FINAL
2022 REMEDIAL ACTION OPERATIONS, LAND USE/INSTITUTIONAL CONTROL REPORT

Port Heiden Radio Relay Station
Sites OT001, WP002, SS006, and LF007

Prepared for:

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January 2024

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2022 REMEDIAL ACTION OPERATIONS, LAND USE/INSTITUTIONAL CONTROL REPORT

Port Heiden Radio Relay Station, Alaska
Sites OT001, WP002, SS006, and LF007

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ACRONYMS AND ABBREVIATIONS

%	percent
%R	percent recovery
µg/L	microgram(s) per liter
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska
bgs	below ground surface
BLO	Black Lagoon Outfall
BTEX	benzene, toluene, ethylbenzene, and total xylenes
btoc	below top of casing
CCV	continuing calibration verification
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMW Arlington	Chemical Waste Management of the Northwest
COC	contaminant of concern
COV	coefficient of variation
DEW	Distant Early Warning
DL	detection limit
DoD	Department of Defense
DQO	data quality objective
DRO	diesel range organics
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
GRO	gasoline range organics
IC	institutional control
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOQ	limit of quantitation
LOD	limit of detection
LTM	Long-term Management

LUC	Land Use Control
LUCMP	Land Use Control Management Plan
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
MK	Mann-Kendall
MDL	method detection limit
MNA	monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
p	probability
PAH	polycyclic aromatic hydrocarbon
PAL	Project Action Limit
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
POL	petroleum, oil, and lubricants
ppb	parts per billion
PVC	polyvinyl chloride
QC	quality control
QSM	Quality Systems Manual
RAO	remedial action objective
RI	Remedial Investigation
ROD	Record of Decision
RPD	relative percent difference
RRO	residual range organics
RRS	Radio Relay Station
SVOC	semivolatile organic compound
TCE	trichloroethene
TKN	Total Kjeldahl Nitrogen
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plan
U.S.	United States

USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
UST	underground storage tank
VOC	volatile organic compound

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EXECUTIVE SUMMARY

This Remedial Action Operation (RAO), Institutional Control (IC) and Land Use Control (LUC) Report summarizes the 2022 LUC and landfill cap inspection activities at Port Heiden Radio Relay Station (RRS) Sites OT001, WP002, LF007, and SS006, and groundwater monitoring at Sites OT001, WP002, and SS006. North Wind-EA Joint Venture prepared this report for the U.S. Air Force (USAF) under United States (U.S.) Army Corps of Engineers (USACE) Contract Number W911KB-20-D-0012, Task Order Number W911KB20F0120.

The 2009 Record of Decision (ROD) (USAF 2009a) specifies the Final Selected Remedy for the source areas LF006, OT001, and WP002 which requires signs placed at the property to provide notification of the presence of contamination and to warn against intrusive activities. IC inspections were completed at all four sites. Most LUCs appeared to be in good condition with no evidence of activities contradictory to the Land Use Control Management Plan, except for evidence of unauthorized site use at LF007 and OT001 to include surface debris at LF007 and unauthorized dumping at OT001. Sites OT001 and LF007 each had two signs in good condition. Two new signs were installed at both entrances to WP002 as per the requirements in the ROD.

Twelve (12) monitoring wells at OT001 and WP002 were sampled in September 2022. The wells sampled at OT001 and WP002 included: BLO-MW-01, BLO-MW-05, BLO-MW-06, BLO-MW-07, DSA-MW-01, DSA-MW-02, DSA-MW-05, DSA-MW-06, DSA-MW-07, GLO-MW-04, RRS-MW-05, and RRS-MW-06. Samples collected for laboratory analysis from OT001 and WP002 were analyzed for diesel range organics (DRO) by Alaska (AK) Method 102, volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method SW8260D, and monitored natural attenuation (MNA) of iron, manganese, sulfate, alkalinity, nitrate and nitrogen. Four monitoring wells at Site OT001 (GLO-MW-03, DSA-MW-04, PG1-MW-01, and UST-MW-02) were not sampled as the field team was not adequately prepared to collect samples from the smaller, 1.5-in well casing during the initial mobilization. Monitoring well PG1-MW-01 was documented to have been destroyed during excavation activities in 2020. The remainder of the wells were observed to have obstructions in the well casing during the site visit.

There were a number of Project Action Limit (PAL) exceedances at OT001 and WP002 based on the Alaska Department of Environmental Conservation's (ADEC) groundwater cleanup levels in 18 Alaska Administrative Code 75.345 Table C (ADEC 2023). Samples from two wells (BLO-MW-01 and BLO-MW-05) located at OT001 exceeded the ADEC human health cleanup level for manganese. Total petroleum hydrocarbons (TPH) high fraction DRO was detected above the ADEC human health cleanup level in BLO-MW-01 and 006-MW-06. Three wells exceeded the ADEC human health cleanup level for trichloroethene (TCE), including DSA-MW-01, DSA-MW-02, and DSA-MW-05. Results from the Mann-Kendall (MK) trend analysis indicates DRO concentrations are significantly increasing at one well (066-MW-06) and stable at 066-MW-05. TCE is shown to be probably increasing at three wells (GLO-MW-04, RRS-MW-05, and RRS-MW-06), significantly decreasing at DSA-MW-02, and stable at BLO-MW-07. Manganese concentrations are shown to be significantly decreasing at one well (RRS-MW-05) and stable at three wells (DSA-MW-01, RRS-MW-05, and DSA-MW-06).

Seven monitoring wells were sampled at SS006. One well (215-MW-12) was sampled in September 2022. In December 2022, a second site visit was made to collect the remaining samples at SS006 from monitoring wells 215-MW-08, 215-MW09, 066-MW-04, 066-MW-05, 066-MW-06, and 066-MW-07. Groundwater samples collected from SS006 were analyzed for DRO by AK102 and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method SW8260D. All samples collected in December 2022 were non-detect for the suspected analytes with the exception of DRO in well 066-MW-05 detected

above the PAL at 2,410 micrograms per liter. Results from the MK trend analysis indicates DRO concentrations are increasing in one well (066-MW-06), decreasing in two wells (215-MW-09 and BLO-MW-01), and stable in 066-MW-05.

During the September 2022 site visit, several minor repairs to wells were completed to include installation of new monument lids and locks.

Based on these observations, the following activities are recommended:

- Replace the following wells in Sites OT001/WP002:
  - DSA-MW-04,
  - PG1-MW-01,
  - UST-MW-02, and
  - GLO-MW-03.
- Repair the following wells in Site SS006:
  - 215-MW-09,
  - 066-MW-04, and
  - 066-MW-06.
- Consideration should be given to analysis of water using low-level VOCs by EPA method 8260ULL to ensure LODs are below groundwater cleanup levels for subsequent monitoring events.
- Repair and maintain the fencing across driveway between the LUC notification signs to discourage trespassing at LF007.
- Continue annual LUC/IC inspections at Sites OT001, WP002, SS006, and LF007.
- Continue groundwater monitoring at Sites OT001, WP002, and SS006.

1. INTRODUCTION

This report details the 2022 Remedial Action Operation (RAO) Institutional Control/Land Use Control (IC/LUC) activities performed at the Port Heiden Radio Relay Station (RRS). The United States (U.S.) Army Corps of Engineers-Alaska District (USACE, Alaska), on behalf of the United States Air Force (USAF), has tasked North Wind-EA Joint Venture (North Wind-EA JV) with conducting Long-Term Management (LTM) activities at several Pacific Regional Support Center locations throughout Alaska. This work is authorized under Contract Number W911KB-20-D-0012, Task Order W911KB20F0120 and includes work at the Port Heiden RRS.

This report presents the site activities and the results of the 2022 Environmental LTM Program at Port Heiden RRS conducted between 14 – 21 September 2022 and on 6 December 2022. Sampling and inspection activities were conducted in accordance with the Final 2021 Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) for Long-Term Management and Remedial Action Operation Activities Port Heiden Radio Relay Station, Alaska (USAF 2021b), and the Final Work Plan Amendment 1 (USAF 2022a).

Site observations and monitoring activities documented in this report include the following sites:

- Former Composite Building (Site OT001);
- Black Lagoon Outfall (Site WP002);
- Radio Relay Station Landfill (Site LF007); and
- The Former Pipeline Corridor (Site SS006).

Three sites (OT001, WP002, and LF007 are Environmental Restoration Program (ERP) sites containing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances identified as contaminants of concern (COCs). Site SS006 is a former pipeline corridor where groundwater was contaminated with petroleum, oil, and lubricants (POLs), contaminants which are not regulated under CERCLA. Because the source areas were identified as ERP/non-CERCLA sites at different times, their numeric site designations were not necessarily established at the time of discussed historic documents and results. As a result, response actions do not refer to the individual ERP site numbers when the action occurred prior to 1995.

1.1 Purpose

The purpose of this project is continued LTM of the Port Heiden RRS sites in compliance with existing state and federal regulations, the Land Use Control Management Plan (LUCMP; USAF 2019a), and Record of Decision (ROD) for Sites OT001, WP002, and LF007 to ensure the active LUCs are functioning as designed in respect to the selected remedies. The LUCs for Port Heiden RRS are designed to restrict/prohibit the following activities:

- Restriction of any soil disturbance without the approval of ADEC to prevent the constant contact of this media with water which could impact groundwater or surface water quality.
- Maintenance of the landfill cover and restriction of excavation into or development over the Port Heiden RRS landfill to maintain the integrity of cap and to prevent migration of contaminants.

- Limitation on groundwater use as approved by ADEC.
- Prevent excavation into or development over buried solid waste and potentially hazardous materials in the former RRS landfill and maintain current land use designation.
- Restrict excavations and the installation of water wells (except for the purposes of monitoring) where contamination levels exceed cleanup levels to reduce the possibility of exposure to contaminants in the contaminated aquifer.

1.2 Project Background and History

The former Port Heiden RRS is located approximately 1.5 miles east of Bristol Bay and approximately 400 miles southwest of Anchorage, on the north side of the Alaska Peninsula (Figure 1), and within the former Fort Morrow, a World War II Army Corps Air Base. The installation can be accessed by commercial carrier via the nearby airstrip or by barge, approximately 3 miles to the southwest. The RRS, accessed by Site Road, is located approximately 3.5 miles north of the Native Village of Port Heiden. Site Road extends north from the Port Heiden airport, then northwest into the installation through ERP Site OT001.

The Port Heiden installation was initially one of 12 Distant Early Warning (DEW) line radar stations constructed in Alaska between 1950 and 1959. The Port Heiden RRS was constructed between 1955 and 1960 over a footprint of several square miles. Port Heiden RRS became operational in 1961 to provide reliable communications for the DEW line station. Originally known as White Alice Communications System, the Air Force Alaska Air Command redesignated facilities in the system as RRSs in 1969. The site consisted of a composite building with dormitories, office space, storage space and equipment for standby power generation, four billboard antennas and feed horns (White Alice Arrays), and a heliport. Port Heiden RRS was deactivated in 1978. The buildings and facilities associated with the former Port Heiden RRS have been removed (USAF 2014a).

Past activities resulting in potential environmental contamination at the Port Heiden RRS include road oiling, transformer use, improper disposal of contaminated waste, drum storage, installation and use of underground storage tanks (USTs), and communications system operations. Remedial activities were initiated as part of the ERP and have occurred at the Port Heiden RRS since an initial site inspection in 1977 (USAF 2017). The investigation of the contamination found at the former Port Heiden RRS was initiated in 1986. Remediation activities at Port Heiden RRS are being conducted pursuant to CERCLA, as amended by Superfund Amendments and Reauthorization Act (SARA) and National Oil and Hazardous Substances Contingency Plan (NCP) requirements for LF007 and OT001, and Alaska Department of Environmental Conservation (ADEC) 18 Alaska Administrative Code (AAC) 75.325-.370 (ADEC 2023), following guidance from CERCLA for SS006 and WP002. Regulatory oversight is provided by ADEC. Site-specific background and histories are described below.

1.2.1 Site OT001 – Former Composite Building

The Former Composite Building (OT001) is located near the center of the former Port Heiden RRS. The site consists of a gravel pad that contained the former composite building along with four surrounding USTs (Figure 2). The former composite building was constructed of reinforced concrete slabs and contained offices, dormitories, storage space, a garage, and a generator room. Investigations at Site OT001 identified polychlorinated biphenyls (PCBs) and chlorinated solvent-contaminated soil around the perimeter of the concrete foundations. The foundation of the composite building was covered with soil after contaminated soil removal (USAF 2006).

In 1986, soil samples were collected throughout the former Port Heiden RRS and tested for PCBs, metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), semivolatile organic compounds (SVOCs), and halogenated volatile organic compounds (VOCs). At the former composite building, PCBs in soil at concentrations up to 15 milligrams per kilogram (mg/kg) were found near the automotive shop, and halogenated VOCs and trichlorofluoromethane were detected at a maximum concentration of 84.2 parts per billion (ppb) outside the generator room (USAF 2006).

In 1987 and 1988, eighty soil samples collected from the north end of the former composite building were analyzed for PCBs, and contaminated soil was identified along the entire northern wall of the former composite building at concentrations up to 190 mg/kg. The highest concentrations were found at the east edge of the concrete slab in front of the large garage doors. The north end of the former composite building was subsequently the focus for soil excavation and removal during the 1990 investigation and restoration (USAF 2006).

In 1990, approximately 170 cubic yards of PCB-impacted soil removed from the Former Facility Area and from a Federal Aviation Administration site were sent offsite for disposal (USAF 2006). Surface soil with total petroleum hydrocarbons (TPH) concentrations above 5,000 mg/kg on the north side of the former composite building was removed in 1-foot-thick intervals; the remaining soil was then retested. The cleanup goal of TPH concentrations below 100 mg/kg throughout the excavation area was not achieved. In 1991, ADEC agreed to an alternative cleanup level of 5,000 mg/kg TPH. Soil with TPH concentrations below 5,000 mg/kg and PCB concentrations below 10 mg/kg was used as covers at Landfills A (west of the composite building) and B (south of the runway).

During 1990 activities, an unsuccessful search was conducted for a 30,000-gallon motor gas UST shown to exist on as-built drawings. The tank's absence was confirmed during 2004 Remedial Investigation (RI) work (USAF 2006). Additional USTs formerly located at the site, but removed prior to 1990 activities, include a 600-gallon ADEC-registered UST and two 20,000-gallon diesel USTs (USAF 2006).

In 1995, soil was excavated along the north wall of the former composite building. The site inspection report concluded that no further action was needed at Site OT001, as analytical results indicated that soil with POL and PCB concentrations above the cleanup levels had been removed.

In 1999, nine subsurface soil samples were collected beneath vegetation near the composite building and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). No BTEX constituents were detected above the laboratory's method detection limits (MDLs) (USAF 2006).

During an RI in 2004, the PCB Aroclor 1260 was detected above the cleanup level (1 mg/kg) in four of the initial nine surface soil samples (USAF 2006). A polycyclic aromatic hydrocarbon (PAH) compound, benzo(a)pyrene, was also found slightly above the cleanup level (1 mg/kg) in one sample and its duplicate. Of the soil samples collected during the 2004 RI, eight had concentrations of PCBs above the cleanup level (1 mg/kg), with a maximum detected concentration of 6.4 mg/kg (USAF 2014a).

The groundwater monitoring program began at the site in 2009 with the installation of a total of 10 monitoring wells among former sites FPC-029, FPC-215, and FPC-066 based on findings from temporary well points and olfactory observations. All monitoring wells were sampled for GRO, DRO, RRO, and BTEX. DRO was detected at FPC-066 in monitoring wells 066-MW-05 (formerly MW5) and former WP-14 at with concentrations of 2.25 milligrams per liter (mg/L) and 37.9 mg/L, respectively. DRO was also detected at FPC-215 in 215-MW-09 (formerly MW-9) and its duplicate sample with concentrations of 4.18 mg/L and 3.99 mg/L, respectively (USAF 2010).

Annual LUC/IC reporting began in 2019. An inventory of site monitoring wells was performed, indicating repairs and/or replacement is necessary. Recommendations to improve the effectiveness of the selected remedy included the decommissioning and replacement of monitoring wells GLO-MW-03, PG1-MW-01 and UST-MW-02 (USAF 2020).

The 2020 inspection found that six wells were in need of repair or replacement. Analytical results showed that tetrachloroethene (PCE), trichloroethene (TCE), and diesel range organics (DRO) were detected above the ADEC Human Health Cleanup Levels (EA Engineering, Science, and Technology, Inc., PBC [EA]) (USAF 2021a).

In 2021, an LUC inspection reported significant surface erosion at GLO-MW-03 and DSA-MW-05 at Site OT001. Areas of damaged and/or downed fencing was also reported at OT001. Four signs were observed and found to be in good condition. Twelve monitoring wells were sampled at Sites OT001 and WP002, and include BLO-MW01, BLO-MW05, BLO-MW06, BLO-MW07, DSA-MW01, DSA-MW02, DSA-MW05, DSA-MW06, DSA-MW07, GLO-MW04, RRS-MW05, and RRS-MW06. Four monitoring wells (GLO-MW03, DSA-MW04, PG1-MW01, and UST-MW02) were damaged and could not be sampled (USAF 2022b).

In 2022, PCB-contaminated and Toxic Substances Control Act (TSCA) PCB soils were excavated fand transported to the Chemical Waste Management of the Northwest (CMW Arlington). A total of approximately 3000 tons of soil was removed from Sites OT001 and LF007 as part of this effort. Final confirmation sampling of the excavated cells indicates remaining PCB concentrations are below the Project Action Limit (PAL) of 1 mg/kg. Based on these findings, nor further action pertaining to PCB-contaminated soil is recommended at OT001 (USAF 2022c).

1.2.2 Site WP002 – Black Lagoon Outfall

The Black Lagoon Outfall (BLO) is located southwest of OT001. The site was the location of a series of holding ponds at the outfall of a pipe (Figure 2). POL wastes were reported to have been disposed of in a floor drain connecting the automotive shop to the composite building, flowing into the BLO 500 feet to the east (USAF 2014a).

In 1987, four samples were collected from the BLO, two from each of the ponds and two from the distressed vegetation area soils. Fuels, PCBs, and chlorinated solvents were detected at low concentrations. In 1988, sixteen samples were tested for metals; no samples contained detectable concentrations (USAF 2006). A review of the analytical results from soil samples collected in 1987 and 1988 showed concentrations of TPH, PCBs, and SVOCs exceeded action levels.

In 1990, surface samples were analyzed for TPH and PCBs, and four trenches were excavated to delineate the extent of impacted soil. PCBs were not detected in any of the samples. Soil with TPH concentrations greater than 5,000 mg/kg was found at the surface and to 12 feet below ground surface (bgs). Approximately 4,000 cubic yards of soil with concentrations above 5,000 mg/kg TPH was estimated to remain at the site (USAF 2006).

During the 2004 RI, DRO, residual range organics (RRO), metals, PCBs, VOCs, gasoline range organics (GRO), PAHs, and herbicides were identified as potential COCs within surface and subsurface soil samples (USAF 2006). PCE and DRO were the only contaminants identified with concentrations above cleanup levels (USAF 2015a). From the 2004 results, two plumes were identified in the aquifer underlying the Port Heiden RRS. They include a TCE plume (approximately 700 feet long, 400 feet wide, and at a depth of 50 feet bgs) underlying the former pad and a smaller benzene and TCE plume

(approximately 100 feet long, 100 feet wide, and at a depth of 50 to 60 feet bgs) underlying the BLO (USAF 2014a).

In 2009, DRO and PCE concentrations above ADEC Method Two migration to groundwater cleanup levels were detected in soils at several locations (USAF 2015a). In 2011, DRO, PCE, and TCE were detected at maximum concentrations of 4,250 mg/kg, 0.622 mg/kg, and 3.83 mg/kg, respectively. Consistent with the 2004 RI, all PCE and TCE detections were co-located with DRO exceedances; however, not all DRO exceedances were associated with detectable PCE and TCE (USAF 2015a). In 2013 and 2014, PCB-contaminated soil was excavated (USAF 2015a). In 2014, PCE- and fuel-contaminated soil was also excavated and used to construct two passively ventilated biopiles to investigate biopiles as a remediation technique for PCE-contaminated soil. In 2015, sample results demonstrated a significant reduction in concentrations of the three analytes; PCE concentrations had fallen below ADEC cleanup levels in all but two samples, and TCE concentrations were all below cleanup levels. DRO concentrations decreased; however, 13 of the 15 samples remained above ADEC cleanup levels (USAF 2016). In 2017, the soil from the biopiles was placed in soil landspreading areas and land farmed (USAF 2019b).

