2.83	4.52	5.88	5.92
EW7-PM27A	4.2	13	42	15	NS	124	164	196	200	NS	610	170	6400	7900	NS	280	370	440	450	NS	2.89	2.48	6.60	5.30	NS
EW7-PM28A	4.8	29	46	72	28	164	187	209	240	244	1600	3300	15000	14000	ND	370	420	470	540	550	3.30	4.42	7.05	2.64	5.00
EW7-PM29A	3.1	93	38	12	12	102	160	196	156	187	450	1900	22000	12000	16000	230	360	440	350	420	3.30	11.28	2.64	7.50	6.12
Shallow-Intermediate Wells																									
EW7-PM21B	3.2	43	63	8.1	NS	133	160	182	142	NS	770	1300	6700	3800	NS	300	360	410	320	NS	2.89	>15	>15	5.34	NS
EW7-PM22B	3.3	480	96	33	NS	133	142	218	173	NS	690	1500	15000	10000	NS	300	320	490	390	NS	2.89	>15	>15	6.90	NS
EW7-PM23B	3.2	270	66	37	NS	138	196	253	253	NS	620	3300	21000	18000	NS	310	440	570	570	NS	2.89	>15	>15	2.50	NS
EW7-PM24B	3.8	140	150	34	NS	147	178	222	213	NS	1300	1100	14000	12000	NS	330	400	500	480	NS	3.30	9.56	>15	7.17	NS
EW7-PM25B	4.8	69	72	18	35	182	271	342	236	249	3900	1600	18000	21000	19000	410	610	770	530	560	0.72	2.12	4.28	3.15	6.48
EW7-PM26B	4.7	490	220	23	39	173	196	231	213	191	2900	3700	19000	14000	11000	390	440	520	480	430	2.78	>15	>15	2.02	7.32
EW7-PM27B	5.1	120	47	44	47	173	222	218	236	253	1700	3400	16000	11000	16000	390	500	490	530	570	2.89	6.20	4.32	6.78	6.54
EW7-PM28B	6.5	25	23	16	NS	200	311	329	227	NS	3500	2200	16000	19000	NS	450	700	740	510	NS	3.30	11.28	5.48	2.89	NS
EW7-PM29B	3.7	280	64	14	21	156	244	213	187	200	750	3100	9600	18000	16000	350	550	480	420	450	3.30	12.08	6.51	7.05	2.73
Load Line 1																									
G0094	NS	NS	5.8	NS	5.5	NS	NS	129	NS	169	NS	NS	19000	NS	12000	NS	NS	290	NS	380	NS	NS	12.20	NS	1.67
G0096	NS	NS	4.4	NS	120	NS	NS	124	NS	200	NS	NS	5100	NS	2200	NS	NS	280	NS	450	NS	NS	1.26	NS	3.22
Load Line 2																									
G0111	NS	NS	7.9	NS	9.5	NS	NS	320	NS	351	NS	NS	3800	NS	6400	NS	NS	720	NS	790	NS	NS	0.38	NS	2.24
G0121	NS	NS	8.0	NS	69	NS	NS	222	NS	356	NS	NS	10000	NS	5200	NS	NS	500	NS	800	NS	NS	8.08	NS	3.09
G0122	NS	NS	7.0	NS	150	NS	NS	258	NS	622	NS	NS	8500	NS	14000	NS	NS	580	NS	1400	NS	NS	7.80	NS	2.64
G0123	NS	NS	5.6	NS	580	NS	NS	231	NS	360	NS	NS	15000	NS	12000	NS	NS	520	NS	810	NS	NS	0.88	NS	6.54
Decant Station																									
G0102	NS	NS	3.90	NS	22	NS	NS	191	NS	293	NS	NS	1.80	NS	57	NS	NS	430	NS	660	NS	NS	2.95	NS	2.20

Notes:

µg/L = micrograms per liter
CO_2 = carbon dioxide
DO = dissolved oxygen
DOC = dissolved organic carbon
EW = extraction well
mg/L = milligrams per liter
mS/cm = milliSiemens per centimeter
mV = millivolts
ND = nondetect
NS = no sample/measurement collected
NS* = Specific Conductance not measured due to instrument error.
ORP = oxidation/reduction potential
OU = Operable Unit
PM = performance monitoring
PZ = piezometer
TKN = total Kjeldahl nitrogen

TABLE 5-4
SUMMARY OF WATER QUALITY PARAMETERS, PERFORMANCE MONITORING LOCATIONS
OU1 SUBSURFACE INJECTION
OU1 REBOUND STUDY LETTER REPORT - QUARTER 5

Performance Monitroing Well Number	Sulfate (mg/L)					Sulfide (mg/L)					pH					Conductance (mS/cm)				
	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21	Oct-19	Feb-20	Jun-20	Oct-20	Mar-21
Shallow Wells																				
G0022	NS	NS	NS	NS	120	NS	NS	0.80	NS	ND	NS	NS	7.08	NS	6.87	NS	NS	0.862	NS	0.850
PZ017R	74	83	62	64	53	ND	ND	ND	1.6	ND	6.34	6.16	6.90	6.07	6.40	0.652	0.797	0.788	0.840	0.900
PZ018	100	62	67	65	49	ND	ND	ND	ND	ND	6.57	5.52	6.46	5.99	6.30	0.664	0.520	0.590	0.550	0.700
EW7-PM21A	84	61	49	78	72	ND	ND	ND	ND	ND	7.66	6.12	6.38	6.65	6.35	0.724	0.700	0.920	0.886	0.925
EW7-PM22A	85	22	30	13	NS	ND	0.80	ND	ND	NS	7.05	6.11	6.16	6.46	NS	0.673	0.817	0.932	1.004	NS
EW7-PM23A	90	91	44	21	NS	ND	ND	ND	ND	NS	8.21	6.53	6.54	6.50	NS	0.740	0.705	0.949	1.223	NS
EW7-PM24A	84	57	40	32	16	ND	0.80	ND	ND	0.80	7.56	6.33	6.44	6.49	6.52	0.903	0.716	1.070	0.908	1.071
EW7-PM25A	87	39	38	ND	2.4	ND	0.80	0.80	ND	0.80	7.23	5.87	6.21	6.26	6.32	0.794	0.814	1.230	1.503	1.243
EW7-PM26A	73	20	36	54	48	ND	ND	ND	ND	ND	7.69	6.18	6.54	6.58	6.56	0.684	0.674	1.050	0.818	0.925
EW7-PM27A	120	83	47	37	NS	ND	ND	ND	ND	NS	7.01	6.35	6.07	6.37	NS	0.771	0.753	1.010	1.019	NS
EW7-PM28A	80	53	28	ND	2.5	ND	ND	ND	ND	0.80	7.45	6.11	6.23	6.29	6.34	0.797	0.731	1.110	1.222	0.106
EW7-PM29A	97	7.9	7.1	24	5.0	ND	ND	ND	0.80	0.80	7.29	5.71	6.25	6.40	6.52	0.600	0.623	0.955	0.818	0.817
Shallow-Intermediate Wells																				
EW7-PM21B	150	29	70	93	NS	ND	ND	ND	ND	NS	9.46	6.15	6.29	6.67	NS	0.697	0.646	0.952	0.553	NS
EW7-PM22B	160	45	14	11	NS	ND	ND	ND	ND	NS	7.64	5.32	6.15	6.49	NS	0.734	0.933	1.090	NS*	NS
EW7-PM23B	150	4.0	1.1	ND	NS	ND	ND	ND	ND	NS	7.98	5.72	6.14	6.30	NS	0.750	0.870	1.270	1.356	NS
EW7-PM24B	110	43	6.0	5.9	NS	ND	ND	0.80	0.80	NS	8.84	5.80	6.13	6.35	NS	0.707	0.786	1.160	1.095	NS
EW7-PM25B	110	4.0	ND	ND	ND	ND	ND	ND	ND	ND	7.11	6.38	6.46	6.43	6.42	0.791	0.971	1.530	1.464	0.746
EW7-PM26B	79	29	6.8	ND	46	ND	ND	ND	ND	ND	9.22	5.28	6.06	6.49	6.46	0.792	1.091	1.280	0.867	0.820
EW7-PM27B	90	16	37	2.1	ND	ND	0.80	ND	ND	ND	8.70	5.80	6.41	6.33	6.29	0.798	0.897	1.180	1.192	0.974
EW7-PM28B	71	3.4	ND	13	NS	ND	ND	0.80	ND	NS	7.09	6.44	6.74	6.58	NS	0.802	1.028	1.460	NS*	NS
EW7-PM29B	140	ND	ND	8.0	ND	ND	0.80	ND	0.80	0.80	8.07	5.66	6.32	6.50	6.49	0.769	1.099	1.11	0.964	0.953
Load Line 1																				
G0094	NS	NS	59	NS	82	NS	NS	ND	NS	ND	NS	NS	6.04	NS	6.30	NS	NS	0.791	NS	0.887
G0096	NS	NS	85	NS	120	NS	NS	ND	NS	ND	NS	NS	6.72	NS	6.19	NS	NS	1.040	NS	1.138
Load Line 2																				
G0111	NS	NS	370	NS	320	NS	NS	ND	NS	ND	NS	NS	7.06	NS	6.69	NS	NS	1.620	NS	1.762
G0121	NS	NS	500	NS	110	NS	NS	ND	NS	4.80	NS	NS	6.86	NS	5.02	NS	NS	1.770	NS	3.539
G0122	NS	NS	700	NS	45	NS	NS	ND	NS	1.60	NS	NS	7.01	NS	6.48	NS	NS	2.340	NS	2.339
G0123	NS	NS	490	NS	5.6	NS	NS	ND	NS	0.80	NS	NS	6.85	NS	6.00	NS	NS	1.860	NS	1.673
Decant Station																				
G0102	NS	NS	1100	NS	870	NS	NS	ND	NS	2.40	NS	NS	7.00	NS	6.68	NS	NS	2.740	NS	2.271

Notes:

µg/L = micrograms per liter

CO_2 = carbon dioxide

DO = dissolved oxygen

DOC = dissolved organic carbon

EW = extraction well

mg/L = milligrams per liter

mS/cm = milliSiemens per centimeter

mV = millivolts

ND = nondetect

NS = no sample/measurement collected

NS* = Specific Conductance not measured due to instrument error.

ORP = oxidation/reduction potential

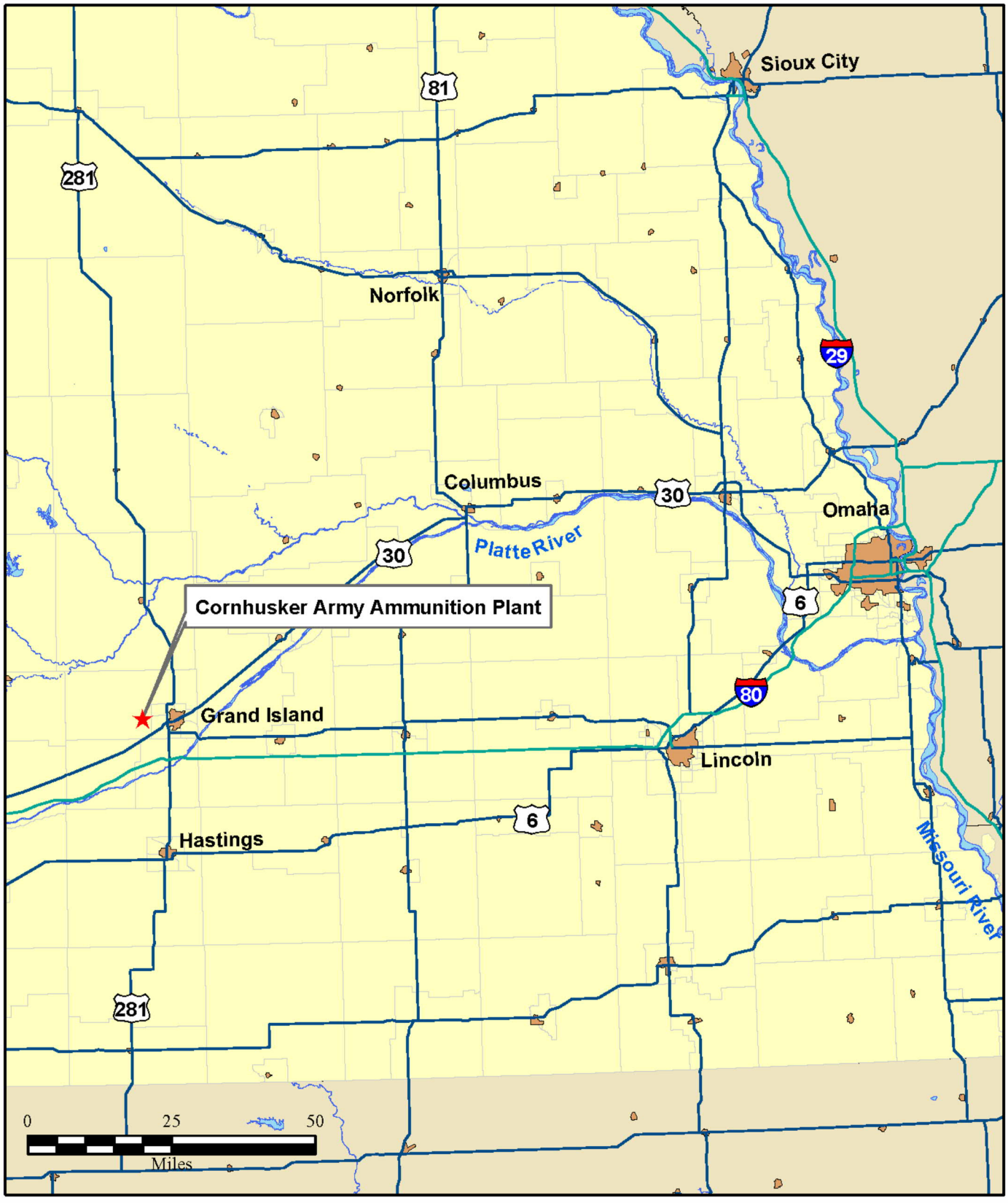
OU = Operable Unit

PM = performance monitoring

PZ = piezometer

TKN = total Kjeldahl nitrogen

Figures



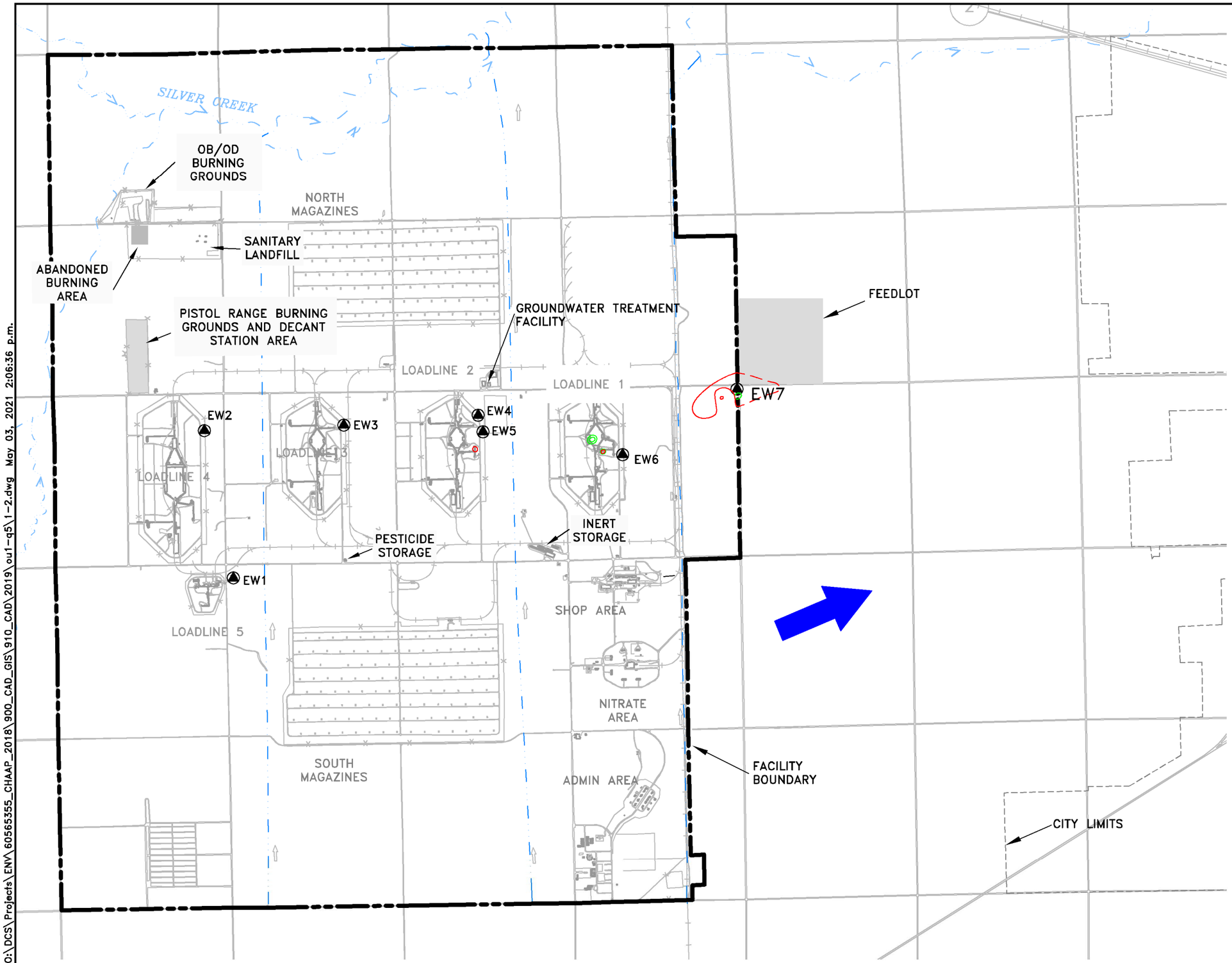
Brice ENGINEERING

AECOM

FACILITY LOCATION MAP
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 04/21/21	PROJECT NO. 60565355	FIG. NO. 1-1
CHK'D. BY: DC	DATE: 04/21/21		

Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\ou1-q5\1-1.dwg April 21, 2021 1:16:23 p.m.



LEGEND:

- ROADS
- FENCE
- FACILITY BOUNDARY
- SURFACE DRAINAGE
- DRAINAGE DITCH FLOW DIRECTION
- GRAND ISLAND CITY LIMITS
- ABANDONED BURNING GROUNDS, SANITARY LANDFILL, PISTOL RANGE BURNING GROUNDS, AND FEEDLOT
- INACTIVE GROUNDWATER EXTRACTION WELL
- 281 STATE ROUTE
- 30 U.S. ROUTE
- GENERAL GROUNDWATER FLOW DIRECTION
- 2 INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021
- 2 INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021
- 20 INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >20µg/L) FEBRUARY/MARCH 2021

N

0 3000 6000

SCALE FEET

Bruce ENGINEERING AECOM

SITE LOCATION MAP
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 04/21/21	PROJECT NO. 60565355	FIG. NO. 1-2
CHK'D. BY: DC	DATE: 04/21/21		

Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\ou1-qs\1-2.dwg May 03, 2021 2:06:36 p.m.

N. 60th Road

Monitor Road

13th Street

9

10

OS003		
Depth	TNT	RDX
21'-25'	0.2	ND
31'-35'	ND	ND
41'-45'	ND	ND

OS001		
Depth	TNT	RDX
21'-25'	20	ND
31'-35'	2	0.82
41'-45'	0.25	ND

NW050R		
Depth	TNT	RDX
16'-20'	ND	ND
31'-35'	ND	ND
56'-60'	ND	ND

(ND)(ND) G0080

(ND)(0.27) G0091
(ND)(ND) G0092

(0.8)(1.2) NW020
(ND)(ND) NW021
(ND)(ND) NW022

(3.9)(0.57) PZ020

(ND)(0.17) G0087

(0.48)(ND) G0024
(3.6)(0.82) G0077
(ND)(ND) G0078

G0086
(4.9)(0.59)

EW7

(10)(2.2) PZ017R

PZ018
(6)(ND)

(ND)(ND) PZ019

G0079 (ND)(ND)
G0075 (ND)(ND)
G0076 (ND)(ND)
G0070 (ND)(ND)

(ND)(ND) G0081

(ND)(0.53) G0082

G0090

OS002

OS004

NW060 (ND)(ND)
NW061 (ND)(ND)
NW062 (ND)(ND)

NW050
NW051
NW052

CA210 (ND)(ND)
CA211 (ND)(ND)
CA212 (ND)(ND)
CA213 (ND)(ND)

NW080
NW081R
NW082R

(ND)(ND) NW070
(ND)(ND) NW071

LEGEND:

- ON-POST GROUNDWATER MONITORING WELL
- OFF-POST GROUNDWATER MONITORING WELL
- ON-POST PIEZOMETER
- INACTIVE GROUNDWATER EXTRACTION WELL
- G0029 — OU1 GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 5 (FEBRUARY/MARCH 2021)
- OS001 — OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 5 (FEBRUARY/MARCH 2021)
- OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 4 (SEPTEMBER 2020)
- OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)

- (ND) TNT CONCENTRATION (µg/L)
- (ND) RDX CONCENTRATION (µg/L)
- ND NON DETECT
- GENERAL GROUNDWATER FLOW DIRECTION
- ROADS
- FACILITY BOUNDARY
- GRAND ISLAND CITY LIMITS
- SURFACE DRAINAGE
- (281) STATE ROUTE
- [30] U.S. ROUTE

- FEEDLOT
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021
- DASHED WHERE INFERRED
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021

NOTE: EW7 PUMPING RATE SET AT 0 GPM DURING OU1 REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

N

800 400 0 800
SCALE IN FEET

Bruce ENGINEERING AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 REBOUND STUDY, QUARTER 5 (FEBRUARY/MARCH 2021)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 04/21/21	PROJECT NO. 60565355	FIG. NO. 2-1
CHK'D. BY: DC	DATE: 04/21/21		

July 01, 2021 10:20:06 a.m.
Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\ou1-q5\2-1.dwg

13th Street

G0086
(4.9)
(0.59)

EW7
(INACTIVE)

EW7-PM23

EW7-PM22

EW7-PM21		
Depth	TNT	RDX
20'-30'	5.8	ND

EW7-PM24		
Depth	TNT	RDX
20'-30'	4.6	ND

EW7-PM25		
Depth	TNT	RDX
20'-30'	ND	ND
30'-40'	ND	ND

EW7-PM26		
Depth	TNT	RDX
20'-30'	0.66	ND
30'-40'	ND	ND

EW7-PM27		
Depth	TNT	RDX
30'-40'	ND	ND

EW7-PM28		
Depth	TNT	RDX
20'-30'	ND	ND

EW7-PM29		
Depth	TNT	RDX
20'-30'	ND	ND
30'-40'	ND	ND

EW7-T17
EW7-T18
EW7-T19
EW7-T20
EW7-T21
EW7-T22
EW7-T23
EW7-T24
EW7-T25
EW7-T26
EW7-T27

(10)
(2.2)
PZ017R

PZ018
(6)
(ND)

(ND)
(ND)
PZ019

N. 60th Road

2

2020 EW7 INJECTION WALL	LENGTH (FEET)	NUMBER OF POINTS	SPACING (FEET)	AMENDMENT
EW7-T17	165	12	15	WB66-10 9.8%
EW7-T18	165	12	15	WB66-10 9.8%
EW7-T19	165	12	15	WB66-10 9.8%
EW7-T20	165	12	15	WB66-10 9.8%
EW7-T21	345	24	15	WB66-10 9.8%
EW7-T22	165	12	15	WB66-10 9.8%
EW7-T23	525	36	15	WB66-10 9.8%
EW7-T24	525	36	15	WB66-10 9.8%
EW7-T25	525	36	15	WB66-10 9.8%
EW7-T26	432	30	15	WB66-10 9.8%
EW7-T27	165	12	15	WB66-10 9.8%
2020 EW7 TOTAL	3345	234		
EW7-T17 AND T18 ARE SHOWN ON FIGURE 2-3				

LEGEND

- G0121 — OU1 GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 5 (FEBRUARY/MARCH 2021)
- EW7-PM21 — OU1 GROUNDWATER SAMPLING LOCATIONS – PERFORMANCE MONITORING, QUARTER 5 (FEBRUARY/MARCH 2021)
- (ND) — TNT CONCENTRATION (µg/L)
- (ND) — RDX CONCENTRATION (µg/L)
- ND — NON DETECT
- WESBLEND 66–10 TREATMENT WALL LOCATION (9.8% BY VOLUME) (FEBRUARY/MARCH 2021)
- WESBLEND 66–10 TREATMENT WALL LOCATION (9.8% BY VOLUME) (OCTOBER/NOVEMBER 2019)
- BLDG 14 — FORMER SITE FEATURES
- ROADS
- FACILITY BOUNDARY

EW7 (INACTIVE)

- EXTRACTION WELL
- G0015 — ON–POST GROUNDWATER MONITORING WELL
- PZ007 — ON–POST PIEZOMETER
- PERFORMANCE MONITORING SAMPLING LOCATION (TEMPORARY WELL)
- 2018 DIRECT PUSH GROUNDWATER SAMPLING LOCATION (MARCH)
- 2016 DIRECT PUSH GROUNDWATER SAMPLING LOCATION (FEBRUARY)
- 2015 DIRECT PUSH GROUNDWATER SAMPLING LOCATION (MARCH)
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021
- DASHED WHERE INFERRED
- GENERAL GROUNDWATER FLOW DIRECTION

NOTE:
EW7 PUMPING RATE SET AT 0 GPM DURING OU1 REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

N

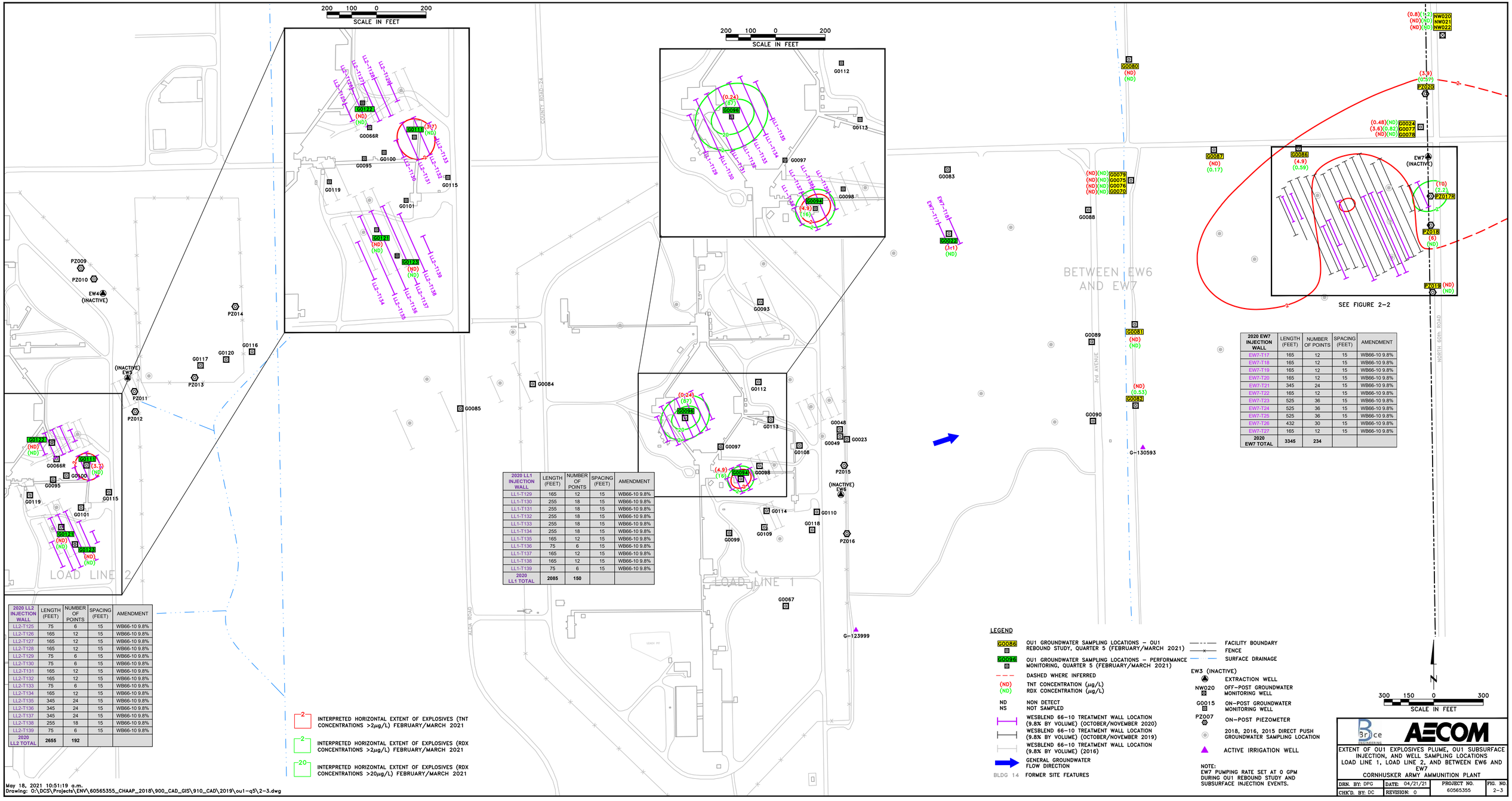
100 50 0 100
SCALE IN FEET

Bruce ENGINEERING
AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 SUBSURFACE INJECTION PERFORMANCE MONITORING, QUARTER 5 (FEBRUARY/MARCH 2021)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 04/21/21	PROJECT NO. 60565355	FIG. NO. 2-2
CHK'D. BY: DC	REVISION: 0		

July 01, 2021 10:24:11 a.m.
Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\ou1-q5\2-2.dwg



2020 LL2 INJECTION WALL	LENGTH (FEET)	NUMBER OF POINTS	SPACING (FEET)	AMENDMENT
LL2-T125	75	6	15	WB66-10 9.8%
LL2-T126	165	12	15	WB66-10 9.8%
LL2-T127	165	12	15	WB66-10 9.8%
LL2-T128	165	12	15	WB66-10 9.8%
LL2-T129	75	6	15	WB66-10 9.8%
LL2-T130	75	6	15	WB66-10 9.8%
LL2-T131	165	12	15	WB66-10 9.8%
LL2-T132	165	12	15	WB66-10 9.8%
LL2-T133	75	6	15	WB66-10 9.8%
LL2-T134	165	12	15	WB66-10 9.8%
LL2-T135	345	24	15	WB66-10 9.8%
LL2-T136	345	24	15	WB66-10 9.8%
LL2-T137	345	24	15	WB66-10 9.8%
LL2-T138	255	18	15	WB66-10 9.8%
LL2-T139	75	6	15	WB66-10 9.8%
2020 LL2 TOTAL	2655	192		

2020 LL1 INJECTION WALL	LENGTH (FEET)	NUMBER OF POINTS	SPACING (FEET)	AMENDMENT
LL1-T129	165	12	15	WB66-10 9.8%
LL1-T130	255	18	15	WB66-10 9.8%
LL1-T131	255	18	15	WB66-10 9.8%
LL1-T132	255	18	15	WB66-10 9.8%
LL1-T133	255	18	15	WB66-10 9.8%
LL1-T134	255	18	15	WB66-10 9.8%
LL1-T135	165	12	15	WB66-10 9.8%
LL1-T136	75	6	15	WB66-10 9.8%
LL1-T137	165	12	15	WB66-10 9.8%
LL1-T138	165	12	15	WB66-10 9.8%
LL1-T139	75	6	15	WB66-10 9.8%
2020 LL1 TOTAL	2085	150		

2020 EW7 INJECTION WALL	LENGTH (FEET)	NUMBER OF POINTS	SPACING (FEET)	AMENDMENT
EW7-T17	165	12	15	WB66-10 9.8%
EW7-T18	165	12	15	WB66-10 9.8%
EW7-T19	165	12	15	WB66-10 9.8%
EW7-T20	165	12	15	WB66-10 9.8%
EW7-T21	345	24	15	WB66-10 9.8%
EW7-T22	165	12	15	WB66-10 9.8%
EW7-T23	525	36	15	WB66-10 9.8%
EW7-T24	525	36	15	WB66-10 9.8%
EW7-T25	525	36	15	WB66-10 9.8%
EW7-T26	432	30	15	WB66-10 9.8%
EW7-T27	165	12	15	WB66-10 9.8%
2020 EW7 TOTAL	3345	234		

INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021

INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2021

INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >20µg/L) FEBRUARY/MARCH 2021

LEGEND

- OU1 GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 5 (FEBRUARY/MARCH 2021)
- OU1 GROUNDWATER SAMPLING LOCATIONS – PERFORMANCE MONITORING, QUARTER 5 (FEBRUARY/MARCH 2021)
- DASHED WHERE INFERRED
- TNT CONCENTRATION (µg/L)
- RDX CONCENTRATION (µg/L)
- ND NON DETECT
- NS NOT SAMPLED
- WESBLEND 66-10 TREATMENT WALL LOCATION (9.8% BY VOLUME) (OCTOBER/NOVEMBER 2020)
- WESBLEND 66-10 TREATMENT WALL LOCATION (9.8% BY VOLUME) (OCTOBER/NOVEMBER 2019)
- WESBLEND 66-10 TREATMENT WALL LOCATION (9.8% BY VOLUME) (2016)
- GENERAL GROUNDWATER FLOW DIRECTION
- BLDG 14 FORMER SITE FEATURES
- FACILITY BOUNDARY
- FENCE
- SURFACE DRAINAGE
- EW3 (INACTIVE) EXTRACTION WELL
- NW020 OFF-POST GROUNDWATER MONITORING WELL
- G0015 ON-POST GROUNDWATER MONITORING WELL
- PZ007 ON-POST PIEZOMETER
- 2018, 2016, 2015 DIRECT PUSH GROUNDWATER SAMPLING LOCATION
- ACTIVE IRRIGATION WELL

NOTE:
EW7 PUMPING RATE SET AT 0 GPM DURING OU1 REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

300 150 0 300
SCALE IN FEET

N

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 SUBSURFACE INJECTION, AND WELL SAMPLING LOCATIONS
LOAD LINE 1, LOAD LINE 2, AND BETWEEN EW6 AND EW7
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 04/21/21	PROJECT NO. 60565355	FIG. NO. 2-3
CHK'D. BY: DC	REVISION: 0		

May 18, 2021 10:51:19 a.m.
Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\ou1-q5\2-3.dwg

LEGEND:

- 4–FOOT BARBED WIRE FENCE
- G0102 — OU1 GROUNDWATER SAMPLING LOCATIONS – PERFORMANCE MONITORING, QUARTER 5 (MARCH 2021)
- (ND) — RDX CONCENTRATION (µg/L)
- (ND) — TNT CONCENTRATION (µg/L)
- ND — NON DETECT
- WESBLEND 66–10 TREATMENT WALL LOCATION (9.8% BY VOLUME) (SEPTEMBER/OCTOBER 2020)
- GENERAL GROUNDWATER FLOW DIRECTION

G0063

G0105

G0107

G0104

DS–T24

DS–T25

DS–T26

DS–T27

DS–T28

G0103

G0102
(ND)
(ND)

G0106

2020 DECANT STATION INJECTION WALL	LENGTH (FEET)	NUMBER OF POINTS	SPACING (FEET)	AMENDMENT
DS-T24	30	3	15	WB66-10 9.8%
DS-T25	75	6	15	WB66-10 9.8%
DS-T26	75	6	15	WB66-10 9.8%
DS-T27	75	6	15	WB66-10 9.8%
DS-T28	30	3	15	WB66-10 9.8%
2020 TOTAL	285	24		

N

50 0 50

SCALE IN FEET

Bruce ENGINEERING AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 SUBSURFACE INJECTION AND WELL SAMPLING LOCATIONS DECANT STATION (OU1)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 04/21/21	PROJECT NO. 60565355	FIG. NO. 2-4
CHK'D. BY: DC	DATE: 04/21/21		

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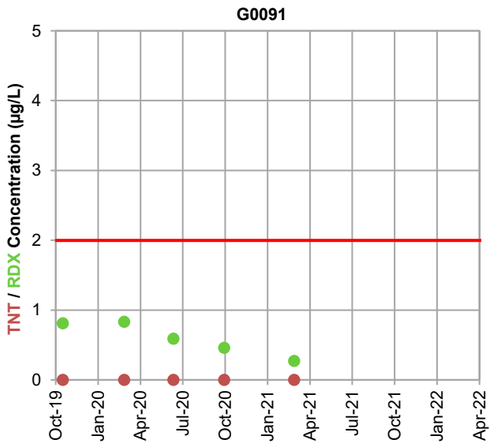
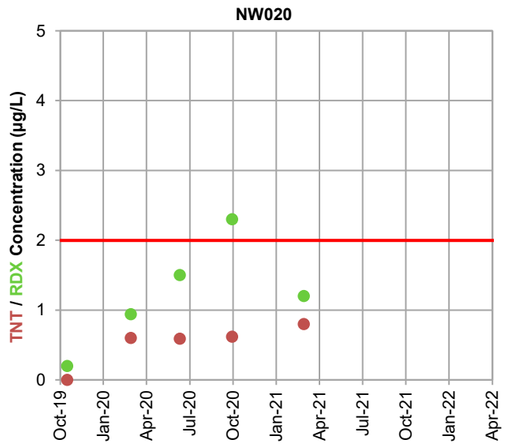




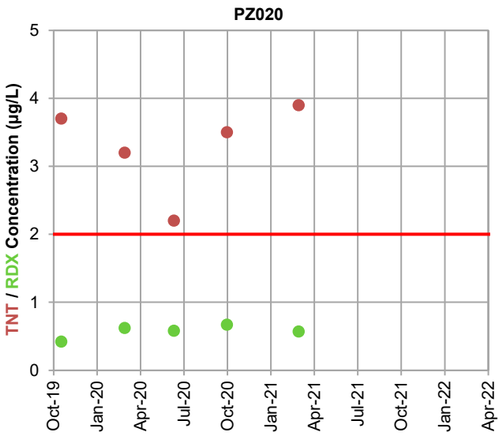
Nonparametric Trend Analysis for TNT and RDX (OU1 Rebound Study)

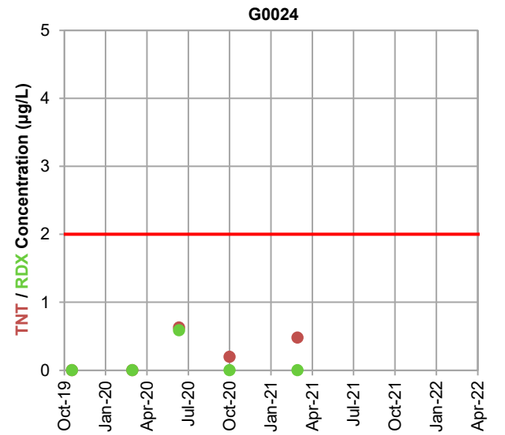
Well	Detects	Non-detects	Total Samples	Detection Frequency	Min (µg/L)	Max (µg/L)	Mean (µg/L)	Median (µg/L)	MK Result	Trend
G0091	0 / 5	5 / 0	5 / 5	ND / 100%	ND / 0.27	ND / 0.83	ND / 0.59	ND / 0.59	-8 / -8	ND / D
NW020	4 / 5	1 / 0	5 / 5	80% / 100%	ND / 0.20	0.80 / 2.3	0.52 / 1.2	0.60 / 1.2	8 / 6	I / NT
PZ020	5 / 5	0 / 0	5 / 5	100% / 100%	2.2 / 0.42	3.9 / 0.67	3.3 / 0.57	3.5 / 0.58	2 / 2	NT / NT
G0024	3 / 1	2 / 4	5 / 5	60% / 20%	ND / ND	0.63 / 0.59	0.26 / 0.12	0.20 / ND	5 / -5	NT / NT
G0077	5 / 5	0 / 0	5 / 5	100% / 100%	2.7 / 0.19	3.6 / 0.91	3.2 / 0.54	3.3 / 0.46	8 / 0	I / S
PZ017R	5 / 5	0 / 0	5 / 5	100% / 100%	10 / 0.87	17 / 2.2	14 / 1.5	15 / 1.4	-5 / 9	S / I
PZ018	4 / 2	1 / 3	5 / 5	80% / 40%	ND / ND	19 / 1.0	10 / 0.38	8.0 / ND	-2 / -4	S / NT

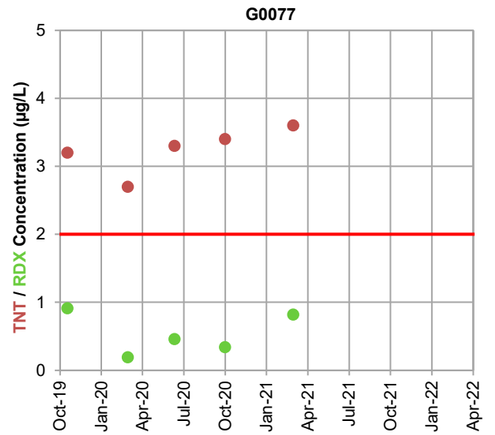
Notes:

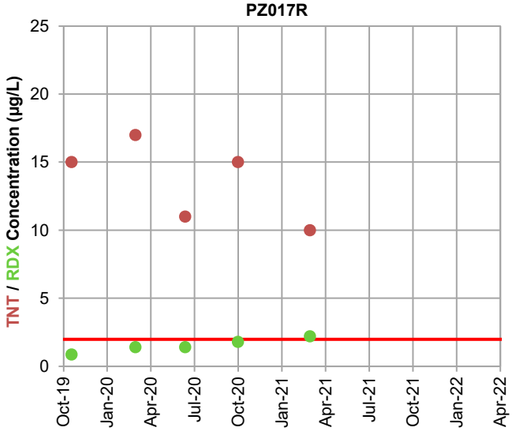
Trend analysis performed using Mann-Kendall test at 0.05 significance level. Only wells with detections are shown.

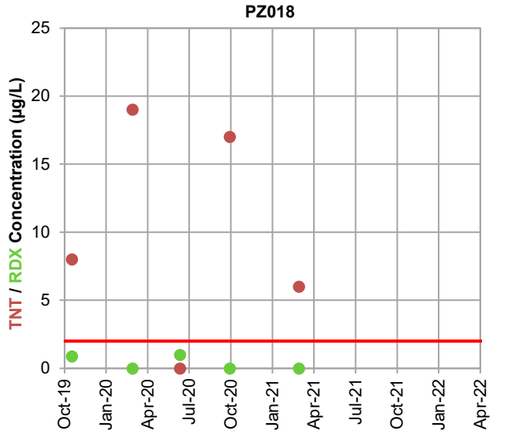
µg/L = micrograms per liter
MK = Mann-Kendall
OU = Operable Unit
= Health Advisory Level (HAL) (1994) TNT/RDX
TNT = 2,4,6-trinitrotoluene
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
I = Increasing
S = Stable
NT = No Trend
ND = No Detections
D = Decreasing





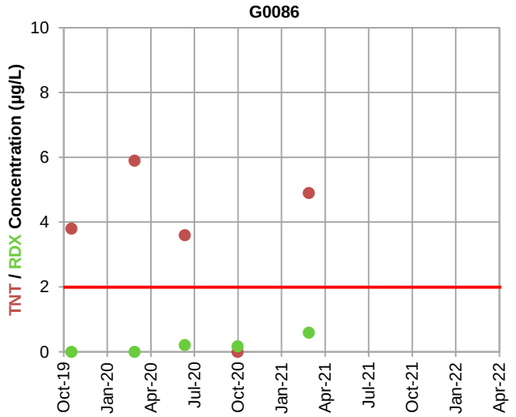


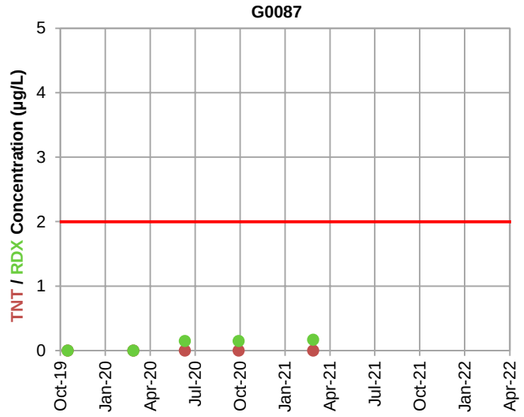


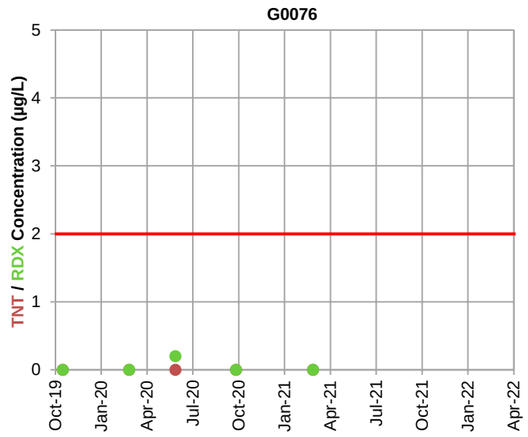


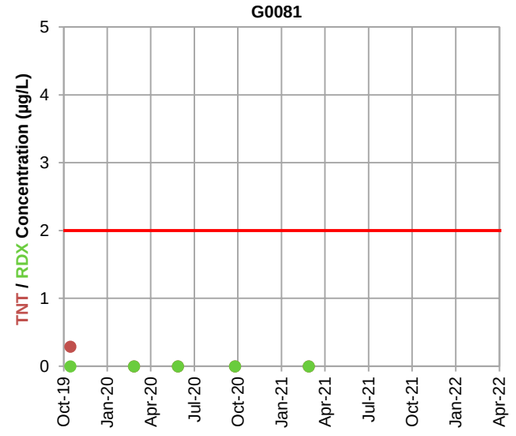
Mann-Kendall Analysis for TNT and RDX
Former Facility Boundary Wells (OU1)
Cornhusker Army Ammunition Plant

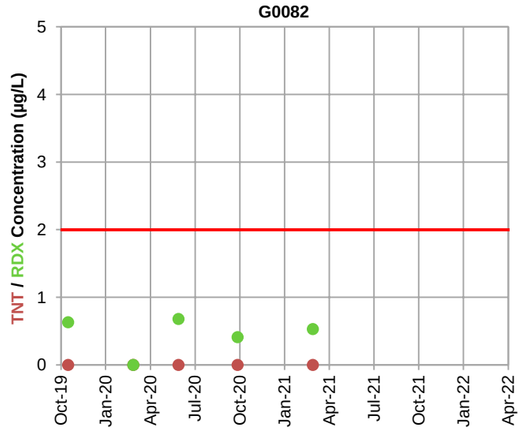
Drawn By:	Date:	
DC	4/30/2021	**Figure 4-1**
Checked By:	Project No.:	
JO	60565355	











Nonparametric Trend Analysis for TNT and RDX (OU1 Rebound Study)

Well	Detects	Non-detects	Total Samples	Detection Frequency	Min (µg/L)	Max (µg/L)	Mean (µg/L)	Median (µg/L)	MK Result	Trend
G0086	4 / 3	1 / 2	5 / 5	80% / 60%	ND / ND	5.9 / 0.59	3.6 / 0.19	3.8 / 0.17	-2 / 6	S / NT
G0087	0 / 3	5 / 2	5 / 5	ND / 60%	ND / ND	ND / 0.17	ND / 0.09	ND / 0.15	-6 / 8	ND / I
G0076	0 / 1	5 / 4	5 / 5	ND / 20%	ND / ND	ND / 0.20	ND / 0.04	ND / ND	-6 / -2	ND / S
G0081	1 / 0	4 / 5	5 / 5	20% / ND	ND / ND	0.29 / ND	0.06 / ND	ND / ND	-7 / -5	PD / ND
G0082	0 / 4	5 / 1	5 / 5	ND / 80%	ND / ND	ND / 0.68	ND / 0.45	ND / 0.53	-6 / 0	ND / S

Notes:

Trend analysis performed using Mann-Kendall test at 0.05 significance level. Only wells with detections are shown.

µg/L = micrograms per liter
MK = Mann-Kendall
OU = Operable Unit
= Health Advisory Level (HAL) (1994) TNT/RDX
TNT = 2,4,6-trinitrotoluene
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
I = Increasing
PD = Probably Decreasing
S = Stable
NT = No Trend
ND = No Detections

Brice ENGINEERING
AECOM

Mann-Kendall Analysis for TNT and RDX
Upgradient Wells (OU1)
Cornhusker Army Ammunition Plant

Drawn By:	Date:	
DC	4/30/2021	**Figure 4-2**
Checked By:	Project No.:	
JO	60565355	

Appendix A
Well Drilling Licenses

NEBRASKA
Good Life. Great Mission.
DEPT. OF HEALTH AND HUMAN SERVICES

Pete Ricketts, Governor

Public Health Licensure Unit
Certification of Licensure

This certificate serves as primary source verification of licensure in the State of Nebraska as of the close of the business day before 2/12/2021.

Name:	Corey S Anderson
Type:	WD-PIC
Number:	39516
Status:	
Issued:	01/02/2011
Expiration:	12/31/2022
Education:	None on record at this time

Disciplinary/Non-Disciplinary Information:

No disciplinary/non-disciplinary actions taken against this license.

If you have questions about this information, please contact the Licensure Unit at (402) 471-2115 or DHHS.LicensureUnit@nebraska.gov.

NEBRASKA
Good Life. Great Mission.
DEPT. OF HEALTH AND HUMAN SERVICES

Pete Ricketts, Governor

Public Health Licensure Unit
Certification of Licensure

This certificate serves as primary source verification of licensure in the State of Nebraska as of the close of the business day before 4/ 6/2021.

Name:	Jesse V Kalvig
Type:	Well Drilling Contractor
Number:	19210
Status:	Active
Issued:	09/19/2000
Expiration:	12/31/2022
Education:	None on record at this time

Disciplinary/Non-Disciplinary Information:

No disciplinary/non-disciplinary actions taken against this license.

If you have questions about this information, please contact the Licensure Unit at (402) 471-2115 or DHHS.LicensureUnit@nebraska.gov.

Appendix B
OU1 Rebound Study and Performance Monitoring Completed Field Forms

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. NW050R-DP05-20 SAMPLE DEPTH. 20'

DATE/TIME COLLECTED 2-22-21 @ 1300 PERSONNEL BE JO

SAMPLE METHOD Peristaltic Pump w/ Tubing

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	(NO)	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)

JO

WELL PURGING DATA

Date	2-22-21	PID Measurements	
Time Started	1235	Background	ND
Time Completed	1300	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	19.33 NTU	Purge Water	ND
Depth to Water (ft bgs)	8.05 bgs		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. NW050R-DP05-35 SAMPLE DEPTH. 35'

DATE/TIME COLLECTED 2-22-21 @ 1355 PERSONNEL BE

SAMPLE METHOD Peristaltic Pump w/ Tubing JO

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	(NO)	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)
	JO	

WELL PURGING DATA

Date	2-22-21	PID Measurements	
Time Started	1325	Background	ND
Time Completed	1355	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	795 NTU	Purge Water	ND
Depth to Water (ft bgs)	10.1		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. NW050R-DP05-60 SAMPLE DEPTH. 60'

DATE/TIME COLLECTED 2-22-21 @ 1500 PERSONNEL BE
SAMPLE METHOD Peristaltic Pump w/ Tubing JO

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	(NO)	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)
JO		

WELL PURGING DATA

Date	2-22-21	PID Measurements	
Time Started	1430	Background	ND
Time Completed	1500	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	1756 NTU	Purge Water	ND
Depth to Water (ft bgs)	10.9		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. 05001-DP05-25 SAMPLE DEPTH. 25' bgs

DATE/TIME COLLECTED 2-23-21 @ 1315 PERSONNEL BE JO

SAMPLE METHOD Peristaltic Pump w/ Tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: (YES) NO DUPLICATE SAMPLE NO. 05501-DP05-25@0800

MS/MSD REQUESTED YES (NO) MS/MSD SAMPLE NO. NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4 ~~2~~ 500mL Amber JO	6°C	Explosives + MNX (8330A)
JO		

WELL PURGING DATA

Date	2-23-21	PID Measurements	
Time Started	1240	Background	ND
Time Completed	1315	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	1070 NTU	Purge Water	ND
Depth to Water (ft bgs)	4.71		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. 05001-DP05-35 SAMPLE DEPTH. 35' bgs

DATE/TIME COLLECTED 2-23-21 @ 1410 PERSONNEL BE

SAMPLE METHOD Peristaltic Pump w/ Tubing JO

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED YES (NO) MS/MSD SAMPLE NO. NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)

JO

WELL PURGING DATA

Date	2-23-21	PID Measurements	
Time Started	1340	Background	ND
Time Completed	1410	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	917 NTU	Purge Water	ND
Depth to Water (ft bgs)	3.39		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. 05001-DP05-45 SAMPLE DEPTH. 45' bgs

DATE/TIME COLLECTED 2-23-21 @ 1515 PERSONNEL BE JO

SAMPLE METHOD Peristaltic Pump w/ Tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED YES (NO) MS/MSD SAMPLE NO. NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)

JO

WELL PURGING DATA

Date	2-23-21	PID Measurements	
Time Started	1440	Background	ND
Time Completed	1515	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	984 NTU	Purge Water	ND
Depth to Water (ft bgs)	10.15		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. 05003-DP05-25 SAMPLE DEPTH. 25' bgs

DATE/TIME COLLECTED 2-23-21 @ 0900 PERSONNEL BE

SAMPLE METHOD Peristaltic Pump w/ Tubing JO

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	(NO)	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)
NA		

WELL PURGING DATA

		PID Measurements	
Date	2-23-21		
Time Started	0820	Background	ND
Time Completed	0900	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	882 NTU	Purge Water	ND
Depth to Water (ft bgs)	11.52		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. 05003-DP05-35 SAMPLE DEPTH. 35' bgs

DATE/TIME COLLECTED 2-23-21 @ 1015 PERSONNEL BE

SAMPLE METHOD Peristaltic Pump w/ Tubing JO

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED YES (NO) MS/MSD SAMPLE NO. NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500mL Amber	6°C	Explosives + MNX (8330A)
JO		

WELL PURGING DATA

Date	2-23-21	PID Measurements	
Time Started	0925	Background	ND
Time Completed	1015	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	1518 NTU	Purge Water	ND
Depth to Water (ft bgs)	16.9		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

PROJECT NAME **CHAAP OU1 Rebound Study- Direct Push GW (Screen Point)** PROJECT NO. **60565355**

SAMPLE NO. 05003-DP05-~~35~~ 45 (JO) SAMPLE DEPTH. 45' bgs

DATE/TIME COLLECTED 2-23-21 @ 1120 (JO) PERSONNEL BE, JO

SAMPLE METHOD Peristaltic Pump w/ Tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED (YES) NO MS/MSD SAMPLE NO. 05003-DP05-45 (MS/MSD)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
6 ~~2~~ (JO) 500mL Amber	6°C	Explosives + MNX (8330A)
JO		

WELL PURGING DATA

Date	2-23-21	PID Measurements	
Time Started	1050	Background	ND
Time Completed	1120	Breathing Zone	ND
Purge Volume (gal)	3	Well Head	ND
Sample Turbidity	104 NTU	Purge Water	ND
Depth to Water (ft bgs)	4.68		

GENERAL COMMENTS

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	CA210-5	WELL NO.	CA210
DATE/TIME COLLECTED	3-2-21 @ 1335	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	16.85
Time Started	1255	Depth to Water (ft BTOC)	11.48
Time Completed	1335	Water Column Length	5.37
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	13.26
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1300	2.5	6.65	12.17	1.548	0.31	190.7	0.17	11.49	0.5
1305	5.0	6.68	12.31	1.548	0.29	188.2	0.12	11.48	↓
1310	7.5	6.71	12.33	1.548	0.28	185.8	0.08	11.48	
1315	10.0	6.73	12.59	1.547	0.27	183.6	0.19	11.46	
1320	12.5	6.74	13.07	1.550	0.25	181.2	3.01	11.47	
1325	15.0	6.74	13.00	1.549	0.20	179.6	1.45	11.46	
1330	17.5	6.75	13.03	1.545	0.18	178.5	0.58	11.46	
1335	20.0	6.75	13.17	1.545	0.21	177.6	0.41	11.46	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.18 mg/L

Multi-Parameter Probe Unit # 653 996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 14 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 7.9 - 17.9

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	61.3	210.0	210.0	**126.7**
DO	0.17	1.99	0.17	**0.77**
PH	5.83	6.66	6.36	**6.36**
Cond.	0.708	1.560	1.199	**1.199**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	CA211-5	WELL NO.	CA211
DATE/TIME COLLECTED	3-2-21 @ 1220	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	43.10
Time Started	1135	Depth to Water (ft BTOC)	11.66
Time Completed	1220	Water Column Length	31.44
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	77.66
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	22.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1140	2.5	6.74	12.25	1.003	0.75	168.5	0.00	11.66	0.5
1145	5.0	6.74	12.29	1.006	0.73	165.4	9.99	11.67	
1150	7.5	6.74	12.17	1.009	0.77	164.0	10.71	11.64	
1155	10.0	6.74	12.26	1.014	0.77	162.9	11.10	11.64	
1200	12.5	6.73	12.46	1.013	0.76	162.1	9.21	11.63	
1205	15.0	6.73	12.53	1.015	0.76	162.0	12.24	11.63	
1210	17.5	6.73	12.68	1.020	0.75	161.9	0.02	11.63	
1215	20.0	6.72	12.74	1.025	0.75	162.1	0.03	11.63	
1220	22.5	6.72	12.88	1.026	0.75	162.3	0.05	11.63	
		JO							

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.08 mg/L

Multi-Parameter Probe Unit # 653 996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 37 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 32.8 - 42.8