The 2021 analytical results showed six monitoring wells at OT001 and WP002 had exceeded ADEC Human Health Cleanup Levels for various constituents in the groundwater. Naphthalene was detected above the ADEC cleanup level (1.7 µg/L) in BLO-MW01 (23.1 µg/L). Naphthalene was also detected above the ADEC cleanup level but below the limit of detection (LOD) in all other wells, thus qualifying them as non-detects (U). 1,1,1-Trichloroethane was detected in DSA-MW02 above the LOD (0.5 µg/L) at an estimated value of 1.09 J µg/L. TPH (DRO)was detected at BLO-MW01 with a concentration of 13,000 J µg/L (USAF 2022b).

1.2.3 Site SS006 – Former Pipeline Corridor

The Former Pipeline Corridor (Site SS006), formerly known as AOC05, connected the Port Heiden RRS Facility Area to the Marine Terminal Area, south of the Former Facility Area in the village of Meshik (Figure 1). Site SS006 includes the subsites of the aboveground portion of the pipeline from the Marine Terminal Area at the Former Facility Area, and the buried portion within the Former Facility Area (Figure 3 and Figure 4).

The POL distribution system, operated by the USAF until the Former Facility Area was abandoned in 1978, consisted of two large aboveground storage tanks, a pumphouse, and piping. The tanks were refueled by barge through piping along the beach that extended to the tanks. Fuel was distributed from the tank farm pumphouse to the Former Facility Area through a 2-inch pipeline over approximately 5.8 miles. The pipeline was primarily aboveground, except where it intersected driveways and was buried. The pipeline was also buried from the eastern margin of the Former Facility Area pad to the former USTs northeast of the Former Composite Building. The aboveground portion of the pipeline between the airport and the former composite building was dismantled in 1990 (USAF 2009b). Parts of SS006 were transferred to Reeves Aleutian Airways in 1989, and the two POL tanks and fuel pipeline to the airport were sold by the USAF to Reeve Aleutian Airways in 1989 under a USACE contract sale invitation for bids No. 88-1 and No. 88-3.

The Former Pipeline Corridor was investigated during the 2004 RI (USAF 2006). Surface and subsurface soil, surface water, and groundwater samples were collected at intervals along the length of the pipeline. Soil and water samples were analyzed for GRO, DRO, RRO, VOCs, pesticides, herbicides, metals, PCBs, and PAHs. Fuel constituents (DRO and GRO) were detected above screening criteria in soils along the Former Pipeline. Groundwater and surface water contamination along the pipeline were linked to contaminated source soils (USAF 2009b).

A 2008 soil removal action addressed most soil and groundwater contamination, and natural attenuation mechanisms were expected to continue to eliminate residual contamination (USAF 2010). In 2009, a hydrogeological study characterized the groundwater contamination identified during the 2008 removal action (USAF 2009b). Two spill sites in wetland areas along the pipeline corridor were also investigated. The study concluded that TPH contamination was not widespread on the surface but extended down to the water table. The study recommended annual monitoring at Subareas FPC-066 and FPC-215, and additional soil investigation at FPC-086. In 2012, additional soil samples were collected in the FPC-086 area, north of FPC-066 along the road. Results were below cleanup levels (Native Village of Port Heiden [NVPH] 2012). No further actions were recommended for FPC-029 and FPC-074 (USAF 2009b).

DRO has been repeatedly detected in groundwater at concentrations above ADEC cleanup levels in both FPC-066 and FPC-215. Groundwater from FPC-066 (well MW-05) and from FPC-215 (well MW-09) exceeded the ADEC DRO cleanup level in 2010 (NVPH 2012). In 2011, groundwater samples from FPC-066 were analyzed for VOCs, with no detections. At FPC-215, wells were sampled and analyzed for DRO and BTEX. DRO remained above cleanup levels in MW-09 (NVPH 2012). In 2013, the samples from monitoring well MW-05 in FPC-066 and MW-09 in FPC-215 again exceeded the ADEC cleanup level for DRO (USAF 2014b). In 2014, all samples from FPC-066 were below ADEC cleanup levels for DRO. In contrast, the DRO concentrations in monitoring well FPC-215 well MW-09 exceeded the cleanup level and exhibited an increasing trend (USAF 2015b). Groundwater samples from MW-05 and MW-09 continued to exceed cleanup levels in 2016 and 2017 (USAF 2019c, 2019d).

The 2019 groundwater monitoring results indicated DRO was present in concentrations that exceeded the ADEC Human Health Cleanup Level of 1,500 µg/L at monitoring wells 066-MW-05 and 215-MW-12. Concentrations were reported as 1,500 µg/L and 3,900 µg/L, respectively (USAF 2020).

The 2020 inspection found that three wells were in need of repair. Analytical results showed that DRO were detected above the ADEC Human Health Cleanup Level (USAF 2021a).The 2021 analytical results showed that one well in SS006 was found to have groundwater exceeding the ADEC Human Health Cleanup Levels for TPH (DRO) at monitoring well 215-MW-09, which had an estimated TPH concentration of 3,430 J µg/L. The four damaged monitoring wells identified in the QAPP could not be sampled and were recommended for replacement (USAF 2022b).

1.2.4 Site LF007 – Radio Relay Station Landfill

Site LF007, the RRS Landfill, is located north of Port Heiden RRS and is approximately 350 feet long by 300 feet wide (Figure 5). Approximately 3.5 feet of fill have been placed over the RRS Landfill contents as a cover. PCBs, PAHs, and pesticide contamination were detected in the soil cover material placed over the landfill (USAF 2014a). The soil cover material was contaminated with PCBs and consequently removed during the 2016-2018 PCB-contaminated soil removal action (USAF 2019b). No contaminants above screening criteria in surface or subsurface soil around the perimeter of the landfill have been detected (USAF 2014a). The 2020 inspection found that a fence should be installed around the capped area of LF007 to eliminate human exposure to contaminated soil in compliance with the 2009 ROD (USAF 2021a).In 2021, LUC inspection observed two signs in good condition at the entrance to the site. Although a fence was present at the entrance from the road, additional fence was laying on the ground nearby and did not surround the site. The landfill cover was in good condition however, stray debris (i.e., metal drum, wooden pallet, pieces of metal and electronics, and cans) was observed within the boundary of the site. Larger items were likely illegally dumped, and smaller items may potentially have been windblown (USAF 2022b).

In 2022, PCB-contaminated soils were excavated from LF007 in conjunction with soils removed at OT001 (see Section 1.2.1). Further remedial actions will be required to remove both non-TSCA PCB-contaminated and TSCA PCB-contaminated soils at the LF007 (USAF 2022c).

1.3 Project Objectives

The overall objectives of the former Port Heiden RRS environmental site restoration are to ensure that conditions at each site are protective of human health and the environment and to comply with state and federal regulations. The ROD presents the Final Selected Remedy for sites OT001. WP002, and LF007. The selected soil remedy consists of following (USAF 2009a):

- Excavation of soil containing PCBs greater than or equal to 10 mg/Kg (soil may contain incidental pesticides and PAHs);
- Alcohol based washing of the excavated soil containing PCBs greater than or equal to 10 mg/kg to reduce the PCB concentration to less than 10 mg/Kg;
- Excavation of soil containing greater than 1 mg/Kg of PCBs but less than 10 mg/Kg and pesticides/PAHs over their respective cleanup levels; and
- Offsite disposal of washed or unwashed soil in a permitted Class III landfill in the vicinity of the Village of Port Heiden.

The selected groundwater remedy consists of the following:

- Natural attenuation of groundwater contaminated with TCE and benzene.
- Periodic groundwater monitoring would be performed at the facility to assess changes in groundwater contaminant concentrations over time;
- A notice placed on the property records to inform current and future property owners of the presence of the groundwater contamination. These institutional controls would remain in-place until groundwater cleanup levels were achieved through natural attenuation.

The LUCs identified in the ROD include signs to warn the public of the presence of contaminated soil, and landfill cover maintenance to prevent contaminated soil from coming into contact with water, although signs are not specified in the 2019 LUCMP (USAF 2019a). Soil excavation is restricted and ADEC approval is required prior to moving or disposing of soil subject to the cleanup rules identified in 18 AAC 75.325-.370 (ADEC 2023). Soil must be characterized if it is removed from the sites.

Planned groundwater use must be approved by ADEC, and groundwater removed from the site in the future must be characterized. ICs will be evaluated every five (5) years. Monitoring was required annually for first five (5) years and will continue until groundwater contamination is no longer a threat to human health and the environment, as verified by a minimum of two (2) years of consecutive sampling events with COC concentrations below ADEC Table C groundwater cleanup levels, and concentrations of daughter products below federal minimum cleanup levels and state groundwater cleanup levels. RAOs have not been established for Site SS006 though monitoring of natural attenuation is ongoing (USAF 2019e).

1.4 Report Organization

This report is organized as follows:

- **Section 1, Introduction**. This section presents the project purpose, project background (including historical investigations and remedial activities), and report organization.
- **Section 2, 2022 Site Activities and Observations.** This section discusses the LUC/IC inspections, groundwater sampling, and analytical results.
- **Section 3, 2022 Groundwater Sample Results.** This section presents the results of the 2022 groundwater sampling events.
- **Section 4, Data Quality Review.** This section summarizes the quality and usability of laboratory analytical results.
- **Section 5, Mann-Kendall Trend Analysis.** This section presents the results of the site concentration trends.
- **Section 6, Summary and Recommendations.** This section presents conclusions and makes recommendations for further LTM activities at Port Heiden RRS.
- **Section 7, References.** This section provides the reference documents used to develop this LTM Report.
- **Appendix A, Photographic Log**
- **Appendix B, Field Notes and Forms**
- **Appendix C, Chemical Data Tables**
- **Appendix D, Data Usability Assessment Report and ADEC Laboratory Data Review Checklist**
- **Appendix E, Laboratory Analytical Reports**
- **Appendix F, Mann-Kendall Trend Analysis Files**
- **Appendix G, ADEC Correspondence**

2. 2022 SITE ACTIVITIES AND OBSERVATIONS

2.1 Land Use/Institutional Control and Landfill Cover Inspections

The site inspections occurred between 14 – 21 September 2022. Inspection results were documented through photographs (provided in Appendix A) and a visual inspection checklist (provided in Appendix B). The inspection was conducted in accordance with the approved *Final Uniform Federal Policy for Quality Assurance Project Plan for Long-Term Management and Remedial Action Operation Activities Port Heiden Radio Relay Station, Alaska* (USAF 2021b).

2.1.1 Site OT001

Most of the land within the Site OT001 boundary is covered in packed gravel with light vegetation. Excavated pits were observed during the inspection. Exposed wires and metal debris were visible in the walls of these pits. There was evidence of ponded water from recent rain near UST-MW-02 (Appendix A, Photograph 113118). The area around DSA-MW-01 and DSA-MW-05 has been landscaped and new grass planted (Appendix A, Photograph 112349 and 112418). Monitoring well PG1-MW-01 was removed or destroyed during the excavation. The area surrounding monitoring well GLO-MW-03 was dry; the well was not sampled due to previous damage (Appendix A, Photograph 112828). One sign within the border of OT001 was observed and is in good condition (Appendix A, Photograph 153056).

The four damaged monitoring wells (GLO-MW-03, DSA-MW-04, PG1-MW-01, and UST-MW-02) at Site OT001 appeared damaged beyond use or repair. GLO-MW-03 was obstructed at 56.10 feet below top of casing (btoc) which prevented the submersible pump from reaching ground water. The obstruction may be a kink in the well casing. DSA-MW-04 was obstructed at 12.81 feet btoc by grout or bentonite in the well casing and could not be sampled. PG1-MW-01 had been destroyed during excavation activities in 2020. UST-MW-02 was not sampled due to an obstruction in the well. As noted by the previous contractor, the pump encountered a kink in the PVC pipe and became stuck. The pump was abandoned inside the well, as it could not be removed.

2.1.2 Site WP002

The site surface is generally in good condition, although rain has caused some surface erosion and ponding of water in some areas. The monitoring wells in the WP002 area are in good condition, although all well locks were severely corroded which were subsequently cut; one lock was replaced and one lid was zip tied shut. Two signs were installed on the southeast side and northwest sides of WP002 (Appendix A, Photographs 111635 and 111915).

2.1.3 Site SS006

Many of the well locks were observed to rusted and monument lids broken. The interior polyvinyl chloride (PVC) casing for 066-MW-04 sticks up above the exterior casing, preventing the lid from closing and locking Appendix A, Photograph 094214). Six of the wells in the SS006 zone have 1.5-inch diameter PVC, as opposed to the 2-inch PVC well casings. The field team did not have the appropriate sampling equipment to collect samples from the 1.5-in well casings and had to return during a second mobilization to complete groundwater monitoring at these wells.

2.1.4 Site LF007

Two signs were observed to be in good condition at the entrance to the site (Appendix A, Photograph 155549). A fence is present at the entrance from the road and additional fencing laying on the ground nearby that does not surround the site. Overall, the landfill cover is in good condition though some trash appears to have been illegally dumped and other debris may have been blown to the site by the wind.

Evidence of the PCB excavation activities to on the east side of the landfill cap and soil stockpile area was also observed (Appendix A, Photograph 155818).

2.2 Groundwater Monitoring Activities

Groundwater sampling was conducted 17 September through 20 September 2022, and again on 6 December 2022. The completed groundwater sampling forms are provided in Appendix B. Monitoring wells were purged and sampled using low flow sampling procedures according to ADEC guidance (ADEC 2022). Four wells at Site OT001 were damaged and could not be sampled (see Section 2.4 for well conditions). Groundwater sampling photographs are presented in Appendix A. Monitoring wells with a 2-in well casing were sampled with a submersible pump (Proactive, Pro Series Stainless Steel Mega-Monsoon Pump w/ Proactive, Low Flow Power Booster Controller). Wells with a 1.5-in casing were purged and sampled using a Geotech small-diameter bladder pump.

Water quality parameters were recorded during purging to ensure stabilization before samples were collected. Parameters included potential hydrogen, temperature, conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity. Parameters were measured with a YSI 556 MPS handheld multiparameter meter and a MicroTPW 2000 turbidimeter. Both instruments were calibrated daily prior to use. Groundwater sampling forms with records of well depth, time, date, location, and field stabilization parameters are included in Appendix B, along with calibration forms and field logbook notes. Purge water was filtered through a 5-gallon granulated activated carbon filter and discharged over 100 feet away from the nearest surface water, as described in the UFP-QAPP (USAF 2021b) and per current guidance (ADEC 2022).

Groundwater samples were placed into preserved or unpreserved containers appropriate for the targeted analyte and placed in coolers that were packed with gel ice. One set of field duplicates was collected for each day of sampling; duplicate samples were noted as such per the UFP-QAPP (USAF 2021b). Additional aliquots for preparation of matrix spike/matrix spike duplicate (MS/MSD) samples by the laboratory were also submitted. Trip blanks were included in sample shipments for samples intended for VOC analysis to verify that no contamination occurred in transit. Samples collected in September 2022 were packed in a sealed cooler with chain-of-custody documentation and shipped to Pace Analytical Laboratory on 28 September 2022 in Mt. Juliet, Tennessee for analysis. These samples were received by the laboratory on 29 September 2022. Samples collected in December 2022 were packed in a sealed cooler with chain-of-custody documentation and shipped to Pace Analytical Laboratory on 9 December 2022 in Mt. Juliet, Tennessee for analysis. These samples were received by the laboratory on 10 December 2022.

2.2.1 Sites OT001 and WP002

Twelve monitoring wells were sampled in September 2022 at Sites OT001 and WP002, and include BLO-MW-01, BLO-MW-05, BLO-MW-06, BLO-MW-07, DSA-MW-01, DSA-MW-02, DSA-MW-05, DSA-MW-06, DSA-MW-07, GLO-MW-04, RRS-MW-05, and RRS-MW-06 (Figure 2). Duplicate samples were collected at BLO-MW-06 and BLO-MW-01. Four monitoring wells (GLO-MW03, DSA-MW-04, PG1-MW-01, and UST-MW-02) were damaged to the extent as to where samples could not be collected (see Section 2.4). A summary of the samples collected, and container type is presented in Table C- 1.

2.2.2 Site SS006

Seven monitoring wells associated with subareas FPC-215 (Figure 3) and FPC-066 (Figure 4) were sampled. The wells sampled in 2022 included 215-MW-08, 215-MW09, 215-MW-12, 066-MW-04, 066-MW-05, 066-MW-06, and 066-MW-07. A duplicate sample was collected at 066-MW-09. One well (215-

MW-12) in subarea FPC-215 was sampled in September 2022, and the remaining six wells were sampled in December 2022. A summary of the samples collected, and container type is presented in Table C- 1.

2.3 Work Plan Deviations

Monitoring well 215-MW-12 was the only well from Site SS006 that was sampled during the September 2022 site visit. The remaining six wells at Site SS006 (215-MW-08, 215-MW09, 066-MW-04, 066-MW-05, 066-MW-06, and 066-MW-07), were sampled in December 2022 as the field team was not adequately prepared to collect samples from the smaller, 1.5-in well casing during the initial mobilization.

Monitoring well 215MW09 from Site SS006 was erroneously sampled for monitored natural attenuation (MNA) along with the other samples during the September 2022 field. All other monitoring wells sampled from SS006 were collected for the correct constituents. The deviation should not affect data quality.

2.4 Monitoring Well Conditions

2.4.1 Sites OT001 and WP002

The following wells were observed to be in good condition:

- GLO-MW-04
- DSA-MW-01
- DSA-MW-02
- DSA-MW-05
- DSA-MW-06
- DSA-MW-07
- RRS-MW-05
- RRS-MW-06
- BLO-MW-01
- BLO-MW-05
- BLO-MW-06
- BLO-MW-07

The well cap lock was replaced at the following well:

- BLO-MW-01

Locks were cut and the well cap is held in place with a zip tie at the following wells:

- BLO-MW-05
- BLO-MW-06
- BLO-MW-07
- RRS-MW-05
- RRS-MW-06
- DSA-MW-01
- DSA-MW-02
- DSA-MW-05
- DSA-MW-06
- DSA-MW-07
- GLO-MW-04

- DSA-MW05: Well sticks out of the ground approximately 4 feet due to significant erosion around the casing. Access to well interior is difficult (Appendix A, Photograph 112349).

- GLO-MW04: Lock was cut and replaced. Outer well casing is loose and requires repair/stabilization (Appendix A, Photograph 112911).

The following wells were in poor condition, were not sampled, and require replacement:

- PG1-MW01: Well was not sampled, as it was destroyed during excavation.

- DSA-MW04: Well was obstructed at 12.81 feet btoc by grout or bentonite in the PVC inner casing and could not be sampled.

- UST-MW02: Well was not sampled due to an obstruction in the well. As noted by the previous contractor, the pump encountered a kink in the PVC pipe and became stuck. The pump was abandoned inside the well, as it could not be removed (Appendix A, Photograph 113118).

- GLO-MW03: Lock was cut and replaced. Well was obstructed at 56.10 feet btoc and could not be sampled. The obstruction was estimated by the field team to be a kink in the well (Appendix A, Photograph 112828).

2.4.2 Site SS006

The following wells were in good condition but required minor repairs:

- 215-MW-08: Lock and well cap were in poor condition; well cap was replaced, and lock was cut and replaced (Appendix A, Photograph 172849).

- 215-MW-12: Lock was in poor condition; new lock was placed on the well.

The following wells were in fair condition and require repair:

- 215-MW-09: Well does not have a lid in place and is secured by an orange screw cap on the inner PVC casing. The well cannot be locked. A replacement lid is needed for this well (Appendix A, Photograph PC061099).

- 066-MW-04: An orange screw cap securing the top of the inner PVC casing sticks up above the outer casing (Appendix A, Photograph 094214). The well lid sitting on top is situated too high for the well to lock. The old lock was in place but had been previously cut. A flush mount PVC cap should be used on the inner PVC casing to allow the well to lock, and the lock should be replaced with a combination lock. This PVC is 1.5-inch diameter.

- 066-MW-06: The lower portion of the well lid has been broken and is unable to be locked. The lock that is present is a thick, keyed lock. The lock needs large, sturdy bolt cutters to cut. The lock should be replaced with a combination lock, and a new lid is needed (Appendix A, Photograph 162542).

3. 2022 GROUNDWATER SAMPLE RESULTS

Groundwater samples were collected from September 17 through September 20, 2022 and on December 6 2022. Groundwater monitoring results were compared to the ADEC groundwater cleanup levels in 18 AAC 75.345 Table C (ADEC 2023), which are the PALs. The PALs are the final RAOs per the site-specific ROD for OT001, LF007, and WP002 (USAF 2009a).

3.1 Sites OT001 and WP002

The monitoring wells sampled at OT001 and WP002 include BLO-MW-01, BLO-MW-05, BLO-MW-06, BLO-MW-07, DSA-MW-01, DSA-MW-02, DSA-MW-05, DSA-MW-06, DSA-MW-07, GLO-MW-04, RRS-MW-05, and RRS-MW-06. Primary samples were collected from each of these wells, and duplicates were collected from BLO-MW-01 and BLO-MW-06. In addition, one MS/MSD was collected from RRS-MW-06. Samples from OT001 and WP002 were analyzed for DRO by Alaska (AK) Method 102, VOCs by U.S. Environmental Protection Agency (EPA) Method SW8260D, and MNA for iron, manganese, sulfate, alkalinity, nitrate and nitrogen. Groundwater monitoring results for Sites OT001 and WP002 are presented on Figure 6 and Table C- 2.