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	33.6	188.2	188.2	**119.3**
DO	0.10	0.93	0.10	**0.56**
PH	6.45	6.72	6.53	**6.53**
Cond.	0.662	1.110	0.834	**0.834**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	CA212-5	WELL NO.	CA212
DATE/TIME COLLECTED	3-2-21 @ 1025	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	67.12
Time Started	0945	Depth to Water (ft BTOC)	11.64
Time Completed	1025	Water Column Length	55.48
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	137.04
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
0950	2.5	6.94	11.09	0.631	0.17	165.8	0.16	11.64	0.5
0955	5.0	6.98	11.21	0.625	0.12	162.5	4.64	11.65	
1000	7.5	6.99	11.20	0.626	0.10	161.6	3.74	11.65	
1005	10.0	6.99	11.39	0.624	0.08	161.1	19.51	11.64	
1010	12.5	6.98	11.45	0.622	0.07	161.1	2.59	11.63	
1015	15.0	6.98	11.43	0.623	0.06	161.2	2.91	11.63	
1020	17.5	6.97	11.49	0.621	0.05	161.6	3.41	11.64	
1025	20.0	6.97	11.17	0.621	0.05	161.4	2.64	11.64	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.16 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 62 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 57.0 - 67.0

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	22.3	167.4	167.4	**109.3**
DO	0.13	0.89	0.13	**0.47**
PH	6.64	7.05	6.82	**6.82**
Cond.	0.496	0.732	0.615	**0.615**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	CA213-5	WELL NO.	CA213
DATE/TIME COLLECTED	3-2-21 @0900	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	91.34
Time Started	0820	Depth to Water (ft BTOC)	12.38
Time Completed	0900	Water Column Length	78.96
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	195.03
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20 L
Purge Water	ND	Actual Purge (L)	20 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
0825	2.5	7.74	8.60	0.452	0.53	172.8	134.80	12.38	0.5
0830	5.0	7.71	7.90	0.450	0.51	172.1	209.74	12.38	
0835	7.5	7.67	7.22	0.448	0.58	171.8	37.31	12.37	
0840	10.0	7.67	5.62	0.440	0.49	173.9	35.48	12.37	
0845	12.5	7.65	5.06	0.442	0.49	175.5	44.92	12.38	
0850	15.0	7.64	4.92	0.451	0.60	175.3	54.87	12.37	
0855	17.5	7.69	5.14	0.450	0.66	169.8	47.34	12.36	
0900	20.0	7.63	5.25	0.447	0.66	172.3	42.94	12.36	
				JO					

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.00 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 84 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 79.6 - 89.6

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	17.4	118.3	97.9	**82.2**
DO	0.09	1.51	0.09	**0.58**
PH	7.47	7.82	7.62	**7.62**
Cond.	0.373	0.501	0.426	**0.426**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW020-5	WELL NO.	NW020
DATE/TIME COLLECTED	3-3-21 @ 0845	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED:	YES / **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft BTOC)	29.92
Time Started	0805	Depth to Water (ft BTOC)	15.50
Time Completed	0845	Water Column Length	14.42
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	35.62
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
0810	2.5	6.76	10.43	1.512	5.77	193.8	4.06	15.50	~~0~~ 0.5
0815	5.0	6.79	10.60	1.511	5.69	179.8	4.78	15.51	
0820	7.5	6.82	10.71	1.509	5.67	169.4	3.85	15.50	
0825	10.0	6.85	10.87	1.507	5.63	160.5	4.94	15.49	
0830	12.5	6.87	11.01	1.506	5.60	152.8	5.55	15.50	
0835	15.0	6.88	11.10	1.505	5.59	146.0	5.95	15.50	
0840	17.5	6.90	10.96	1.504	5.55	142.6	6.36	15.49	
0845	20.0	6.90	11.81	1.504	5.54	138.9	6.57	15.48	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.15 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = ~~30~~ ~~35~~ 22 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 15-~~55~~ 30

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	41.1	153.0	118.2	**113.9**
DO	2.72	6.30	5.41	**4.50**
PH	6.19	6.81	6.48	**6.48**
Cond.	0.802	1.510	1.510	**1.108**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW021-5	WELL NO.	NW021
DATE/TIME COLLECTED	3-3-21 @ 1005	PERSONNEL	JO
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		GC
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft BTOC)	45.75
Time Started	0925	Depth to Water (ft BTOC)	15.72
Time Completed	1005	Water Column Length	30.03
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	74.17
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20 L
Purge Water	ND	Actual Purge (L)	20 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
0930	2.5	6.67	11.86	1.032	0.04	-9.5	65.34	15.72	0.5
0935	5.0	6.67	11.89	1.029	0.04	-13.4	36.69	15.74	↓
0940	7.5	6.69	12.05	0.997	0.03	-43.3	30.16	15.77	
0945	10.0	6.70	12.18	0.943	0.03	-73.1	23.01	15.79	
0950	12.5	6.73	12.02	0.924	0.04	-90.9	16.44	15.79	
0955	15.0	6.74	12.05	0.914	0.04	-103.9	21.14	15.79	
1000	17.5	6.75	12.44	0.984	0.04	-115.8	12.72	15.79	
1005	20.0	6.79	12.51	0.982	0.04	-110.2	15.22	15.79	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.18 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 46 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 37-52

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	26.7	150.0	137.5	**105.7**
DO	0.06	1.18	0.06	**0.43**
PH	6.53	6.93	6.75	**6.75**
Cond.	0.825	1.180	1.070	**0.974**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW022-5	WELL NO.	NW022
DATE/TIME COLLECTED	3-3-21 @1125	PERSONNEL	JO
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		GC
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft BTOC)	66.60
Time Started	1045	Depth to Water (ft BTOC)	15.67
Time Completed	1125	Water Column Length	50.93
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	125.80
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1050	2.5	6.88	12.72	1.276	0.14	10.9	7.80	15.69	0.5
1055	5.0	6.90	12.77	1.260	0.12	2.2	12.23	15.68	
1100	7.5	6.91	12.92	1.265	0.10	-4.3	2.00	15.67	
1105	10.0	6.92	13.40	1.252	0.09	-9.3	~~8.70~~ 2.61	15.68	
1110	12.5	6.93	13.37	1.210	0.09	-12.8	8.70	15.69	
1115	15.0	6.94	13.45	1.222	0.08	-15.2	11.46	15.69	
1120	17.5	6.95	13.56	1.223	0.08	-17.6	10.46	15.68	
1125	20.0	6.97	13.58	1.257	0.08	-19.9	20.04	15.68	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 1.00 mg/L

Multi-Parameter Probe Unit # 653946

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 62 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 59 - 64

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-34.9	207.7	-34.9	**64.5**
DO	0.05	1.15	0.05	**0.43**
PH	6.77	7.14	6.98	**6.98**
Cond.	0.964	1.390	1.280	**1.144**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW060-5	WELL NO.	NW060
DATE/TIME COLLECTED	3-1-21 @ 1310	PERSONNEL	JO
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		GC

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	20.15
Time Started	1230	Depth to Water (ft BTOC)	13.94
Time Completed	1310	Water Column Length	6.21
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	15.34
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1235	2.5	6.59	11.54	0.210 ~~210.~~	10.20	179.5	0.94	13.94	0.5
1240	5.0	6.57	11.44	0.208	10.21	184.5	0.29	14.00	
1245	7.5	6.56	11.36	0.207	10.23	186.3	0.07	14.00	
1250	10.0	6.57	11.38	0.206	10.23	188.5	0.06	14.00	
1255	12.5	6.56	11.32	0.205	10.22	191.3	0.07	14.00	
1300	15.0	6.56	11.35	0.204	10.22	194.3	0.07	13.99	
1305	17.5	6.56	11.40	0.204	10.21	194.8	0.05	13.98	
1310	20.0	6.56	11.43	0.203	10.23	196.7	0.05	13.98	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.00 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 17 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 10.0 - 20.0

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	29.2	171.6	156.7	**121.9**
DO	9.26	10.75	9.26	**10.21**
PH	5.82	6.46	6.04	**6.04**
Cond.	0.065	0.200	0.200	**0.104**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW061-5	WELL NO.	NW061
DATE/TIME COLLECTED	3-1-21 @ 1550	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	44.90
Time Started	1505	Depth to Water (ft BTOC)	13.62
Time Completed	1550	Water Column Length	31.28
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	77.26
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	22.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1510	2.5	7.13	12.32	0.936	0.04	16.2	546.72	13.62	0.5
1515	5.0	7.13	12.07	0.589	0.04	15.6	631.09	13.62	
1520	7.5	7.13	12.09	0.945	0.03	17.0	61.60	13.62	
1525	10.0	7.13	12.00	0.942	0.03	19.7	15.77	13.64	
1530	12.5	7.13	11.89	0.943	0.03	23.2	8.88	13.65	
1535	15.0	7.13	11.82	0.949	0.03	25.9	29.46	13.65	
1540	17.5	7.13	11.75	0.945	0.03	29.0	7.66	13.66	
1545	20.0	7.13	11.68	0.946	0.03	31.0	8.24	13.65	
1550	22.5	7.13	11.70	0.941	0.03	35.3	8.27	13.65	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.00 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 42 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 40.3 - 45.3

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	0.1	196.8	196.8	**128.6**
DO	0.18	0.68	0.22	**0.37**
PH	6.59	7.01	6.90	**6.90**
Cond.	0.308	1.070	1.070	**0.713**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW062-5	WELL NO.	NW062
DATE/TIME COLLECTED	3-1-21 @ 1420	PERSONNEL	JO GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	63.45
Time Started	1340	Depth to Water (ft BTOC)	13.94
Time Completed	1420	Water Column Length	49.51
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	122.29
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20 L
Purge Water	ND	Actual Purge (L)	20 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1345	2.5	7.38	12.62	0.883	0.10	-39.5	157.32	13.94	0.5
1350	5.0	7.39	12.48	0.877	0.07	-59.1	241.82	13.94	
1355	7.5	7.40	12.38	0.884	0.06	-75.6	264.36	13.94	
1400	10.0	7.40	12.40	0.885	0.06	-88.2	212.18	13.93	
1405	12.5	7.40	12.47	0.887	0.06	-88.6	318.52	13.95	
1410	15.0	7.40	12.27	0.885	0.06	-92.9	18.96	13.94	
1415	17.5	7.40	12.48	0.885	0.05	-96.8	32.75	13.95	
1420	20.0	7.41	12.35	0.883	0.05	-100.6	30.26	13.95	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.73 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 61 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 58.1 - 63.1

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	-67.0	38.6	-62.2	**-26.6**
DO	0.15	0.65	0.15	**0.35**
PH	6.71	8.11	7.29	**7.29**
Cond.	0.270	0.850	0.850	**0.601**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW070-5	WELL NO.	NW070
DATE/TIME COLLECTED	3-1-21 @ 0920	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	20.91
Time Started	0840	Depth to Water (ft BTOC)	10.57
Time Completed	0920	Water Column Length	10.34
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	25.54
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
0845	2.5	7.16	13.02	0.941	0.21	168.2	0.38	10.57	0.5
0850	5.0	7.14	13.24	0.941	0.18	168.3	0.31	10.58	
0855	7.5	7.15	13.68	0.939	0.15	167.8	0.14	10.58	
0900	10.0	7.17	14.10	0.935	0.12	166.8	0.12	10.58	
0905	12.5	7.18	13.48	0.936	0.11	166.4	0.11	10.58	
0910	15.0	7.20	13.52	0.932	0.09	165.6	0.09	10.58	
0915	17.5	7.22	13.60	0.930	0.08	166.2	0.10	10.61	
0920	20.0	7.24	13.59	0.926	0.07	163.2	1.01	10.61	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.00 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 15 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 10.6 - 20.6

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-307.4	127.0	107.0	**-20.1**
DO	0.12	1.59	0.12	**0.62**
PH	6.51	7.25	6.86	**6.86**
Cond.	0.096	0.910	0.910	**0.346**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	NW071-5	WELL NO.	NW071
DATE/TIME COLLECTED	3-1-21 @ 1100	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	60.43
Time Started	1020	Depth to Water (ft BTOC)	10.39
Time Completed	1100	Water Column Length	50.04
PID Measurements		Well Casing Volume (per ft)	2.47 L
Background	ND	Volume of Water in Well (L)	123.60
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1025	2.5	6.56	11.46	0.680	1.80	89.4	13.25	10.39	0.5
1030	5.0	6.58	10.28	0.683	1.88	94.9	14.25	10.39	
1035	7.5	6.57	10.35	0.684	1.91	99.8	17.55	10.39	
1040	10.0	6.57	10.46	0.687	1.94	102.2	17.42	10.38	
1045	12.5	6.59	10.47	0.685	1.91	103.7	19.50	10.38	
1050	15.0	6.59	10.87	0.686	1.93	104.8	15.37	10.38	
1055	17.5	6.61	10.53	0.685	1.93	106.7	14.63	10.38	
1100	20.0	6.61	11.55	0.686	1.94	107.8	12.84	10.38	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.18 mg/L

Multi-Parameter Probe Unit # 653496

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 58 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 55.2 - 60.2

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-151.2	158.1	130.0	**56.2**
DO	0.46	3.43	0.46	**2.27**
PH	6.32	6.62	6.42	**6.42**
Cond.	0.519	0.745	0.610	**0.609**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0024-5	WELL NO.	G0024
DATE/TIME COLLECTED	3-3-21 @1330	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft BTOC)	33.28
Time Started	1250	Depth to Water (ft BTOC)	12.69
Time Completed	1330	Water Column Length	20.59
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	50.86
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1255	2.5	6.56	13.17	0.663	5.28	157.6	0.29	12.69	0.5
1300	5.0	6.56	13.23	0.663	5.28	163.1	0.28	12.70	
1305	7.5	6.56	13.62	0.664	5.28	166.7	0.56	12.71	
1310	10.0	6.56	13.49	0.664	5.29	169.7	1.78	12.73	
1315	12.5	6.58	13.55	0.663	5.28	172.1	7.04	12.77	
1320	15.0	6.59	13.72	0.661	5.30	173.7	3.69	12.79	
1325	17.5	6.61	13.65	0.659	5.30	174.6	6.31	12.78	
1330	20.0	6.64	13.64	0.654	5.31	175.4	5.52	12.78	
		JO							

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.10 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 23 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 16-31

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	22.5	156.5	155.4	**104.4**
DO	4.70	8.09	5.01	**5.95**
PH	6.19	6.87	6.70	**6.55**
Cond.	0.226	1.201	0.740	**0.812**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0070-5	WELL NO.	G0070
DATE/TIME COLLECTED	3-1-21 / 1600	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	**YES**	NO	MS/MSD SAMPLE NO.	**G0070-5 MS/MSD**

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	82.65
Time Started	1520	Depth to Water (ft BTOC)	16.03
Time Completed	1600	Water Column Length	66.62
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	164.5
Breathing Zone		Casing Volumes to Purge	NA
Well Head		Minimum to Purge (L)	20
Purge Water		Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1525	2.5	6.94	11.69	.427	2.41	130.1	0.45	16.22	.500
1530	5.0	6.89	11.80	.426	2.29	117.0	0.51	16.22	.500
1535	7.5	6.88	11.90	.426	2.15	108.9	0.47	16.22	.500
1540	10	6.90	12.10	.426	2.04	102.1	0.45	16.22	.500
1545	12.5	6.93	12.10	.426	1.95	96.6	0.29	16.22	.500
1550	15	6.95	12.00	.425	1.89	91.7	0.31	16.22	.500
1555	17.5	6.99	11.93	.425	1.81	87.9	0.35	16.22	.500
1600	20	7.02	11.97	.427	1.80	84.2	0.37	16.22	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.0 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 77 ft

Pump Rate = 500 ml/min

Well Diameter = 4"

Screen Interval = 75-80

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	16.5	138.1	68.5	**87.9**
DO	0.42	3.29	0.54	**1.35**
PH	6.78	7.12	6.88	**6.96**
Cond.	0.354	0.511	NS	**0.429**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0075-5	WELL NO.	G0075
DATE/TIME COLLECTED	3-1-21 / 1330	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	↓
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	37.71
Time Started	1250	Depth to Water (ft BTOC)	16.0
Time Completed	1330	Water Column Length	21.71
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	~~54~~ 53.6
Breathing Zone	↓	Casing Volumes to Purge	NA
Well Head		Minimum to Purge (L)	20 L
Purge Water		Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1255	2.5	6.97	13.34	.809	2.16	110.6	1.02	16.0	.500
1300	5.0	6.97	13.85	.809	1.81	94.7	.89	16.0	.500
1305	7.5	6.97	14.10	.806	1.77	88.0	.56	16.0	.500
1310	10	6.97	14.00	.804	1.90	84.3	.48	16.0	.500
1315	12.5	6.97	12.52	.808	2.14	86.3	.46	16.0	.500
1320	15	6.96	13.05	.808	2.29	87.3	.43	16.00	.500
1325	17.5	6.96	13.25	.807	2.22	88.1	.41	16.00	.500
1330	20	6.98	13.15	.809	2.09	88.2	.44	16.00	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.14 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 33 ft

Pump Rate = 500 ml/

Well Diameter = 4"

Screen Interval = 25-35

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	36.8	257.3	257.3	**133.3**
DO	0.03	6.86	0.03	**1.66**
PH	6.44	6.83	6.72	**6.60**
Cond.	0.650	0.995	0.730	**0.825**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0076-5	WELL NO.	G0076
DATE/TIME COLLECTED	3-1-21 / 1445	PERSONNEL	BE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	↓
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	65.20
Time Started	1405	Depth to Water (ft BTOC)	15.79
Time Completed	1445	Water Column Length	49.44
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	122.1
Breathing Zone	↓	Casing Volumes to Purge	NA
Well Head		Minimum to Purge (L)	20
Purge Water		Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1410	2.5	6.73	12.54	1.144	0.19	-30.4	1.6	15.79	.500
1415	5.0	6.71	12.78	1.142	0.13	-36.3	20.0	15.79	.500
1420	7.5	6.69	12.99	1.141	0.10	-38.7	0.14	15.79	.500
1425	10	6.68	12.99	1.135	0.08	-39.9	0.30	15.79	.500
1430	12.5	6.70	13.05	1.136	0.07	-41.3	0.41	15.79	.500
1435	15	6.73	13.15	1.137	0.06	-44.0	0.37	15.79	.500
1440	17.5	6.78	13.15	1.134	0.06	-46.4	0.40	15.79	.500
1445	20	6.81	13.15	1.135	0.05	-49.0	0.35	15.79	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.11 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 60 ft

Pump Rate = 500

Well Diameter = 4"

Screen Interval = 54-64

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-36.2	83.2	-13.1	**17.1**
DO	0.08	1.91	0.09	**0.69**
PH	6.59	6.93	6.74	**6.75**
Cond.	0.870	1.260	NS	**1.060**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0077-5	WELL NO.	G0077
DATE/TIME COLLECTED	3-3-21 @ 1500	PERSONNEL	JO
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		GC
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft BTOC)	37.70
Time Started	1420	Depth to Water (ft BTOC)	13.07
Time Completed	1500	Water Column Length	24.63
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	60.84
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1425	2.5	6.55	13.81	0.659	5.37	191.6	1.33	13.10	0.5
1430	5.0	6.57	13.91	0.699	5.37	191.0	1.69	13.09	
1435	7.5	6.58	13.96	0.739	4.13	192.9	1.53	13.10	
1440	10.0	6.58	13.96	0.749	3.97	192.9	1.46	13.08	
1445	12.5	6.59	14.14	0.773	3.10	193.4	0.24	13.08	
1450	15.0	6.60	14.21	0.782	2.52	193.3	0.32	13.08	
1455	17.5	6.60	14.23	0.793	2.29	193.1	1.08	13.08	
1500	20.0	6.61	14.25	0.795	2.34	194.5	0.27	13.08	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.16 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 30 ft

Pump Rate = 0.5 L/min

Well Diameter = 4"

Screen Interval = 25-35

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	20.4	144.8	115.5	**88.5**
DO	1.53	5.43	2.62	**2.86**
PH	6.53	6.83	6.71	**6.68**
Cond.	0.620	1.012	0.780	**0.847**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0078-5	WELL NO.	G0078
DATE/TIME COLLECTED	3-3-21 @ 1615	PERSONNEL	JO
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		GC
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft BTOC)	62.80
Time Started	1530	Depth to Water (ft BTOC)	13.06
Time Completed	1615	Water Column Length	49.74
PID Measurements		Well Casing Volume (per ft)	2.47
Background	NP	Volume of Water in Well (L)	122.86
Breathing Zone	NP	Casing Volumes to Purge	NA
Well Head	NP	Minimum to Purge (L)	20
Purge Water	NP	Actual Purge (L)	22.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1535	~2.5	6.72	15.26	0.941	0.23	28.2	9.03	13.06	0.5
1540	5.0	6.73	14.16	0.955	0.26	14.5	17.79	13.07	
1545	7.5	6.74	14.06	0.976	0.23	1.7	14.56	13.08	
1550	10.0	6.75	14.01	0.970	0.18	-6.2	4.96	13.09	
1555	12.5	6.75	14.20	0.984	0.16	-9.3	21.71	13.09	
1600	15.0	6.75	14.20	0.978	0.14	-10.7	28.83	13.07	
1605	17.5	6.75	14.24	0.939	0.12	-10.9	2.79	13.07	
1610	20.0	6.76	14.39	0.948	0.11	-10.6	5.55	13.07	
1615	22.5	6.78	14.44	0.957	0.10	-10.9	5.93	13.07	
				JO					

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 1.41 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 55 ft

Pump Rate = 0.5 L / min

Well Diameter = 4"

Screen Interval = 50-60

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-21.2	99.4	-21.2	**31.7**
DO	0.09	0.45	0.09	**0.28**
PH	6.78	7.10	6.78	**6.92**
Cond.	0.878	1.280	1.070	**1.082**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0079-5	WELL NO.	G0079
DATE/TIME COLLECTED	3-1-21 / 1225	PERSONNEL	RE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	↓
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	19.62
Time Started	1145	Depth to Water (ft BTOC)	16.15
Time Completed	1225	Water Column Length	3.47
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	8.57
Breathing Zone	↓	Casing Volumes to Purge	NA
Well Head	↓	Minimum to Purge (L)	20
Purge Water	↓	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1150	2.5	6.65	11.95	.498	3.13	82.4	23.1	16.22	500
1155	5.0	6.66	12.01	.513	3.00	78.5	18.5	16.22	500
1200	7.5	6.66	12.57	.527	2.88	77.5	16.1	16.22	500
1205	10	6.67	12.79	.539	2.78	77.5	13.3	16.22	500
1210	12.5	6.66	12.81	.550	2.69	78.7	10.7	16.22	500
1215	15	6.66	12.85	.561	2.63	79.3	8.5	16.22	500
1220	17.5	6.66	12.79	.568	2.56	80.3	5.9	16.22	500
1225	20	6.67	12.81	.575	2.51	81.8	5.0	16.22	500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.30 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 18 ft

Pump Rate = 500

Well Diameter = 4"

Screen Interval = 8-18

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	18.5	170.4	18.5	**106.1**
DO	1.03	7.99	1.03	**4.77**
PH	5.73	6.63	6.13	**6.19**
Cond.	0.174	0.706	0.502	**0.387**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0080-5	WELL NO.	G0080
DATE/TIME COLLECTED	2-28-21 @ 1540	PERSONNEL	BE
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-28-21	Well Depth (ft BTOC)	37.70
Time Started	1500	Depth to Water (ft BTOC)	14.29
Time Completed	1540	Water Column Length	23.41
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	14.51
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20 L
Purge Water	ND	Actual Purge (L)	20 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1505	2.5	6.83	11.98	0.695	0.18	53.3	43.56	14.29	0.5
1510	5.0	6.82	12.01	0.710	0.13	43.6	9.08	14.29	↓
1515	7.5	6.82	12.15	0.710	0.10	39.9	2.72	14.29	
1520	10.0	6.82	12.00	0.710	0.09	38.7	0.25	14.29	
1525	12.25	6.82	12.01	0.707	0.09	37.8	0.00	14.29	
1530	15.0	6.82	12.25	0.707	0.09	71.9	0.00	14.29	
1535	17.5	6.82	12.27	0.706	0.09	55.3	0.00	14.29	
1540	20.0	6.82	12.18	0.703	0.09	48.7	0.00	14.29	
		JO							

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.21 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 33 ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 25-35

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-16.4	160.8	148.6	**62.5**
DO	0.08	1.23	0.20	**0.50**
PH	6.48	6.70	6.54	**6.60**
Cond.	0.557	0.884	0.840	**0.702**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0081-5	WELL NO.	G0081
DATE/TIME COLLECTED	3-2-21 / 1410	PERSONNEL	RE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	41.30
Time Started	1330	Depth to Water (ft BTOC)	15.84
Time Completed	1410	Water Column Length	25.46
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	15.78
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1335	2.5	6.21	13.9	0.859	0.17	10.3	6.9	15.84	.500
1340	5.0	6.27	14.38	0.856	0.13	0.3	4.5	15.84	.500
1345	7.5	6.34	14.62	0.863	0.10	-7.7	4.3	15.84	.500
1350	10	6.40	14.67	0.872	0.09	-13.3	4.1	15.44	.500
1355	12.5	6.45	14.78	0.875	0.07	-17.5	4.2	15.84	.500
1400	15	6.48	14.90	0.873	0.06	-20.7	3.9	15.84	.500
1405	17.5	6.50	15.03	0.884	0.05	-23.1	3.6	15.84	.500
1410	20	6.51	15.11	0.891	0.05	-25.1	3.5	15.85	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 1.16 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 36 ft

Pump Rate = 500 ml/min

Well Diameter = 2"

Screen Interval = 28-38

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	14.9	174.2	32.7	**85.3**
DO	0.07	1.63	0.07	**0.55**
PH	6.00	6.46	6.31	**6.25**
Cond.	0.550	1.020	0.550	**0.770**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0082-5	WELL NO.	G0082
DATE/TIME COLLECTED	3-2-21 / 1245	PERSONNEL	RE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES / **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES / **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES / **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	41.01
Time Started	1205	Depth to Water (ft BTOC)	15.14
Time Completed	1245	Water Column Length	25.87
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	16.04
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1210	2.5	6.67	13.01	0.814	0.21	17.9	24.6	15.14	500
1215	5.0	6.65	14.23	0.782	0.19	2.5	20.5	15.14	500
1220	7.5	6.65	14.26	0.809	0.22	-5.1	18.7	15.14	500
1225	10	6.64	14.44	0.795	0.22	-9.5	24.5	15.14	500
1230	12.5	6.64	14.59	0.797	0.20	-12.8	18.4	15.14	500
1235	15	6.63	14.71	0.795	0.17	-15.4	18.0	15.14	500
1240	17.5	6.63	14.73	0.788	0.14	-18.2	17.7	15.14	500
1245	20	6.62	14.83	0.790	0.13	-21.0	17.4	15.14	500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.20 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 36 ft

Pump Rate = 500 ml / min

Well Diameter = 2"

Screen Interval = 28-38

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-12.0	164.0	104.1	**71.0**
DO	0.06	1.40	0.23	**0.47**
PH	6.21	6.50	6.45	**6.35**
Cond.	0.488	0.858	0.820	**0.707**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0086-5	WELL NO.	G0086
DATE/TIME COLLECTED	3-2-21 / 1540	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	~~WDR~~ NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	40.30
Time Started	1500	Depth to Water (ft BTOC)	13.02
Time Completed	1540	Water Column Length	27.28
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	16.9
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	2.0
Purge Water	NA	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1505	2.5	6.71	14.26	0.855	0.15	65.2	16.9	13.02	500
1510	5.0	6.75	14.56	0.849	0.09	66.6	5.6	13.02	500
1515	7.5	6.81	14.58	0.849	0.06	67.2	9.1	13.02	500
1520	10	6.85	14.56	0.812	0.04	68.0	17.9	13.02	500
1525	12.5	6.84	14.60	0.831	0.03	68.2	2.16	13.02	500
1530	15	6.90	14.61	0.816	0.05	68.9	0.21	13.02	500
1535	17.5	6.91	14.58	0.821	0.06	69.5	0.09	13.02	500
1540	20	6.92	14.54	0.808	0.06	70.7	0.11	13.02	500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.0 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 35 ft

Pump Rate = 500 ml/min

Well Diameter = 2"

Screen Interval = 28-38

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	12.2	193.8	193.8	**105.1**
DO	0.05	1.14	0.05	**0.48**
PH	6.43	7.03	6.91	**6.78**
Cond.	0.585	0.923	0.880	**0.751**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0087-5	WELL NO.	G0087
DATE/TIME COLLECTED	3-2-21 / 1655	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	↓ NA
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	↓ NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	37.56
Time Started	1615	Depth to Water (ft BTOC)	13.37
Time Completed	1655	Water Column Length	24.19
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	14.99
Breathing Zone	↓ ND	Casing Volumes to Purge	NA
Well Head	↓ ND	Minimum to Purge (L)	20
Purge Water	↓ ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1620	2.5	6.68	15.18	0.714	0.21	126.9	6.9	13.4	.500
1625	5	6.76	15.49	0.712	0.14	109.5	5.4	13.4	.500
1630	7.5	6.76	15.26	0.749	0.10	107.4	3.82	13.4	.500
1635	10	6.77	15.22	0.747	0.08	104.7	3.61	13.4	.500
1640	12.5	6.79	15.16	0.741	0.07	101.9	3.55	13.4	.500
1645	15	6.81	15.15	0.729	0.06	99.5	3.41	13.4	.500
1650	17.5	6.82	15.07	0.728	0.05	98.1	3.3	13.4	.500
1655	20	6.82	14.95	0.731	0.05	100.1	3.12	13.4	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.06 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 32.5 ft

Pump Rate = 500 ml / min

Well Diameter = 2"

Screen Interval = 25-35

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	14.3	164.9	115.9	**95.7**
DO	0.08	0.87	0.09	**0.41**
PH	6.44	7.03	6.79	**6.72**
Cond.	0.551	0.851	0.710	**0.692**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0091-5	WELL NO.	G0091
DATE/TIME COLLECTED	3-2-21 @ 1525	PERSONNEL	GC
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	31.85
Time Started	1445	Depth to Water (ft BTOC)	13.80
Time Completed	1525	Water Column Length	18.05
PID Measurements		Well Casing Volume (per ft)	0.62 L
Background	ND	Volume of Water in Well (L)	11.19
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1450	2.5	6.78	13.32	1.160	5.44	165.9	31.94	13.81	0.5
1455	5.0	6.79	13.33	1.164	5.47	168.0	31.10	13.81	↓
1506	7.5	6.81	13.32	1.163	5.49	168.5	12.54	13.80	
1505	10.0	6.84	13.51	1.173	5.53	169.0	18.63	13.81	
1510	12.5	6.87	13.53	1.170	5.52	170.4	20.76	13.80	
1515	15.0	6.89	13.65	1.169	5.55	170.2	1.83	13.80	
1520	17.5	6.92	13.68	1.172	5.51	170.0	2.22	13.80	
1525	20.0	6.93	13.83	1.170	5.53	170.1	2.26	13.80	
				JO					

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.14 mg/L

Multi-Parameter Probe Unit # 653 946

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 20-30

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	27.4	196.8	196.8	**121.3**
DO	2.11	6.99	6.99	**4.16**
PH	6.65	7.29	6.98	**6.92**
Cond.	0.973	1.362	1.140	**1.207**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0092-5	WELL NO.	G0092
DATE/TIME COLLECTED	3-2-21 @ 1635	PERSONNEL	G C
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		J O
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	52.78
Time Started	1555	Depth to Water (ft BTOC)	13.95
Time Completed	1635	Water Column Length	38.83
PID Measurements		Well Casing Volume (per ft)	0.62 L
Background	ND	Volume of Water in Well (L)	24.07
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1600	2.5	7.22	13.53	1.325	0.13	71.1	41.59	13.95	0.5
1605	5.0	7.22	13.61	1.317	0.10	64.5	50.33	13.95	
1610	7.5	7.24	13.41	1.312	0.08	59.3	8.89	13.96	
1615	10.0	7.25	13.29	1.310	0.06	54.2	83.51	13.96	
1620	12.5	7.26	13.19	1.307	0.05	51.0	0.06	13.95	
1625	15.0	7.26	13.16	1.304	0.04	48.6	11.11	13.96	
1630	17.5	7.27	13.20	1.300	0.04	46.0	0.05	13.96	
1635	20.0	7.28	13.04	1.297	0.04	43.8	0.06	13.96	
							~~0.10~~ JO		
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.10 mg/L

Multi-Parameter Probe Unit # 653996

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 45 ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 40-50

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	14.7	122.9	56.4	**83.3**
DO	0.11	0.74	0.11	**0.37**
PH	7.06	7.54	7.36	**7.26**
Cond.	0.940	1.290	1.290	**1.175**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	PZ017R-5	WELL NO.	PZ017R
DATE/TIME COLLECTED	3-3-21 / 1115	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	**YES** NO	DUPLICATE SAMPLE NO.	PZ021-5 0800
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft. BTOC)	32.42
Time Started	~~0935~~ 1035	Depth to Water (ft. BTOC)	11.95
Time Completed	1115	Water Column Length	20.47
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	12.69
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
NA 4AR									
1045	2.5	6.40	12.43	0.897	0.11	56.2	0.08	11.95	.500
1045	5.0	6.40	12.61	0.932	0.06	-13.5	0.07	11.95	.500
1050	7.5	6.39	12.80	0.918	0.04	-16.0	0.12	11.95	.500
1055	10	6.39	12.87	0.893	0.03	-11.5	2.8	11.95	.500
1100	12.5	6.39	13.09	0.932	0.02	-5.4	0.8	11.95	.500
1105	15	6.39	13.13	0.906	0.01	-1.2	2.4	11.95	.500
1110	17.5	6.39	13.05	0.896	0.01	~~3~~ 3.1	~~8~~ 2.2	11.95	.500
1115	20	6.38	13.31	0.902	0.01	6.8	~~46 or 82~~ 2.3	11.95	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 1.25 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 22.5 ft

Pump Rate = .500 L/min

Well Diameter = 2"

Screen Interval = 10-30

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	68.6	202.6	68.6	**136.6**
DO	0.65	5.92	0.65	**3.40**
PH	6.07	6.90	6.07	**6.37**
Cond.	0.628	0.840	0.840	**0.750**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	PZ018-5	WELL NO.	PZ018
DATE/TIME COLLECTED	3-3-21 / 955	PERSONNEL	BE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft. BTOC)	31.90
Time Started	905	Depth to Water (ft. BTOC)	13.39
Time Completed	955	Water Column Length	18.51
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	11.47
Breathing Zone	NA	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	25

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
910	2.5	6.12	11.58	0.548	4.44	187.1	1.2	13.39	.500
915	5.0	6.19	11.93	0.569	3.35	144.5	0.03	13.39	.500
920	7.5	6.22	12.12	0.640	1.95	39.2	0.05	13.39	.500
925	10	6.24	12.20	0.676	1.42	12.0	1.7	13.39	.500
930	12.5	6.25	12.34	0.693	1.05	3.3	18.8	13.39	.500
935	15	6.26	12.43	0.702	0.84	-1.4	3.48	13.39	.500
940	17.5	6.27	12.49	0.720	0.64	-4.4	3.46	13.39	.500
945	20	6.28	12.51	0.719	0.50	-6.9	3.41	13.39	.500
950	22.5	6.28	12.58	0.722	0.42	-8.5	3.40	13.39	.500
955	25	6.28	12.60	0.713	0.36	-9.9	3.36	13.39	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.62 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 23 ft

Pump Rate = 500 ml/min

Well Diameter = 2"

Screen Interval = 10-30

Historic (7-year average low and high / Q4 / Avg in Bold)				
ORP	94.4	187.6	136.6	**148.9**
DO	0.33	9.26	5.99	**3.88**
PH	5.52	6.57	5.99	**6.26**
Cond.	0.520	0.822	0.550	**0.636**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	PZ019-5	WELL NO.	PZ019
DATE/TIME COLLECTED	3-3-21/835	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft. BTOC)	32.23
Time Started	755	Depth to Water (ft. BTOC)	17.52
Time Completed	835	Water Column Length	14.71
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	9.12
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	NA	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
		6.28 MB							
800	2.5	6.18	11.82	0.627	9.07	174.5	9.9	17.52	.500
805	5.0	6.20	11.99	0.633	8.85	169.2	4.3	MS 17.52	.500
810	7.5	6.22	12.35	0.643	8.42	166.9	10.6	17.52	.500
815	10	6.24	12.47	0.647	7.92	164.2	19.1	17.52	.500
820	12.5	~~6.28~~	12.46	0.644	7.66	163.1	15.0	17.52	.500
825	15	6.29	12.47	0.653	7.54	162.8	5.0	17.52	.500
830	17.5	6.31	12.51	0.662	7.41	162.5	2.0	17.52	.500
835	20	6.32	12.54	0.663	7.35	162.2	3.6	17.52	.500
			Max						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.23 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 25 ft

Pump Rate = 500 ml/min.

Well Diameter = 2"

Screen Interval = 10-30

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	-5.3	287.2	166.3	**130.9**
DO	6.44	10.83	9.36	**8.65**
PH	5.92	6.49	6.22	**6.13**
Cond.	0.377	0.616	0.570	**0.524**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	PZ020-5	WELL NO.	PZ020
DATE/TIME COLLECTED	3-3-21 / 1255	PERSONNEL	ME, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-3-21	Well Depth (ft. BTOC)	32.33
Time Started	1215	Depth to Water (ft. BTOC)	16.09
Time Completed	1255	Water Column Length	16.24
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	10.1
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1220	2.5	6.70	13.62	0.938	3.52	142.5	3.7	16.09	.500
1225	5.0	6.69	13.97	0.947	3.20	122.5	3.6	16.09	.500
1230	7.5	6.73	14.04	0.936	3.06	115.0	3.2	16.09	.500
1235	10	6.76	13.88	0.924	2.88	110.5	2.2	16.09	.500
1240	12.5	6.79	13.81	0.920	2.77	107.8	2.8	16.09	.500
1245	15	6.83	14.15	0.923	2.70	105.4	2.1	16.09	.500
1250	17.5	6.85	14.22	0.926	2.68	104.4	2.1	16.09	.500
1255	20	6.87	14.22	0.916	2.65	104.1	2.9	16.09	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.05 mg/L

Multi-Parameter Probe Unit # C375 98

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 24 ft

Pump Rate = 500 ml/min

Well Diameter = 2"

Screen Interval = 10-30

	Historic (7-year average low and high / Q4 / Avg in Bold)			
ORP	21.7	166.3	114.1	**102.3**
DO	1.73	7.07	4.06	**3.73**
PH	6.54	6.86	6.85	**6.72**
Cond.	0.796	1.350	1.160	**1.059**

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM21A
Date: 2-27-21
Samplers: ME, JO

WELL MEASUREMENTS

800 start

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 20'
Initial water level (ft bgs): 13.51 30-13.51 = 16.49 X 0.16 = 2.63
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 2.63 L
Weather conditions: Clear - 27°

SAMPLING MEASUREMENT

DISCHARGE

Time	0805	0810	815	820	825	830	835	840	845	850
Water level (ft. bgs)	13.55	13.55	13.55	13.55	13.55	13.55	13.55	13.55	13.55	13.55
Pump Placement Depth (ft bgs)	29	29	29	25	25	25	21	21	21	21
Discharge (Liters)	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25

WATER QUALITY DATA

pH	6.18	6.16	6.17	6.18	6.20	6.22	6.24	6.25	6.26	6.29
Temperature (°C)	10.28	10.23	10.25	10.37	10.35	10.35	10.45	10.35	10.61	10.59
Conductivity (mS/cm)	.965	.157	.275	.257	.838	1.034	1.032	.911	.926	.925
Dissolved Oxygen (mg/L)	0.26	0.13	0.11	~~0.00~~ 0.10	0.09	0.09	0.08	0.07	0.06	0.06
Redox (ORP) (mV)	-104.5	-129.8	-142.7	-150.3	-155.3	~~156.3~~ ~~165.7~~	-159.5	-157.5	-156.4	-156.7
Turbidity (NTUs) initial/end	NA/169	169/460	460/239	239/73	73/449	449/249	249/58	58/63	63/332	332/69
Color	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy
Odor	None	None	None	None	None	None	None	None	None	None

Total discharge: 35
Casing volumes removed: 13.3
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

FT 2.67

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments: 1gal H_2O used

(30-13.51) = 16.49 X 0.16 = 2.63 X 10 = 26.3
26.3 + (3.79 X 2) = 33.9

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM21A
Date: 2-27-21
Samplers: AE, JO

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	855	900	905	910						
Water level (ft. bgs)	~~13.55~~	13.55	13.55	13.55						
Pump Placement Depth (ft bgs)	25	25	25	25						
Discharge (Liters)	27.5	30	32.5	35						

WATER QUALITY DATA

pH	6.29	6.31	6.32	6.34						
Temperature (°C)	10.65	10.62	10.91	10.77						
Conductivity (mS/cm)	.930	.920	.925	.936						
Dissolved Oxygen (mg/L)	0.06	0.06	0.06	0.06						
Redox (ORP) (mV)	-152.3	-149.7	-150.5	-146.2						
Turbidity (NTUs) initial/end	63/66	60/65	69/61	61/57						
Color	Cloudy	Cloudy	Cloudy	Cloudy						
Odor	None	None	None	None						

Total discharge: 35
Casing volumes removed: 13.3
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM24A
Date: 2-27-21
Samplers: AE, JO

WELL MEASUREMENTS

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 20'
Initial water level (ft bgs): 13.89
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 2.58
Weather conditions: clear 30s

start 1240

SAMPLING MEASUREMENT

DISCHARGE

Time	1245	1250	1255	1300	1305	1310	1315	1320	1325	1330
Water level (ft. bgs)	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
Pump Placement Depth (ft bgs)	29	29	29	29	25	25	25	21	21	21
Discharge (Liters)	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25

WATER QUALITY DATA

pH	6.47	6.48	6.49	6.51	6.51	6.51	6.51	6.51	6.51	6.52
Temperature (°C)	11.71	11.75	11.65	11.50	11.34	11.21	11.19	11.00	11.01	10.85
Conductivity (mS/cm)	1.106	1.114	1.114	1.115	1.096	1.091	1.085	1.078	1.066	1.044
Dissolved Oxygen (mg/L)	0.17	0.10	0.09	0.07	0.07	0.09	0.07	0.07	0.07	0.07
Redox (ORP) (mV)	-98.5	-108.6	-114.4	-118.0	-120.9	-122.4	-125.1	-125.9	-126.1	-127.4
Turbidity (NTUs) initial/end	NA / 43	43 / 47	47 / 26	26 / 25	25 / 19	19 / 20	20 / 13	13 / 14	14 / 12.3	12.3 / 12.2
Color	cloudy	cloudy	clear	clear	clear	clear	clear	clear	clear	clear
Odor	None	None	None	None	None	None	None	None	None	None

Total discharge: 35
Casing volumes removed: 12.9
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe - 2.10

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments: 1gal. H2O Added

((30 - 13.89) x .16) x 10 = 25.8L
3.79 x 2 = 7.58L
Total = 33.38L

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM24A
Date: 2-27-21
Samplers: AE, JO

WELL MEASUREMENTS

Well inside diameter (in): see page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1335	1340	1345	1350						
Water level (ft. bgs)	13.9	13.9	13.9	13.9						
Pump Placement Depth (ft bgs)	21	25	25	25						
Discharge (Liters)	27.5	30	32.5	35						

WATER QUALITY DATA

pH	6.52	6.52	6.52	6.52						
Temperature (°C)	10.75	10.79	10.60	10.69						
Conductivity (mS/cm)	1.045	1.070	1.073	1.075						
Dissolved Oxygen (mg/L)	0.07	0.07	0.07	0.07						
Redox (ORP) (mV)	-127.7	~~-129.8~~ -129.7	-128.7	-129.1						
Turbidity (NTUs) initial/end	12.2 / 13.1	13.1 / 9.9	9.9 / 6.3	6.3 / 8.0	/	/	/	/	/	/
Color	clear	clear	clear	clear						
Odor	None	None	~~Slight~~ None	None						

Total discharge: 35
Casing volumes removed: 12.9
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: PM 25 ~~B~~ A
Date: 2-25-21
Samplers: BJ2.

StmT 850

WELL MEASUREMENTS

Well inside diameter (in): 1'
Screen length (ft): 10'
Depth of well casing (ft bgs): 20'
Initial water level (ft bgs): ~~9~~ 9.34'
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): ~~9.34-~~ (30.1 - 9.34) X .16 = 3.21 L
Weather conditions: clear

SAMPLING MEASUREMENT

DISCHARGE

Time	900	905	910	915	920	925	930	935	940	945
Water level (ft. bgs)	9.38	9.38	9.38	9.38	9.38	9.39	9.38	9.38	9.38	9.38
Pump Placement Depth (ft bgs)	~~Both~~ 29	29	21	21	25	25	25	25	25	25
Discharge (Liters)	~~10~~ 5	~~15~~ 7.5	10	12.5	15	17.5	20	22.5	25	27.5

WATER QUALITY DATA

pH	6.24	6.32	6.33	6.32	6.31	6.31	6.31	6.31	6.31	6.31
Temperature (°C)	8.71	10.87	10.9	10.96	10.96	11.01	11.07	10.96	11.06	11.40
Conductivity (mS/cm)	1.224	1.254	1.143	1.107	1.099	1.028	1.261.2	1.243	1.271	1.242
Dissolved Oxygen (mg/L)	0.29	0.08	0.05	0.05	.03	0.03	0.02	6.02	0.02	0.02
Redox (ORP) (mV)	-126.5	-144.6	-158.7	-166.8	-166	-176.4	-179.3	-182.8	-181.8	-185.2
Turbidity (NTUs) initial/end	507/507	5500/5500	1370/1370	5998/5998	245/245	175/175	190/190	~~190~~ ~~253~~ 253	253/118	118/107
Color	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy
Odor	None	None	None	None	None	None	None	None	None	None

Total discharge: 42.5
Casing volumes removed: 12.8
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe - 6.52

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-25-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-25-21
Comments:

(3.21 & L X 10) + 7.58 = 39.68 L

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: PM 25 ~~B~~ A
Date:
Samplers:

WELL MEASUREMENTS

Well inside diameter (in): see page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs): ~~9.38~~
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	956	955	1000	1005	1010	1015				
Water level (ft. bgs)	9.38	9.38	9.38	9.38	9.38	9.38				
Pump Placement Depth (ft bgs)	25	25	25	25	25	25				
Discharge (Liters)	30	32.5	35	37.5	40	42.5				

WATER QUALITY DATA

pH	6.31	6.31	6.31	6.31	6.31	6.32				
Temperature (°C)	11.20	11.26	11.17	11.15	11.15	11.12				
Conductivity (mS/cm)	~~1.137~~ ~~.934~~	.934	.716	1.268	1.216	1.243				
Dissolved Oxygen (mg/L)	0.01	0.01	0.01	0.01	0.01	0.01				
Redox (ORP) (mV)	-186.4	-196.0	-185.9	-185.6	-184.8	-184.5				
Turbidity (NTUs) initial/end	107 / 89.9	89.9 / 101.7	101.7 / 80.38	9.38 / 93.94	93.94 / 73.04	73.04				
Color	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy				
Odor	None	None	None	None	None	None				

Total discharge: 42.5 L
Casing volumes removed: 12.8
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-25-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-25-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method: Peristaltic pump and tubing

Well No: EW7-PM25B
Date: 2-25-21
Samplers: ME JO

stmt 1120

WELL MEASUREMENTS

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 30'
Initial water level (ft bgs): 9.3
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 4.9 L
Weather conditions: Cloudy 34°

SAMPLING MEASUREMENT

DISCHARGE

Time	1130	1140	1150	1200	1210	1220	1230	1240	1250	1300
Water level (ft. bgs)	9.36	9.36	9.36	9.36	9.36	9.36	9.36	9.36	9.36	9.36
Pump Placement Depth (ft bgs)	39	39	31	31	35	35	35	35	35	35
Discharge (Liters)	5	10	15	20	25	30	35	40	45	50

WATER QUALITY DATA

pH	6.43	6.42	6.41	6.41	6.43	6.43	6.42	6.42	6.41	6.42
Temperature (°C)	11.24	11.34	11.36	11.71	11.38	11.39	11.65	11.60	11.79	11.74
Conductivity (mS/cm)	0.146 ~~146.87~~	.143	.119	.117 ~~.117~~	.130	.133	.984	.157	1.055	.991
Dissolved Oxygen (mg/L)	0.49	0.42	0.44	.50	0.54	0.52	0.56	0.53	0.52	0.57
Redox (ORP) (mV)	-106.1	-111.9	-110.7	-109.8	-107.9	-108	-106.5	~~-104.5~~ ~~-164.5~~	-103.4	-102.4
Turbidity (NTUs) initial/end	447 / 59.23	59.23 / 61.71	61.71 / 59.70	59.7 / 191.1	191.1 / 69.6	69.6 / 63.72	63.72 / 59.17	59.17 / 60.3	60.3 / 75.6	75.6 / 60.35
Color	Cloudy	→	→	→	→	→	→	→	→	→
Odor	None	→	→	→	→	→	→	→	→	→

Total discharge: 65 L
Casing volumes removed: 13.26
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-25-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-25-21
Comments:

(40 - 9.36) x .16 = 4.9 L x 10 = 49
3.79 x 2 x 2 = 15.16
total = 64.16 L

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM25B
Date: 7-25-21
Samplers: AE, JG

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1310	1320	1330							
Water level (ft. bgs)	9.36	9.36	9.36							
Pump Placement Depth (ft bgs)	35	35	35							
Discharge (Liters)	55	60	65							

WATER QUALITY DATA

pH	6.42	6.42	6.42							
Temperature (°C)	11.35	11.35	11.35							
Conductivity (mS/cm)	.733	.752	.746							
Dissolved Oxygen (mg/L)	0.57	0.64	0.64							
Redox (ORP) (mV)	-100.4	-99.8	-99.8							
Turbidity (NTUs) initial/end	60.3/86.4	86.4/46.3	46.3/4							
Color	Cloudy	→	→							
Odor	None	→	→							

Total discharge: 65 L
Casing volumes removed:
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba Calibrated:
Water Quality Meters: Aqua TROLL 500 w/ flow through cell Calibrated:
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method: Peristaltic pump and tubing

Well No: EW7-PM26A
Date: 2-27-21
Samplers: AE, JG

WELL MEASUREMENTS

1440 start

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 20'
Initial water level (ft bgs): 13.61
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 2.62
Weather conditions: Cloudy 30s

SAMPLING MEASUREMENT

DISCHARGE

Time	1445	1450	1455	1500	1505	1510	1515	1520	1525	1530
Water level (ft. bgs)	13.61	13.61	13.61	13.61	13.61	13.61	13.61	13.61	13.61	13.61
Pump Placement Depth (ft bgs)	29	29	29	29	25	25	25	21	21	21
Discharge (Liters)	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25

WATER QUALITY DATA

pH	6.54	6.56	6.57	6.56	6.55	6.55	6.55	6.55	6.54	6.54
Temperature (°C)	10.53	10.46	10.49	10.51	10.63	10.66	10.66	10.74	10.82	10.72
Conductivity (mS/cm)	.945	.938	.937	.932	.924	.929	.930	.926	.928	.926
Dissolved Oxygen (mg/L)	0.16	0.11	0.09	0.09	0.06	0.06	0.06	0.05	.04	0.04
Redox (ORP) (mV)	-58.7	-63.6	-71.9	-74.9	-77.2	-76.9	-78.1	-79.6	-79.7	-78.8
Turbidity (NTUs) initial/end	NA / 56	56 / 52	52 / 42.5	42.5 / 40.1	40.1 / 37.6	37.6 / 35.6	35.6 / 32.1	32.1 / 30.1	30.1 / 27.5	27.3 / 41.4
Color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Odor	None	None	None	None	None	None	None	None	None	None

Total discharge: 35
Casing volumes removed: 13.3
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe - 5.92

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments:

((30-13.61) X.16) X10 = 26.2
3.79 X 2 = 7.58
Total 33.78

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM26A
Date: 2-27-21
Samplers: AE, JO

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1535	1540	1545	1550						
Water level (ft. bgs)	13.61	13.61	13.61	13.61						
Pump Placement Depth (ft bgs)	25	25	25	25						
Discharge (Liters)	27.5	30	32.5	35						

WATER QUALITY DATA

pH	6.54	6.54	6.54	6.55						
Temperature (°C)	10.81	10.74	10.65	10.66						
Conductivity (mS/cm)	.929	.922	.927	.926						
Dissolved Oxygen (mg/L)	0.04	0.04	0.04	0.03						
Redox (ORP) (mV)	-77.9	-77.8	-75.7	-75.5						
Turbidity (NTUs) initial/end	41.4 / 33.4	33.4 / 26.7	26.7 / 31.1	31.1 / 25.9						
Color	Clear	Clear	Clear	Clear						
Odor	None	None	None	None						

Total discharge: 35
Casing volumes removed: 13.3
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM26AB
Date: 2-26-21
Samplers: AE, JO

WELL MEASUREMENTS

1300 ~~12:55~~ me start

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 30'
Initial water level (ft bgs): 13.61 (40-13.61) = 26.39 x 0.16 = 4.22
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 4.22
Weather conditions: Clear 35

SAMPLING MEASUREMENT

DISCHARGE

Time	1310	1320	1330	1340	1350	1400	1410	1420	1430	1440
Water level (ft. bgs)	13.65	13.65	13.65	13.65	13.65	13.65	13.65	13.65	13.65	13.65
Pump Placement Depth (ft bgs)	39	39	39	~~35~~ 35 ft	35	35	~~35~~ 31 ft	31	31	35
Discharge (Liters)	5	10	15	20	25	30	35	40	45	50

WATER QUALITY DATA

pH	6.38	6.42	6.46	6.46	6.46	6.46	6.46	6.46	6.47	6.47
Temperature (°C)	9.97	10.04	9.89	9.76	10.06	10.35	10.06	9.83	9.83	9.85
Conductivity (mS/cm)	1.023	.826	.919	.888	.837	.836	.936	.803	.803	.810
Dissolved Oxygen (mg/L)	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.05
Redox (ORP) (mV)	-79.2	-97.6	-106.7	-110.7	-114.5	-114.5	-112.4	-109.7	-107.3	-106.4
Turbidity (NTUs) initial/end	NA/151	151/73	73/190	190/40	80/5.4	5.4/28	28/33	33/31	31/36	36/34
Color	Cloudy	→	→	→	→	Clear	→	→	→	→
Odor	None	→	→	→	→	→	→	→	→	→

Total discharge: 60
Casing volumes removed: 14.2
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe - 7.32

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-26-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-26-21
Comments:

((40 - 13.61) X 0.16) X 10 = 42.2 + 15.16 = 57.36 L
15.16 = (3.79 X 4)

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM26RB
Date: 2-26-21
Samplers: AE, JC

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1450	1500
Water level (ft. bgs)	13.65	13.65
Pump Placement Depth (ft bgs)	35	35
Discharge (Liters)	55	60

WATER QUALITY DATA

pH	6.45	6.45
Temperature (°C)	10.05	10.10
Conductivity (mS/cm)	.810	.808
Dissolved Oxygen (mg/L)	0.05	0.05
Redox (ORP) (mV)	-104.6	-104.8
Turbidity (NTUs) initial/end	34/41	41/39
Color	Clear	Clear
Odor	None	None

Total discharge: 60
Casing volumes removed: 14.2
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-26-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-26-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM27B
Date: 2-27-21
Samplers: BE, JC

WELL MEASUREMENTS

Start 950

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 30'
Initial water level (ft bgs): 11.59
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 4.54
Weather conditions: clear 30

SAMPLING MEASUREMENT

DISCHARGE

Time	1000	1010	1020	1030	1040	1050	1100	1110	1120	1130
Water level (ft. bgs)	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6
Pump Placement Depth (ft bgs)	39	39	39	35	35	35	31	31	35	35
Discharge (Liters)	5	10	15	20	25	30	35	40	45	50

WATER QUALITY DATA

pH	6.18	6.21	6.23	6.24	6.26	6.27	6.28	6.28	6.29	6.29
Temperature (°C)	11.32	11.28	11.38	11.24	11.30	11.39	11.34	11.38	11.40	11.43
Conductivity (mS/cm)	.733	1.046	1.166	1.012	1.035	1.034	1.024	1.041	1.055	.977
Dissolved Oxygen (mg/L)	0.15	0.04	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Redox (ORP) (mV)	-120	-126.1	-127.4	-130.3	-131.9	-132.6	-132.9	-134.3	-134.5	-135.6
Turbidity (NTUs) initial/end	NA/213	213/111	111/94	98/177	177/157	157/141	141/241	241/90	90/51	51/62
Color	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy
Odor	None	None	None	None	None	None	None	None	None	None

Total discharge: 65
Casing volumes removed: 14.3
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments: 2gal H2O used

(40 - 11.59) X .16 = 4.54 X 10 = 45.4
28.41
3.79 X 4 = 15.16 + 45.4 = 60.56

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM27B
Date: 2-27-21
Samplers: RE, JG

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1140	1150	1200							
Water level (ft. bgs)	11.6	11.6	11.6							
Pump Placement Depth (ft bgs)	35	35	35							
Discharge (Liters)	55	60	65							

WATER QUALITY DATA

pH	6.29	6.29	6.28							
Temperature (°C)	11.56	11.57	11.57							
Conductivity (mS/cm)	.971	.975	.977							
Dissolved Oxygen (mg/L)	0.01	0.01	0.01							
Redox (ORP) (mV)	-135.6	-136.9	-135.2							
Turbidity (NTUs) initial/end	63/55	55/50	50/47							
Color	Cloudy	Cloudy	Cloudy							
Odor	None	None	None							

Total discharge: 65
Casing volumes removed: 14.3
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe 6.54