All samples were non-detect for DRO with the exceptions of samples WP002-BLOMW01-091922 (13,700 micrograms per liter [µg/L]) and duplicate WP002-BLOMW01-091922-99 (13,600 µg/L), which exceeded the ADEC cleanup level of 1,500 µg/L.

All samples were non-detect for trichloroethene with the exceptions of sample OT001-DSAMW02-091922 (410 µg/L), which was received by the laboratory past or too close to the hold time expiration; sample OT001-DSAMW01-091822 (10.5 µg/L); and sample OT001-DSAMW05-091822 (3.30 µg/L). These samples exceeded the ADEC cleanup level of 2.8 µg/L.

All samples had detectable concentrations of manganese, but only three samples exceeded the PAL of 430 µg/L. These samples include OT001-BLOMW05-091922 at 748 µg/L, and duplicate pair WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 at 15,600 µg/L and 17,900 µg/L, respectively.

3.2 Site SS006

Seven groundwater wells were sampled in Site SS006. Well 215-MW-12 was sampled in September 2022 site visit. The remaining six wells at Site SS006 (215-MW-08, 215-MW09, 066-MW-04, 066-MW-05, 066-MW-06, and 066-MW-07), were sampled in December 2022. Duplicate samples were collected from SS006-215-MW12 and SS006-215-MW09. MS/MSD samples were collected from SS006-006-MW07

All samples were analyzed for DRO by AK 102, BTEX by EPA Method SW8260D. Monitoring well 215-MW09 was erroneously sampled for MNA along with the samples from OT001 during the September 2022 sampling event. All samples were non-detect for DRO except for sample SS006-066MW05-120622 with a concentration of 2,410 µg/L, which exceeded the ADEC cleanup level of 1,500 µg/L. All samples were non-detect for BTEX. Results for Sites SS006 FPC-215 and SS006 FPC-066 are presented in Figure 7 and in Table C- 4.

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4. DATA QUALITY REVIEW

The analytical data were reviewed as described in the UFP-QAPP (USAF 2021b). A detailed summary of the chemical data is provided in tables in Appendix C. A summary of the data quality assessment review and ADEC checklists are provided in Appendix E. The complete laboratory reports are included in Appendix E.

The results of data verification and validation processes indicate that the data generated from the samples collected during the 2022 field activities are of sufficient quality and quantity necessary to accomplish project objectives. Sample results accurately indicate the presence and/or absence of target analyte concentrations at sampled locations.

Samples were collected and analyzed as specified in the UFP-QAPP (USAF 2021b), except as noted within the ADEC data checklists provided in Appendix C and the discrepancies noted below. Sample results are representative of site conditions at the time of collection. Results obtained are comparable to industry standards in that collection and analytical techniques followed approved, documented procedures. Results are reported in industry standard units. Although data were qualified as estimated due to sample receipt, headspace, technical holding time, initial calibration verification percent differences, continuing calibration percent difference, surrogate recoveries, and MS/MSD percent recoveries (%R), the data are complete, and the results are usable for project objectives. The overall completeness of the data indicates that the quality of the analytical program and the laboratory and field procedures were sufficient to meet the data quality objectives (DQOs).

The overall quality of the data was acceptable. One field sample and associated trip blank result for bromomethane at well DSA-MW07 was rejected due to the CCV and LCS recovery failures; however the project completeness goal of 95 percent (%) was met. Acceptable data are associated with quality control (QC) data that meet QC criteria, or with QC samples that did not meet QC criteria; however, DQOs were not impacted. Estimated results are considered potentially biased by matrix interference, as discussed in the data usability assessment in Appendix C. The requirements of the UFP-QAPP (USAF 2021b), Department of Defense (DoD) Quality Systems Manual (QSM) (2021), DoD General Validation Guidelines (2019), EPA *National Functional Guidelines for Organic and Inorganic Superfund Methods Data Review* (2017), and EPA SW 846, Third Edition, *Test Methods for Evaluation Solid Waste* (2018) were used to evaluate the acceptability of the data.

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose. The subsequent sections summarize the findings from the data validation. The data qualifiers are defined below.

Qualifier	Definition
B	The same analyte is found in the associated blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
J	The identification of the analyte is acceptable; the reported value is an estimate.
QH	Analyte result is considered an estimated value biased high due to a quality control failure.
QL	Analyte result is considered an estimated value biased low due to a quality control failure.
QN	Analyte result is considered an estimated value with unknown bias due to a quality control failure.
R	Analyte result is rejected – result is not usable.

4.1 Sample Delivery Group: 1540948

Volatiles

Holding Times and Preservation

- The samples were collected on 09/19/22 and 09/20/22 and were received by the laboratory on 09/29/22 at 4.7° Celsius (C). Samples OT001-DSAMW07-092022, SS006-TRIPBLANK-HCL-01, and-EQBLK01-091922 (laboratory ID 1003_49) was analyzed within 15-16 days of collection, but outside the 14-day collection to analysis holding time. All OT001-DSAMW07-092022 and SS006-TRIPBLANK-HCL-01 sample results and the 10/04/22 analysis of OT001-EQBLK01-091922 (laboratory ID 1003_49) sample results have been qualified with a 'H' validation flag due to the exceeded holding time.

Continuing Calibration

- Bromomethane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 was non-detect and has been qualified with an 'R', rejected, validation flag as the continuing calibration verification (CCV) %R was less than 10%, and as the laboratory control sample (LCS) recovery was less than 10%.
- The following sample results have been qualified with a 'QN' validation flag as the CCV %R criteria was exceeded:
    - 1,1,2-Trichlorotrifluoroethane, 1,2-dibromo-3-chloropropane, and acetone in sample OT001 EQBLK01-091922, and
    - Naphthalene in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022.

Method Blank

- Hexachloro-1,3-butadiene (0.469 ug/l, J) and 1,2,3-trichlorobenzene (0.759 ug/l, J) were present in the method blank (laboratory ID R3845564-4) associated with samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 and acetone (16.3 ug/l, J) was present in the method blank (laboratory ID R3845009-3) associated with sample OT001-EQBLK01-091922. Acetone in sample OT001-EQBLK01-091922 was detected at a concentration below the limit of quantitation (LOQ) and has been qualified with a 'B' validation flag due to the method blank detection.

Surrogate Standards

- Surrogate toluene-d8 in samples OT001-DSAMW07-092022 (114%) and SS006-TRIPBLANK-HCL-01 (114%) exceeded the 89.0-112% recovery criteria. Toluene in sample OT001-DSAMW07-092022 was reported above the detection limit (DL) and has been qualified with a "QH" validation flag due to the high surrogate recovery.

MS/MSD

- Sample SS006-215MW12-092022 (laboratory ID L1540948-03) was the parent sample for the MS/MSD analysis. In the MS/MSD, benzene (157% & 146%), ethylbenzene (142% & 133%), toluene (129%), and total xylenes (137% & 135%) were outside of the 79.0-120%, 79.0-121%, 80.0-121%, and 79.0-121% recovery criteria, respectively. Per the EPA Functional Guidelines, only the parent sample shall be qualified due to MS/MSD considerations. Data assessment is as follows:

MS/MSD, Continued

- All SS006-215MW12-092022 sample results were non-detect and warrant no qualifications due to the high MS/MSD recoveries.
- All precision criteria were met. No qualifications were warranted.

LCS/LCSD

- Bromomethane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 was non-detect and has been qualified with an 'R', rejected, validation flag as the LCS recovery was below 10% and as the CCV %R was below 10%.
- The following sample results were non-detect and have been qualified with a 'QL' validation flag due to low LCS/ laboratory control sample duplicate (LCSD) recovery:
  - 1,2,3-Trichlorobenzene in sample OT001-EQBLK01-091922.
  - Naphthalene in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022.
- Acrolein, di-isopropyl ether, 4-methyl-2-pentanone (MIBK), 1,1,2,2-tetrachloroethane, and 1,2,3-trichloropropane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 were non-detect and warrant no qualification due to the high LCS/LCSD recoveries. No qualifications were warranted due to the high LCSD relative percent differences (RPDs) as the sample results were non-detect. The remaining LCS recoveries were within the acceptance criteria. No further qualifications were warranted.

Wet Chemistry

MS/MSD

- The MS result for Total Kjeldahl Nitrogen (TKN) (12.5%) was outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QL' validation flag as the MS%R was below 90%.
- The MS duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were five times greater than the LOQ, but the absolute difference between the sample and duplicate was below the LOQ.

Field Duplicates

- Samples SS006-215MW12-092022 and SS006-215MW12-092022-99 were the field duplicates for this sample delivery group (SDG). TKN was outside of the 30% acceptance criteria for aqueous samples. TKN has been left unqualified as the sample and duplicate results were five times greater than the LOQ and the absolute difference between the sample and duplicate was below the LOQ.

Method Quantitation Limits

- The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:
  - TKN in sample SS006-215MW12-092022,
  - Nitrate/Nitrite in sample OT001-DSAMW07-092022, and
  - Sulfate in samples OT001-DSAMW07-092022, SS006-215MW12-092022, and SS006-215MW12-092022-99.

4.2 Sample Delivery Group: 1540953

Volatiles

Holding Times and Preservation

- The samples were collected on 09/19/22 and received by the laboratory on 09/29/22 at 5.6°C. The samples were analyzed on 10/01/22, 10/04/22, and 10/06/22. The samples analyzed on 10/04/22 and 10/06/22 were analyzed within 15-17 days of collection, but outside the 14-day collection to analysis holding time. All sample results analyzed on 10/04/22 and 10/06/22 have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining sample results were analyzed on 10/01/22 within 12 days of collection, and no further qualifications were warranted due to holding times.
- The case narrative noted, "Samples OT001-BLOMW06-091922 (laboratory ID L1540953-04- batch WG1937829) and WP002-TRIPBLANK-HCL-01 (laboratory ID L1540953-08-batch WG1935909) were analyzed from a headspace vial. " Samples OT001-BLOMW06-091922 (batch WG1937829) and WP002-TRIPBLANK-HCL-01 (batch WG1935909) have been qualified with a 'QL' validation flag due to improper sample preservation.

Method Blanks

- Acetone (16.3 ug/l, J) was present in the method blank and benzene (0.269 ug/l, J), total xylenes (0.188 ug/l, J), and acetone (15.3 ug/l, J) were present in trip blank WP002-TRIPBLANK-HCL-01. The following sample results were detected at a concentration below the LOQ and have been qualified with a 'B' validation flag due to the method blank and/or trip blank detections:
    - Total xylenes in sample OT001-BLOMW06-091922.
    - All acetone results, except in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99.

Laboratory Control Samples

- Naphthalene (23.1%RPD) and 1,2,3-trichlorobenzene (67.0%R & 27.3%RPD) in the LCSD were outside of the 69-129 % acceptance criteria and 20%RPD criteria. All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a 'QL' validation flag due to low LCSD recovery.

Method Quantitation Limits

- Several sample results have been qualified with a 'J' validation flag to denote the reported results are estimated due to sample results reported at levels between the DL and the LOQ.

Alaska Methods

Field Duplicates

- Samples OT001-BLOMW06-091922/OT001-BLOMW06-091922-99 and WP002-BLOMW01-091922/ WP002-BLOMW01-091922-99 were the field duplicates for this SDG. The field duplicate results for iron and manganese in samples were outside of the 30% RPD acceptance criteria. The iron and manganese results have been qualified with a 'QN' validation flag as the sample and duplicate results were five times greater than the LOQ.

Sample Delivery Group 1540953, continued.

Wet Chemistry

Equipment Blanks

- TKN in sample WP002-BLOMW01-091922 has been qualified with a 'B' validation flag as the sample results were <2x the negative blank concentration.

MS/MSD

- The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QL' validation flag as the MS%R was below 90%.
- The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were five times greater than the LOQ, but the absolute difference between the sample and duplicate was below the LOQ.

Method Quantitation Limits

- The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:
  - Nitrate/Nitrite in samples OT001-BLOMW07-091922, OT001-BLOMW06-091922, and OT001-BLOMW06-091922-99,
  - Sulfate in samples OT001-BLOMW07-091922, OT001-BLOMW05-091922, OT001-BLOMW06-091922,
  - WP002-BLOMW01-091922, and WP002-BLOMW01-091922-99, and
  - TKN in sample OT001-DSAMW02-091922.

4.3 Sample Delivery Group: 1540980

Volatiles

Holding Times and Preservation

- The samples were collected on 09/17/22 and 09/18/22 and were received by the laboratory on 09/29/22 at 4.6°C. All samples were analyzed on 10/01/22 and 10/04/22. The sample results analyzed on 10/04/22 were analyzed within 16-17 days of collection, but outside the 14-day collection to analysis holding time. All sample results analyzed on 10/04/22 have been qualified with a 'H' validation flag due to the exceeded holding time.

Continuing Calibration

- All 1,1,2-trichlorotrifluoroethane and 1,2-dibromo-3-chloropropane results, and acetone in all samples except OT001-TRIPBLANK-HCL-01 have been qualified with a 'QN' validation flag as the CCV %R criteria was exceeded.

Method Blank

- Acetone in all samples, except OT001-TRIPBLANK-HCL-01, was detected at a concentration <LOQ and has been qualified with a 'B' validation flag due to the method blank detection.

Sample Delivery Group 1540980, continued.

Surrogate Standards

- Surrogate 4-bromofluorobenzene (117%) in sample OT001-RRSMW06-091722 analyzed on 10/04/22 exceeded the 85-114% recovery criteria. Acetone in sample OT001-RRSMW06-091722 was reported above the DL and has been qualified with a "QH" validation flag due to the high surrogate recovery.

Laboratory Control Samples

- All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a 'QL' validation flag due to the low LCSD recovery.

Method Quantitation Limits

- Several sample results have been qualified with a 'J' validation flag to denote the reported results are estimated due to sample results reported at levels between the DL and the limit of quantitation (LOQ)

Metals

Method Blanks

- Iron and manganese in samples OT001-RRSMW06-091722, and OT001-DSAMW01-091822 have been qualified with a 'B' validation flag as the sample results were five times greater than the blank concentration.

Method Quantitation Limits

- The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:
  - Manganese in sample OT001-RRSMW06-091722,
  - Manganese and Iron in sample OT001-DSAMW01-091822, and
  - The results were either non-detect or were >LOQ.

Wet Chemistry

MS/MSD

- The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QL' validation flag as the MS%R was <90%.
- The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were 5x below the LOQ, but the absolute difference between the sample and duplicate was below the LOQ.

Method Quantitation Limits

- The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ.
  - Nitrate/Nitrite in sample OT001-RRSMW05-091822, and
  - Sulfate in samples OT001-RRSMW06-091722, OT001-RRSMW05-091822, OT001-GLOMW04-091822, and OT001-DSAMW06-091822.

4.4 Sample Delivery Group: 1566427

Volatiles

MS/MSD

- Sample SS006-066MW07-120622 (laboratory ID L1566427-08) was the parent sample for the MS/MSD analysis. In the MSD, benzene (75%) was outside of the 79-120% recovery criteria. Per the DoD QSM, only the parent sample shall be qualified due to MS/MSD considerations. Benzene was non-detect in sample SS006-066MW07-120622 and has been qualified with a 'QL' validation flag due to low MSD recovery.

Alaska Standards

Surrogate Standards

- Surrogate o-terphenyl in sample SS006-066MW05-120622 (13.6%) exceeded the 50-150% recovery criteria. The Form 1s for the sample noted, *"Sample produced emulsion during extraction process, low surrogate/spike recoveries due to matrix."*
- AK102 DRO C10-C25 in sample SS007-WP04-100722 was reported above the DL and has been qualified with a "QL" validation flag due to the low surrogate recovery.

Method Quantitation Limits

- AK102 DRO C10-C25 in sample SS006-066MW05-120622 was reported above the LOQ.

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5. MANN-KENDALL TREND ANALYSIS

The Mann-Kendall (MK) test was used to evaluate the site concentration trends. The EPA ProUCL program (EPA 2022) was used to complete the statistical analyses. The MK test is well-suited for environmental data because it can be used on small sample sizes (i.e., $n \geq 4$) and does not assume any underlying distribution for the data (i.e., it is nonparametric). The output of the MK test is the S statistic. Positive and negative S statistics are indicators of increasing and decreasing concentration trends, respectively. To differentiate whether a trend finding from the S-statistic is statistically significant, ProUCL was used to develop a decision matrix based on the S-statistic, the confidence in the trend, and the coefficient of variation (COV). The confidence level, expressed as a percentage, is calculated by subtracting the probability (p) from 1 (i.e., confidence = [1-p] x 100). The p-value indicates whether or not the association between the response and predictor (analyte concentration vs. time) is statistically significant at the given level of confidence. The COV is defined as the standard deviation of the sample set divided by the average of the sample set. Based on the results of calculating these three statistics, the concentration trend indicated by the S-statistic as listed in the decision matrix presented in Table 1. Appendix F provides the ProUCL output for the MK analyses for DRO, TCE and manganese.

Table 1. Mann-Kendall Analysis Decision Matrix

Mann-Kendall Statistic	Confidence in Trend	Statistical Trend
S > 0	> 95%	Increasing
	90 - 95%	Likely Increasing
	< 90%	No Trend
S ≤ 0	< 90% and COV ≥ 1	No Trend
	< 90% and COV < 1	Stable
S < 0	90 - 95%	Likely Decreasing
	> 95%	Decreasing

Acronyms:
> = greater than; ≥ greater or equal to; < less than
COV = Coefficient of Variation

The results of the MK tests are summarized in Table 2 for DRO, Table 3 for TCE, and Table 4 for manganese. A summary from the trend analysis is presented below:

- The MK results for DRO show significant increasing of concentrations at 066-MW-06, whereas significant decreasing concentrations were observed for 215-MW-09, and BLO-MW-01. Concentrations have stabilized at 066-MW-05. No data trends were be identified from the remaining sample locations. The trend results for DRO concentrations are presented in Table 2.

- The MK results for TCE show concentrations are probably increasing at GLO-MW-04, RRS-MW-05, and RRS-MW-06. Results indicate significantly decreasing concentrations at a single location (DSA-MW-02) with concentrations stable at BLO-MW-07 and DSA-MW-05. No data trends were identified from the remaining sample locations. The trend results for TCE concentrations are presented in Table 3.

- The MK results for manganese indicated concentrations are significantly decreasing at RRS-MW-05 and are stable at DSA-MW-01, DSA-MW-05, and DSA-MW-06. No data trends were identified at all other sample locations. The trend results for manganese concentrations are presented in Table 4.