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-27-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-27-21
Comments:

WELL DEVELOPMENT LOG

Page 1 of 2

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method: Peristaltic pump and tubing

Well No: EW7-PM28A
Date: 2-25-21
Samplers: ME, JO

WELL MEASUREMENTS

Start 1410

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 20'
Initial water level (ft bgs): 9.28
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 3.31 L
Weather conditions: PC 30°

SAMPLING MEASUREMENT

DISCHARGE

Time	1420	1425	1430	1435	1440	1445	1450	1455	1500	1505
Water level (ft. bgs)	9.41	9.41	9.41	9.41	9.41	9.41	9.41	9.41	9.41	9.41
Pump Placement Depth (ft bgs)	29	29	21	21	25	25	25	25	25	25
Discharge (Liters)	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5

WATER QUALITY DATA

pH	6.39	6.39	6.35	6.35	6.35	6.34	6.34	6.34	6.34	6.34
Temperature (°C)	11.56	11.51	11.57	11.60	11.59	11.49	11.51	11.64	11.63	11.65
Conductivity (mS/cm)	.761	.136	.109	.187	.102	.131	.100	.085	.068	.264
Dissolved Oxygen (mg/L)	1.67	1.72	1.78	1.71	1.70	1.74	1.75	1.74	1.77	1.77
Redox (ORP) (mV)	-131.9	-129.2	-118	-110.0	-103.3	-94.3	-86.6	-81.8	-78.8	-73.1
Turbidity (NTUs) initial/end	148/112	112/75	75/58	58/46	46/39	39/45	45/35	35/47	47/32	32/36
Color	Cloudy	—	—	—	—	—	Clear	—	—	→
Odor	None	—	—	—	—	—	—	—	—	→

Total discharge: 42.5
Casing volumes removed: 12.8
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-25-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-25-21
Comments:

((30 - 9.28) x 0.16) x 10 = 33.152

33.152 + (3.79 x 2) = 40.73 L

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM 28A
Date: 2-25-21
Samplers: AE, JO

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1510	1515	1520	1525	1530	1535				
Water level (ft. bgs)	9.41	9.41	9.41	9.41	9.41	9.41				
Pump Placement Depth (ft bgs)	25	25	25	25	25	25				
Discharge (Liters)	30	32.5	35	37.5	40	42.5				

WATER QUALITY DATA

pH	6.34	6.34	6.34	6.34	6.34	6.34				
Temperature (°C)	11.69	11.90	11.67	11.63	11.62	11.59				
Conductivity (mS/cm)	.162	.130	.103	.104	.105	.106				
Dissolved Oxygen (mg/L)	1.77	1.80	1.85	1.79	1.78	1.78				
Redox (ORP) (mV)	-68.9	-44.6	-59.1	-59.0	-58.0	-58.1				
Turbidity (NTUs) initial/end	36/30	30/39	39/61	61/33	33/32	32/30				
Color	clear	→	→	→	→	→				
Odor	None	→	→	→	→	→				

Total discharge: 42.5
Casing volumes removed: 12.9
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe - 5.0

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-25-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-25-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM29A
Date: 2-26-21
Samplers: ME, JO

1100 start

WELL MEASUREMENTS

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 20'
Initial water level (ft bgs): 9.54
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 3.27 L
Weather conditions: clear 30°

SAMPLING MEASUREMENT

DISCHARGE

Time	1105	1110	1115	1120	1125	1130	1135	1140	1145	1150
Water level (ft. bgs)	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54	9.54
Pump Placement Depth (ft bgs)	29	29	29	29	25	25	25	25	21	21
Discharge (Liters)	2.5	5.0	7.5	10	12.5	15	17.5	20	22.5	25

WATER QUALITY DATA

pH	6.20	6.18	6.20	6.23	6.27	6.31	6.35	6.39	6.42	6.45
Temperature (°C)	11.01	10.69	10.79	10.72	10.67	10.87	10.71	10.81	10.79	10.95
Conductivity (mS/cm)	.676	.826	.757	.799	.786	.817	.813	.810	.818	.807
Dissolved Oxygen (mg/L)	0.05	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Redox (ORP) (mV)	-57.9	-62.0	-66.5	-71.0	-75.1	-78.7	-82.5	-85.4	-88.3	-90.4
Turbidity (NTUs) initial/end	NA/46	46/25	25/22	22/17	17/16	16/20	20/15	15/106	106/51 ~~513~~	51/18
Color	clear	→	→	→	→	→	→	→	→	→
Odor	None	→	→	→	→	→	→	→	→	→

Total discharge: ~~30~~ 42.5 m
Casing volumes removed: 13
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe-6.12

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-26-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-26-21
Comments: Add 1 gal. H_2O

((30 - 9.54) X 0.16) X 10 = ~~32.73~~ ~~20.46~~ 20.46 m L
3.79 X 2 = 7.58 L
Total = ~~28.04~~ 28.04 m L 40.31 L

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM29A
Date: 2-26-21
Samplers: ME, JG

WELL MEASUREMENTS

Well inside diameter (in): See page 1
Screen length (ft):
Depth of well casing (ft bgs):
Initial water level (ft bgs):
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters):
Weather conditions:

SAMPLING MEASUREMENT

DISCHARGE

Time	1155	1200	1205	1210	1215	1220	1225			
Water level (ft. bgs)	9.54	9.54	9.54	9.54	9.54	9.54	9.54			
Pump Placement Depth (ft bgs)	21	21	25	25	25	25	25			
Discharge (Liters)	27.5	30	32.5	35	37.5	40	42.5			

WATER QUALITY DATA

pH	6.47	6.48	6.49	6.51	6.50	6.51	6.52			
Temperature (°C)	10.85	10.78	10.80	10.63	10.76	10.60	10.61			
Conductivity (mS/cm)	.820	.807	.794	.810	.817	.820	.810			
Dissolved Oxygen (mg/L)	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
Redox (ORP) (mV)	-92.2	-93.7	-94.7	-95.7	-96.2	-97.1	-97.6			
Turbidity (NTUs) initial/end	14 / 11.3	11.3 / 10.6	10.6 / 10.2	10.2 / 10.4	10.2 / 6.7	6.7 / 9.1	9.1 / 11.3			
Color	Clear	→	→	→	→	→	→			
Odor	None	→	→	→	→	→	→			

Total discharge: ~~80~~ 42.5 (N)
Casing volumes removed: 13
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-26-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-26-21
Comments:

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM29B
Date: 2-26-21
Samplers: AE, JC

WELL MEASUREMENTS

Well inside diameter (in): 1"
Screen length (ft): 10'
Depth of well casing (ft bgs): 30'
Initial water level (ft bgs): 9.53'
Top of Casing Stick-up (ft): 1'
Fluid well casing volume (Liters): 4.9 L
Weather conditions: Clear · 270

START 810

SAMPLING MEASUREMENT

DISCHARGE

Time	820	830	840	850	900	910	920	930	940	950
Water level (ft. bgs)	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53
Pump Placement Depth (ft bgs)	39	39	~~39~~ 31	~~39~~ 35	35	35	31	~~35~~ 31	31	35
Discharge (Liters)	5	10	15	20	25	30	35	40	45	50

WATER QUALITY DATA

pH	6.16	6.17	6.57	6.13	6.19	6.17	6.36	6.43	6.47	6.49
Temperature (°C)	10.16	9.88	10.26	10.56	10.85	10.76	11.14	10.84	10.87	10.72
Conductivity (mS/cm)	.762	.970	1.12	~~1.139~~ 1.13	.921	1.097	.956	.934	.912	.850
Dissolved Oxygen (mg/L)	6.09	6.13	10.04	0.07	.05	0.04	0.02	0.02	0.02	.02
Redox (ORP) (mV)	-46.7	-46.2	-56.6	-72.7	-88.7	-98.5	-105.0	-111.9	-115.1	-117.5
Turbidity (NTUs) initial/end	NA / 29.9	28.8 / 75	75 / 94	34 / 64	64 / 60	60 / 55	55 / 123	123 / 43	43 / 129	129 / 47
Color	Clear	Cloudy	→							→
Odor	None	→								→

Total discharge: 65
Casing volumes removed: 13.26
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

Fe-2.73

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-26-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-26-21
Comments: 2 gal H_2O Added

$(40 - 9.53) \times .16 = 4.9\,L + (2\ gal\ added\ H_2O \times 2 = 15.16$
$(4.9 \times 10) + 15.16 = 64.16$

WELL DEVELOPMENT LOG

Project: CHAAP OU1 RAO Performance Monitoring
Project No: 60565355
Develo. Method Peristaltic pump and tubing

Well No: EW7-PM 29B
Date: 2-26-21
Samplers: AE, JG

WELL MEASUREMENTS

Well inside diameter (in): See Page 1
Screen length (ft): 11
Depth of well casing (ft bgs): 41
Initial water level (ft bgs): 31
Top of Casing Stick-up (ft):
Fluid well casing volume (Liters): 16
Weather conditions: 11

SAMPLING MEASUREMENT

DISCHARGE

Time	1000	1010	1020							
Water level (ft. bgs)	9.53	9.53	9.55							
Pump Placement Depth (ft bgs)	35	35	35							
Discharge (Liters)	55	60	65							

WATER QUALITY DATA

pH	6.49	6.49	6.49							
Temperature (°C)	10.64	10.67	10.73							
Conductivity (mS/cm)	.930	.939	.945							
Dissolved Oxygen (mg/L)	0.02	0.02	0.02							
Redox (ORP) (mV)	-119.8	-119.5	-118.7							
Turbidity (NTUs) initial/end	47/90	90/86	86/47							
Color	cloudy	→	→							
Odor	clear	→	→							

Total discharge: 65
Casing volumes removed: 13.2L
Method of disposal of discharged water: IDW polly tank at GWTF (pending analysis)

QUALITY ASSURANCE

Water Level Indicator: Horiba — Calibrated: 2-26-21
Water Quality Meters: Aqua TROLL 500 w/ flow through cell — Calibrated: 2-26-21
Comments:

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: **CHAAP OU1 RAO_Performance Monitoring** PROJECT NO.: **60565355**

SAMPLE NO.: EW7-PM21A-5-25 WELL NO.: EW7-PM21A

DATE/TIME COLLECTED: 2-27-21 / 0925 PERSONNEL: AE, JO

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO.: NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO.:

MS/MSD REQUESTED: YES (NO) MS/MSD SAMPLE NO.:

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-27-21	Well Depth (ft bgs)	30
Time Started	910	Depth to Water (ft bgs)	1
Time Completed	925	Water Column Length	16.49
PID Measurements		Well Casing Volume (per ft)	0.16
Background	ND	Volume of Water in Well (L)	2.63
Breathing Zone		Casing Volumes to Purge	NA -
Well Head		Minimum to Purge (L)	NA -
Purge Water		Actual Purge (L)	~~3.5~~ 7.5 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
915	2.5	6.34	10.77	.920	0.05	-146.4	57	13.55	0500
920	5.0	6.35	10.75	.920	0.05	-146.9	55	13.55	"
925	7.5	6.35	10.80	.925	0.05	-146.6	54	13.55	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.67 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 25

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 20-30

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: CHAAP OU1 RAO_Performance Monitoring | PROJECT NO.: 60565355

SAMPLE NO.: EW7-PM24A-5-25 | WELL NO.: EW7-PM 24A

DATE/TIME COLLECTED: 2-27-21 / 1405 | PERSONNEL: AE, JO

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-27-21	Well Depth (ft bgs)	30
Time Started	1350	Depth to Water (ft bgs)	13.89
Time Completed	1405	Water Column Length	16.11
PID Measurements		Well Casing Volume (per ft)	2.58
Background	ND	Volume of Water in Well (L)	2.58
Breathing Zone		Casing Volumes to Purge	NA -
Well Head		Minimum to Purge (L)	NA -
Purge Water		Actual Purge (L)	7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1355	2.5	6.52	10.69	1.075	0.07	-129.2	8.4	13.9	500
1400	~~2.5~~ 5	6.52	10.71	1.073	0.07	-129.4	9.1	13.9	500
1405	7.5	6.52	10.71	1.071	0.07	-129.6	9.1	13.9	500

BOG

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.10 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 25

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 20-30

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP OU1 RAO_Performance Monitoring	PROJECT NO.	60565355
SAMPLE NO.	EW7-PM25A-5-25	WELL NO.	EW7-PM25A
DATE/TIME COLLECTED	2-25-21 / 1015	PERSONNEL	AR, AH
SAMPLE METHOD	Peristaltic Pump and tubing		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	
MS/MSD REQUESTED	YES	~~NO~~	MS/MSD SAMPLE NO.	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-25-21	Well Depth (ft bgs)	30.1'
Time Started	BE ~~0950~~ 1000	Depth to Water (ft bgs)	9.34
Time Completed	1015	Water Column Length	20.76
PID Measurements		Well Casing Volume (per ft)	~~2.32~~ 0.16 L
Background	ND	Volume of Water in Well (L)	3.32 L
Breathing Zone		Casing Volumes to Purge	~~10~~ NA
Well Head		Minimum to Purge (L)	~~39.68~~ NA
Purge Water		Actual Purge (L)	~~40~~ 7.5 BE

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
	w 70								
1005	2.5 ~~5.0~~	6.31	11.15	1.268	0.01	-185.6	93.94	9.38	.500 ml/min
1010	~~7.5~~ 5.0	6.31	11.15	1.216	0.01	-184.8	73.04	"	"
1015	~~10~~ 7.5	6.32	11.12	1.243	0.01	-184.5	73.04	"	"
955									
1000									
1005									
1010									

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 6.52 mg/L
Multi-Parameter Probe Unit # 1
Field Parameters Measured in Flow-Through Cell
Sample Depth (ft bgs) = 25
Pump Rate = 500 ml/min
Temp Well Diameter = 1"
Screen Interval (ft bgs) = 20-30'

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: CHAAP OU1 RAO_Performance Monitoring | PROJECT NO.: 60565355

SAMPLE NO.: EW7-PM25B-5-35 | WELL NO.: EW7-PM25B

DATE/TIME COLLECTED: 2-25-21 / 1330 | PERSONNEL: ~~[illegible]~~ JO BE JO

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	↓
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-25-21	Well Depth (ft bgs)	40
Time Started	~~1120~~ 1305	Depth to Water (ft bgs)	9.3
Time Completed	1330	Water Column Length	30.7
PID Measurements		Well Casing Volume (per ft)	0.16 L
Background	ND	Volume of Water in Well (L)	4.9 L
Breathing Zone	↓	Casing Volumes to Purge	~~1~~ NA
Well Head		Minimum to Purge (L)	~~64 L~~ NA
Purge Water		Actual Purge (L)	~~64 L~~ 7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1310	To ~~5~~ 2.5	6.42	11.35	.733	0.57	-100.8	60.3	9.36	500 ml/min
1320	To ~~10~~ 5.0	6.42	11.35	.752	0.64	-99.8	86.4	9.36	"
1330	To ~~15~~ 7.5	6.42	11.35	.746	0.64	-99.8	46.3	9.36	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 6.48 mg/L

Multi-Parameter Probe Unit # 1

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 35

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 30-40'

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: **CHAAP OU1 RAO_Performance Monitoring** PROJECT NO.: **60565355**

SAMPLE NO.: EW7-PM26A-S-25 WELL NO.: EW7-PM26A

DATE/TIME COLLECTED: 2-27-21 1605 PERSONNEL: BE, JG

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO.: NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO.: ↓

MS/MSD REQUESTED: YES (NO) MS/MSD SAMPLE NO.: ↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-27-21	Well Depth (ft bgs)	30'
Time Started	1550	Depth to Water (ft bgs)	13.59
Time Completed	1605	Water Column Length	16.39
PID Measurements		Well Casing Volume (per ft)	~~2.62~~ 0.16
Background	ND	Volume of Water in Well (L)	2.62
Breathing Zone	↓	Casing Volumes to Purge	NA -
Well Head		Minimum to Purge (L)	NA -
Purge Water		Actual Purge (L)	7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1550	2.5	6.55	10.66	.926	0.03	-75.6	26.3	13.61	.500
1600	5.0	6.55	10.66	.928	0.03	-75.4	25.9	13.61	.500
1605	7.5	6.56	10.67	.925	0.03	-75.4	26.5	13.61	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 5.92 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 25

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 20 - 30

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: CHAAP OU1 RAO_Performance Monitoring | PROJECT NO.: 60565355

SAMPLE NO.: EW7-PM26B-5-35 | WELL NO.: EW7-PM26B

DATE/TIME COLLECTED: 2-26-21 1515 | PERSONNEL: AE, JO

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-26-21	Well Depth (ft bgs)	40
Time Started	1500	Depth to Water (ft bgs)	13.61
Time Completed	1515	Water Column Length	26.39
PID Measurements		Well Casing Volume (per ft)	0.16
Background	ND	Volume of Water in Well (L)	4.22
Breathing Zone		Casing Volumes to Purge	NA -
Well Head		Minimum to Purge (L)	NA -
Purge Water		Actual Purge (L)	7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1505	2.5	6.46	10.06	.815	0.01	-104.9	38	13.65	.500
1510	5.0	6.46	10.10	.817	0.01	-104.7	41	"	"
1515	7.5	6.46	10.10	.820	0.01	-104.6	35	"	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 7.32 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 35

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 30-40

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: CHAAP OU1 RAO_Performance Monitoring | PROJECT NO.: 60565355

SAMPLE NO.: EW7-PM27B-5-35 | WELL NO.: EW7 - PM27B

DATE/TIME COLLECTED: 2-27-21 / 1215 | PERSONNEL: B.E, JO

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.: NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.:
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.:

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-27-21	Well Depth (ft bgs)	40
Time Started	1200	Depth to Water (ft bgs)	11.59
Time Completed	1215	Water Column Length	28.41
PID Measurements		Well Casing Volume (per ft)	0.16
Background	ND	Volume of Water in Well (L)	4.54
Breathing Zone	↓	Casing Volumes to Purge	NA -
Well Head		Minimum to Purge (L)	NA -
Purge Water		Actual Purge (L)	7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1205	2.5	6.29	11.52	.978	0.01	-139.9	45	119.6	500
1210	5.0	6.29	11.57	.975	0.01	-135.7	47	119.6	"
1215	7.5	6.29	11.57	.974	0.01	-135.3	47	11.6	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 6.54 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 35

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 30 - 40

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: **CHAAP OU1 RAO_Performance Monitoring** PROJECT NO.: **60565355**

SAMPLE NO.: EW7-PM28A-5-25 WELL NO.: EW7-PM28A

DATE/TIME COLLECTED: 2-25-21 / 1535 PERSONNEL: AE, JO

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-25-21	Well Depth (ft bgs)	30'
Time Started	~~1440~~ 1520	Depth to Water (ft bgs)	9.28
Time Completed	1535	Water Column Length	20.72
PID Measurements		Well Casing Volume (per ft)	0.16
Background	ND	Volume of Water in Well (L)	3.31
Breathing Zone	↓	Casing Volumes to Purge	~~10~~ 6 ~~to 10~~
Well Head		Minimum to Purge (L)	~~49.65~~
Purge Water		Actual Purge (L)	~~42.5~~ 7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
	TO								
1525	~~37.5~~ 2.5	6.34	11.63	.104	1.75	-59.0	33	9.41	.500 ml/min
1530	~~40~~ 5.0	6.34	11.62	.105	1.78	-58.0	32	9.41	"
1535	~~42.5~~ 7.5	6.34	11.59	.106	1.78	-58.1	30	9.41	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 5.00 mg/L

Multi-Parameter Probe Unit # 1

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 25

Pump Rate = 500

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 20-30

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: CHAAP OU1 RAO_Performance Monitoring | PROJECT NO.: 60565355

SAMPLE NO.: EW7-PM29A-5-25 | WELL NO.: EW7-PM29A

DATE/TIME COLLECTED: 2-26-21 / 1240 | PERSONNEL: AE, JC

SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: Groundwater

SAMPLE QA SPLIT: YES (NO) | SPLIT SAMPLE NO.: NA

SAMPLE QC DUPLICATE: YES (NO) | DUPLICATE SAMPLE NO.: ↓

MS/MSD REQUESTED: YES (NO) | MS/MSD SAMPLE NO.: ↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-26-21
Time Started	~~HOO~~ 1225
Time Completed	1240
PID Measurements	
Background	~~NAA~~ ND
Breathing Zone	
Well Head	
Purge Water	↓

Well Depth (ft bgs)	30'
Depth to Water (ft bgs)	9.54'
Water Column Length	20.46
Well Casing Volume (per ft)	0.16
Volume of Water in Well (L)	3.27
Casing Volumes to Purge	10
Minimum to Purge (L)	~~32.7 L + 1 gal H2O x 2~~ NA
Actual Purge (L)	~~*~~ 7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1230	2.5	6.52	10.61	.810	0.01	-97.6	11.5	9.54	500
1235	5.0	6.53	10.65	.813	0.01	-97.2	11.7	9.54	"
1240	7.5	6.52	10.67	.817	0.01	-97.7	9.3	9.54	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 6.12 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Sample Depth (ft bgs) = 25

Pump Rate = 500 ml/min

Temp Well Diameter = 1"

Screen Interval (ft bgs) = 20-30

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: CHAAP OU1 RAO_Performance Monitoring
PROJECT NO.: 60565355
SAMPLE NO.: EW7-PM29B-5-35
WELL NO.: EW7-PM29B
DATE/TIME COLLECTED: 2-26-21 / 1035
PERSONNEL: AE, JO
SAMPLE METHOD: Peristaltic Pump and tubing

SAMPLE MEDIA: Groundwater
SAMPLE QA SPLIT: YES (NO)
SPLIT SAMPLE NO.: NA
SAMPLE QC DUPLICATE: YES (NO)
DUPLICATE SAMPLE NO.: NA
MS/MSD REQUESTED (YES) NO
MS/MSD SAMPLE NO.: EW7-PM29B-5-35 MS/MSD

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-26-21	Well Depth (ft bgs)	~~9.53~~ 40
Time Started	~~0810~~ 1020	Depth to Water (ft bgs)	9.53
Time Completed	1035	Water Column Length	30.47
PID Measurements		Well Casing Volume (per ft)	0.16 L
Background	ND	Volume of Water in Well (L)	4.9
Breathing Zone		Casing Volumes to Purge	1.0
Well Head		Minimum to Purge (L)	~~4.9 L~~ NA
Purge Water		Actual Purge (L)	7.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (ORP) (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1025	2.5	6.49	10.67	.947	0.02	-119.4	84	9.53	~500
1030	5.0	6.49	10.68	.950	0.02	-119.6	87	9.53	"
1035	7.5	6.49	10.66	.953	0.02	-119.7	90	9.53	"

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.73 mg/L
Multi-Parameter Probe Unit # 637598
Field Parameters Measured in Flow-Through Cell
Sample Depth (ft bgs) = 35
Pump Rate = 500 ml/min
Temp Well Diameter = 1"
Screen Interval (ft bgs) = 30-40

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0022-5	WELL NO.	G0022
DATE/TIME COLLECTED	3-2-21 / 1105	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	34.98
Time Started	1000	Depth to Water (ft BTOC)	12.77
Time Completed	1105	Water Column Length	22.21
PID Measurements		Well Casing Volume (per ft)	2.47
Background	ND	Volume of Water in Well (L)	54.85
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	32.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1005	2.5	6.93	8.91	0.850	4.06	-176.4	1.9	12.55	.500
1010	5.0	6.91	8.93	0.852	4.00	-180.3	0.01	12.55	.500
1015	7.5	6.90	8.98	0.851	3.93	-177.9	0.08	12.55	.500
1020	10	6.90	9.11	0.850	3.84	-173.8	0.07	12.55	.500
1025	12.5	6.89	9.22	0.852	3.75	-168.1	0.05	12.55	.500
1030	15	6.89	9.32	0.852	3.69	-160.7	0.06	12.55	.500
1035	17.5	6.89	9.62	0.852	3.651	-152.6	0.06	12.55	.500
1040	20	6.89	9.80	0.853	3.654	-143.2	0.06	12.55	.500
1045	22.5	6.89	9.99	0.845	3.49	-133.7	0.05	12.55	.500
1050	25.0	6.88	10.25	0.847	3.44	-124.5	0.04	12.55	.500
1055	27.5	6.87	10.29	0.850	3.41	-114.4	0.04	12.55	.500
1100	30	6.87	10.37	0.850	3.37	-104.7	0.04	12.55	.500
1105	32.5	6.87	10.52	0.850	3.32	-94.9	0.04	12.55	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 0.11 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 30 ft

Pump Rate = 500 ml/min

Well Diameter = 4"

Screen Interval = 18-33

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	64.0	157.3	64.0	**107.3**
DO	0.40	2.07	2.07	**1.00**
PH	6.39	7.25	7.25	**6.77**
Cond.	0.635	0.862	0.862	**0.731**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0094-5	WELL NO.	G0094
DATE/TIME COLLECTED	3-1-21/1045	PERSONNEL	AE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA: **Groundwater**

SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	**NO**	DUPLICATE SAMPLE NO.	↓
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	27.50
Time Started	1005	Depth to Water (ft BTOC)	14.93
Time Completed	1045	Water Column Length	12.57
PID Measurements		Well Casing Volume (per ft)	.62
Background	ND	Volume of Water in Well (L)	7.8
Breathing Zone	↓	Casing Volumes to Purge	~~3~~ NA
Well Head		Minimum to Purge (L)	20
Purge Water		Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1010	2.5	6.40	11.30	.972	0.13	59.9	126.7	14.64	.500
1015	5.0	6.38	11.66	.943	0.08	44.9	74.5	14.64	.500
1020	7.5	6.36	11.89	.918	0.07	529.9	84.05	14.64	.500
1025	10	6.33	12.33	.911	0.05	15.9	41.9	14.64	.500
1030	12.5	6.32	12.31	.904	0.04	4.2	47.5	14.64	.500
1035	15	6.32	12.57	.888	0.03	-4.5	47.5	14.64	.500
1040	17.5	6.30	12.82	.893	0.03	-9.1	16.8	14.64	.500
1045	20	6.30	12.93	.887	0.03	-12.1	18.0	14.64	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 1.67 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 22.5 ft

Pump Rate = 500

Well Diameter = 2"

Screen Interval = 15-25

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	-53.6	27.7	-28.0	**-21.8**
DO	0.16	0.64	0.64	**0.48**
PH	5.92	6.29	6.04	**6.04**
Cond.	0.359	0.791	0.791	**0.601**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0096-5	WELL NO.	G0096
DATE/TIME COLLECTED	3-1-21 / 910	PERSONNEL	V. B, RE
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	**NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	**YES**	NO	DUPLICATE SAMPLE NO.	G0296-5 Tim 915
MS/MSD REQUESTED	YES	**NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-1-21	Well Depth (ft BTOC)	27.93
Time Started	830	Depth to Water (ft BTOC)	16.96 ~~16.78~~
Time Completed	910	Water Column Length	10.97
PID Measurements		Well Casing Volume (per ft)	6.8 = 10.97 x .62
Background	ND	Volume of Water in Well (L)	& .62
Breathing Zone		Casing Volumes to Purge	NA
Well Head	↓	Minimum to Purge (L)	20L
Purge Water		Actual Purge (L)	20L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
835	2.5	6.16	10.09	1.230	0.11	-109.5	20.9	16.79	.500
840	5	6.17	10.01	1.199	0.09	-106.9	14	16.79	.500
845	7.5	6.17	10.13	1.181	0.07	-104.8	9.6	16.79	.500
850	10	6.17	10.27	1.170	0.06	-103.6	6.9	16.79	.500
855	~~12.5~~ 12.5	6.16	10.55	1.161	0.05	-103.0	5.7	16.79	.500
900	15	6.17	10.51	1.154	0.04	-102.2	5.2	16.79	.500
905	17.5	6.17	10.77	1.144	0.03	-101.7	4.7	16.79	.500
~~910~~ 910	20.0	6.19	10.69	1.138	0.03	-102.0	4.2	16.79	.500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 3.22 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 23 ft

Pump Rate = 500

Well Diameter = 2"

Screen Interval = 15-25

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	-57.3	133.1	65.0	**17.8**
DO	0.32	0.61	0.61	**0.50**
PH	6.40	7.04	6.72	**6.62**
Cond.	0.483	1.040	1.040	**0.697**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0102-5	WELL NO.	G0102
DATE/TIME COLLECTED	3-2-21 / 905	PERSONNEL	BE, JB
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	3-2-21	Well Depth (ft BTOC)	28.19
Time Started	825	Depth to Water (ft BTOC)	13.3
Time Completed	905	Water Column Length	14.89
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	9.23
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
830	2.5	6.62	8.56	2.226	0.18	-182.8	39.4	13.3	500
835	5.0	6.63	8.80	2.232	0.12	-204.6	18.4	13.3	500
840	7.5	6.64	8.90	2.231	0.08	-244.5	16.0	13.3	500
845	10	6.65	9.17	2.238	0.08	-260.4	33.6	13.3	500
850	12.5	6.66	9.14	2.257	0.05	-266.2	24.3	13.3	500
855	15	6.67	9.29	2.260	0.04	-270.9	20.3	13.3	500
900	17.5	6.68	9.30	2.257	0.03	-275.3	20.5	13.3	500
905	20	6.68	9.62	2.271	0.03	-279.2	20.1	13.3	500

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.2 mg/L Diluted

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 23 ft

Pump Rate = 500 ml/min

Well Diameter = 2"

Screen Interval = 15-25

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	-195.8	10.9	-60.0	**-47.3**
DO	0.39	1.31	0.43	**0.62**
PH	6.81	7.04	7.00	**6.92**
Cond.	1.717	2.740	2.740	**2.318**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0111-5	WELL NO.	G0111
DATE/TIME COLLECTED	2-28-21 @ 1055	PERSONNEL	BE, JO
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		

SAMPLE MEDIA:	Groundwater			
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES	NO	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2S0_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-28-21	Well Depth (ft BTOC)	27.54
Time Started	1015	Depth to Water (ft BTOC)	19.26
Time Completed	1055	Water Column Length	8.28
PID Measurements		Well Casing Volume (per ft)	0.62
Background	ND	Volume of Water in Well (L)	5.13
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	20

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1020	2.5	6.69	10.88	1.758	0.36	-204.0	4.18	19.26	0.5
1025	5.0	6.70	11.31	1.726	0.35	-204.8	4.21	19.26	
1030	7.5	6.71	11.52	1.792	0.33	-204.7	0.72	19.26	
1035	10.0	6.70	11.64	1.782	0.29	-204.1	0.42	19.26	
1040	12.5	6.70	11.67	1.774	0.27	-202.8	0.28	19.26	
1045	15.0	6.69	11.68	1.769	0.24	-201.7	0.29	19.26	
1050	17.5	6.69	11.74	1.765	0.23	-200.1	0.19	19.26	
1055	20.0	6.69	11.78	1.762	0.22	-198.4	0.17	19.26	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.24 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 23.5 ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 15-25

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	-77.6	14.0	14.0	**-42.2**
DO	0.15	2.85	0.86	**0.92**
PH	6.22	7.06	7.06	**6.52**
Cond.	1.012	1.620	1.620	**1.285**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0121-5	WELL NO.	G0121
DATE/TIME COLLECTED	2-28-21 @1220	PERSONNEL	BE
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-28-21	Well Depth (ft BTOC)	32.35
Time Started	1140	Depth to Water (ft BTOC)	~~15.22~~ 15.62
Time Completed	1220	Water Column Length	17.13
PID Measurements		Well Casing Volume (per ft)	0.62 L
Background	ND	Volume of Water in Well (L)	10.62
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20 L
Purge Water	ND	Actual Purge (L)	20 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1145	2.5	4.88	10.17	4.033	0.08	-87.2	462.27	15.62	0.5
1150	5.0	4.88	10.91	4.073	0.05	-97.9	322.62	15.62	
1155	7.5	4.88	11.08	4.045	0.05	-105.0	325.53	15.62	
1200	10.0	4.90	11.34	3.962	0.04	-110.2	267.33	15.62	
1205	12.5	4.92	11.43	3.873	0.04	-114.7	238.21	15.62	
1210	15.0	4.97	11.55	3.672	0.04	-119.5	207.23	15.62	
1215	17.5	4.98	11.60	3.580	0.04	-122.3	241.31	15.62	
1220	20.0	5.02	11.55	3.539	0.04	-127.9	185.82	15.62	
			JO						

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 3.09 mg/L

Light brown color, smells bad.

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

High turbidity

Pump Placement Depth = 27 ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 20'-30'

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	-97.8	-52.9	-80.0	**-73.4**
DO	0.50	1.24	0.50	**0.78**
PH	6.35	6.86	6.86	**6.55**
Cond.	1.446	1.836	1.770	**1.643**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0122-5	WELL NO.	G0122
DATE/TIME COLLECTED	2-28-21 @ 0920	PERSONNEL	~~B. Exe~~ BE
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-28-21	Well Depth (ft BTOC)	32.85
Time Started	0840	Depth to Water (ft BTOC)	17.28
Time Completed	0920	Water Column Length	15.57
PID Measurements		Well Casing Volume (per ft)	0.62 L
Background	ND	Volume of Water in Well (L)	9.65
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20
Purge Water	ND	Actual Purge (L)	22.5

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
0840	2.5	6.44	9.24	2.209	0.89	-32.8	94.13	17.28	0.5
0845	5.0	6.45	8.77	2.254	0.56	-133.7	78.49	17.28	0.5
0850	7.5	6.46	9.10	2.285	0.40	-161.1	69.47	17.28	0.5
0855	10.0	6.47	9.30	2.252	0.32	-182.1	248.29	17.28	0.5
0900	12.5	6.48	9.08	2.273	0.28	-199.7	468.38	17.28	0.5
0905	15.0	6.48	9.13	2.244	0.22	-217.4	60.91	17.28	0.5
0910	17.5	6.48	8.90	2.327	0.13	-242.2	38.27	17.28	0.5
0915	20.0	6.47	9.09	2.323	0.09	-256.8	37.81	17.28	0.5
0920	22.5	6.48	9.00	2.339	0.06	-266.4	35.32	17.28	0.5
				JO					

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 2.64 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 28 ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 20'-30'

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	-61.0	-61.0	-61.0	**-61.0**
DO	0.30	0.30	0.30	**0.30**
PH	7.01	7.01	7.01	**7.01**
Cond.	2.340	2.340	2.340	**2.340**

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME	CHAAP	PROJECT NO.	60565355
SAMPLE NO.	G0123-5	WELL NO.	G0123
DATE/TIME COLLECTED	2-28-21 1350	PERSONNEL	BE
SAMPLE METHOD	PRO-ACTIVE SS MONSOON		JO
SAMPLE MEDIA:	Groundwater		
SAMPLE QA SPLIT:	YES **NO**	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES **NO**	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED	YES **NO**	MS/MSD SAMPLE NO.	NA

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
2 - 500 mL Amber	6°C	Explosives + MNX (8330A)
3 - 40 mL VOA	6°C, HCl	Methane (RSK 175)
1 - 500 mL HDPE	6°C, H_2SO_4	TKN (351.2), NH_3 (350.1), NO_2/NO_3 (353.2)
1 - 250 mL HDPE	6°C	SO_4 (9056A), Alkalinity (2320B)
1 - 250 mL HDPE	6°C, ZnOAc/NaOH	Sulfide (9034)
1 - 250 mL Amber	6°C	DOC (9060A)

WELL PURGING DATA

Date	2-28-21	Well Depth (ft BTOC)	31.98
Time Started	1310	Depth to Water (ft BTOC)	15.59
Time Completed	1405	Water Column Length	16.39
PID Measurements		Well Casing Volume (per ft)	0.62 L
Background	ND	Volume of Water in Well (L)	10.16
Breathing Zone	ND	Casing Volumes to Purge	NA
Well Head	ND	Minimum to Purge (L)	20 L
Purge Water	ND	Actual Purge (L)	20 L

FIELD MEASUREMENTS

Time	Amount Purged (L)	pH	Temperature (Celsius)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Turbidity (NTU)	Depth to Water (ft BTOC)	Purge Rate (L/min)
1315	2.5	6.01	10.61	1.896	0.75	-87.8	37.71	15.59	0.5
1320	5.0	6.00	11.11	1.917	0.41	-98.2	32.89	15.59	
1325	7.5	6.00	11.26	1.960	0.26	-105.8	24.40	15.59	
1330	10.0	6.00	11.64	1.993	0.15	-115.5	25.37	15.59	
1335	12.5	6.00	11.55	1.918	0.10	-116.7	23.13	15.59	
1340	15.0	6.00	11.63	1.958	0.05	-82.1	23.80	15.59	
1345	17.5	5.99	11.65	1.725	0.01	-119.6	21.81	15.59	
1350	20.0	6.00	11.97	1.673	0.03	-126.2	18.89	15.59	↓
		JO							

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	Heron	Checked Against Calibrated Length
Water Quality Meter	Aqua TROLL 500 w/ flow through cell	Twice Daily Calibration Verification also Calibrated Weekly

GENERAL COMMENTS

Ferrous Iron = 6.54 mg/L

Multi-Parameter Probe Unit # 637598

Field Parameters Measured in Flow-Through Cell

Pump Placement Depth = 26 ft

Pump Rate = 0.5 L/min

Well Diameter = 2"

Screen Interval = 20'-30'

	Historic (7-year average low and high / 2020 / Avg in Bold)			
ORP	45.0	45.0	45.0	**45.0**
DO	0.31	0.31	0.31	**0.31**
PH	6.85	6.85	6.85	**6.85**
Cond.	1.860	1.860	1.860	**1.860**

DAILY QUALITY CONTROL REPORT

Date	02/22/21

Day	S	S	M	T	W	T	F
			X				

On Site Hours	0945 - 1630
Travel Time	2.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun: X	Clear: X	Overcast	Rain	Snow
Temp	To 32	32-50: X	50-70	70-85	85 up
Wind	Still: X	Moderate	High	**Report No.**	
Humidity	Dry	Moderate: X	Humid	1	

Subcontractors on Site:

Plains Environmental Services (PES) (Direct Push Subcontractor) - Jason Auernheimer

Equipment on Site:

One direct push rig (Geoprobe 6620DT), Screen point sampler (SP15), support trucks, hand-held GPS unit, performance monitoring (PM) temporary well materials (1"-OD PVC., 10' screens, filter pack sand, granular bentonite, coated chips, grout mix), peristaltic pump and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, LaMotte turbidity meter, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):

-Began OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Off-post Direct Push Sampled
NW050R-DP05-20
NW050R-DP05-35
NW050R-DP05-60

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Completed staking of sample locations using hand-held GPS with predetermined coordinates. Utility locates and notifying property owners of field activities were completed week of 2/15/21.
-Calibration check of PIDs (serial #'s 110-014926, 110-014888) and water level indicators (#'s 1324-T, 1323-T).

Health and Safety and Activities:

Had the initial H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	02/23/21

Day	S	S	M	T	W	T	F
				X			

On Site Hours	0700 - 1700
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun: X	Clear: X	Overcast	Rain	Snow
Temp	To 32	32-50	50-70: X	70-85	85 up
Wind	Still: X	Moderate	High	**Report No.**	
Humidity	Dry	Moderate: X	Humid	2	

Subcontractors on Site:

Plains Environmental Services (PES) (Direct Push Subcontractor) - Jason Auernheimer

Equipment on Site:

One direct push rig (Geoprobe 6620DT), Screen point sampler (SP15), support trucks, hand-held GPS unit, performance monitoring (PM) temporary well materials (1"-OD PVC., 10' screens, filter pack sand, granular bentonite, coated chips, grout mix), peristaltic pump and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, LaMotte turbidity meter, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Off-post Direct Push Sampled

OS003-DP05-25	OS001-DP05-25
OS003-DP05-35	OS001-DP05-35
OS003-DP05-45	OS001-DP05-45

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calibration check of PIDs (serial #'s 110-014926, 110-014888) and water level indicators (#'s 1324-T, 1323-T).
-Duplicate OS501-DP05-25 (parent:OS001-DP05-25). OS003-DP05-45 MS/MSD

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.

-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	**02/24/21**

Day	S	S	M	T	W	T	F
					X		

On Site Hours	0700 - 1700
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun X	Clear X	Overcast	Rain	Snow
Temp	To 32	32-50	50-70 X	70-85	85 up
Wind	Still X	Moderate	High	**Report No.**	
Humidity	Dry	Moderate X	Humid	3	

Subcontractors on Site:
Plains Environmental Services (PES) (Direct Push Subcontractor) - Jason Auernheimer

Equipment on Site:
One direct push rig (Geoprobe 6620DT), Screen point sampler (SP15), support trucks, hand-held GPS unit, performance monitoring (PM) temporary well materials (1"-OD PVC., 10' screens, filter pack sand, granular bentonite, coated chips, grout mix), peristaltic pump and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, LaMotte turbidity meter, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:
None.

AECOM/Brice Personnel on Site:
AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):
-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well Installed (temporary)
EW7-PM25- A & B
EW7-PM26- A & B
EW7-PM27- B
EW7-PM29- A & B

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):
-Calibration check of PIDs (serial #'s 110-014926, 110-014888) and water level indicators (#'s 1324-T, 1323-T).

Health and Safety and Activities:
Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:
None.

Office Work Performed:
-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date **02/25/21**

Day	S	S	M	T	W	T	F
						X	

On Site Hours	0700 - 1700
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun	Clear	Overcast	Rain	Snow
			X		
Temp	To 32	32-50	50-70	70-85	85 up
		X			
Wind	Still	Moderate	High	**Report No.**	
		X			
Humidity	Dry	Moderate	Humid	4	
		X			

Subcontractors on Site:

Plains Environmental Services (PES) (Direct Push Subcontractor) - Jason Auernheimer

Equipment on Site:

One direct push rig (Geoprobe 6620DT), Screen point sampler (SP15), support trucks, hand-held GPS unit, performance monitoring (PM) temporary well materials (1"-OD PVC., 10' screens, filter pack sand, granular bentonite, coated chips, grout mix), peristaltic pump and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, LaMotte turbidity meter, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well Installed (temporary)	Performance Monitoring Well sampled
EW7-PM21-A	EW7-PM25A-5-25
EW7-PM24-A	EW7-PM25B-5-35
EW7-PM28-A	EW7-PM28A-5-25

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	**02/26/21**

Day	S	S	M	T	W	T	F
							X

On Site Hours	0700 - 1700
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun	Clear	Overcast	Rain	Snow
			X		
Temp	To 32	32-50	50-70	70-85	85 up
		X			
Wind	Still	Moderate	High	**Report No.**	
		X			
Humidity	Dry	Moderate	Humid	5	
		X			

Subcontractors on Site:

None.

Equipment on Site:

Support trucks, hand-held GPS unit, peristaltic pump and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well sampled
EW7-PM26B-5-35
EW7-PM29A-5-25
EW7-PM29B-5-35

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).
-EW7-PM29B-5-35 MS/MSD

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.

-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	02/27/21

Day	S	S	M	T	W	T	F
	X						

On Site Hours	0700 - 1700
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun	Clear	Overcast	Rain	Snow
			X		

Temp	To 32	32-50	50-70	70-85	85 up
		X			

Wind	Still	Moderate	High	**Report No.**
		X		

Humidity	Dry	Moderate	Humid	6
		X		

Subcontractors on Site:

None.

Equipment on Site:

Support trucks, hand-held GPS unit, peristaltic pump and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well sampled

EW7-PM21A-5-25
EW7-PM24A-5-25
EW7-PM26A-5-25
EW7-PM27B-5-35

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.

-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	02/28/21

Day	S	S	M	T	W	T	F
		X					

On Site Hours	0700 - 1700
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun		Clear	Overcast	Rain	Snow
				X		
Temp	To 32		32-50	50-70	70-85	85 up
			X			
Wind	Still	Moderate		High	**Report No.**	
		X				
Humidity	Dry	Moderate		Humid	7	
		X				

Subcontractors on Site:

None.

Equipment on Site:

Support trucks, hand-held GPS unit, monsoon submersible pumps and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well sampled		Monitoring Well sampled
G0111-5	G0123-5	G0080-5
G0121-5		
G0122-5		

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.

-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	03/01/21

Day	S	S	M	T	W	T	F
			X				

On Site Hours	0700 - 1730
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun		Clear X	Overcast	Rain / Snow
Temp	To 32		32-50 X	50-70	70-85 / 85 up
Wind	Still	Moderate X		High	**Report No.**
Humidity	Dry	Moderate X		Humid	8

Subcontractors on Site:

None.

Equipment on Site:

Support trucks, hand-held GPS unit, monsoon submersible pumps and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen
Brice - Gary Carson, Jacob Bougere

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well sampled	Monitoring Well sampled		
G0094-5	G0070-5	G0079-5	NW060-5
G0096-5	G0075-5	NW070-5	NW061-5
	G0076-5	NW071-5	NW062-5

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).
-Duplicate G0296-5 (parent G0096-5). G0070-5 MS/MSD.

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	03/02/21

Day	S	S	M	T	W	T	F
				X			

On Site Hours	0700 - 1800
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun		Clear	Overcast	Rain	Snow
			X			
Temp	To 32		32-50	50-70	70-85	85 up
				X		
Wind	Still	Moderate		High	**Report No.**	
				X		
Humidity	Dry	Moderate		Humid	9	
		X				

Subcontractors on Site:

None.

Equipment on Site:

Support trucks, hand-held GPS unit, monsoon submersible pumps and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen
Brice - Gary Carson, Jacob Bougere

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Performance Monitoring Well sampled	Monitoring Well sampled			
G0022-5	G0081-5	G0087-5	CA210-5	CA213-5
G0102-5	G0082-5	G0091-5	CA211-5	
	G0086-5	G0092-5	CA212-5	

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	03/03/21

Day	S	S	M	T	W	T	F
					X		

On Site Hours	0700 - 1800
Travel Time	0.5
Office Time	1

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun	Clear	Overcast	Rain	Snow
		X			
Temp	To 32	32-50	50-70	70-85	85 up
			X		
Wind	Still	Moderate	High	**Report No.**	
		X			
Humidity	Dry	Moderate	Humid	10	
		X			

Subcontractors on Site:

None.

Equipment on Site:

Support trucks, hand-held GPS unit, monsoon submersible pumps and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:

None.

AECOM/Brice Personnel on Site:

AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen
Brice - Gary Carson, Jacob Bougere

Field Work Performed (including sampling):

-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

Monitoring Well sampled

NW020-5	G0024-5	PZ017R-5	-Abandoned 10 temporary PM wells
NW021-5	G0077-5	PZ018-5	
NW022-5	G0078-5	PZ019-5	PZ020-5

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):

-Calib. check of PIDs (#'s 110-014926, 110-014888) , WL meters (#'s 1324-T, 1323-T), TROLLs (#'s 653996 and 637598).
-Duplicate PZ021-5 (parent PZ017R-5).

Health and Safety and Activities:

Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
-Completed Daily Task Hazard Assessment Sheet

Observations/Problems Encountered/Corrective Action Taken:

None.

Office Work Performed:

-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

DAILY QUALITY CONTROL REPORT

Date	03/04/21

Day	S	S	M	T	W	T	F
						X	

On Site Hours	0800 - 1000
Travel Time	3
Office Time	2

COE Project Manager	Jeff Gill
Project	CHAAP OU1 Rebound Study/ PMs-Q#5
Project No.	60565355
Contract No.	W9128F-18-D-0020

Weather	Bright Sun	Clear X	Overcast	Rain	Snow
Temp	To 32	32-50	50-70 X	70-85	85 up
Wind	Still	Moderate X	High	**Report No.**	
Humidity	Dry	Moderate X	Humid	11	

Subcontractors on Site:
None.

Equipment on Site:
Support trucks, hand-held GPS unit, monsoon submersible pumps and tubing, laboratory provided sample containers, IDW buckets, decon supplies, AquaTroll 500, Hach Colormeter, water level meters, MiniRAE PID, level D PPE, first-aid/safety supplies, and field/safety paperwork.

Visitors on Site:
None.

AECOM/Brice Personnel on Site:
AECOM - Ryan Herold, Jonathan Ortiz, Bob Exceen
Brice - Gary Carson, Jacob Bougere

Field Work Performed (including sampling):
-Continued OU1 Rebound Study/performance monitoring Q#5 groundwater sampling event (DP screen point sampling, install/sample/abandon performance monitoring wells, and MW sampling).

-Collected IDW-water characterization sample: WATER-WC-Q5-MAR21
-Completed site restoration, equipment storage, and demobilization.

-OU1 sample analysis will be completed in accordance with Addendum 2, and Addendum 3 UFP-QAPPs.
-Containerized IDW purge/decontamination water in a designated labeled 1000-gallon poly tank at GWTF.

Quality Control Activities (including field calibration):
-None.

Health and Safety and Activities:
Had the initial H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, hazards with direct push rigs, pump and traffic safety, potential exposure to explosives contamination, fire hazards, cold stress, hearing protection, slip-trip-falls, COVID-19, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety. Utility locates were performed (Nebraska811) and utilities were marked.
-Completed Daily Tailgate Meeting Sheet
Had the daily H&S meeting with all personnel on site. All persons on site completed required paperwork/checklists and discussed

Observations/Problems Encountered/Corrective Action Taken:
None.

Office Work Performed:
-Organized paperwork and equipment, scanned SCFSs.
-Completed DQCR.

By Ryan Herold **Title** Field Manager

WEEKLY REPORT

COE Project Manager	Brian Fettin	**Report No.**	1
Project	CHAAP - OU1 Rebound Study /	**Date**	2/22/21 to 2/26/21
	Performance Monitoring - Quarter #5	**Brice/AECOM On-site Hours**	139
Project No.	60565355	**Subcontractor Hours**	32
Contract No.	Brice W9128F-18-D-0020		
Delivery Order No.	F0041		

AECOM/Brice Personnel on Site:

Ryan Herold, Bob Exceen, Jonathan Ortiz (AECOM)

Subcontractors on Site:

Plains Environmental Services (PES) (Direct Push Subcontractor) - Jason Auernheimer

Visitors on Site:

None.

Summary of Work Performed:

-Contacted private land owners and informed them of the upcoming OU1 Rebound Study/performance monitoring (PM) field activities. Completed utility locates prior to subsurface activities (week of 2/15/21).

-Mobilized to site, conducted initial health and safety meeting, prepped field equipment, and staked all direct push (DP) locations using hand-held GPS including: 3 off-site (screen point) locations - OS001, OS003, and NW050R (adjacent to MW cluster NW050); and 10 temporary PM wells for 2020 subsurface injections.

-Calibration (weekly) and calibration checks (daily) of field PIDs, water level indicators, and Aqua TROLL 500s.

BEGAN QUARTER #5 (Q5) OU1 REBOUND STUDY AND INJECTION PM SAMPLING ACTIVITIES:

-Collected 9 DP groundwater samples (screen point) at depths 25 feet, 35 feet, and 45 feet bgs (at locations OS001, OS003) and 20 feet, 35 feet, and 60 feet bgs (at location NW050R) for explosives + MNX (Method 8330A) analysis only (**OS001-DP05-25, OS001-DP05-35, OS001-DP05-45, OS003-DP05-25, OS003-DP05-35, OS003-DP05-45, NW050R-DP05-20, NW050R-DP05-35, NW050R-DP05-60**).

-Onsite, installed 10 temporary PM wells (1" PVC via DP techniques) at 7 locations for 2020 subsurface injection PM. Each location included either a shallow well (A) (10-foot screen, 20 to 30 feet bgs) or a shallow intermediate well (B) (10-foot screen, 30-40 feet bgs), or both dependent upon location accordingly: EW7-PM21A, EW7-PM24A, EW7-PM25A/B, EW7-PM26A/B, EW7-PM27B, EW7-PM28A, and EW7-PM29A/B.

-Collected 6 of the 10 groundwater samples at temporary PM wells **(EW7-PM25A, PM25B, PM26B, PM28A, PM29A, PM29B**). Each PM temp well was developed prior to sample collection and sampled using low-flow groundwater sampling techniques. Each PM well sample will be analyzed for explosives+MNX (Method 8330A) and water quality parameters including: TKN (351.2), NH3 (350.1), NO2/NO3 (353.2), SO4 (9056A), Alkalinity (2320B), Sulfide (9034), DOC (9060A), and Methane (RSK 175). CO2 will be back calculated from 2320B.

-IDW water (purge and decon) from all sample locations were containerized in an IDW-labeled poly tank located at GWTF. At the completion of Q5 field activities, the IDW water will be sampled for site waste characterization analysis (Explosives+MNX [Method 8330A]) prior to disposal or discharge to ground surface.

-All field and sampling activities were completed in accordance with the 2019 Final Addendum 3 UFP-QAPP, the 2018 Final Addendum 2 UFP-QAPP, and recommendations provided in the 2018 and 2019 Annual Groundwater Monitoring Reports and Final OU1 Rebound Study Letter Report - Quarter 3 Event.

Percentage of Work Completed:

Mobilization, 9 of 9 planned off-site DP (screen point) groundwater samples were collected, 10 of 10 temporary PM wells were installed, 6 of 10 temporary PM wells were developed and sampled, 0 of 10 PM wells (permanent) were sampled, and 0 of 30 OU1 Rebound Study wells were sampled. Approximately 36% of the Q5 OU1 Rebound Study/injection PM sampling field work is now complete.

WEEKLY REPORT

COE Project Manager	Brian Fettin	**Report No.**	1
Project	CHAAP - OU1 Rebound Study / Performance Monitoring - Quarter #5	**Date**	2/22/21 to 2/26/21
		Brice/AECOM On-site Hours	139
Project No.	60565355	**Subcontractor Hours**	32
Contract No.	Brice W9128F-18-D-0020		
Delivery Order No.	F0041		

Schedule for Next Week:

Calibration of water quality equipment, complete Q5 PM well sampling (4 temp. wells and 10 permanent wells remain), abandon all temporary PM wells, complete Q5 OU1 Rebound Study groundwater purge and sample collection activities at 30 monitoring wells, and collect IDW water sample.

Health and Safety and Activities:

-Had the initial and daily H&S meetings with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, potential exposure to explosives contamination, direct push equipment hazards and safety, cold stress, slip-trip-falls, traffic hazards, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety.
-Completed equipment and vehicle safety checks.
-Completed Daily Tailgate Meeting Sheets and Daily Task Hazard Assessment Sheets.

Deviations from SOW and/or WP:

Due to off-site landowner not renewing access agreement, 6 OU1 Rebound Study monitoring wells (NW050, NW051, NW052, NW080, NW081R, and NW082R) will not be accessed/sampled during Q5 and future events, and will be abandoned at a future date. However, during the Q5 and future events, three direct push groundwater samples (screen point) will be collected at one location (adjacent to NW050 cluster in ROW) at comparable interval depths. Groundwater samples will be analyzed for explosives only.

Problems Encountered/Corrective Action Taken:

None.

Recommendations:

None.

Communication Notice This Week:

None.

Key Personnel Changes:

Jason Auernheimer (PES) off site 2/25/21.

Purging off-site DP location NW050R (facing north)

Installation of temporary PM wells: EW7-PM26A (shallow) and PM26B (shallow intermediate)

WEEKLY REPORT

COE Project Manager	Brian Fettin	**Report No.**	1
Project	CHAAP - OU1 Rebound Study / Performance Monitoring - Quarter #5	**Date**	2/22/21 to 2/26/21
		Brice/AECOM On-site Hours	139
Project No.	60565355	**Subcontractor Hours**	32
Contract No.	Brice W9128F-18-D-0020		
Delivery Order No.	F0041		

By: Ryan Herold **Title: Field Manager**

WEEKLY REPORT

COE Project Manager	Brian Fettin	**Report No.**	2
Project	CHAAP - OU1 Rebound Study / Performance Monitoring - Quarter #5	**Date**	2/27/21 to 3/4/21
		Brice/AECOM On-site Hours	273
Project No.	60565355	**Subcontractor Hours**	0
Contract No.	Brice W9128F-18-D-0020		
Delivery Order No.	F0041		

AECOM/Brice Personnel on Site:

Ryan Herold, Bob Exceen, Jonathan Ortiz (AECOM), Gary Carson, Jacob Bougere (Brice)

Subcontractors on Site:

None.

Visitors on Site:

None.

Summary of Work Performed:

CONTINUED QUARTER #5 (Q5) OU1 REBOUND STUDY AND INJECTION PERFORMANCE MONITORING (PM) SAMPLING ACTIVITIES:

-Collected 4 of the 10 groundwater samples at temporary PM wells (**EW7-PM21A, PM24A, PM26A, PM27B**). Each temp. PM well was developed prior to sample collection and sampled using low-flow groundwater sampling techniques. Each temp. PM well sample will be analyzed for explosives+MNX (Method 8330A) and water quality parameters including: TKN (351.2), NH3 (350.1), NO2/NO3 (353.2), SO4 (9056A), Alkalinity (2320B), Sulfide (9034), DOC (9060A), and Methane (RSK 175). CO2 will be back calculated from 2320B.

-Abandoned all 10 temp. PM wells.

-Collected 10 of the 10 groundwater samples at permanent PM wells (**G0022, PZ017R, PZ018, G0094, G0096, G0102, G0111, G0121, G0122, G0123**). Each PM monitoring well was purged and sampled using low-flow groundwater sampling techniques and will be analyzed for explosives+MNX and water quality parameters (above).

-Collected groundwater samples from 30 of the 30 OU1 Rebound Study off-post and on-post wells/piezometers (**CA210, CA211, CA212, CA213, NW020, NW021, NW022, NW060, NW061, NW062, NW070, NW071, G0024, G0070, G0075, G0076, G0077, G0078, G0079, G0080, G0081, G0082, G0086, G0087, G0091, G0092, PZ017R, PZ018, PZ019, PZ020**). Each well was purged and sampled using low-flow groundwater sampling techniques and will be analyzed for explosives+MNX (Method 8330A) and water quality parameters (above).