Table 2. DRO Mann-Kendall Analysis

Site ID	Well ID	Analyte	Mann-Kendall Statistic (S)	p-Value	Confidence Factor (%)	COV	Mann-Kendall Trend
SS006	066-MW-04	DRO	2	0.451	54.900	0.75	No Trend
	066-MW-05	DRO	-12	0.225	77.500	0.461	Stable
	066-MW-06	DRO	18	0.016	98.400	1.088	Significantly Increasing
	066-MW-07	DRO	7	0.130	87.000	1.386	No Trend
	215-MW-08	DRO	2	0.464	53.600	2.118	No Trend
	215-MW-09	DRO	-31	0.020	98.040	0.578	Significantly Decreasing
	215-MW-12	DRO	5	0.226	77.400	0.801	No Trend
WP002	BLO-MW-01	DRO	-29	0.006	99.387	1.991	Significantly Decreasing
OT001	BLO-MW-05	DRO	-7	0.265	73.500	1.210	No Trend
	BLO-MW-06	DRO	-9	0.159	84.100	1.539	No Trend
	BLO-MW-07	DRO	0	NA	NA	1.072	No Trend
	DSA-MW-01	DRO	0	N/A	N/A	0.785	No Trend
	DSA-MW-02	DRO	-1	0.500	50.000	1.143	No Trend
	DSA-MW-05	DRO	0	N/A	N/A	0.765	No Trend
	DSA-MW-06	DRO	1	0.500	50.000	0.741	No Trend
	DSA-MW-07	DRO	0	0.625	37.500	0.697	No Trend
	GLO-MW-04	DRO	-2	0.375	62.500	0.975	No Trend
	RRS-MW-05	DRO	0	0.625	37.500	0.692	No Trend
	RRS-MW-06	DRO	2	0.375	62.500	0.803	No Trend

Acronyms:
COV = Coefficient of Variation
DRO = diesel range organics
NA = Not Applicable

Table 3. TCE Mann-Kendall Analysis

Site ID	Well ID	Analyte	Mann-Kendall Statistic (S)	p-Value	Confidence Factor (%)	COV	Mann-Kendall Trend
WP002	BLO-MW-01	TCE	12	0.162	83.800	3.111	No Trend
OT001	BLO-MW-05	TCE	2	0.440	56.000	0.854	No Trend
	BLO-MW-06	TCE	2	0.424	57.600	1.003	No Trend
	BLO-MW-07	TCE	0	N/A	NA	0.492	Stable
	DSA-MW-01	TCE	-2	0.473	52.700	2.866	No Trend
	DSA-MW-02	TCE	-40	0.004	99.626	0.199	Significantly Decreasing
	DSA-MW-05	TCE	-4	0.377	62.300	0.538	Stable
	DSA-MW-06	TCE	2	0.424	57.600	0.689	No Trend
	DSA-MW-07	TCE	4	0.231	76.900	2.013	No Trend
	GLO-MW-04	TCE	5	0.074	92.570	0.726	Probably Increasing
	RRS-MW-05	TCE	7	0.065	93.520	1.023	Probably Increasing
	RRS-MW-06	TCE	5	0.074	92.570	0.917	Probably Increasing

Acronyms:
COV = Coefficient of Variation
NA = Not Applicable
TCE = trichloroethene

Table 4. Manganese Mann-Kendall Analysis

Site ID	Well ID	Analyte	Mann-Kendall Statistic (S)	p-Value	Confidence Factor (%)	COV	Mann-Kendall Trend
OT001	BLO-MW-01	Manganese	5	0.226	77.400	1.311	No Trend
	BLO-MW-05	Manganese	7	0.130	87.000	0.765	No Trend
	BLO-MW-06	Manganese	8	0.144	85.600	0.865	No Trend
	BLO-MW-07	Manganese	7	0.184	81.600	1.114	No Trend
	DSA-MW-01	Manganese	-3	0.382	61.800	0.770	Stable
	DSA-MW-02	Manganese	1	0.500	50.000	1.742	No Trend
	DSA-MW-05	Manganese	-9	0.115	88.500	0.551	Stable
	DSA-MW-06	Manganese	-5	0.274	72.600	0.251	Stable
	DSA-MW-07	Manganese	-3	0.382	61.800	1.581	No Trend
	GLO-MW-04	Manganese	1	0.500	50.000	1.772	No Trend
	RRS-MW-05	Manganese	-17	0.008	99.187	0.785	Significantly Decreasing
	RRS-MW-06	Manganese	-9	0.115	88.500	1.952	No Trend

Acronyms:
COV = Coefficient of Variation
NA = Not Applicable

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6. SUMMARY AND RECOMMENDATIONS

The following conclusions and recommendations are made based on the visual observations and analytical results of the 2022 LTM activities conducted at Port Heiden RRS in September and December 2022. Site activities included IC inspections at four (4) sites and groundwater sampling at three sites.

IC inspections were completed at four sites listed below. Most LUCs appeared to be in good condition with no evidence of activities prohibited under the LUCMP (USAF 2019a). Specific findings from the visual site inspections, if any, are presented below.

6.1 Sites OT001 and WP002

The following summarizes the findings at Sites OT001 and WP002:

- Two signs in good condition were observed at OT001, and two signs were installed at WP002.
- Portions of the fence surrounding the excavation areas and in the vicinity of DSA-MW-01 and DSA-MW-05 are broken and laying on the ground.
- Mild rains have caused minor surface erosion and ponding of water around the site.
- Of the 16 monitoring wells, four wells (DSA-MW-04, PG1-MW-01, GLO-MW-03, and UST-MW-02) could not be sampled. PG1-MW-01 has been destroyed. All four wells need replacement.
- Consideration should be given to analysis of water using low-level VOCs by EPA method 8260ULL to ensure LODs are below groundwater cleanup levels for subsequent monitoring events.

The following exceedances of 2023 ADEC Table C human health cleanup levels were reported in groundwater samples collected in 2022:

- DRO at well BLO-MW-01 in duplicate sample pair WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99.
- Trichloroethene in three wells: DSA-MW-01, DSA-MW-02, and DSA-MW-05.
- Manganese in two wells: BLO-MW-01 and BLO-MW-05.
- Several VOCs were not detected but the laboratory LODs exceeded ADEC cleanup levels. With the elevated LOD above cleanup levels, it is uncertain if the non-detect result is true.

Results from the MK trend analysis indicates DRO concentrations are significantly decreasing at one well (BLO-MW-01) at Site WP002. TCE is shown to be probably increasing at three OT001 wells (GLO-MW-04, RRS-MW-05, and RRS-MW-06), and significantly decreasing at DSA-MW-02, and stable at BLO-MW-07. Manganese concentrations are shown to be significantly decreasing at one well (RRS-MW-05) and stable at three wells (DSA-MW-01, RRS-MW-05, and DSA-MW-06). No other trends were observed at OT001/WP002.

The following site-specific actions are recommended based on the 2022 site inspection observations and sampling results:

- Add new combination locks to the following wells at OT001/WP002:
  - BLO-MW-05
  - BLO-MW-06
  - BLO-MW-07
  - RSS-MW-05
  - RSS-MW-06
  - DSA-MW-01
  - DSA-MW-02
  - DSA-MW-05
  - DSA-MW-06
  - DSA-MW-07
  - GLO-MW-04
- Replace the following wells in Sites OT001/WP002:
  - DSA-MW-04
  - PG1-MW-01
  - UST-MW-02
  - GLO-MW-03
- Continue annual LUC/IC inspections at Sites OT001 and WP002.
- Continue groundwater monitoring at Sites OT001 and WP002.

6.2 Site SS006

The following summarizes the findings at Site SS006:

- Of the seven (7) wells at SS006, three (3) need repairs (215-MW-09, 066-MW-04, and 066-MW-06).

The following exceedance of 2022 ADEC Table C cleanup level was reported in one groundwater sample collected in 2022:

- Well 066-MW-05 had a concentration of DRO (2,410 µg/L) that exceeded the human health cleanup level of 1,500 µg/L.

Results from the MK trend analysis indicates DRO concentrations are significantly increasing at one well (066-MW-06), decreasing at one well (215-MW-09), and stable at 066-MW-05. No other trends were observed.

The following site-specific actions are recommended based on the 2022 site inspection observations and sampling results:

- Repair the following wells in Site SS006:
  - 215-MW-09: A replacement lid is needed for this well.
  - 066-MW-04: A flush mount PVC cap should be used on the inner PVC casing to allow the well to lock, and the lock should be replaced with a combination lock. This PVC is 1.5-inch diameter.
  - 066-MW-06: The lock should be replaced with a combination lock, and a new lid is needed.

- Continue annual LUC/IC inspections at SS006.
- Continue groundwater monitoring at SS006.

6.3 Site LF007

The following summarizes the findings at Site LF007:

- The field team observed two signs in good condition at the entrance to the site.
- Although a fence is present at the entrance from the road, additional fence is laying on the ground nearby and does not surround the site.
- Stray debris (i.e., metal drum, wooden pallet, pieces of metal and electronics, and cans) was observed around the site and was likely illegally dumped or windblown.

The following site-specific actions are recommended based on the 2022 site inspection observations:

- Continue annual LUC/IC inspections at LF007.
- Repair and maintain the fencing across the driveway between the LUC notification signs to discourage trespassing at the landfill.

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FIGURES

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Legend

Installation Boundary

ERP Sites and LUC Status

Land Use Control Restriction

Acronyms
ERP - Environmental Restoration Program
GIS - Geographic Information System
LUC - Land Use Control
RRS - Radio Relay Station

0 1,000 2,000 4,000 6,000

Feet

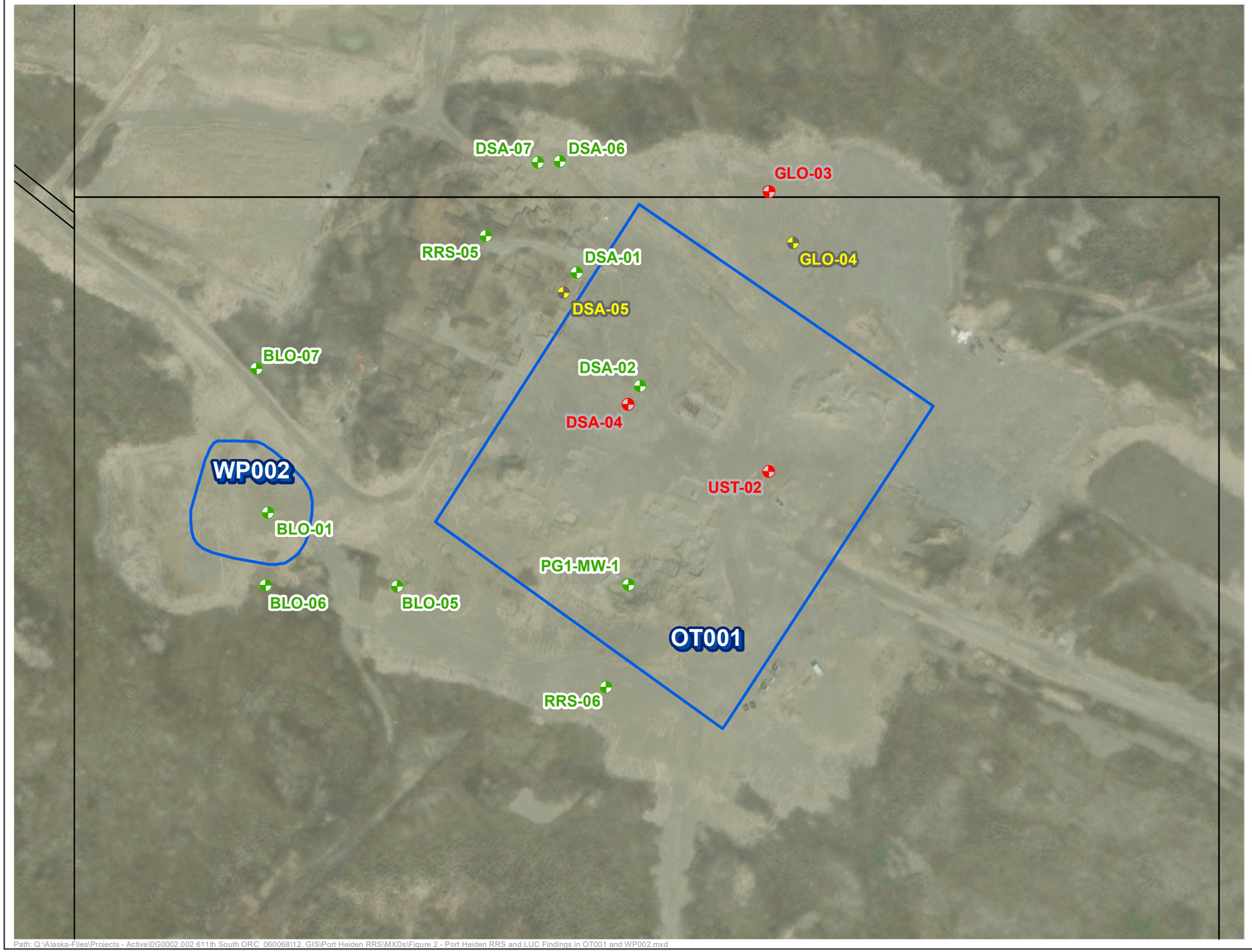
1 inch = 3,000 feet

Coordinate System: NAD 1983 UTM Zone 4N

2022 Remedial Action Operations, Land Use/Institutional Control
Port Heiden RRS, Alaska

Figure 1 - Port Heiden RRS Installation Map

Path: Q:\Alaska-Files\Projects - Active\0G0002.002 611th South ORC_060068\12. GIS\Port Heiden RRS\MXDs\Figure 1 - Site Installation Map.mxd



Legend

- Monitoring Well (In Good Condition)
- Monitoring Well (Serviceable, in need of repair)
- Monitoring Well (Unserviceable or destroyed)
- Installation Boundary

Acronyms
ERP - Environmental Restoration Program
GIS - Geographic Information System
LUC - Land Use Control
RRS - Radio Relay Station

0 100 200 300
Feet
1 inch = 150 feet

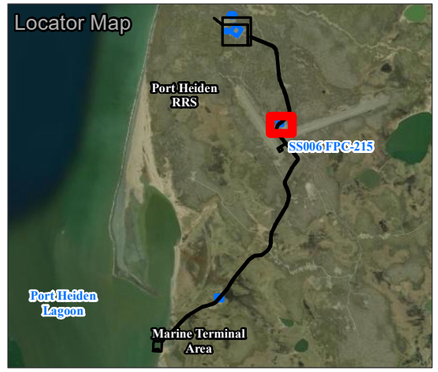
Coordinate System: NAD 1983 UTM Zone 4N

2022 Remedial Action Operations, Land Use/Institutional Control

Port Heiden RRS, Alaska

Figure 2 - Port Heiden OT001 and WP002 Site Location and Monitoring Wells

Path: Q:\Alaska-Files\Projects - Active\0G0002.002 611th South ORC 060068\12. GIS\Port Heiden RRS\MXDs\Figure 2 - Port Heiden RRS and LUC Findings in OT001 and WP002.mxd



Legend

- Monitoring Well (Good Condition)
- Monitoring Well (In Need of Repair)
- Installation Boundary

Acronyms
ERP - Environmental Restoration Program
GIS - Geographic Information System
LUC - Land Use Control
RRS - Radio Relay Station

0 25 50 100 150 200
Feet
1 inch = 125 feet

2022 Remedial Action Operations, Land Use/Institutional Control

Port Heiden RRS, Alaska

Figure 3 - Port Heiden SS006 FPC-215 Site Location and Monitoring Wells

Path: Q:\Alaska-Files\Projects - Active\0G0002.002.611th South ORC_060068\12. GIS\Port Heiden RRS\MXDs\Figure 3 - Site SS006 FPC-215 Layout and Groundwater Monitoring Locations.mxd

Legend

- Monitoring Well (Good Condition)
- Monitoring Well (In Need of Repair)
- Installation Boundary

Acronyms
ERP - Environmental Restoration Program
GIS - Geographic Information System
LUC - Land Use Control
RRS - Radio Relay Station

0 25 50 100 150 200
Feet
1 inch = 100 feet

2022 Remedial Action Operations, Land Use/Institutional Control

Port Heiden RRS, Alaska

Figure 4 - Port Heiden SS006 FPC-066 Site Location and Monitoring Wells

Path: Q:\Alaska-Files\Projects - Active\0G0002.002 611th South ORC_060068\12. GIS\Port Heiden RRS\MXDs\Figure 4 - Site SS006 FPC-066 Layout and Groundwater Monitoring Locations.mxd

Legend

- Monitoring Well (In Good Condition)
- Monitoring Well (Unserviceable or destroyed)
- Installation Boundary

Acronyms
ERP - Environmental Restoration Program
GIS - Geographic Information System
LUC - Land Use Control
RRS - Radio Relay Station

0 100 200 300
Feet
1 inch = 125 feet

Coordinate System: NAD 1983 UTM Zone 4N

2022 Remedial Action Operations, Land Use/Institutional Control

Port Heiden RRS, Alaska

Figure 5 - Port Heiden LF007 Site Location

Path: Q:\Alaska-Files\Projects - Active\0G0002.002 611th South ORC_060068\12. GIS\Port Heiden RRS\MXDs\Figure 5 - Port Heiden RRS LUC Findings in LF007.mxd

Sample ID:				OT001-RRS-MW05-091822
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/L	14000	13.3 [25.0] H,QN,B,J
Nitrate-Nitrite	E353.2	ug/l	—	62.1 [100] J
Alkalinity, Total	SM2320B	ug/l	—	56200 [10000]
Iron, total	SW6010D	ug/l	—	833 [50.0]
Manganese	SW6010D	ug/l	430	10.6 [5.00]
Sulfate	SW9056	ug/l	—	3320 [2500] J

Sample ID:				OT001-DSA-MW01-091822
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/l	14000	12.9 [25.0] H,QN,B,J
Trichloroethene	SW8260D	ug/L	2.8	**10.5 [0.500]**
Nitrate-Nitrite	E353.2	ug/l	—	642 [100]
Alkalinity, Total	SM2320B	ug/l	—	88800 [10000]
Iron, total	SW6010D	ug/l	—	35.6 [50.0] J,B
Manganese	SW6010D	ug/l	430	1.57 [5.00] J,B
Sulfate	SW9056	ug/l	—	6390 [2500]

Sample ID:				OT001-DSA-MW07-092022
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Toluene	SW8260D	ug/l	1100	0.285 [0.600] H,QH,J
Nitrate-Nitrite	E353.2	ug/l	—	82.4 [100] J
Alkalinity, Total	SM2320B	ug/l	—	83600 [10000]
Iron, total	SW6010D	ug/l	—	2430 [50.0]
Manganese	SW6010D	ug/l	430	59.9 [5.00]
Sulfate	SW9056	ug/l	—	3380 [2500] J

Sample ID:				OT001-DSA-MW06-091822
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/L	14000	11.4 [25.0] H,QN,B,J
Tetrachloroethene	SW8260D	ug/l	41	0.521 [0.600] J
Alkalinity, Total	SM2320B	ug/l	—	58700 [10000]
Iron, Total	SW6010D	ug/l	—	3050 [50.0]
Manganese	SW6010D	ug/l	—	211 [5.00]
Sulfate	SW9056	ug/l	—	4400 [2500] J

Sample ID:				OT001-DSA-MW05-091822
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Alkalinity, total	SM2320B	ug/l	—	68300
Iron, total	SW6010D	ug/l	—	573 [50.0]
Manganese	SW6010D	ug/l	430	64.6 [5.00]
Acetone	SW8260D	ug/l	14000	11.5 [25.0] H,QN,B,J
Trichloroethene	SW8260D	ug/l	2.8	**3.30 [0.500]**
Sulfate	SW9056	ug/l	—	12700 [2500]

Sample ID:				OT001-GLO-MW04-091822
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/L	14000	11.5 [25.0] H,QN,B,J
Nitrate-Nitrite	E353.2	ug/l	—	425 [100]
Alkalinity, Total	SM2320B	ug/l	—	64200 [10000]
Iron, total	SW6010D	ug/l	—	556 [50.0]
Manganese	SW6010D	ug/l	430	27.9 [5.00]
Sulfate	SW9056	ug/l	—	3790 [2500] J

Sample ID:				OT001-BLO-MW07-091922
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/l	14000	14.8 [25.0] H,QN,B,J
Nitrate-Nitrite	E353.2	ug/l	—	69.0 [100] J
Alkalinity, Total	SM2320B	ug/l	—	48300 [10000]
Iron, total	SW6010D	ug/l	—	11000 [50.0] QN
Manganese	SW6010D	ug/l	430	283 [5.00] QN
Sulfate	SW9056	ug/l	—	3090 [2500] J