-IDW water (purge and decon) from all sample locations were containerized in an IDW-labeled poly tank located at GWTF. At the completion of Q5 field activities, the IDW water was sampled for site waste characterization analysis (Explosives+MNX [Method 8330A]) prior to disposal or discharge to ground surface.

-All field and sampling activities were completed in accordance with the 2019 Final Addendum 3 UFP-QAPP, the 2018 Final Addendum 2 UFP-QAPP, and recommendations provided in the 2018 and 2019 Annual Groundwater Monitoring Reports and Final OU1 Rebound Study Letter Report - Quarter 3 Event.

-Calibration (weekly) and calibration checks (daily) of field PIDs, water level indicators, and Aqua TROLL 500s.

Percentage of Work Completed:

Mobilization, 9 of 9 planned off-site DP (screen point) groundwater samples were collected, 10 of 10 temporary PM wells were installed, developed, sampled, and abandoned; 10 of 10 PM wells (permanent) were sampled, 30 of 30 OU1 Rebound Study wells were sampled, collected IDW water waste characterization sample, completed site restoration activities, and demobilized from site. 100% of the Q5 OU1 Rebound Study/injection PM sampling field work is now complete.

Schedule for Next Week:

None.

WEEKLY REPORT

COE Project Manager	Brian Fettin	**Report No.**	2
Project	CHAAP - OU1 Rebound Study / Performance Monitoring - Quarter #5	**Date**	2/27/21 to 3/4/21
		Brice/AECOM On-site Hours	273
Project No.	60565355	**Subcontractor Hours**	0
Contract No.	Brice W9128F-18-D-0020		
Delivery Order No.	F0041		

Health and Safety and Activities:

-Had the daily H&S meetings with all personnel on site. All persons on site completed required paperwork/checklists and discussed sections of QAPP-APP/SSHP and H&S procedures including: PPE, potential exposure to explosives contamination, cold stress, slip-trip-falls, traffic hazards, and lifting hazards. Discussed route to hospital, severe weather procedures, farming activities, and trains and railroad track safety.

-Completed equipment and vehicle safety checks.

-Completed Daily Tailgate Meeting Sheets and Daily Task Hazard Assessment Sheets.

Deviations from SOW and/or WP:

Due to off-site landowner not renewing access agreement, 6 OU1 Rebound Study monitoring wells (NW050, NW051, NW052, NW080, NW081R, and NW082R) will not be accessed/sampled during Q5 and future events, and will be abandoned at a future date. However, during the Q5 and future events, three direct push groundwater samples (screen point) will be collected at one location (adjacent to NW050 cluster in ROW) at comparable interval depths. Groundwater samples will be analyzed for explosives only.

Problems Encountered/Corrective Action Taken:

None.

Recommendations:

None.

Communication Notice This Week:

None.

Key Personnel Changes:

All AECOM and Brice personnel demobilized from site on 3/4/21.

Development of PM temp. wells EW7-PM29A/B (facing north)

Purge and sample collection at on-post monitoring well G0091 (facing south)

By: Ryan Herold **Title: Field Manager**

Appendix C
Photographic Log

SITE ACTIVITIES PHOTOGRAPHIC LOG

Field Activities: OU1 Rebound Study and Performance Monitoring – Quarter 5 Event Cornhusker Army Ammunition Plant, Nebraska	**USACE – Omaha District**	**Contract No. W9128F-18-D-0020 Delivery Order No. F0041**

Photograph No. 1

Description:

OU1 Rebound Study Q5 Sampling

To establish off-post extent of explosives greater than HALs in groundwater, direct push locations were collected at off-site locations OS001 and OS003 (1000 feet further east). Groundwater samples were collected (via Direct Push technology) at screen point depths 25 feet, 35 feet, and 45 feet bgs and analyzed for explosives + MNX only.

Date: 02/23/2021
Direction: south
Photographer: RH
Location: OS001

Photograph No. 2

Description:

OU1 Rebound Study Q5 Sampling

To supplement for six OU1 Rebound Study wells no longer being accessible (clusters NW050 and NW080), an additional direct push location (NW050R) was collected in ditch adjacent to NW050 well cluster and sampled at equivalent depths. Location NW050R was sampled at depths 20 feet, 35 feet, and 60 feet bgs and analyzed for explosives + MNX only.

Date: 2/22/2021
Direction: north
Photographer: RH
Location: NW050R

SITE ACTIVITIES PHOTOGRAPHIC LOG

Field Activities: OU1 Rebound Study and Performance Monitoring – Quarter 5 Event Cornhusker Army Ammunition Plant, Nebraska	**USACE – Omaha District**	**Contract No. W9128F-18-D-0020 Delivery Order No. F0041**

Photograph No. 3

Description:

OU1 Rebound Study Q5 Sampling

Monitoring wells were purged, and groundwater samples were collected using low-flow techniques with submersible pumps. All purging and sample collection were completed in accordance with UFP-QAPP.

Date: 3/2/2021
Direction: south
Photographer: JO
Location: G0091

Photograph No. 4

Description:

OU1 Rebound Study Q5 Sampling

Groundwater samples were collected in laboratory-provided containers and analyzed for explosives + MNX and laboratory MNA parameters by Eurofins - TestAmerica laboratory.

Date: 3/3/2021
Direction: -
Photographer: RH
Location: G0077

SITE ACTIVITIES PHOTOGRAPHIC LOG

Field Activities: OU1 Rebound Study and Performance Monitoring – Quarter 5 Event Cornhusker Army Ammunition Plant, Nebraska	**USACE – Omaha District**	**Contract No. W9128F-18-D-0020 Delivery Order No. F0041**

Photograph No. 5

Description:

OU1 Rebound Study Q5 Sampling

The pump and water level meter were decontaminated after every well.

Date: 2/28/2021
Direction: -
Photographer: JO
Location: G0121

Photograph No. 6

Description:

OU1 Q5 Performance Monitoring

For Q5 subsurface injection performance monitoring (1st event following the 2020 injection event), ten 1" PVC temporary wells were installed (via Direct Push technology). at seven locations between EW6 and EW7. The seven locations included wells either shallow (30-foot deep) wells, shallow-intermediate (40-foot deep) wells, or both.

Date: 2/24/2021
Direction: east
Photographer: RH
Location: EW7-PM25

SITE ACTIVITIES PHOTOGRAPHIC LOG

Field Activities: OU1 Rebound Study and Performance Monitoring – Quarter 5 Event Cornhusker Army Ammunition Plant, Nebraska	**USACE – Omaha District**	**Contract No. W9128F-18-D-0020 Delivery Order No. F0041**

Photograph No. 7

Description:

OU1 Q5 Performance Monitoring

All temporary performance monitoring wells were developed, purged, and sampled for explosives + MNX and laboratory water quality parameters analysis.

Date: 2/26/2021
Direction: east
Photographer: RH
Location: EW7-PM29

Photograph No. 8

Description:

OU1 Q5 Performance Monitoring

Additionally, for Q5 subsurface injection performance, ten permanent monitoring wells were used at LL1, LL2, the Decant Station, and between EW6 and EW7. Purging and sample collection for explosives + MNX and laboratory water quality parameters analysis were completed in accordance with UFP-QAPP.

Date: 3/3/2021
Direction: south
Photographer: RH
Location: PZ017R

SITE ACTIVITIES PHOTOGRAPHIC LOG

Field Activities: OU1 Rebound Study and Performance Monitoring – Quarter 5 Event Cornhusker Army Ammunition Plant, Nebraska	**USACE – Omaha District**	**Contract No. W9128F-18-D-0020 Delivery Order No. F0041**

Photograph No. 9

Description:

OU1 Q5 Rebound Study and Performance Monitoring

All decontamination, development, and purge IDW water from sampling activities were collected in field poly tanks, transferred to an IDW tank at GWTF, and sampled at conclusion of event for explosives +MNX only analysis.

Date: 3/3/2021
Direction: east
Photographer: RH
Location: GWTF

Photograph No. 10

Description:

OU1 Q5 Performance Monitoring

Each temporary well PVC stickup was retracted, and the well was abandoned within 10 days of installation using time-release bentonite pellets and hydrated granular bentonite.

Date: 3/3/2021
Direction: -
Photographer: RH
Location: EW7-PM29

Appendix D
Analytical Data and Validation

Appendix E
OU1 Statistical Trend Data Sheets

MAROS Mann-Kendall Statistics Summary

Project: CHAAP OU1 Rebound Study - Q5 User Name: Dean Converse

Location: Grand Island State: Nebraska

Time Period: 10/22/2019 to 3/3/2021
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
2,4,6-TRINITROTOLUENE								
G0024	T	5	3	0.85	5	82.1%	No	NT
G0077	T	5	5	0.10	8	95.8%	No	I
G0078	T	5	0	0.69	-8	95.8%	Yes	ND
G0091	T	5	0	0.67	-8	95.8%	Yes	ND
G0092	T	5	0	0.67	-9	97.5%	Yes	ND
NW020	T	5	4	0.50	8	95.8%	No	I
NW021	T	5	0	0.65	-9	97.5%	Yes	ND
NW022	T	5	0	0.68	-8	95.8%	Yes	ND
PZ017R	S	5	5	0.22	-5	82.1%	No	S
PZ018	T	5	4	0.79	-2	59.2%	No	S
PZ019	T	5	0	0.68	-5	82.1%	Yes	ND
PZ020	T	5	5	0.20	2	59.2%	No	NT
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZIN								
G0024	T	5	1	1.54	-5	82.1%	No	NT
G0077	T	5	5	0.57	0	40.8%	No	S
G0078	T	5	0	0.60	-9	97.5%	Yes	ND
G0091	T	5	5	0.40	-8	95.8%	No	D
G0092	T	5	0	0.70	-10	99.2%	Yes	ND
NW020	T	5	5	0.63	6	88.3%	No	NT
NW021	T	5	0	0.59	-9	97.5%	Yes	ND
NW022	T	5	0	0.59	-9	97.5%	Yes	ND
PZ017R	S	5	5	0.32	9	97.5%	No	I
PZ018	T	5	2	1.23	-4	75.8%	No	NT
PZ019	T	5	0	0.62	-5	82.1%	Yes	ND
PZ020	T	5	5	0.16	2	59.2%	No	NT

MAROS Mann-Kendall Statistics Summary

Project: CHAAP OU1 Rebound Study - Q5 User Name: Dean Converse

Location: Grand Island State: Nebraska

HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZIN

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Mann-Kendall Statistics Summary

Project: CHAAP OU1 Rebound Study - Q5 User Name: Dean Converse

Location: Grand Island State: Nebraska

Time Period: 10/21/2019 to 3/3/2021
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
2,4,6-TRINITROTOLUENE								
G0070	T	5	0	0.66	-8	95.8%	Yes	ND
G0075	T	5	0	0.66	-4	75.8%	Yes	ND
G0076	T	5	0	0.66	-6	88.3%	Yes	ND
G0079	T	5	0	0.66	-6	88.3%	Yes	ND
G0080	T	5	0	0.68	-7	92.1%	Yes	ND
G0081	S	5	1	1.29	-7	92.1%	No	PD
G0082	T	5	0	0.65	-6	88.3%	Yes	ND
G0086	T	5	4	0.61	-2	59.2%	No	S
G0087	T	5	0	0.64	-6	88.3%	Yes	ND
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZIN								
G0070	T	5	0	0.59	-8	95.8%	Yes	ND
G0075	T	5	0	0.59	-4	75.8%	Yes	ND
G0076	T	5	1	0.88	-2	59.2%	No	S
G0079	T	5	0	0.60	-6	88.3%	Yes	ND
G0080	T	5	0	0.61	-6	88.3%	Yes	ND
G0081	S	5	0	0.64	-5	82.1%	Yes	ND
G0082	T	5	4	0.51	0	40.8%	No	S
G0086	T	5	3	0.94	6	88.3%	No	NT
G0087	T	5	3	0.37	8	95.8%	No	I

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

The Number of Samples and Number of Detects shown above are post-consolidation values.

TABLE E.1
FORMER FACILITY BOUNDARY WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
G0024	2,067,195	403,887	2,4,6-TRINITROTOLUENE	3/3/2021	0.48	ug/L	0.042	
G0024	2,067,195	403,887	2,4,6-TRINITROTOLUENE	10/4/2020	0.2	ug/L	0.086	
G0024	2,067,195	403,887	2,4,6-TRINITROTOLUENE	6/15/2020	0.63	ug/L	0.048	TR
G0024	2,067,195	403,887	2,4,6-TRINITROTOLUENE	3/4/2020		ug/L	0.160	ND
G0024	2,067,195	403,887	2,4,6-TRINITROTOLUENE	10/23/2019		ug/L	0.160	ND
G0024	2,067,195	403,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021		ug/L	0.048	ND
G0024	2,067,195	403,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/4/2020		ug/L	0.053	ND
G0024	2,067,195	403,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020	0.59	ug/L	0.055	
G0024	2,067,195	403,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020		ug/L	0.150	ND
G0024	2,067,195	403,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019		ug/L	0.150	ND
G0077	2,067,218	403,894	2,4,6-TRINITROTOLUENE	3/3/2021	3.6	ug/L	0.042	
G0077	2,067,218	403,894	2,4,6-TRINITROTOLUENE	10/4/2020	3.4	ug/L	0.046	
G0077	2,067,218	403,894	2,4,6-TRINITROTOLUENE	6/15/2020	3.3	ug/L	0.047	
G0077	2,067,218	403,894	2,4,6-TRINITROTOLUENE	3/4/2020	2.7	ug/L	0.160	
G0077	2,067,218	403,894	2,4,6-TRINITROTOLUENE	10/23/2019	3.2	ug/L	0.160	
G0077	2,067,218	403,894	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021	0.82	ug/L	0.048	
G0077	2,067,218	403,894	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/4/2020	0.34	ug/L	0.052	
G0077	2,067,218	403,894	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020	0.46	ug/L	0.054	
G0077	2,067,218	403,894	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020	0.19	ug/L	0.160	TR
G0077	2,067,218	403,894	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019	0.91	ug/L	0.150	
G0078	2,067,199	403,930	2,4,6-TRINITROTOLUENE	3/3/2021		ug/L	0.042	ND
G0078	2,067,199	403,930	2,4,6-TRINITROTOLUENE	10/4/2020		ug/L	0.044	ND
G0078	2,067,199	403,930	2,4,6-TRINITROTOLUENE	6/15/2020		ug/L	0.047	ND
G0078	2,067,199	403,930	2,4,6-TRINITROTOLUENE	3/4/2020		ug/L	0.160	ND
G0078	2,067,199	403,930	2,4,6-TRINITROTOLUENE	10/23/2019		ug/L	0.150	ND
G0078	2,067,199	403,930	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021		ug/L	0.048	ND
G0078	2,067,199	403,930	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/4/2020		ug/L	0.050	ND
G0078	2,067,199	403,930	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020		ug/L	0.054	ND
G0078	2,067,199	403,930	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020		ug/L	0.150	ND
G0078	2,067,199	403,930	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019		ug/L	0.150	ND
G0091	2,067,221	405,336	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.043	ND
G0091	2,067,221	405,336	2,4,6-TRINITROTOLUENE	10/3/2020		ug/L	0.045	ND

TABLE E.1
FORMER FACILITY BOUNDARY WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
G0091	2,067,221	405,336	2,4,6-TRINITROTOLUENE	6/16/2020		ug/L	0.048	ND
G0091	2,067,221	405,336	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND
G0091	2,067,221	405,336	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.150	ND
G0091	2,067,221	405,336	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021	0.27	ug/L	0.049	TR
G0091	2,067,221	405,336	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020	0.46	ug/L	0.052	
G0091	2,067,221	405,336	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/16/2020	0.59	ug/L	0.055	
G0091	2,067,221	405,336	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020	0.83	ug/L	0.160	
G0091	2,067,221	405,336	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019	0.81	ug/L	0.150	
G0092	2,067,222	405,350	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.042	ND
G0092	2,067,222	405,350	2,4,6-TRINITROTOLUENE	10/3/2020		ug/L	0.043	ND
G0092	2,067,222	405,350	2,4,6-TRINITROTOLUENE	6/16/2020		ug/L	0.047	ND
G0092	2,067,222	405,350	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.150	ND
G0092	2,067,222	405,350	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.150	ND
G0092	2,067,222	405,350	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021		ug/L	0.048	ND
G0092	2,067,222	405,350	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020		ug/L	0.049	ND
G0092	2,067,222	405,350	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/16/2020		ug/L	0.054	ND
G0092	2,067,222	405,350	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.150	ND
G0092	2,067,222	405,350	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.200	ND
NW020	2,067,328	404,441	2,4,6-TRINITROTOLUENE	3/3/2021	0.8	ug/L	0.042	
NW020	2,067,328	404,441	2,4,6-TRINITROTOLUENE	10/3/2020	0.62	ug/L	0.045	TR
NW020	2,067,328	404,441	2,4,6-TRINITROTOLUENE	6/15/2020	0.59	ug/L	0.046	
NW020	2,067,328	404,441	2,4,6-TRINITROTOLUENE	3/4/2020	0.6	ug/L	0.160	
NW020	2,067,328	404,441	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW020	2,067,328	404,441	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021	1.2	ug/L	0.048	
NW020	2,067,328	404,441	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020	2.3	ug/L	0.052	
NW020	2,067,328	404,441	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020	1.5	ug/L	0.053	
NW020	2,067,328	404,441	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020	0.94	ug/L	0.150	
NW020	2,067,328	404,441	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019	0.2	ug/L	0.150	TR
NW021	2,067,301	404,393	2,4,6-TRINITROTOLUENE	3/3/2021		ug/L	0.043	ND
NW021	2,067,301	404,393	2,4,6-TRINITROTOLUENE	10/3/2020		ug/L	0.044	ND
NW021	2,067,301	404,393	2,4,6-TRINITROTOLUENE	6/15/2020		ug/L	0.050	ND
NW021	2,067,301	404,393	2,4,6-TRINITROTOLUENE	3/4/2020		ug/L	0.150	ND

TABLE E.1
FORMER FACILITY BOUNDARY WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
NW021	2,067,301	404,393	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.150	ND
NW021	2,067,301	404,393	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021		ug/L	0.049	ND
NW021	2,067,301	404,393	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020		ug/L	0.050	ND
NW021	2,067,301	404,393	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020		ug/L	0.058	ND
NW021	2,067,301	404,393	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020		ug/L	0.150	ND
NW021	2,067,301	404,393	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.150	ND
NW022	2,067,310	404,436	2,4,6-TRINITROTOLUENE	3/3/2021		ug/L	0.042	ND
NW022	2,067,310	404,436	2,4,6-TRINITROTOLUENE	10/3/2020		ug/L	0.046	ND
NW022	2,067,310	404,436	2,4,6-TRINITROTOLUENE	6/15/2020		ug/L	0.047	ND
NW022	2,067,310	404,436	2,4,6-TRINITROTOLUENE	3/4/2020		ug/L	0.160	ND
NW022	2,067,310	404,436	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.150	ND
NW022	2,067,310	404,436	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021		ug/L	0.049	ND
NW022	2,067,310	404,436	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020		ug/L	0.052	ND
NW022	2,067,310	404,436	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020		ug/L	0.054	ND
NW022	2,067,310	404,436	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020		ug/L	0.150	ND
NW022	2,067,310	404,436	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.150	ND
PZ017R	2,067,255	403,469	2,4,6-TRINITROTOLUENE	3/3/2021	10	ug/L	0.048	
PZ017R	2,067,255	403,469	2,4,6-TRINITROTOLUENE	10/4/2020	15	ug/L	0.043	
PZ017R	2,067,255	403,469	2,4,6-TRINITROTOLUENE	6/16/2020	11	ug/L	0.048	
PZ017R	2,067,255	403,469	2,4,6-TRINITROTOLUENE	3/4/2020	17	ug/L	0.150	
PZ017R	2,067,255	403,469	2,4,6-TRINITROTOLUENE	10/23/2019	15	ug/L	0.160	
PZ017R	2,067,255	403,469	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021	2.2	ug/L	0.055	
PZ017R	2,067,255	403,469	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/4/2020	1.8	ug/L	0.049	TR
PZ017R	2,067,255	403,469	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/16/2020	1.4	ug/L	0.055	
PZ017R	2,067,255	403,469	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020	1.4	ug/L	0.150	
PZ017R	2,067,255	403,469	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019	0.87	ug/L	0.160	
PZ018	2,067,257	403,293	2,4,6-TRINITROTOLUENE	3/3/2021	6	ug/L	0.047	
PZ018	2,067,257	403,293	2,4,6-TRINITROTOLUENE	10/3/2020	17	ug/L	0.043	
PZ018	2,067,257	403,293	2,4,6-TRINITROTOLUENE	6/16/2020		ug/L	0.049	ND
PZ018	2,067,257	403,293	2,4,6-TRINITROTOLUENE	3/4/2020	19	ug/L	0.160	
PZ018	2,067,257	403,293	2,4,6-TRINITROTOLUENE	10/23/2019	8	ug/L	0.160	TR
PZ018	2,067,257	403,293	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021		ug/L	0.053	ND

TABLE E.1
FORMER FACILITY BOUNDARY WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
PZ018	2,067,257	403,293	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020		ug/L	0.049	ND
PZ018	2,067,257	403,293	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/16/2020	1	ug/L	0.056	
PZ018	2,067,257	403,293	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020		ug/L	0.160	ND
PZ018	2,067,257	403,293	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019	0.88	ug/L	0.160	TR
PZ019	2,067,268	402,887	2,4,6-TRINITROTOLUENE	3/3/2021		ug/L	0.048	ND
PZ019	2,067,268	402,887	2,4,6-TRINITROTOLUENE	10/3/2020		ug/L	0.043	ND
PZ019	2,067,268	402,887	2,4,6-TRINITROTOLUENE	6/16/2020		ug/L	0.047	ND
PZ019	2,067,268	402,887	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND
PZ019	2,067,268	402,887	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
PZ019	2,067,268	402,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021		ug/L	0.055	ND
PZ019	2,067,268	402,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/3/2020		ug/L	0.049	ND
PZ019	2,067,268	402,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/16/2020		ug/L	0.054	ND
PZ019	2,067,268	402,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.160	ND
PZ019	2,067,268	402,887	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
PZ020	2,067,224	404,088	2,4,6-TRINITROTOLUENE	3/3/2021	3.9	ug/L	0.048	
PZ020	2,067,224	404,088	2,4,6-TRINITROTOLUENE	10/4/2020	3.5	ug/L	0.045	
PZ020	2,067,224	404,088	2,4,6-TRINITROTOLUENE	6/15/2020	2.2	ug/L	0.047	
PZ020	2,067,224	404,088	2,4,6-TRINITROTOLUENE	3/4/2020	3.2	ug/L	0.150	
PZ020	2,067,224	404,088	2,4,6-TRINITROTOLUENE	10/23/2019	3.7	ug/L	0.150	
PZ020	2,067,224	404,088	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2021	0.57	ug/L	0.054	
PZ020	2,067,224	404,088	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/4/2020	0.67	ug/L	0.051	
PZ020	2,067,224	404,088	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020	0.58	ug/L	0.054	
PZ020	2,067,224	404,088	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/4/2020	0.62	ug/L	0.150	
PZ020	2,067,224	404,088	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019	0.42	ug/L	0.150	

TABLE E.2
UPGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
G0070	2,065,484	403,541	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.046	ND
G0070	2,065,484	403,541	2,4,6-TRINITROTOLUENE	9/29/2020		ug/L	0.044	ND
G0070	2,065,484	403,541	2,4,6-TRINITROTOLUENE	6/2/2020		ug/L	0.050	ND
G0070	2,065,484	403,541	2,4,6-TRINITROTOLUENE	3/1/2020		ug/L	0.150	ND
G0070	2,065,484	403,541	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
G0070	2,065,484	403,541	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.053	ND
G0070	2,065,484	403,541	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/29/2020		ug/L	0.050	ND
G0070	2,065,484	403,541	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/2/2020		ug/L	0.057	ND
G0070	2,065,484	403,541	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2020		ug/L	0.150	ND
G0070	2,065,484	403,541	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
G0075	2,065,479	403,559	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.049	ND
G0075	2,065,479	403,559	2,4,6-TRINITROTOLUENE	9/29/2020		ug/L	0.044	ND
G0075	2,065,479	403,559	2,4,6-TRINITROTOLUENE	6/1/2020		ug/L	0.048	ND
G0075	2,065,479	403,559	2,4,6-TRINITROTOLUENE	3/1/2020		ug/L	0.160	ND
G0075	2,065,479	403,559	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.150	ND
G0075	2,065,479	403,559	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.056	ND
G0075	2,065,479	403,559	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/29/2020		ug/L	0.051	ND
G0075	2,065,479	403,559	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/1/2020		ug/L	0.054	ND
G0075	2,065,479	403,559	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2020		ug/L	0.160	ND
G0075	2,065,479	403,559	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.150	ND
G0076	2,065,469	403,583	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.047	ND
G0076	2,065,469	403,583	2,4,6-TRINITROTOLUENE	9/29/2020		ug/L	0.043	ND
G0076	2,065,469	403,583	2,4,6-TRINITROTOLUENE	6/1/2020		ug/L	0.049	ND
G0076	2,065,469	403,583	2,4,6-TRINITROTOLUENE	3/1/2020		ug/L	0.160	ND
G0076	2,065,469	403,583	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.150	ND
G0076	2,065,469	403,583	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.054	ND
G0076	2,065,469	403,583	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/29/2020		ug/L	0.049	ND
G0076	2,065,469	403,583	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/1/2020	0.2	ug/L	0.056	TR
G0076	2,065,469	403,583	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2020		ug/L	0.160	ND
G0076	2,065,469	403,583	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.150	ND
G0079	2,065,479	403,553	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.047	ND
G0079	2,065,479	403,553	2,4,6-TRINITROTOLUENE	9/29/2020		ug/L	0.044	ND

TABLE E.2
UPGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
G0079	2,065,479	403,553	2,4,6-TRINITROTOLUENE	6/1/2020		ug/L	0.048	ND
G0079	2,065,479	403,553	2,4,6-TRINITROTOLUENE	3/1/2020		ug/L	0.160	ND
G0079	2,065,479	403,553	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.150	ND
G0079	2,065,479	403,553	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.054	ND
G0079	2,065,479	403,553	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/29/2020		ug/L	0.050	ND
G0079	2,065,479	403,553	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/1/2020		ug/L	0.055	ND
G0079	2,065,479	403,553	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2020		ug/L	0.160	ND
G0079	2,065,479	403,553	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.150	ND
G0080	2,065,443	404,329	2,4,6-TRINITROTOLUENE	2/28/2021		ug/L	0.044	ND
G0080	2,065,443	404,329	2,4,6-TRINITROTOLUENE	9/29/2020		ug/L	0.044	ND
G0080	2,065,443	404,329	2,4,6-TRINITROTOLUENE	6/11/2020		ug/L	0.047	ND
G0080	2,065,443	404,329	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND
G0080	2,065,443	404,329	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.150	ND
G0080	2,065,443	404,329	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	2/28/2021		ug/L	0.051	ND
G0080	2,065,443	404,329	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/29/2020		ug/L	0.050	ND
G0080	2,065,443	404,329	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/11/2020		ug/L	0.054	ND
G0080	2,065,443	404,329	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.160	ND
G0080	2,065,443	404,329	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.150	ND
G0081	2,065,490	402,722	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.047	ND
G0081	2,065,490	402,722	2,4,6-TRINITROTOLUENE	9/29/2020		ug/L	0.044	ND
G0081	2,065,490	402,722	2,4,6-TRINITROTOLUENE	6/2/2020		ug/L	0.047	ND
G0081	2,065,490	402,722	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.180	ND
G0081	2,065,490	402,722	2,4,6-TRINITROTOLUENE	10/21/2019	0.29	ug/L	0.160	TR
G0081	2,065,490	402,722	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021		ug/L	0.054	ND
G0081	2,065,490	402,722	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/29/2020		ug/L	0.044	ND
G0081	2,065,490	402,722	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/2/2020		ug/L	0.054	ND
G0081	2,065,490	402,722	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.170	ND
G0081	2,065,490	402,722	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.150	ND
G0082	2,065,493	402,207	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.047	ND
G0082	2,065,493	402,207	2,4,6-TRINITROTOLUENE	9/30/2020		ug/L	0.043	ND
G0082	2,065,493	402,207	2,4,6-TRINITROTOLUENE	6/2/2020		ug/L	0.052	ND
G0082	2,065,493	402,207	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND