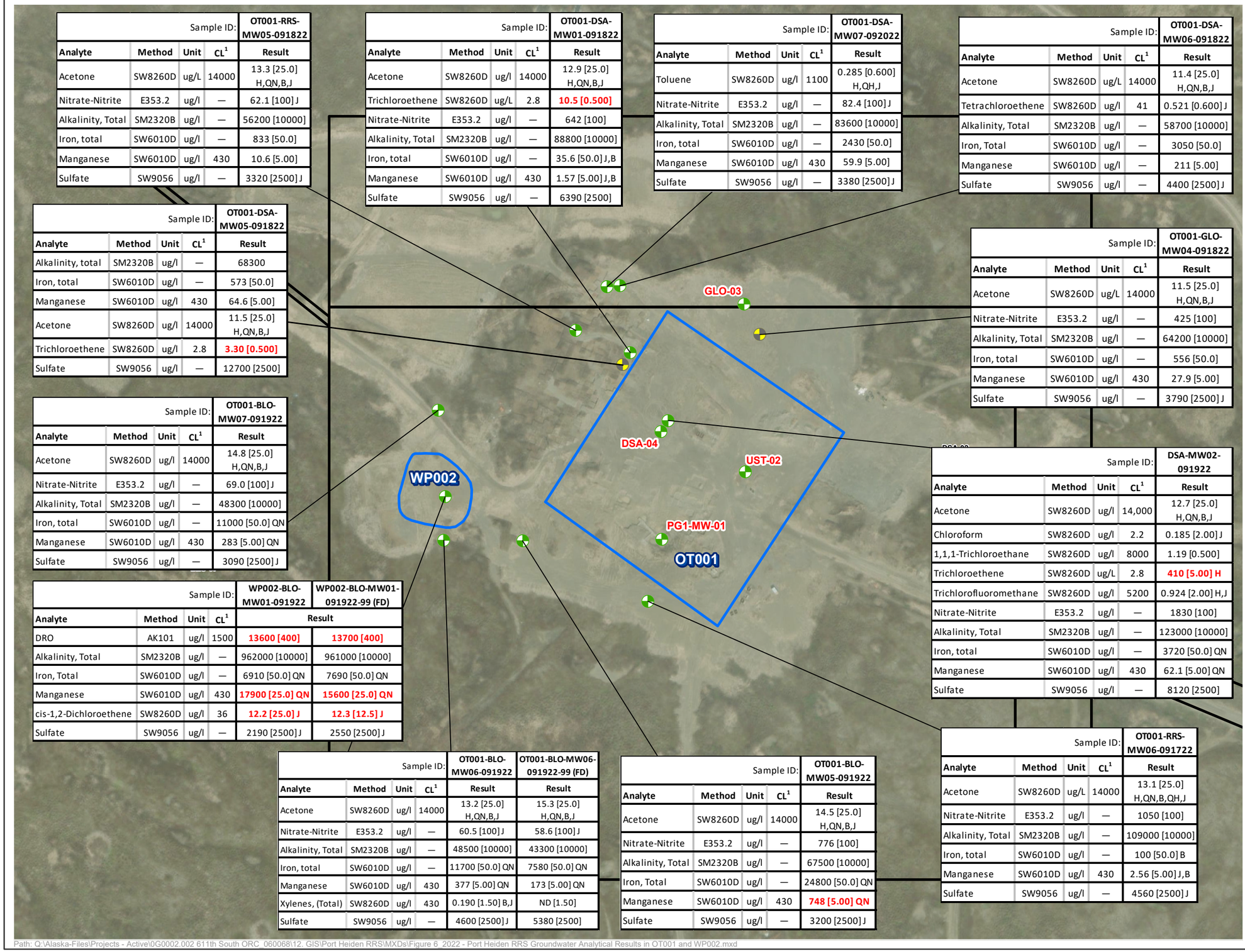
Sample ID:				DSA-MW02-091922
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/l	14,000	12.7 [25.0] H,QN,B,J
Chloroform	SW8260D	ug/l	2.2	0.185 [2.00] J
1,1,1-Trichloroethane	SW8260D	ug/l	8000	1.19 [0.500]
Trichloroethene	SW8260D	ug/L	2.8	**410 [5.00] H**
Trichlorofluoromethane	SW8260D	ug/l	5200	0.924 [2.00] H,J
Nitrate-Nitrite	E353.2	ug/l	—	1830 [100]
Alkalinity, Total	SM2320B	ug/l	—	123000 [10000]
Iron, total	SW6010D	ug/l	—	3720 [50.0] QN
Manganese	SW6010D	ug/l	430	62.1 [5.00] QN
Sulfate	SW9056	ug/l	—	8120 [2500]

Sample ID:				WP002-BLO-MW01-091922	WP002-BLO-MW01-091922-99 (FD)
Analyte	**Method**	**Unit**	**CL[1]**	**Result**	
DRO	AK101	ug/l	1500	**13600 [400]**	**13700 [400]**
Alkalinity, Total	SM2320B	ug/l	—	962000 [10000]	961000 [10000]
Iron, Total	SW6010D	ug/l	—	6910 [50.0] QN	7690 [50.0] QN
Manganese	SW6010D	ug/l	430	**17900 [25.0] QN**	**15600 [25.0] QN**
cis-1,2-Dichloroethene	SW8260D	ug/l	36	**12.2 [25.0] J**	**12.3 [12.5] J**
Sulfate	SW9056	ug/l	—	2190 [2500] J	2550 [2500] J

Sample ID:				OT001-BLO-MW06-091922	OT001-BLO-MW06-091922-99 (FD)
Analyte	**Method**	**Unit**	**CL[1]**	**Result**	**Result**
Acetone	SW8260D	ug/l	14000	13.2 [25.0] H,QN,B,J	15.3 [25.0] H,QN,B,J
Nitrate-Nitrite	E353.2	ug/l	—	60.5 [100] J	58.6 [100] J
Alkalinity, Total	SM2320B	ug/l	—	48500 [10000]	43300 [10000]
Iron, total	SW6010D	ug/l	—	11700 [50.0] QN	7580 [50.0] QN
Manganese	SW6010D	ug/l	430	377 [5.00] QN	173 [5.00] QN
Xylenes, (Total)	SW8260D	ug/l	430	0.190 [1.50] B,J	ND [1.50]
Sulfate	SW9056	ug/l	—	4600 [2500] J	5380 [2500]

Sample ID:				OT001-BLO-MW05-091922
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/l	14000	14.5 [25.0] H,QN,B,J
Nitrate-Nitrite	E353.2	ug/l	—	776 [100]
Alkalinity, Total	SM2320B	ug/l	—	67500 [10000]
Iron, Total	SW6010D	ug/l	—	24800 [50.0] QN
Manganese	SW6010D	ug/l	430	**748 [5.00] QN**
Sulfate	SW9056	ug/l	—	3200 [2500] J

Sample ID:				OT001-RRS-MW06-091722
Analyte	**Method**	**Unit**	**CL[1]**	**Result**
Acetone	SW8260D	ug/L	14000	13.1 [25.0] H,QN,B,QH,J
Nitrate-Nitrite	E353.2	ug/l	—	1050 [100]
Alkalinity, Total	SM2320B	ug/l	—	109000 [10000]
Iron, total	SW6010D	ug/l	—	100 [50.0] B
Manganese	SW6010D	ug/l	430	2.56 [5.00] J,B
Sulfate	SW9056	ug/l	—	4560 [2500] J



Legend

- Monitoring Well (Good Condition)
- Monitoring Well (In Need of Repair)
- Installation Boundary

Notes

- LUC boundaries depicted on this figure are preliminary pending survey information and will be updated when available.
- Boundary data are from 611th GeoBase or have been georeferenced into GIS from historical documents. Data could be incomplete and are of unknown accuracy.
- For more detailed land use restriction information, see 2019 Land Use Control Management Plan.

[1] Groundwater cleanup level is from 18 AAC 75.345 Table C (ADEC 2023). Result presented with the laboratory Limit of Detection in brackets [LOD].

- Samples were analyzed for DRO, VOCs and MNA (iron, manganese, sulfate, alkalinity, nitrate and nitrogen).
- **BOLD** and red exceeds CL.

Qualifers

B = Result considered estimated high due to contamination present in the blank
H = Result considered a low estimate due to holding time exceedance
J = Result is considered estimated because the level is below the laboratory LOQ but above the DL
QH = Result is considered estimated biased high due to matrix effects or a quality control failure
QN = Result is considered estimated biased uncertain due to matrix effects or a quality control failure

Acronyms

µg/L = microgram per liter
CL = Cleanup Level
DRO = Diesel Range Organics
FD = Field Duplicate
GIS = Geographic Information System
DL = Detection limit
LOQ = Level of quantitation
LUC = Land Use Control
MNA = Monitored Natural Attenuation
ND = Not detected above the LOD
RRS = Radio Relay Station
VOC = Volatile Organic Compounds

0 100 200 300 400 500
Feet
1 inch = 250 feet

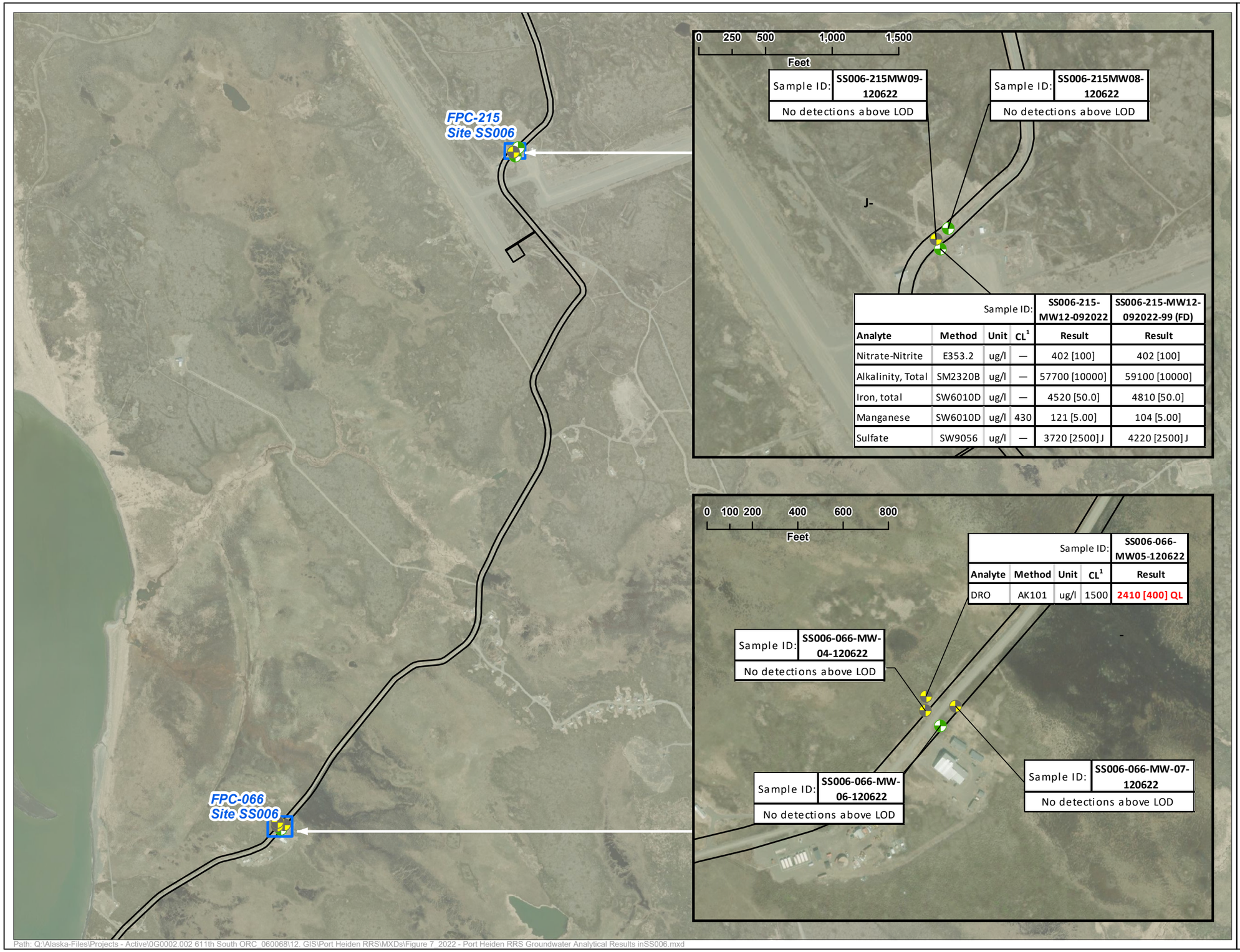
Coordinate System: NAD 1983 UTM Zone 4N

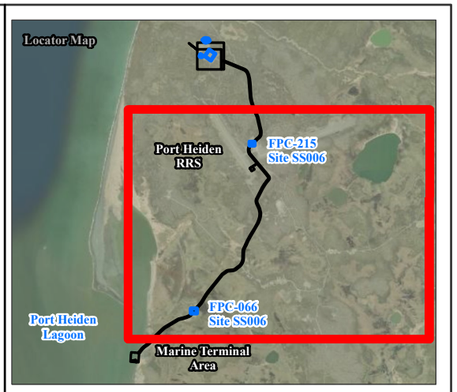
2022 Remedial Action Operations, Land Use/Institutional Control Report

Port Heiden RRS, Alaska

Figure 6 – 2022 Groundwater Analytical Detections, Sites OT001 and WP002

Path: Q:\Alaska-Files\Projects - Active\0G0002.002 611th South ORC_060068\12. GIS\Port Heiden RRS\MXDs\Figure 6_2022 - Port Heiden RRS Groundwater Analytical Results in OT001 and WP002.mxd





Legend

- Monitoring Well (Good Condition)
- Monitoring Well (In Need of Repair)
- Installation Boundary

Notes

- LUC boundaries depicted on this figure are preliminary pending survey information and will be updated when available.
- Boundary data are from 611th GeoBase or have been georeferenced into GIS from historical documents. Data could be incomplete and are of unknown accuracy.
- For more detailed land use restriction information, see 2019 Land Use Control Management Plan.

[1] Groundwater cleanup level is from 18 AAC 75.345 Table C (ADEC 2023). Result presented with the laboratory Limit of Detection in brackets [LOD].

- Samples were analyzed for DRO and BTEX; well 215-MW12 was inadvertently additionally analyzed for MNA.
- **BOLD** and red exceeds CL.

Qualifers

J = Result is considered estimated because the level is below the laboratory LOQ but above the DL
QL = Result is considered estimated biased low due to matrix effects or a quality control failure

Acronyms

µg/L = microgram per liter
BTEX = Benzene, toluene, ethylbenzene and xylenes
CL = Cleanup Level
DRO = Diesel range organics
LOD = Limit of detection
MNA = Monitored Natural Attenuation

0 500 1,000 2,000 3,000
Feet
1 inch = 1,750 feet

Coordinate System: NAD 1983 UTM Zone 4N

2022 Remedial Action Operations, Land Use/Institutional Control Report

Port Heiden RRS, Alaska

Figure 7 – 2022 Groundwater Analytical Detections, Site SS006

Path: Q:\Alaska-Files\Projects - Active\0G0002.002.611th South ORC_060068\12. GIS\Port Heiden RRS\MXDs\Figure 7_2022 - Port Heiden RRS Groundwater Analytical Results inSS006.mxd

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APPENDIX A

Photographic Log

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OT001/WP002

Photograph No.: 153056	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: West	**Location:** OT001
Description: Facing west from the entrance to OT001. Sign is in good condition.	

Photograph No.: 153231	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: Northwest	**Location:** OT001
Description: No signs are present in this area, but there is a metal fence blocking off the area around the old composite building and well PG1-MW-01, which had been destroyed.	

Photograph No.: 1541263	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: North	**Location:** WP002
Description: Facing north across to OT001 from WP002. No signs are present in this area.	

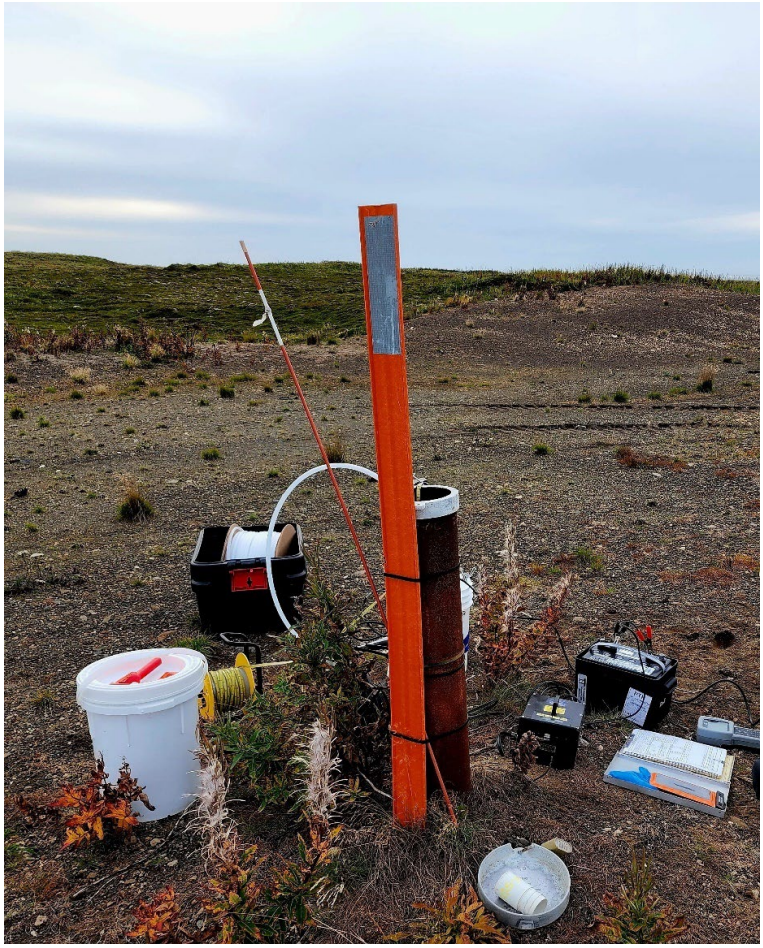
Photograph No.: 1537234	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: Northwest	**Location:** WP002
Description: Facing northwest at WP002 from OT001.	

Photograph No.: 154610	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: West	**Location:** WP002
Description: Facing west with monitoring well BLO-MW-06 in WP002 in the background.	

Photograph No.: 111635	**Date taken:** 09/21/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** WP002
Description: Newly added sign on the southeast side of WP002 facing southwest.	

Photograph No.: 111915	**Date taken:** 09/21/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** WP002
Description: Newly added sign on the northwest side of WP002 facing southwest.	

Photograph No.: 172559	**Date taken:** 09/17/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** OT001
Description: Monitoring well RRS-MW-06.	



Photograph No.: 111535	**Date taken:** 09/19/22
Photograph taken by: D. Carden	
Direction: South	**Location:** OT001
Description: Monitoring well BLO-MW-05. Well cap was replaced and secured with a zip tie after sampling.	

Photograph No.: 135345	**Date taken:** 09/19/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** OT001
Description: Sampling of monitoring well BLO-MW-06 facing southwest.	

Photograph No.: 111655	**Date taken:** 09/19/22
Photograph taken by: D. Carden	
Direction: Northwest	**Location:** WP002
Description: Monitoring well BLO-MW-01. Old lock was replaced with new lock.	

Photograph No.: 112048	**Date taken:** 09/19/22
Photograph taken by: D. Carden	
Direction: Northeast	**Location:** OT001
Description: Monitoring well BLO-MW-07. Well cap was replaced and secured with a zip tie after sampling.	

Photograph No.: 112237	**Date taken:** 09/19/22
Photograph taken by: D. Carden	
Direction: South	**Location:** OT001
Description: Monitoring well DSA-MW-02. Well cap was replaced and secured with a zip tie after sampling.	

Photograph No.: 112349	**Date taken:** **09/18/22**
Photograph taken by: D. Carden	
Direction: South	**Location:** OT001
Description: Monitoring well DSA-MW-05 Well cap was secured with a zip tie after sampling.	

Photograph No.: 112418	**Date taken:** 09/18/22
Photograph taken by: D. Carden	
Direction: North	**Location:** OT001
Description: Monitoring well DSA-MW-01. Well cap secured with a zip tie after sampling.	

Photograph No.: 112502	**Date taken:** 09/18/22
Photograph taken by: D. Carden	
Direction: Southeast	**Location:** OT001
Description: Monitoring well RRS-MW-05. Photograph faces monitoring wells DSA-MW-01 and DSA-MW-05. Well cap secured with a zip tie after sampling.	

Photograph No.: 112643	**Date taken:** 09/18/22
Photograph taken by: D. Carden	
Direction: North	**Location:** OT001
Description: Monitoring well DSA-MW-06. Well cap secured with a zip tie after sampling.	

Photograph No.: 112615	**Date taken:** 09/20/22
Photograph taken by: D. Carden	
Direction: Looking Southeast	**Location:** OT001
Description: Monitoring well DSA-MW-07. Well cap secured with a zip tie after sampling.	

Photograph No.: 112911	**Date taken:** 09/18/22
Photograph taken by: D. Carden	
Direction: North	**Location:** OT001
Description: Monitoring well GLO-MW-04. Well cap secured with a zip tie after sampling.	

Photograph No.: 112828	**Date taken:** 09/18/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** OT001
Description: Monitoring well GLO-MW-03 not sampled due to obstruction at 56.10 feet below top of casing.	

Photograph No.: 113118	**Date taken:** 09/18/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** OT001
Description: Monitoring well UST-MW-02 not sampled due to pump lodged and abandoned in well by previous contractor.	

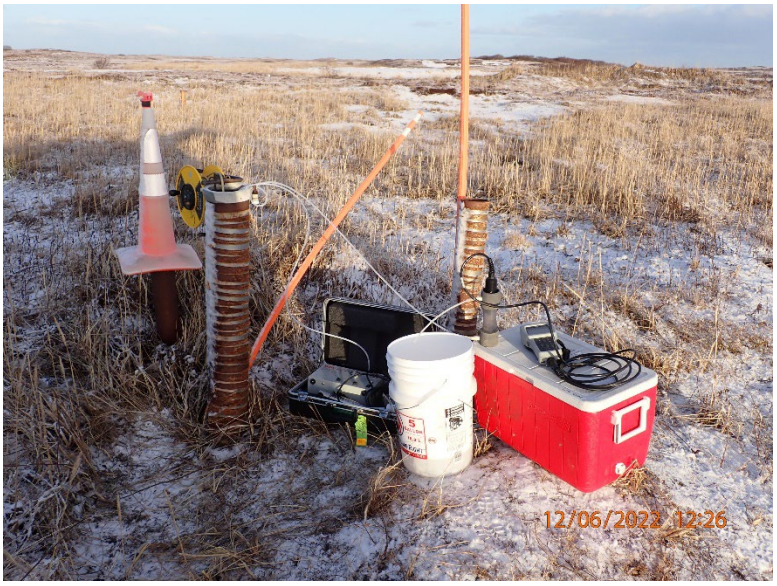
SS006

Photograph No.: 102710	**Date taken:** 09/20/22
Photograph taken by: D. Carden	
Direction: Southwest	**Location:** SS006
Description: Monitoring well 215-MW-12. Well cap was secured with combination lock after sampling.	

Photograph No.: 172849	**Date taken:** **09/20/22**
Photograph taken by: D. Carden	
Direction: North	**Location:** SS006
Description: Monitoring well 215-MW-08. Well cap was replaced and secured with a combination lock.	

Photograph No.: 100035	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: Down	**Location:** SS006
Description: Monitoring well 066-MW-07. Well cap was replaced and secured with a zip tie.	

Photograph No.: PC061099	**Date taken:** 12/06/2022
Photograph taken by: L. Jennings	
Direction: North	**Location:** SS006
Description: Monitoring well 215-MW-09.	

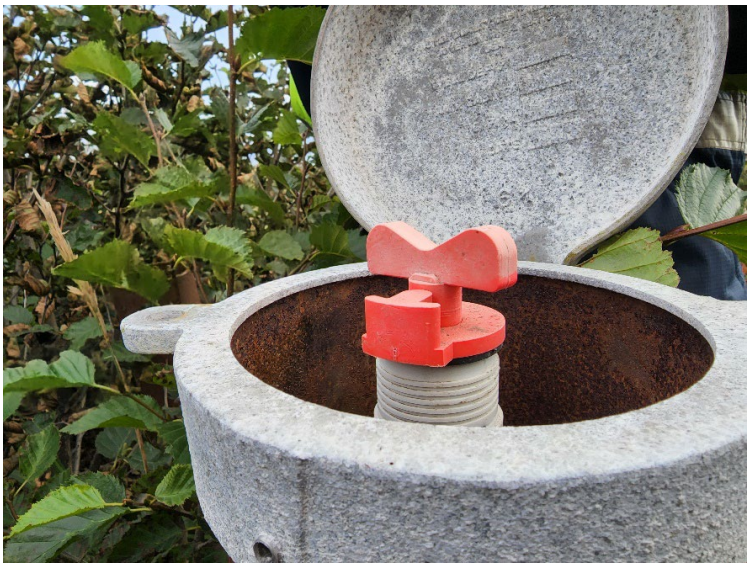


LF007

Photograph No.: 155549	**Date taken:** **09/16/22**
Photograph taken by: D. Carden	
Direction: North	**Location:** LF007
Description: Road into LF007 showing signage in good condition with a fence blocking the path from drivers.	

Photograph No.: 155818	**Date taken:** **09/16/22**
Photograph taken by: D. Carden	
Direction: North	**Location:** LF007
Description: LF007 excavation and stockpile area from another contractor; otherwise, no visible contamination was observed and is in good condition with some visible debris.	

Photograph No.: 094214	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction: West	**Location:** SS006
Description: Monitoring well 066-MW-04 near the school. Looking at the 1.5” well, showing that the PVC rises above the well cap.	



Photograph No.: 095506	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction:	**Location:** SS006
Description: Looking into monitoring well 066-MW-05. Well cap was replaced and secured with a combination lock.	

Photograph No.: 162542	**Date taken:** 09/16/22
Photograph taken by: D. Carden	
Direction:	**Location:** SS006
Description: Looking into monitoring well 066-MW-06 showing broken well cap that needs to be replaced.	

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APPENDIX B

Field Notes and Forms

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VISIUAL INSPECTION CHECKLIST

INSTALLATION: ?ORTHEIDEN — INSPECTION SITE NAME: WP002

MONITORING ITEM	YES	NO	COMMENTS
If unit is a landfill, is there any evidence of settling at ground surface?			N/A
Evidence of fencing? Any damaged or broken areas?			N/A
Evidence of escape of impacted materials or debris from the site?		X	
Survey monuments observed?		X	
Evidence of surface erosion/washouts in area?		X	
Ponded water observed at or near the site? If yes, is petroleum sheen observed?	X		NO SHEEN
Chemical or petroleum odors noted?		X	
Discoloring of vegetations in the surrounding area of the site?		X	
Notification signage present? Confirm present and condition of each sign.	X		UPON SITE ARRIVAL, THERE WAS NONE BUT 2 SIGNS WILL BE INSTALLED DURING VISIT
Integrity of observed monitoring wells, if present?	X		BLO-MW-01 & BLO-MW-06 = GOOD
Is there wildlife present? Indicate number and types.	X		BEARS, PTARMIGANS, PORCUPINES
Evidence of excavation activities or animal burrows?		X	
Structures present on site? If so what is the structural integrity?		X	

Estimated Percent Vegetative Cover: On Cap Surface: – On sideslopes: –

Comments: SPARSELY VEGETATED ~30% VEGETATED SURFACE

Name of Inspector: D. CARDEN, S. SOUZA Date: 09-14-22

Weather Conditions: ?ARTLY SUNNY, DRIZZLY, SLIGHT WIND

Temperature: 55 °F

Photographs Taken: YES

General Comments:

NONE

Correction Action Taken:

~~NONE~~ DC INSTALLED 2 NEW SIGNS AT BOTH ENTRANCES (09/21)

+ 09/19 SAW 3 BEARS JUST NW OF WP002 PERIMETER WHILE SAMPLING @ BLO-MW-05

VISIUAL INSPECTION CHECKLIST

INSTALLATION: TOFTHEIDEN — INSPECTION SITE NAME: OTØØ1

MONITORING ITEM	YES	NO	COMMENTS
If unit is a landfill, is there any evidence of settling at ground surface?		X	
Evidence of fencing? Any damaged or broken areas?	X		PARTIAL FENCE IN CENTER OF SITE NOTING PCB CONTAMINATED
Evidence of escape of impacted materials or debris from the site?		X	
Survey monuments observed?		X	
Evidence of surface erosion/washouts in area?		X	
Ponded water observed at or near the site? If yes, is petroleum sheen observed?	X		NO SHEEN
Chemical or petroleum odors noted?		X	
Discoloring of vegetations in the surrounding area of the site?		X	
Notification signage present? Confirm present and condition of each sign.	X		2 SIGNS - 1 @ ENTRANCE (SOUTH) & 1 ADJ. TO WATER TANK HILL (CENTRAL) BOTH IN GOOD CONDITION
Integrity of observed monitoring wells, if present?	X		MOST WELLS IN GOOD CONDITION 4 WELLS REQUIRE REPLACEMENT → UST-MW02, PG2-MW01, DSA-MW-04, GLO-MW-03
Is there wildlife present? Indicate number and types.	X		PTARMIGANS + BEARS (SCAT)
Evidence of excavation activities or animal burrows?		X	
Structures present on site? If so what is the structural integrity?	X		SHIPPING CONTAINERS, REMNANT CONCRETE STRUCTURES IN BEDDED IN SURFACE
Estimated Percent Vegetative Cover:	On Cap Surface: —		On sideslopes: —
Comments:	ON SITE ~ 30% VEGETATIVE COVER		

Name of Inspector: D. CADEN, S. SOUZA — Date: 09-16-22

Weather Conditions: PARTLY SUNNY, DRIZZLY, SLIGHT WIND

Temperature: 55 °F

Photographs Taken: YES

General Comments:
PARTIAL PCB CONTAMINATION FENCE
SCATTERED MATERIALS, DEBRIS - WOODEN PALLETS, METAL POSTS & RODS

Correction Action Taken:
NONE

+ 09/19 3 BEARS JUST NW OF WP002 WHILE SAMPLING @ BLO-MW-05

VISIUAL INSPECTION CHECKLIST

INSTALLATION: PORT HEIDEN INSPECTION SITE NAME: LF006

MONITORING ITEM	YES	NO	COMMENTS
If unit is a landfill, is there any evidence of settling at ground surface?	X		NO EVIDENCE OF SETTLING - SOME EXPOSED BURLAP, 55-GALDRUMS
Evidence of fencing? Any damaged or broken areas?			ONLY FENCE IS BETWEEN 2 SIGNS @ ENTRANCE
Evidence of escape of impacted materials or debris from the site?	X		SOME EXPOSED WOODEN + METAL + BURLAP DEBRIS (SEE PHOTOS)
Survey monuments observed?		X	
Evidence of surface erosion/washouts in area?		X	
Ponded water observed at or near the site? If yes, is petroleum sheen observed?	X		NO SHEEN
Chemical or petroleum odors noted?		X	
Discoloring of vegetations in the surrounding area of the site?		X	
Notification signage present? Confirm present and condition of each sign.	X		2 SIGNS @ ENTRANCE IN GOOD CONDITION
Integrity of observed monitoring wells, if present?	X		1 WELL IN GOOD CONDITION
Is there wildlife present? Indicate number and types.	X		PTARMIGANS - LOCALS MENTION BEARS
Evidence of excavation activities or animal burrows?		X	
Structures present on site? If so what is the structural integrity?		X	
Estimated Percent Vegetative Cover: On Cap Surface: 15 % On sideslopes: 70 % Comments:			

Name of Inspector: D. CARDEN, S. SOUZA Date: 09-14-22

Weather Conditions: PARTLY SUNNY, BREEZY, LIGHT WIND

Temperature: 55 °F

Photographs Taken: YES

General Comments:
POLY DRUM W/ OILY SUBSTANCE MARKED + LABELED - POSSIBLY LEFT FROM OTHER ENVIRONMENTAL COMPANY DOING EXCAVATION IN PORT HEIDEN THIS YEAR

Correction Action Taken:
N/A

VISIUAL INSPECTION CHECKLIST

INSTALLATION: PORT HEIDEN — INSPECTION SITE NAME: SSOG FPC-215

MONITORING ITEM	YES	NO	COMMENTS
If unit is a landfill, is there any evidence of settling at ground surface?		X	
Evidence of fencing? Any damaged or broken areas?		X	
Evidence of escape of impacted materials or debris from the site?		X	
Survey monuments observed?		X	
Evidence of surface erosion/washouts in area?		X	
Ponded water observed at or near the site? If yes, is petroleum sheen observed?	X		NO SHEEN
Chemical or petroleum odors noted?		X	
Discoloring of vegetations in the surrounding area of the site?		X	
Notification signage present? Confirm present and condition of each sign.		X	NO SIGNS
Integrity of observed monitoring wells, if present?	X		Good 215-MW-09 & -08 NEED REPAIRS
Is there wildlife present? Indicate number and types.	X	~~&~~ DC	PTARMIGANS, BEARS, PORCUPINES
Evidence of excavation activities or animal burrows?		X	
Structures present on site? If so what is the structural integrity?		X	GRAVEL RUNWAY SURROUNDED BY FENCE (AIRPORT) TO EAST
Estimated Percent Vegetative Cover: On Cap Surface: — On sideslopes: — Comments: ~50% VEGETATIVE COVER			

Name of Inspector: D. CARDEN, S. SOUZA — Date: 09-16-22

Weather Conditions: PARTLY SUNNY, DRIZZLY, LIGHT WIND

Temperature: 55 °F

Photographs Taken: YES

General Comments:
ADJ. TO FUEL TANKS @ AIRPORT - NO EVIDENCE OF LEAKAGE

Correction Action Taken:
WELL REPAIRS ON 09/20
NOT ABLE TO FULFILL REPAIRS ON 215-MW-09 DUE TO LIMITED WELL CAPS
~~SSOG-MW-05 : DC~~
215-MW-08 : MONUMENT LID WAS BROKEN & REPLACED
NEW LOCK ALSO PLACED (0000)

VISIUAL INSPECTION CHECKLIST

INSTALLATION: PORT HEIDEN			INSPECTION SITE NAME: SSOOG-FPC OGG
MONITORING ITEM	**YES**	**NO**	**COMMENTS**
If unit is a landfill, is there any evidence of settling at ground surface?		X	
Evidence of fencing? Any damaged or broken areas?		X	
Evidence of escape of impacted materials or debris from the site?		X	
Survey monuments observed?		X	
Evidence of surface erosion/washouts in area?		X	
Ponded water observed at or near the site? If yes, is petroleum sheen observed?		X	
Chemical or petroleum odors noted?		X	
Discoloring of vegetations in the surrounding area of the site?		X	
Notification signage present? Confirm present and condition of each sign.		X	NO SIGNAGE
Integrity of observed monitoring wells, if present?	X		4 WELLS IN RECENT CONDITION 2 WELLS (NOT SAMPLING) ARE FROSTJACKED
Is there wildlife present? Indicate number and types.	X		PTARMIGANS, BEARS, PORCUPINES
Evidence of excavation activities or animal burrows?		X	
Structures present on site? If so what is the structural integrity?	X		SCHOOL - MESHIK BLDG. GOOD CONDITION
Estimated Percent Vegetative Cover: On Cap Surface: — On sideslopes: — Comments: ~ 50% VEGETATIVE COVER			

Name of Inspector: D. CARDEN, S. SOUZA Date: 09-16-22

Weather Conditions: PARTLY SUNNY, DRIZZLY, LIGHT WIND

Temperature: 55 °F

Photographs Taken: YES

General Comments:
ADJ. TO SCHOOL

Correction Action Taken:
WELL REPAIRS ON 09/21
NOT ABLE TO FULFILL REPAIRS ON OGG-MW-04 SINCE THE FLAT PVC LID ISSUE BROUGHT ARE 2" AND NOT THREADED
OGG-MW-05 : REPLACED MONUMENT LID + NEW LOCK (0000)
OGG-MW-07: REPLACED MONUMENT LID + SECURED W/ ZIPTIE SINCE VERA UNIT OF LOCKS

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WELL PURGE AND SAMPLING FIELDSHEET

Well ID: BLO-MW-01

Project: SOFC-PORT HEIDEN
Date: 09-19-22
Project #: 060068.001
Start Time: 1445
Field Team: S. SOUZA, D. CARDEN
End Time:
Sample ID: WP0002-BLOMW01-091922 Time: 1520 primary dup other:
Sample ID: WP0002-BLOMW01-091922-99 Time: 1525 primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y / N 0.45µm 1.0µm

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: 50.0
Stable DTW (BTOC): 49.2

Depth to Water (BTOC): 48.25
Total Depth (BTOC): 54.25
Water Column (ft): 6.0
Casing Volume(gal): 0.978
Screen Interval : to
Measured Stickup: 2.0

Method of Purging

Pump: SUB BLADR PERIST OTHER:
Purge Start Time: ~~1300~~ 1503 Flow Rate (lpm): 0.35
Purge End Time: 1510 Volume Purged (Liters): 5.5
98mL/15sec

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
	1503	~~50.25~~							
1	~~1503~~	~~50.25~~	0.0	6.06	1.278	~~8837~~ 42.07	6.20	-17.4	
2	1506	48.36	1.0	6.06	1.290	34.51	1.39	6.71	-37.0
3	1509	48.64	2.1	5.98	1.337	25.96	1.10	8.06	-33.3
4	1512	48.96	3.4	5.97	1.357	17.87	1.04	9.15	-30.8
5	1515	49.2	4.6	5.97	1.387	15.61	0.82	9.58	-28.2
6	1518	49.2	5.5	5.97	1.402	16.7	0.68	9.86	-26.6
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments:
DOWNHOLE EQUIP CAME UP OILY

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: BLO-MW-05

Project: GILCES SOFC - PORTHEIDEN
Project #: 060068-001
Field Team: S. SOUZA, Z. CARDEN
Sample ID: GTB07-BLOMW05-091922
Sample ID:
Sample ID:

Date: 09-17-22
Start Time: 18:27
End Time: 19:10

Time: 1210 (primary) dup other:
Time: primary dup other:
Time: primary dup other:

Filtered? Y / (N) 0.45µm 1.0µm

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: (2-in) 4-in
gal/ft of casing: (0.163) 0.653
Pump Intake Depth: 54.5
Stable DTW (BTOC): N/A

Depth to Water (BTOC): 51.20
Total Depth (BTOC): 57.382
Water Column (ft): 6.1
Casing Volume(gal): 0.99
Screen Interval : to
Measured Stickup: 2.83

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 1837
Purge End Time:
58 mL/15 sec

Flow Rate (lpm): 0.23
Volume Purged (Liters):

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	1840	51.2	0.0	6.15	0.004	78.86	13.16	8.24	202.9
2	1843	52.0	0.6	6.04	0.004	109.8	11.78	9.32	205.6
3	1846	52.5	1.2	5.98	0.004	100.6	11.14	9.84	204.0
4	1849	54.0	1.8	5.94	0.004	123.7	13.06	7.24	201.1
5	~~1852~~	54.40							
6	~~1855~~								
7	1157	51.85		6.27	0.022	267.1	12.06	6.27	83.8
8	1210			6.21	0.001	599.0	11.42	6.17	91.3
9	1213			6.17	0.002	667.1	10.44	9.21	81.4

09-19

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, (Brown) Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, (High) (Very Turbid), Heavy Silts

Comments: CUTLOCK
1851 - PAUSE TO RECHARGE
1904 - RESTART
1909 - DECISION TO LET RECHARGE OVERNIGHT

09-19-22 @ 10:20am
STILL NOT ENOUGH LIT FOR SAMPLE
COLLECTION & FINISH PURGING
DECISION TO RETURN TOMORROW MORNING

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: BLO-MW-06

Project: SURC-PORTHOLDEN
Project #: UEN066.001
Field Team: S. SOUZA, D. CARDEN

Date: 09-19-22
Start Time: 13:30
End Time: 14:40

Sample ID: DT001-BLOMW06-091922 Time: 1405 primary dup other:
Sample ID: DT001-BLOMW06-091922-99 Time: 1410 primary (dup) other:
Sample ID: DT001-EQBK01-091922 Time: 1430 primary dup other: EQ BLK

Filtered? Y (N) 0.45µm 1.0µm

Well Information

Depth to Top of Product:				Depth to Water (BTOC):	44.00
Depth to Oil/Water Interface:				Total Depth (BTOC):	51.70
Casing Diameter:	(2-in)	4-in		Water Column (ft):	7.7
gal/ft of casing:	0.163	0.653		Casing Volume(gal):	1.255
Pump Intake Depth:			VARIED 46-49	Screen Interval :	to
Stable DTW (BTOC):			48.6	Measured Stickup:	2.45

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 13:47
Purge End Time: 14:03
Flow Rate (lpm): 2.5
Volume Purged (Liters): 8

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	1347	44.06	0.0	6.04	0.121	145.8	9.77	5.57	78.1
2	1350	45.4	1.2	6.22	0.123	123.7	6.98	6.56	68.1
3	1353	47.8	3.6	6.06	0.129	124.2	6.94	8.81	72.1
4	1357	48.6	4.2	6.03	0.134	109.6	6.77	10.17	71.5
5	1400	48.6	6.7	6.00	0.137	94.91	7.22	10.66	69.4
6	1403	48.6	8.0	5.96	0.139	99.19	7.39	10.55	69.6
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, Tan, (Brown), Grey, Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, (Medium), High, Very Turbid, Heavy Silts

Comments:
VTL OK, TIPTED
Pumped dry while collecting samples had to pause 20 min to recharge & finish collecting

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: BLO-MW-07 DC

Project: GILCES SERC-PORTHEIDEN
Date: 09-17-22
Project #: 060068-001
Start Time: 19:22
Field Team: S. SOUZA, D. CARDEN
End Time: 20:15
Sample ID: UTBB1-BLOMW07-09192 Time: 1130 primary dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
UT LEVEL 09/19 @ 11:18 = 43.35
Filtered? Y / N 0.45µm 1.0µm

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: 45.10
Stable DTW (BTOC): NA

Depth to Water (BTOC): 42.82
Total Depth (BTOC): 46.93
Water Column (ft): 4.11
Casing Volume(gal): 0.67
Screen Interval : to
Measured Stickup: 2.05

Method of Purging

Pump: SUB BLADR PERIST OTHER:
Purge Start Time: 19:36
Purge End Time: 10:50 (09/18)
28mL/15SEC
Flow Rate (lpm): 0.112
Volume Purged (Liters): 1.680

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

+BACTERIA

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	19:39	42.9		~~6.67~~ 6.22 DC	0.003	103.9	11.51	7.67	133.5
2	19:42	42.9		6.12	0.003	96.12	9.45	8.31	113.1
3	19:45	43.4		6.06	0.003	88.97	8.88	8.59	102.9
4	19:48	43.8		6.01	0.003	76.18	8.46	8.88	87.3
5	19:51	43.9		5.97	0.003	99.04	8.21	8.91	95.3
6	19:54	PAUSED TO LET RECHARGE							
7	10:33	43.60		5				~~6.44~~	
8	10:42			5.33	0.003	85.45	10.07	6.94	111.0
9	10:50	44.15		4.95	0.003	82.98	10.27	7.29	100.7