TABLE E.2
UPGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
G0082	2,065,493	402,207	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.150	ND
G0082	2,065,493	402,207	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021	0.53	ug/L	0.054	
G0082	2,065,493	402,207	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/30/2020	0.41	ug/L	0.050	
G0082	2,065,493	402,207	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/2/2020	0.68	ug/L	0.059	TR
G0082	2,065,493	402,207	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.160	ND
G0082	2,065,493	402,207	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019	0.63	ug/L	0.150	TR
G0086	2,066,457	403,759	2,4,6-TRINITROTOLUENE	3/2/2021	4.9	ug/L	0.047	TR
G0086	2,066,457	403,759	2,4,6-TRINITROTOLUENE	10/4/2020		ug/L	0.045	ND
G0086	2,066,457	403,759	2,4,6-TRINITROTOLUENE	6/16/2020	3.6	ug/L	0.047	
G0086	2,066,457	403,759	2,4,6-TRINITROTOLUENE	3/3/2020	5.9	ug/L	0.160	TR
G0086	2,066,457	403,759	2,4,6-TRINITROTOLUENE	10/23/2019	3.8	ug/L	0.160	
G0086	2,066,457	403,759	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021	0.59	ug/L	0.054	TR
G0086	2,066,457	403,759	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/4/2020	0.17	ug/L	0.052	TR
G0086	2,066,457	403,759	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/16/2020	0.21	ug/L	0.054	TR
G0086	2,066,457	403,759	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.150	ND
G0086	2,066,457	403,759	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019		ug/L	0.160	ND
G0087	2,065,944	403,749	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.048	ND
G0087	2,065,944	403,749	2,4,6-TRINITROTOLUENE	10/2/2020		ug/L	0.044	ND
G0087	2,065,944	403,749	2,4,6-TRINITROTOLUENE	6/15/2020		ug/L	0.048	ND
G0087	2,065,944	403,749	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.150	ND
G0087	2,065,944	403,749	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.150	ND
G0087	2,065,944	403,749	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021	0.17	ug/L	0.055	TR
G0087	2,065,944	403,749	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/2/2020	0.15	ug/L	0.051	TR
G0087	2,065,944	403,749	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/15/2020	0.15	ug/L	0.055	TR
G0087	2,065,944	403,749	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.150	ND
G0087	2,065,944	403,749	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.150	ND

TABLE E.3
DOWNGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
CA210	2,072,527	405,191	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.043	ND
CA210	2,072,527	405,191	2,4,6-TRINITROTOLUENE	10/2/2020		ug/L	0.043	ND
CA210	2,072,527	405,191	2,4,6-TRINITROTOLUENE	6/9/2020		ug/L	0.048	ND
CA210	2,072,527	405,191	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.150	ND
CA210	2,072,527	405,191	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
CA210	2,072,527	405,191	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021		ug/L	0.049	ND
CA210	2,072,527	405,191	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/2/2020		ug/L	0.049	ND
CA210	2,072,527	405,191	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/9/2020		ug/L	0.055	ND
CA210	2,072,527	405,191	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.150	ND
CA210	2,072,527	405,191	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
CA211	2,072,573	405,210	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.043	ND
CA211	2,072,573	405,210	2,4,6-TRINITROTOLUENE	10/2/2020		ug/L	0.045	ND
CA211	2,072,573	405,210	2,4,6-TRINITROTOLUENE	6/9/2020		ug/L	0.048	ND
CA211	2,072,573	405,210	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
CA211	2,072,573	405,210	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
CA211	2,072,573	405,210	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021		ug/L	0.049	ND
CA211	2,072,573	405,210	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/2/2020		ug/L	0.051	ND
CA211	2,072,573	405,210	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/9/2020		ug/L	0.055	ND
CA211	2,072,573	405,210	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.160	ND
CA211	2,072,573	405,210	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
CA212	2,072,578	405,192	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.042	ND
CA212	2,072,578	405,192	2,4,6-TRINITROTOLUENE	10/2/2020		ug/L	0.044	ND
CA212	2,072,578	405,192	2,4,6-TRINITROTOLUENE	6/9/2020		ug/L	0.049	ND
CA212	2,072,578	405,192	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
CA212	2,072,578	405,192	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
CA212	2,072,578	405,192	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021		ug/L	0.049	ND
CA212	2,072,578	405,192	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/2/2020		ug/L	0.050	ND
CA212	2,072,578	405,192	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/9/2020		ug/L	0.056	ND
CA212	2,072,578	405,192	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.150	ND
CA212	2,072,578	405,192	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
CA213	2,072,600	405,217	2,4,6-TRINITROTOLUENE	3/2/2021		ug/L	0.043	ND
CA213	2,072,600	405,217	2,4,6-TRINITROTOLUENE	10/2/2020		ug/L	0.045	ND

TABLE E.3
DOWNGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
CA213	2,072,600	405,217	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.046	ND
CA213	2,072,600	405,217	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
CA213	2,072,600	405,217	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
CA213	2,072,600	405,217	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2021		ug/L	0.049	ND
CA213	2,072,600	405,217	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/2/2020		ug/L	0.052	ND
CA213	2,072,600	405,217	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.053	ND
CA213	2,072,600	405,217	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.150	ND
CA213	2,072,600	405,217	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
NW050	2,072,396	406,567	2,4,6-TRINITROTOLUENE	10/1/2020		ug/L	0.045	ND
NW050	2,072,396	406,567	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.047	ND
NW050	2,072,396	406,567	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
NW050	2,072,396	406,567	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW050	2,072,396	406,567	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/1/2020		ug/L	0.051	ND
NW050	2,072,396	406,567	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.054	ND
NW050	2,072,396	406,567	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.160	ND
NW050	2,072,396	406,567	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW051	2,072,401	406,543	2,4,6-TRINITROTOLUENE	10/1/2020		ug/L	0.045	ND
NW051	2,072,401	406,543	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.047	ND
NW051	2,072,401	406,543	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
NW051	2,072,401	406,543	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW051	2,072,401	406,543	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/1/2020		ug/L	0.051	ND
NW051	2,072,401	406,543	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.054	ND
NW051	2,072,401	406,543	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.160	ND
NW051	2,072,401	406,543	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW052	2,072,410	406,561	2,4,6-TRINITROTOLUENE	10/1/2020		ug/L	0.044	ND
NW052	2,072,410	406,561	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.047	ND
NW052	2,072,410	406,561	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
NW052	2,072,410	406,561	2,4,6-TRINITROTOLUENE	10/23/2019		ug/L	0.160	ND
NW052	2,072,410	406,561	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/1/2020		ug/L	0.051	ND
NW052	2,072,410	406,561	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.054	ND
NW052	2,072,410	406,561	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.150	ND
NW052	2,072,410	406,561	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/23/2019		ug/L	0.160	ND

TABLE E.3
DOWNGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
NW060	2,072,369	407,799	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.042	ND
NW060	2,072,369	407,799	2,4,6-TRINITROTOLUENE	10/1/2020		ug/L	0.044	ND
NW060	2,072,369	407,799	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.047	ND
NW060	2,072,369	407,799	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND
NW060	2,072,369	407,799	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW060	2,072,369	407,799	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.048	ND
NW060	2,072,369	407,799	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/1/2020		ug/L	0.050	ND
NW060	2,072,369	407,799	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.054	ND
NW060	2,072,369	407,799	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.160	ND
NW060	2,072,369	407,799	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW061	2,072,392	407,806	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.042	ND
NW061	2,072,392	407,806	2,4,6-TRINITROTOLUENE	10/1/2020		ug/L	0.045	ND
NW061	2,072,392	407,806	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.047	ND
NW061	2,072,392	407,806	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.150	ND
NW061	2,072,392	407,806	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW061	2,072,392	407,806	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.048	ND
NW061	2,072,392	407,806	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/1/2020		ug/L	0.051	ND
NW061	2,072,392	407,806	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.054	ND
NW061	2,072,392	407,806	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.150	ND
NW061	2,072,392	407,806	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW062	2,072,383	407,787	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.042	ND
NW062	2,072,383	407,787	2,4,6-TRINITROTOLUENE	10/1/2020		ug/L	0.043	ND
NW062	2,072,383	407,787	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.048	ND
NW062	2,072,383	407,787	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.150	ND
NW062	2,072,383	407,787	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW062	2,072,383	407,787	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.049	ND
NW062	2,072,383	407,787	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/1/2020		ug/L	0.049	ND
NW062	2,072,383	407,787	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.055	ND
NW062	2,072,383	407,787	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.150	ND
NW062	2,072,383	407,787	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW070	2,075,161	404,146	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.041	ND
NW070	2,075,161	404,146	2,4,6-TRINITROTOLUENE	9/30/2020		ug/L	0.043	ND

TABLE E.3
DOWNGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
NW070	2,075,161	404,146	2,4,6-TRINITROTOLUENE	6/10/2020		ug/L	0.048	ND
NW070	2,075,161	404,146	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND
NW070	2,075,161	404,146	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
NW070	2,075,161	404,146	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.047	ND
NW070	2,075,161	404,146	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/30/2020		ug/L	0.050	ND
NW070	2,075,161	404,146	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/10/2020		ug/L	0.055	ND
NW070	2,075,161	404,146	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.160	ND
NW070	2,075,161	404,146	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
NW071	2,075,166	404,140	2,4,6-TRINITROTOLUENE	3/1/2021		ug/L	0.043	ND
NW071	2,075,166	404,140	2,4,6-TRINITROTOLUENE	9/30/2020		ug/L	0.047	ND
NW071	2,075,166	404,140	2,4,6-TRINITROTOLUENE	6/9/2020		ug/L	0.048	ND
NW071	2,075,166	404,140	2,4,6-TRINITROTOLUENE	3/2/2020		ug/L	0.160	ND
NW071	2,075,166	404,140	2,4,6-TRINITROTOLUENE	10/21/2019		ug/L	0.160	ND
NW071	2,075,166	404,140	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/1/2021		ug/L	0.049	ND
NW071	2,075,166	404,140	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/30/2020		ug/L	0.053	ND
NW071	2,075,166	404,140	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/9/2020		ug/L	0.055	ND
NW071	2,075,166	404,140	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/2/2020		ug/L	0.160	ND
NW071	2,075,166	404,140	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/21/2019		ug/L	0.160	ND
NW080	2,075,116	406,616	2,4,6-TRINITROTOLUENE	9/30/2020		ug/L	0.048	ND
NW080	2,075,116	406,616	2,4,6-TRINITROTOLUENE	6/8/2020		ug/L	0.047	ND
NW080	2,075,116	406,616	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.170	ND
NW080	2,075,116	406,616	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW080	2,075,116	406,616	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/30/2020		ug/L	0.054	ND
NW080	2,075,116	406,616	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/8/2020		ug/L	0.054	ND
NW080	2,075,116	406,616	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.170	ND
NW080	2,075,116	406,616	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW081R	2,075,149	406,617	2,4,6-TRINITROTOLUENE	9/30/2020		ug/L	0.045	ND
NW081R	2,075,149	406,617	2,4,6-TRINITROTOLUENE	6/8/2020		ug/L	0.050	ND
NW081R	2,075,149	406,617	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
NW081R	2,075,149	406,617	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW081R	2,075,149	406,617	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/30/2020		ug/L	0.051	ND
NW081R	2,075,149	406,617	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/8/2020		ug/L	0.057	ND

TABLE E.3
DOWNGRADIENT WELLS
CORNHUSKER ARMY AMMUNITION PLANT
MAROS DATA INPUTS

WellName	XCoord	YCoord	Constituent	SampleDate	Result	Units	DetLim	Flags
NW081R	2,075,149	406,617	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.160	ND
NW081R	2,075,149	406,617	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND
NW082R	2,075,190	406,618	2,4,6-TRINITROTOLUENE	9/30/2020		ug/L	0.047	ND
NW082R	2,075,190	406,618	2,4,6-TRINITROTOLUENE	6/8/2020		ug/L	0.048	ND
NW082R	2,075,190	406,618	2,4,6-TRINITROTOLUENE	3/3/2020		ug/L	0.160	ND
NW082R	2,075,190	406,618	2,4,6-TRINITROTOLUENE	10/22/2019		ug/L	0.160	ND
NW082R	2,075,190	406,618	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	9/30/2020		ug/L	0.054	ND
NW082R	2,075,190	406,618	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	6/8/2020		ug/L	0.055	ND
NW082R	2,075,190	406,618	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	3/3/2020		ug/L	0.160	ND
NW082R	2,075,190	406,618	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	10/22/2019		ug/L	0.160	ND

Appendix F
OU1 Rebound Study Historic Figures

(ND)(ND) G0080

(ND)(0.81) G0091
(ND)(ND) G0092

(ND)(0.2) NW020
(ND)(ND) NW021
(ND)(ND) NW022

(3.7)(0.42) PZ020

(ND)(ND) G0087

(ND)(ND) G0024
(3.2)(0.91) G0077
(ND)(ND) G0078

G0086

(3.8)(ND)

EW7

(15)(0.87) PZ017R

PZ018

(8)(0.88)

(ND)(ND) PZ019

G0079 (ND)(ND)
G0075 (ND)(ND)
G0076 (ND)(ND)
G0070 (ND)(ND)

(0.29)(ND) G0081

(ND)(0.63) G0082

G0090

OS002		
Depth	TNT	RDX
21'-25'	1.3	0.63
31'-35'	ND	ND
41'-45'	3.3	ND

OS003		
Depth	TNT	RDX
21'-25'	ND	ND
31'-35'	3	ND
41'-45'	ND	ND

OS001		
Depth	TNT	RDX
21'-25'	12	ND
31'-35'	11	ND
41'-45'	ND	ND

NW060 (ND)(ND)
NW061 (ND)(ND)
NW062 (ND)(ND)

(ND)(ND) NW050
(ND)(ND) NW051
(ND)(ND) NW052

(ND)(ND) NW080
(ND)(ND) NW081R
(ND)(ND) NW082R

CA210 (ND)(ND)
CA211 (ND)(ND)
CA212 (ND)(ND)
CA213 (ND)(ND)

(ND)(ND) NW070
(ND)(ND) NW071

9

10

13th Street

Monitor Road

9th Road

LEGEND:

- ON-POST GROUNDWATER MONITORING WELL
- OFF-POST GROUNDWATER MONITORING WELL
- ON-POST PIEZOMETER
- ACTIVE GROUNDWATER EXTRACTION WELL
- G0029 — 2019 GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)
- OS001 — 2019 OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)

- (ND) TNT CONCENTRATION (µg/L) (OCTOBER 2019)
- (ND) RDX CONCENTRATION (µg/L) (OCTOBER 2019)
- GENERAL GROUNDWATER FLOW DIRECTION
- ROADS
- FACILITY BOUNDARY
- GRAND ISLAND CITY LIMITS
- SURFACE DRAINAGE
- (281) STATE ROUTE
- (30) U.S. ROUTE

- FEEDLOT
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) OCTOBER 2019
- 20 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >20µg/L) OCTOBER 2019
- DASHED WHERE INFERRED
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) JUNE 2019
- 20 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >20µg/L) JUNE 2019

N

0 800 1600
SCALE FEET

NOTE: EW7 PUMPING RATE TO BE SET AT 0 GPM DURING PROPOSED REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

Bruce ENGINEERING AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 12/06/19	PROJECT NO. 60565355	FIG. NO. 2-1
CHK'D. BY: DC	DATE: 12/06/19		

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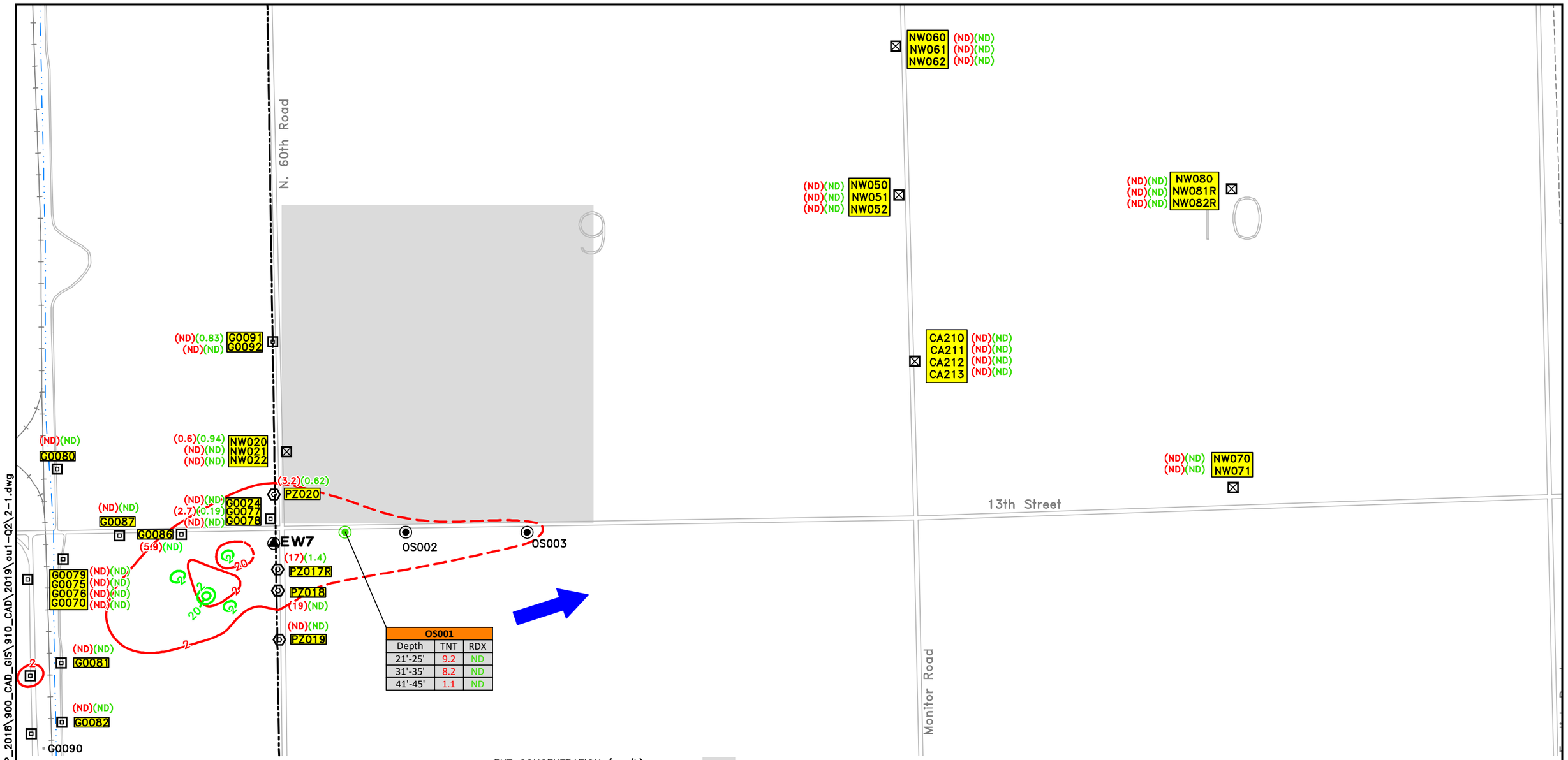
Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\ou1\2-1.dwg



LEGEND:

- ON-POST GROUNDWATER MONITORING WELL
- OFF-POST GROUNDWATER MONITORING WELL
- ON-POST PIEZOMETER
- INACTIVE GROUNDWATER EXTRACTION WELL
- G0029 — GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 2 (FEBRUARY/MARCH 2020)
- OS001 — OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 2 (FEBRUARY/MARCH 2020)
- OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)
- (ND) — TNT CONCENTRATION (µg/L) (FEBRUARY/MARCH 2020)
- (ND) — RDX CONCENTRATION (µg/L) (FEBRUARY/MARCH 2020)
- GENERAL GROUNDWATER FLOW DIRECTION
- ROADS
- FACILITY BOUNDARY
- GRAND ISLAND CITY LIMITS
- SURFACE DRAINAGE
- 281 — STATE ROUTE
- 30 — U.S. ROUTE
- FEEDLOT
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2020
- 20 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >20µg/L) FEBRUARY/MARCH 2020
- DASHED WHERE INFERRED
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) FEBRUARY/MARCH 2020
- 20 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >20µg/L) FEBRUARY/MARCH 2020

N

0 800 1600
SCALE FEET

NOTE: EW7 PUMPING RATE SET AT 0 GPM DURING OU1 REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

Bruce ENGINEERING AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 REBOUND STUDY, QUARTER 2 (FEBRUARY/MARCH 2020)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 12/06/19	PROJECT NO. 60565355	FIG. NO. 2-1
CHK'D. BY: DC	DATE: 12/06/19		

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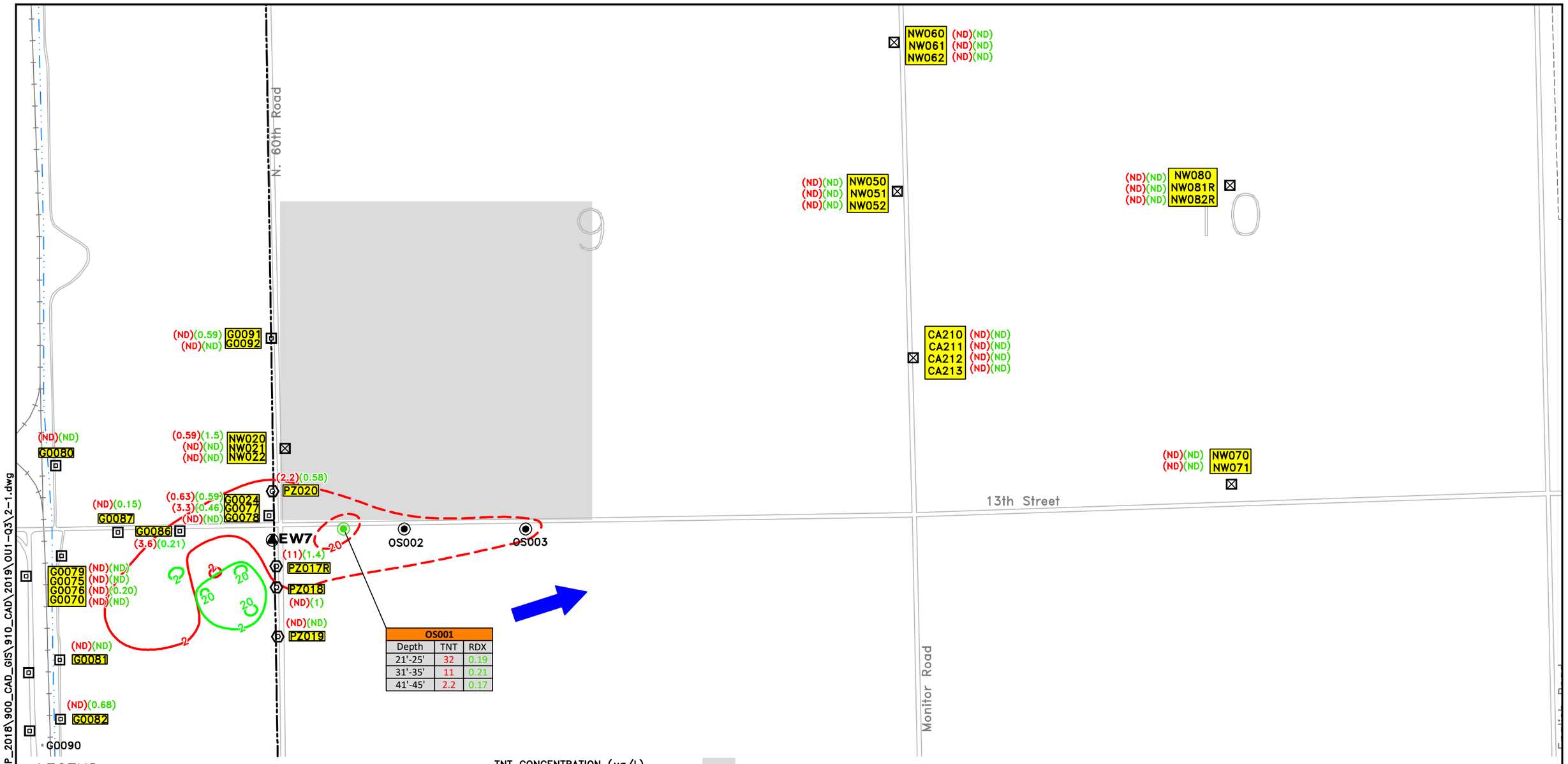

LEGEND:

- ON-POST GROUNDWATER MONITORING WELL
- OFF-POST GROUNDWATER MONITORING WELL
- ON-POST PIEZOMETER
- INACTIVE GROUNDWATER EXTRACTION WELL
- G0029 — GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 3 (MAY/JUNE 2020)
- OS001 — OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 3 (MAY/JUNE 2020)
- OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)
- (ND) — TNT CONCENTRATION (µg/L) (MAY/JUNE 2020)
- (ND) — RDX CONCENTRATION (µg/L) (MAY/JUNE 2020)
- GENERAL GROUNDWATER FLOW DIRECTION
- ROADS
- FACILITY BOUNDARY
- GRAND ISLAND CITY LIMITS
- SURFACE DRAINAGE
- 281 — STATE ROUTE
- 30 — U.S. ROUTE
- FEEDLOT
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) MAY/JUNE 2020
- 20 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >20µg/L) MAY/JUNE 2020
- DASHED WHERE INFERRED
- 2 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) MAY/JUNE 2020
- 20 — INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >20µg/L) MAY/JUNE 2020

N

800 400 0 800
SCALE IN FEET

NOTE: EW7 PUMPING RATE SET AT 0 GPM DURING OU1 REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

Bruce ENGINEERING AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 REBOUND STUDY, QUARTER 3 (MAY/JUNE 2020)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 07/27/20	PROJECT NO. 60565355	FIG. NO. 2-1
CHK'D. BY: DC	DATE: 07/27/20		

September 14, 2020 8:59:06 a.m.
Drawing: O:\DCS\Projects\ENV\60565355_CHAAP_2018\900_CAD_GIS\910_CAD\2019\OU1-Q3\2-1.dwg

N. 60th Road

13th Street

Monitor Road

9

10

(ND)(ND) G0080

(ND)(0.46) G0091
(ND)(ND) G0092

(0.62)(2.3) NW020
(ND)(ND) NW021
(ND)(ND) NW022

(3.5)(0.67) PZ020

(ND)(0.15) G0087

(0.2)(ND) G0024
(3.4)(0.34) G0077
(ND)(ND) G0078

G0086 (ND)(0.17)

EW7

(15)(1.8) PZ017R

PZ018 (17)(ND)

(ND)(ND) PZ019

OS002

G0079 (ND)(ND)
G0075 (ND)(ND)
G0076 (ND)(ND)
G0070 (ND)(ND)

(ND)(ND) G0081

(ND)(0.41) G0082

G0090

NW060 (ND)(ND)
NW061 (ND)(ND)
NW062 (ND)(ND)

(ND)(ND) NW050
(ND)(ND) NW051
(ND)(ND) NW052

(ND)(ND) NW080
(ND)(ND) NW081R
(ND)(ND) NW082R

CA210 (ND)(ND)
CA211 (ND)(ND)
CA212 (ND)(ND)
CA213 (ND)(ND)

(ND)(ND) NW070
(ND)(ND) NW071

OS003		
Depth	TNT	RDX
21'-25'	ND	ND
31'-35'	ND	ND
41'-45'	ND	ND

OS004		
Depth	TNT	RDX
21'-25'	ND	ND
31'-35'	ND	ND
41'-45'	ND	ND

OS001		
Depth	TNT	RDX
21'-25'	29	ND
31'-35'	15	1.8
41'-45'	ND	ND

LEGEND:

- ON-POST GROUNDWATER MONITORING WELL
- OFF-POST GROUNDWATER MONITORING WELL
- ON-POST PIEZOMETER
- INACTIVE GROUNDWATER EXTRACTION WELL
- G0029 — OU1 GROUNDWATER SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 4 (SEPTEMBER/OCTOBER 2020)
- OS001 — OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, QUARTER 4 (SEPTEMBER/OCTOBER 2020)
- OU1 DIRECT PUSH SAMPLING LOCATIONS – OU1 REBOUND STUDY, BASELINE (OCTOBER 2019)

(ND) TNT CONCENTRATION (µg/L) SEPTEMBER/OCTOBER 2020

(ND) RDX CONCENTRATION (µg/L) SEPTEMBER/OCTOBER 2020

GENERAL GROUNDWATER FLOW DIRECTION

ROADS

FACILITY BOUNDARY

GRAND ISLAND CITY LIMITS

SURFACE DRAINAGE

281 STATE ROUTE

30 U.S. ROUTE

FEEDLOT

2 INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >2µg/L) SEPTEMBER/OCTOBER 2020

20 INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (TNT CONCENTRATIONS >20µg/L) SEPTEMBER/OCTOBER 2020

DASHED WHERE INFERRED

2 INTERPRETED HORIZONTAL EXTENT OF EXPLOSIVES (RDX CONCENTRATIONS >2µg/L) SEPTEMBER/OCTOBER 2020

NOTE: EW7 PUMPING RATE SET AT 0 GPM DURING OU1 REBOUND STUDY AND SUBSURFACE INJECTION EVENTS.

N

800 400 0 800
SCALE IN FEET

Bruce ENGINEERING AECOM

EXTENT OF OU1 EXPLOSIVES PLUME, OU1 REBOUND STUDY, QUARTER 4 (SEPTEMBER/OCTOBER 2020)
CORNHUSKER ARMY AMMUNITION PLANT

DRN. BY: DPG	DATE: 11/25/20	PROJECT NO. 60565355	FIG. NO. 2-1
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