9/18

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments:
SLOW RECHARGE

09-18-22 DUE TO LOW WATER LEVELS @ BLO-MW-05 DECIDED TO WAIT TIL TOMORROW TO SAMPLE AS WELL DUE TO SIMILAR CONDITIONS

20:00 DECISION TO LET RECHARGE OVERNIGHT

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: DSA-MW-01

Project: SOFC-PORT HEIDEN
Project #: 0662006.001
Field Team: J. JUNZA, D. CARDEN
Sample ID: CT0001-DSAMW01-091922 Time: 12:55 (primary) dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y / (N) 0.45µm 1.0µm

Date: 09-19-22
Start Time: 12:20
End Time: 13:20

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: (2-in) 4-in
gal/ft of casing: ~~0.163~~ 0.653
Pump Intake Depth: 55.10
Stable DTW (BTOC): 54.30

Depth to Water (BTOC): 54.25
Total Depth (BTOC): 59.45
Water Column (ft): 4.2
Casing Volume(gal): 0.68
Screen Interval : to
Measured Stickup: ~1.9

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 12:17
Purge End Time: 12:51
Flow Rate (lpm): 0.48
Volume Purged (Liters): ~~7.25~~ 5.76
120 mL/15 sec

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1	12:17	54.70
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	12:19	54.30	0.0	5.86	0.001	80.71	10.22	11.64	141.9
2	12:42	"	1.5	5.65	0.001	17.98	14.20	7.34	95.0
3	12:45	"	3.0	5.59	0.001	10.69	14.75	6.28	86.7
4	12:48	"	4.5	5.70	0.001	3.42	14.03	5.35	82.6
5	12:51	"	~~7.25~~ 5.76	5.73	0.001	1.50	14.08	5.21	83.4
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:
OUTLOCK; EXPIRED

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: DSA-MW-02

Project: SOUTHEDEN — Date: 09-19-22

Project #: 060069.001 — Start Time: 12:40

Field Team: S. SOUZA D. CHRDEN — End Time: 13-25

Sample ID: OTØØ1-DSAMWØ2-Ø91922 — Time: 1315 — primary dup other:

Sample ID: ____ — Time: ____ — primary dup other:

Sample ID: ____ — Time: ____ — primary dup other:

Filtered? Y (N) — 0.45µm — 1.0µm

Well Information

Depth to Top of Product: ____

Depth to Oil/Water Interface: ____

Casing Diameter: (2-in) 4-in

gal/ft of casing: (0.163) 0.653

Pump Intake Depth: 64.9

Stable DTW (BTOC): 64.10

Depth to Water (BTOC): 63.79

Total Depth (BTOC): 69.80

Water Column (ft): 6.01

Casing Volume(gal): 0.979 GJ

Screen Interval : ____ to ____

Measured Stickup: ____

Method of Purging

Pump: (SUB) BLADR PERIST OTHER: ____

Purge Start Time: 12:59

Purge End Time: 1312

Flow Rate (lpm): 0.4

Volume Purged (Liters): 6

Bailer: Teflon SS Other: ____

Bailer volume (Liters): ____

Required Pulls: ____

Volume Purged (Liters): ____

108ML/15SEC

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	12:57	63.79	0.0	5.99	0.256	258.4 ~~100.0~~	9.33	5.90	72.9
2	13:00	63.82	1.2	5.74	0.261	190.1	7.20	6.27	77.6
3	13:03	63.96	2.4	5.72	0.265	170.5	7.14	6.49	78.3
4	13:06	64.10	3.6	5.70	0.269	161.2	6.89	7.13	79.0
5	1309	64.10	4.8	5.70	0.278	67.38	6.62	8.62	78.4
6	1312	64.10	6.0	5.72	0.295	54.47	6.53	9.60	76.7
7	1315								
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, (Tan) Brown, Grey, Milky White, Other:

Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, Low, (Medium) (High), Very Turbid, Heavy Silts

Comments:

CUTLOCK, ZIPTIED

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: DSA-MW-05

Project: LUC - PORTHEIDEN
Project #: Weisley 001
Field Team: S. SOUZA, D. CARDEN
Sample ID: OTW01-DSAMW05-091922 Time: 1505 primary dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y / (N) 0.45µm 1.0µm

Date: 09-19-22
Start Time: 13:18
End Time: 15:20

Well Information

Depth to Top of Product:				Depth to Water (BTOC):	58.57
Depth to Oil/Water Interface:				Total Depth (BTOC):	87.70
Casing Diameter:	(2-in)	4-in		Water Column (ft):	29.13
gal/ft of casing:	(0.163)	0.653		Casing Volume(gal):	4.75
Pump Intake Depth:			60.0	Screen Interval :	to
Stable DTW (BTOC):			62.2	Measured Stickup:	2.8

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 14:31
Purge End Time: 1505
Flow Rate (lpm): 0.29
Volume Purged (Liters): 4.0
Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

44 mL/15sec

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C
pH	0 to 14 NTU	+/- 0.1
Conductivity	0 to 200 mS/cm	+/- 3%
ORP	-999 to +999 mV	+/- 10 mV
Dissoved Oxygen	0 to 50 mg/L	+/- 10%
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]

Depth to Water Stabilization

Time	Depth to Water
14:33	60.10

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	14:42	60.9	0.0	6.35	0.001	6.60	11.21	10.16	78.5
2	14:45	61.3	1.0	6.23	0.001	7.91	11.02	10.02	75.6
3	14:48	61.7	2.0	6.15	0.001	9.16	10.82	10.01	75.1
4	14:51	61.8	PUMP RECHARGE						
5	14:54	~~59.66~~							
6	14:57	61.7	2.8	6.02	0.001	10.64	7.68	10.20	75.2
7	15:00		3.5	6.02	0.001	8.26	7.66	10.20	75.3
8	15:03	62.2	4 LITERS	6.02	0.001	6.35	7.73	10.12	75.2
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:

QUICK TO DRAW DOWN DESPITE LOWEST SETTING, WT LOOK ~~STAPLED~~

KINK DOWN WELL WHEN WENT TO REPLACE TUBING AFTER SAMPLING; COULDN'T GET TUBING BACK DOWN - BENTONITE (MUD) CAME

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: DSA-MU-OCo

Project: SORC-PORTHEIDEN
Date: 09-15-22
Project #: 060068.001
Start Time: 16.50
Field Team: S. SUEZA, D. CARDEN
End Time: 17:10
Sample ID: OTØØ1-DJAMWØCo-091822 Time: 1730 (primary) dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y /(N) 0.45µm 1.0µm

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: (2-in) 4-in
gal/ft of casing: (0.163) 0.653
Pump Intake Depth: 57.5
Stable DTW (BTOC): 56.95

Depth to Water (BTOC): 56.91
Total Depth (BTOC): 90.88
Water Column (ft): 33.97
Casing Volume(gal): 5.537
Screen Interval : to
Measured Stickup: 2.35

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 1710
Purge End Time: 1720
Flow Rate (lpm): 0.320
Volume Purged (Liters): 3.95
400 ML/15 SEC

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	1716	56.95	0.0	5.91	0.007	13.67	6.55	5.92	70.9
2	1719	56.95	0.9	5.91	0.001	9.71	5.51	7.07	80.9
3	1722	56.95	1.8	5.81	0.001	8.64	5.41	9.23	78.6
4	1725	"	2.8	5.92	0.001	8.24	5.70	9.79	78.0
5	1726	"	3.95	5.93	0.001	7.18	5.75	8.44	77.6
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:
OUTLOCK; NO INBK TO CAP O/TUBE; ZIPTIED

BATTERY DIED 09-18

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: DSA-MW-07

Project: SWMU-PORTHEIDEN
Project #: 060069.001
Field Team: S. SOUZA, D. CARDEN, ZO
Sample ID: UTB01-DSAMW07-09/922 Time: 0915 primary dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
SWITCH WELL - SUW RECHARGE Filtered? Y / N 0.45µm 1.0µm

Date: 09-14 & 09-19-22
Start Time: ~~17:37~~ 10:10
End Time:

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: 55.0
Stable DTW (BTOC): N/A

Depth to Water (BTOC): 49.35
Total Depth (BTOC): 56.75
Water Column (ft):
Casing Volume(gal):
Screen Interval : to
Measured Stickup:

Method of Purging

Pump: SUB BLADR PERIST OTHER:
Purge Start Time: ~~17:50~~ 10:15
Purge End Time:
190 mL/15sec

Bailer: Teflon SS Other:
Flow Rate (lpm):
Volume Purged (Liters):
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	10:38			6.01	0.003	~~176~~	11.09	7.55	113.7
2	10:52	53.9		5.99	0.004	131.2	10.95	5.94	92.1
3	10:55			5.95	0.003	59.48	10.93	7.02	93.7
4	1055 pumped the switch dry - return tonight to purge and sample								
5									
6									
7	09/20/22 @ 0915 SAMPLE COLLECT								
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well. BATTERY LIVED DESPITE CHARGING OVERNIGHT - CONTROLLER

Sensory Observations

Color: ~~Clear~~, Amber, (Tan), Brown, Grey, Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, ~~Medium~~, High, Very Turbid, Heavy Silts

MAP LOW BATTERY 1020 - Pumping off of SAS CAR

Comments:
CUT LOCK BOLTED; ~~Pump~~ BATTERY DIED 1745 09-18-22
Pump fixed - replaced 1030 09-19-22

DETECTED POUNDS - JUST TO DO ethene (VOCs)

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: GLO-MW-04

Project: SURF-PORT HEIDEN
Project #: 04 0116.001
Field Team: S. SOSA, D. CARDEN
Sample ID: OT001-GLOMW04-071022 Time: 16:16 (primary) dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y (N) 0.45µm 1.0µm

Date: 07-14-22
Start Time: 15:35
End Time: 16:21

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: (2-in) 4-in
gal/ft of casing: (0.163) 0.653
Pump Intake Depth: 58.50
Stable DTW (BTOC): 58.0

Depth to Water (BTOC): 57.90
Total Depth (BTOC): 60.50
Water Column (ft): 2.60
Casing Volume(gal): 0.42
Screen Interval : to
Measured Stickup: 3.0

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 15:56
Purge End Time: 16:16
Flow Rate (lpm): 0.28
Volume Purged (Liters): 4.2

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

70mL/15sec

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C	15:52	58.0
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	16:01	58.0	0.0	6.01	0.002	35.71	10.50	10.17	87.9
2	16:04	58.1	0.8	5.96	0.002	46.92	11.69	9.21	77.3
3	16:07	58.0	2.5	5.91	0.001	44.67	11.34	8.87	75.2
4	16:10	58.0	2.7	5.79	0.001	32.20	11.27	8.62	77.3
5	16:13	58.0	3.0	5.74	0.001	19.61	10.58	8.44	73.8
6	16:16	58.0	4.2	5.71	0.001	14.22	10.65	8.43	73.7
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, (Tan), Brown, Grey, Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None), (Low), Medium, High, Very Turbid, Heavy Silts

Comments:

CUT LOCK, ~~FILL TUBING & TUMETO CAP~~; ZIPTIED SUFFED TUBING INSIDE

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: RFS-MW-05

Project: SOFC - PORT HELDEN
Project #: 060066.001
Field Team: S. KOZA, D. CARDEN
Sample ID: OT0801-RFSMW05-091022 Time: 12:03 (primary) dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y (N) 0.45µm 1.0µm

Date: 09-10-22
Start Time: 11:15
End Time: 12:15

Well Information

Depth to Top of Product:
Depth to Oil/Water Interface:
Casing Diameter: (2-in) 4-in
gal/ft of casing: (0.163) 0.653
Pump Intake Depth: 52.5-54.0
Stable DTW (BTOC): 53.07

Depth to Water (BTOC): 51.84
Total Depth (BTOC): 58.1
Water Column (ft): 6.26
Casing Volume(gal): 1.02
Screen Interval : to
Measured Stickup: 2.7

Method of Purging

Pump: (SUB) BLADR PERIST OTHER:
Purge Start Time: 11:41
Purge End Time: 12:03
77 mL/15sec

Flow Rate (lpm): 0.31
Volume Purged (Liters): 4.6

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C
pH	0 to 14 NTU	+/- 0.1
Conductivity	0 to 200 mS/cm	+/- 3%
ORP	-999 to +999 mV	+/- 10 mV
Dissoved Oxygen	0 to 50 mg/L	+/- 10%
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]

Depth to Water Stabilization

Time	Depth to Water
11:45	52.1

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	11:46	52.35	0.0	5.23	0.002	58.61	12.19	7.12	120.4
2	11:49	52.67	0.9	5.34	0.001	65.21	10.64	8.77	108.2
3	11:52	52.67 (0.70)	1.8	5.41	0.001	37.57	10.08	9.04	107.3
4	11:55	52.72	2.7	5.45	0.001	31.93	9.75	9.50	99.1
5	11:58	52.90	3.6	5.46	0.001	23.83	9.73	9.40	97.5
6	12:01	53.05	4.6	5.45	0.001	17.86	9.74	9.22	96.8
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, (Tan), Brown, Grey, Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments: CUTLOCK
SLOW TO RECHARGE; TUBING IN WELL
ZIPTIED

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: RFS-MW-06

Project: GII CES SORC - PORTHEIDEN
Date: 09-17-22
Project #: 060068.001
Start Time: 16:45
Field Team: D. CARDEN, S. SOUZA
End Time: 18:20
Sample ID: OT001-RFSMW06-091722 Time: 1748 primary dup other:
Sample ID: OT001-RFSMW06-091722-MS Time: 1746 primary dup other: MS
Sample ID: OT001-RFSMW06-091722-MSD Time: 1749 primary dup other: MSD
Filtered? Y / N 0.45µm 1.0µm

Well Information

Depth to Top of Product: ____
Depth to Oil/Water Interface: ____
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: ~~59.40~~ 68.10-ft.
Stable DTW (BTOC): 59.40-ft.
Depth to Water (BTOC): 59.10
Total Depth (BTOC): 68.10
Water Column (ft): 9.0
Casing Volume(gal): 1.467
Screen Interval : to
Measured Stickup: 2.1

Method of Purging

Pump: SUB BLADR PERIST OTHER: ____
Purge Start Time: 1721
Purge End Time: 1748
Flow Rate (lpm): 0.440
Volume Purged (Liters): 6.6
Bailer: Teflon SS Other: ____
Bailer volume (Liters): ____
Required Pulls: ____
Volume Purged (Liters): ____

110mL/15sec

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	1732	59.10	0.0	6.18	0.006	11.75	11.17	6.66	214.2
2	1735	59.40	~~6.6~~ 11.32	6.16	0.005	23.81	11.21	7.41	215.1
3	1738	59.40	2.6	6.18	0.004	2a72	11.35	6.89	215.5
4	1741	59.42	4.0	6.05	0.004	11.41	11.56	6.46	214.4
5	1744	59.40	5.2	6.01	0.004	5.49	11.10	6.74	213.5
6	1747	59.40	6.6	6.05	0.003	3.58	11.19	6.37	212.8
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments:

DID NOT HAVE A LOCK; BOPTIED

WELL PURGE AND SAMPLING FIELDSHEET

Project: SORC
Well ID: 066-MW04
Project #: 060068
Date: 12/06/22
Field Team: J. Hansmeyer / C. Jennings
Start Time: 14:31
Sample ID: SS006-066MW04-120622 Time: 15:14 (primary) dup other:
End Time: 15:20
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y / (N) 0.45µm 1.0µm

Well Information

Depth to Top of Product:		Depth to Water (BTOC):	6.31
Depth to Oil/Water Interface:	NA / NA	Total Depth (BTOC):	15.15
Casing Diameter:	2-in 4-in	Water Column (ft):	8.84
gal/ft of casing:	0.163 0.653	Casing Volume(gal):	
Pump Intake Depth:		Screen Interval :	to
Stable DTW (BTOC):	10.01 / 9.96	Measured Stickup:	

Method of Purging

Pump: SUB (BLADR) PERIST OTHER:
Purge Start Time: 14:31
Purge End Time: 15:20
Flow Rate (lpm): 0.1
Volume Purged (Liters): 2.5
Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C	See below	
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	14:31	10.01	0.5	5.11	0.161	15	13.62	4.96	141.0
2	14:41	9.98	1.0	5.14	0.165	12	9.94	5.15	149.1
3	14:51	9.96	1.5	5.18	0.168	12	9.11	5.24	149.6
4	15:01	9.96	2.0	5.21	0.169	10	9.13	5.20	149.3
5	15:11	9.96	2.5	5.21	0.169	8	9.13	5.21	149.3
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: 066-MW05

Project: S ORC
Project #: D600068
Field Team: J. Hansmeyer/L. Jennings
Sample ID: SS006-066-MW05-120622 Time: 14:22 (primary) dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y (N) 0.45µm 1.0µm

Date: 12/06/22
Start Time: 13:36
End Time: 14:22

Well Information

Depth to Top of Product:		NA	Depth to Water (BTOC):	7.86
Depth to Oil/Water Interface:		NA	Total Depth (BTOC):	15.24
Casing Diameter:	2-in	4-in	Water Column (ft):	7.38
gal/ft of casing:	0.163	0.653	Casing Volume(gal):	
Pump Intake Depth:		8.41	Screen Interval:	to
Stable DTW (BTOC):		8.40	Measured Stickup:	

Method of Purging

Pump: SUB (BLADE) PERIST OTHER: Bailer: Teflon SS Other:
Purge Start Time: 13:36 Flow Rate (lpm): 0.1 Bailer volume (Liters):
Purge End Time: 14:22 Volume Purged (Liters): 2.0 Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C	See below	
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	13:36	8.41	0.5	5.11	0.112	64	9.08	5.23	161.8
2	13:46	8.39	0.5	4.95	0.148	33	9.14	4.95	153.3
3	13:56	8.40	1.0	4.95	0.148	15	8.97	4.95	153.9
4	14:06	8.40	1.5	4.89	0.146	13	6.56	4.79	157.8
5	14:16	8.40	2.0	4.88	0.147	14	3.14	5.06	157.0
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low,) Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: 066-MW-06

Project: S ORC
Project #: 060068
Field Team: J. Hansmeyer / L. Jennings
Sample ID: S5006-MW06-120622
Sample ID:
Sample ID:

Date: 12/06/22
Start Time: 16:03
End Time: 16:55

Time: 16:50 (primary) dup other:
Time: primary dup other:
Time: primary dup other:
Filtered? Y / N 0.45µm 1.0µm

Well Information

Depth to Top of Product: NA
Depth to Oil/Water Interface: NA
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: 8.30
Stable DTW (BTOC): 8.18

Depth to Water (BTOC): 4.48
Total Depth (BTOC): 12.29
Water Column (ft): 7.81
Casing Volume(gal):
Screen Interval: to
Measured Stickup:

Method of Purging

Pump: SUB (BLADR) PERIST OTHER:
Purge Start Time: 16:05
Purge End Time: 16:50
Flow Rate (ipm): 0.1
Volume Purged (Liters): 4.5

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C	see below	
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	16:05	8.00	0.5	5.24	0.157	13	8.14	5.01	140.1
2	16:10	8.13	1.0	5.21	0.153	13	8.12	5.03	141.0
3	16:15	8.20	1.5	5.22	0.152	12	8.11	5.03	141.3
4	16:20	8.18	2.0	5.20	0.151	12	8.12	5.02	141.3
5	16:25	8.18	2.5	5.20	0.152	13	8.10	5.02	141.2
6	16:30	8.20	3.0	5.21	0.150	11	8.11	5.01	141.1
7	16:35	8.17	3.5	5.20	0.152	12	8.10	5.02	141.2
8	16:45	8.16	4.0	5.22	0.153	11	8.12	5.03	140.9
9	16:50	8.18	4.5	5.22	0.152	12	8.12	5.03	141.0

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

Well ID: 066-MW-07

Project: S ORC
Project #: 0600680
Field Team: J. Hansmeyer / L. Jennings
Sample ID: S5006-066MW07-120622 Time: 15:55 (primary) dup other:
Sample ID: S6006-066MW07MS-120622 Time: 15:56 primary dup (other) MS
Sample ID: S5006-066MW07MSD-120622 Time: 15:56 primary dup (other) MSD
Filtered? Y / N 0.45µm 1.0µm

Date: 12/06/22
Start Time: 15:20
End Time: 15:59

Well Information

Depth to Top of Product: NA
Depth to Oil/Water Interface: NA
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: 8.52
Stable DTW (BTOC): 8.50

Depth to Water (BTOC): 5.51
Total Depth (BTOC): 12.82
Water Column (ft): 7.31
Casing Volume(gal):
Screen interval: to
Measured Stickup:

Method of Purging

Pump: SUB (SLOW) PERIST OTHER:
Purge Start Time: 15:20
Purge End Time: 15:59
Flow Rate (lpm): 0.1
Volume Purged (Liters): 2.25

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1	see	below
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	15:20	8.52	0.5	5.39	0.150	60	11.61	4.77	133.1
2	15:30	8.51	1.0	5.38	0.150	61	11.39	4.76	134.2
3	15:40	8.51	1.5	5.24	0.154	60	8.34	5.09	146.9
4	15:50	8.52	2.0	5.22	0.155	60	8.01	5.06	146.4
5	15:55	8.50	2.25	5.22	0.154	58	8.11	5.06	145.5
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: 21S-MW-08

Project: SORC
Project #: 060068
Field Team: L. Hansmeyer/L. Jennings
Sample ID: SS006-MW08-120622 Time: 12:42 (primary) dup other:
Sample ID: Time: primary dup other:
Sample ID: Time: primary dup other:
Filtered? Y / N 0.45µm 1.0µm

Date: 12/06/22
Start Time: 11:55
End Time: 12:42

Well Information

Depth to Top of Product:	NA	Depth to Water (BTOC):	9.49
Depth to Oil/Water Interface:	NA	Total Depth (BTOC):	20.14
Casing Diameter:	2in 4in	Water Column (ft):	10.65
gal/ft of casing:	0.163 0.653	Casing Volume(gal):	
Pump Intake Depth:	11.52	Screen Interval:	to
Stable DTW (BTOC):	11.59	Measured Stickup:	

Method of Purging

Pump: SUB (BLADR) PERIST OTHER:
Purge Start Time: 11:55
Purge End Time: 12:42
Flow Rate (lpm): 0.1
Volume Purged (Liters): 2.95

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C	See below	
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	11:55	11.52	0.5	5.60	0.112	12	10.87	4.88	156.4
2	12:05	11.54	1.0	5.22	0.111	15	9.89	5.22	164.8
3	12:15	11.60	1.5	5.22	0.111	13	9.88	5.17	164.8
4	12:25	11.60	2.0	5.20	0.109	11	9.21	5.17	163.2
5	12:35	11.59	2.5	5.19	0.111	15	9.22	5.18	164.0
6	12:40	11.59	2.75	5.20	0.110	11	9.21	5.17	164.1
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear), Amber, Tan, Brown, Grey, Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: 25-MW-09

Project: SORC
Project #: 960068
Field Team: JHansmeyer / LJennings
Sample ID: SS96-25MW09-120622 Time: 11:34
Sample ID: SS96-25MW99-120622 Time: 11:35
Sample ID: Time:
Filtered? Y / (N) 0.45µm 1.0µm

Date: 12/06/22
Start Time: 11:04
End Time: 11:40
(primary) dup other:
primary (dup) other:
primary dup other:

Well Information

Depth to Top of Product: NA
Depth to Oil/Water Interface: NA
Casing Diameter: 2-in 4-in
gal/ft of casing: 0.163 0.653
Pump Intake Depth: 10.90
Stable DTW (BTOC): 10.92

Depth to Water (BTOC): 10.85
Total Depth (BTOC): 20.80
Water Column (ft): 9.95
Casing Volume(gal):
Screen Interval: to
Measured Stickup:

Method of Purging

Pump: SUB (BLADR) PERIST OTHER:
Purge Start Time: 11:05
Purge End Time: 11:40
Flow Rate (lpm): 0.1
Volume Purged (Liters): 2.5

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C	See below	
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	11:05	10.90	0.5	3.85	0.159	320	8.95	5.61	173.8
2	11:15	11.00	1.0	4.13	0.144	318	6.18	5.65	174.0
3	11:25	10.93	1.5	4.06	0.143	316	7.72	5.55	174.3
4	11:30	10.93	2.0	4.03	0.144	316	7.60	5.58	174.2
5	11:34	10.92	2.5	4.04	0.144	315	7.59	5.58	174.3
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, (an.) Brown, Grey, Milky White, Other:
Odor: (None.) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, (Medium.) High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELDSHEET

Well ID: 215-MW-12

Project: SOFC-PORTHEIDEN
Project #: 060068.001
Field Team: S. SOZA D. CARDEN
Date: 09-20-22
Start Time: 0945
End Time: 1100

Sample ID: SS0006-215MW12-092022 Time: 10:20 primary dup other:
Sample ID: SS0006-215MW12-092022-99 Time: 10:25 primary dup other:
Sample ID: SS0006-215MW12-092022-MS Time: 10:20 primary dup other: MS + MSD
SS0006-215MW12-092022-1155 Filtered? Y / N 0.45µm 1.0µm

Well Information

Depth to Top of Product:				Depth to Water (BTOC):	13.74
Depth to Oil/Water Interface:				Total Depth (BTOC):	19.01
Casing Diameter:	2-in	4-in		Water Column (ft):	5.27
gal/ft of casing:	0.163	0.653		Casing Volume(gal):	0.9568
Pump Intake Depth:			14.6	Screen Interval :	to
Stable DTW (BTOC):			13.9	Measured Stickup:	2.45

Method of Purging

Pump: SUB BLADR PERIST OTHER:
Purge Start Time: 10:00
Purge End Time: 10:20
Flow Rate (lpm): ~~0.2-0.4~~ 0.35
Volume Purged (Liters): 12

Bailer: Teflon SS Other:
Bailer volume (Liters):
Required Pulls:
Volume Purged (Liters):

30 mL/15sec - 85 mL/sec - 175 mL/sec

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Depth to Water Stabilization	
			Time	Depth to Water
Temperature	-5 to 45 degrees C	+/- 0.2 degrees C		
pH	0 to 14 NTU	+/- 0.1		
Conductivity	0 to 200 mS/cm	+/- 3%		
ORP	-999 to +999 mV	+/- 10 mV		
Dissoved Oxygen	0 to 50 mg/L	+/- 10%		
Turbidity	0 to 1,000 NTU	+/- 10% [<10 NTU]		

Instrument Observations

Round	Time	Water Level [ft BTOC]	Volume Purged [Liters]	pH	Cond [mS/cm]	Turbidity [NTU]	DO [mg/L]	Temp [C]	ORP [mV]
1	10:01	13.74	0.0	5.33	0.087	23.47	7.80	6.05	64.7
2	1004	13.76	2.4	5.15	0.090	44.82	8.39	6.4	63.4
3	1007	13.84	3.2	4.99	0.110	102.1	6.23	7.73	70.5
4	1010	13.87	6.7	4.97	0.117	118.6	4.52	8.04	67.7
5	1013	13.90	8.9	4.96	0.126	174.9	3.55	7.3	62.2
6	1016	13.90	12.0	4.95	0.125	181.6	3.46	9.07	60.4
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measuered by: 1)pumping at a low rate (approximately 1 liter/3 minutes or 0.1 gal/min and 2) continually measuring water levels in the well.

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments:
ADDED NEW LOCK: 0000

DRO, MNA, BTEX

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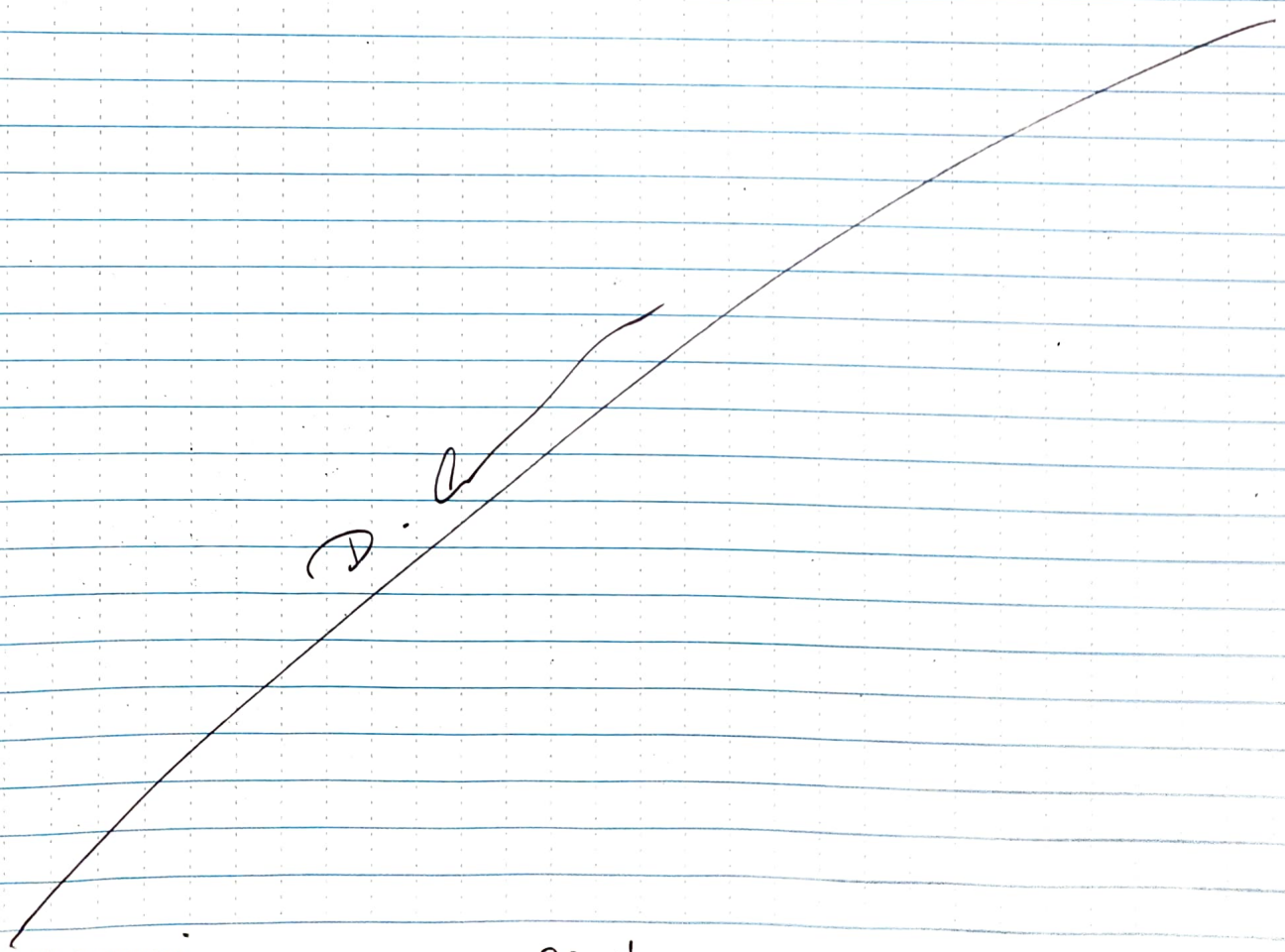
PORT HEIDEN 09-14-22

FIELD TEAM: D. CARDEN, S. SOUZA

WEATHER: CLOUDY, INTERMITTENT RAIN, 50's

GOAL: MOBILIZE TO 7TH VIA LAKE CLARK & GET INTO HOUSE

0700: (ANC) CHECK IN @ LAKE CLARK AIR - MERRILL FIELD
0915: DEPART ANC VIA LAKE CLARK
1010: QUICK STOP IN PORT ALSWORTH
1030: DEPART PORT ALSWORTH
1140: LAND IN PORT HEIDEN
1200: SCOTT ANDERSON ARRIVES TO PICK US UP
1215: PICK UP VEHICLE & FOLLOW SCOTT TO HOUSE
13:00 SAFETY TAILGATE
13:30 DRIVE TO RAY'S PLACE TO GET INTERNET
DAYCARE STAFF ENTERS WITH CODE INTO OUR PHONES
TOUCHBASE W/ RENEE
14:30 DRIVE AROUND SITES & WELLS & GET ORIENTED & GO TO STORE
15:30 RETURN TO HOUSE
20:00 GO TO RAY'S FOR INTERNET - CALL RENEE
21:00 RETURN TO HOUSE
END OF DAY



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PORT HEIDEN 09-15-22

FIELD TEAM: D. CARTEN, S. SOUZA

WEATHER: CLOUDY, RAINY, 40-50s

GOAL: LUC/IC INJECTIONS, RETRIEVE EQUIPMENT FROM GRANT PLANE

0900: TAILGATE SAFETY

0930: GO TO FAYS PLACE FOR INTERNET
CALL GRANT - AKN
↳ THEY DIDNT GET ANYTHING IN YESTERDAY OR THIS MORNING
CALL ALASKA AIR
↳ NOTHING LEFT ANC ~~YESTERDAY~~ (WEDNESDAY)
↳ ALL PIECES OF SHIPMENT (21 pcs! OF 6616 lbs) MANIFESTED FOR TODAY'S FLIGHT @ 1pm
CALL RENEE TO LET HER KNOW

~~1030~~ SCOTT ANDERSON SHOWS UP AND HE SAYS HE TALKED TO GRANT THIS MORNING TOO AND THEY SAID THEY WERENT GOING TO FLY TODAY ANYWAY

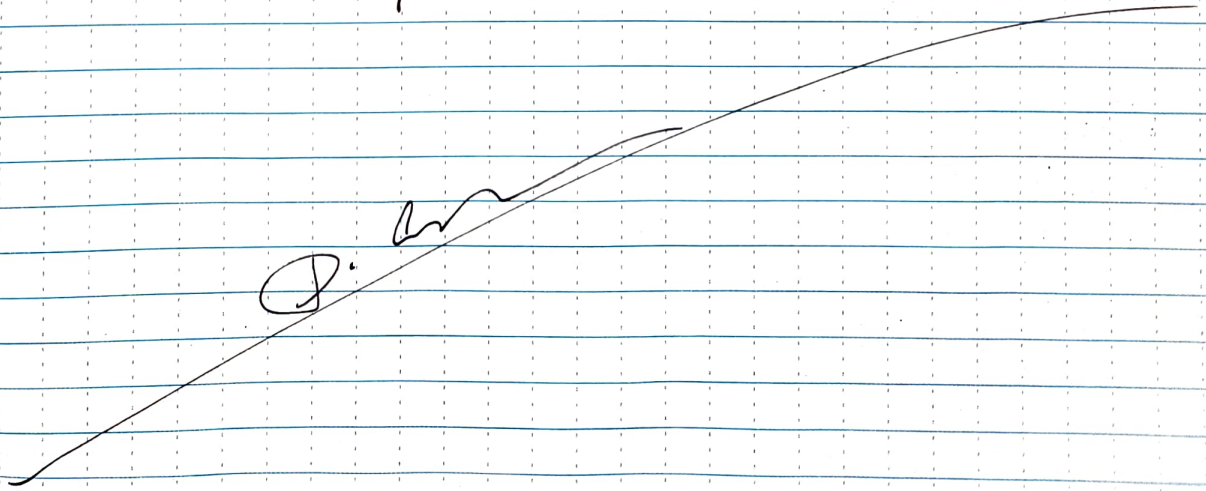
~~1030~~ 11:15 LEAVE TO GO TO STORE (supposed to open @ 11am BUT THEYRE CLOSED)

1130: RAIN TOO HARD TO TAKE PICTURES FOR LUC/IC INSPECTIONS
RETURN TO HOUSE

1500: GO TO FAYS PLACE - SEE WHATS HAPPED TO AKN
↳ EVERYTHING SHIPPED TO AKN
CALLED GRANT
↳ THEY SAID TO CALL "JAYLEN" @ ~0930 TOMORROW AND TALK ABOUT PRIORITIZING CERTAIN ITEMS IF THEY FLY TOMORROW

1600: GO TO STORE - IT DOESNT SUCK! FOR EGGS, CEREAL, MILK, AND BEANIE WEENIES.

1630: END OF DAY



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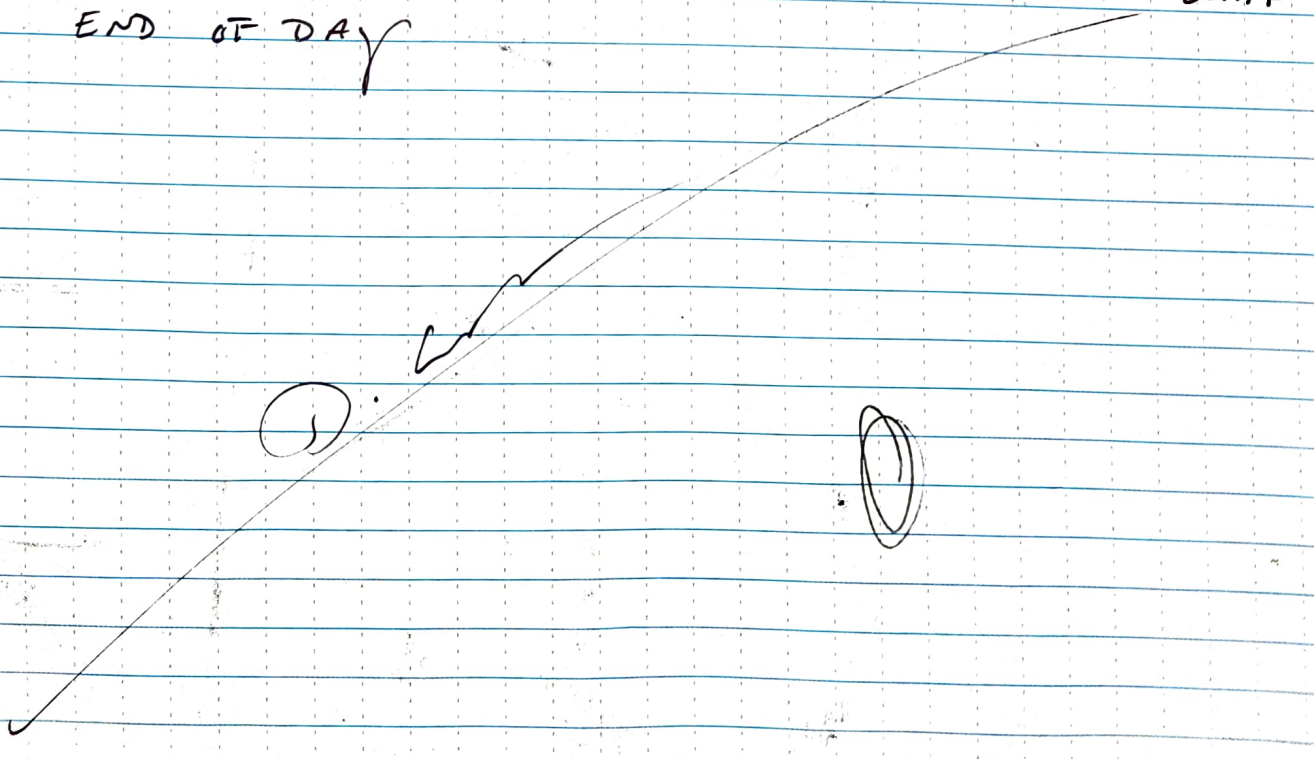
Port Heiden 09/16/22
Field Team: D. Carden & S. Souza
Weather: Cloudy, Rain, 40-50°F
Goal: LUC/IC inspections, Retrieve equipment from Grant Aviation

0900: Tailgate Safety
0930: Go to Ray's place for internet
0940: Called Ak Air about cargo - confirm it's in King Salmon
0955: Called Grant Aviation about Cargo - ~~confirm they received cargo~~ Have not received cargo
-will hopefully be sent to Port Heiden tomorrow
1020: Returned to house
1400: Go back to Ray's
1440: Called Grant
-confirmed all cargo was @ Grant in King Salmon
- Cargo should arrive tomorrow
1500: Starting SS0006 inspection (FPC215) - LUC → weather changed from rain to partly sunny, 50°-55°F
1530: WP002 inspection
1600: OT001 inspection
1630: LF0006 inspection
1700: SS0006-FPC0666 inspection
*-next year → bring rubber caps for locks to protect from salt/elements
1800 RETURN TO RAY'S FOR INTERNET TO ~~CAL~~ CALL GRANT ABOUT EST. ARRIVAL TOMORROW - THEY SAY TO CALL BACK IN THE MORNING; LAUREN TEXTED SHE SHIPPED A SAMPLE BOTTLE VIA LAKE CLARK
1900 RETURN TO HOUSE
END OF DAY



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PORT HEIDEN 09-17-22

48-55°F, up to 12mph, partly sunny & cloudy episodes

D. CARDEN, S. SOUZA

GOAL: RETRIEVE EQUIP. FROM GRANT AVIATION & BEGIN GW SAMPLING

0900: SAFETY TAILGATE

0930: RAY'S PLACE

0940: CALL GRANT TO VERIFY EQUIP IS COMING TODAY
WORD: PLANE SHOULD ARRIVE THIS AFTERNOON
CALL LAKE CLARK TO NEGOTIATE PLANE SPACE FOR DEMOB
WORD: "BUEHLER?"

1230: GO TO STORE & ASK ABOUT COFFEE
TISHA INVITED US TO HER HOUSE FOR FOLGERS
FIRST HOUSE ON LEFT ACROSS FROM RAY'S

1330: GO TO AIRPORT TO WAIT FOR POSSIBLE PLANES
NICE CROWD. SA, JM, & BILLY THERE TOO.
"BILLY" = BLONDE WOMAN IN 7TH. HAS TEENAGE SON.
SHE KNOWS EVERYTHING. SHE'S THE VILLAGE AGENT FOR GRANT. 907-444-4779

1340 LAKE CLARK FLIGHT ARRIVES
LJ'S box of sample bottle did NOT arrive
ASK PILOT about upcoming cargo space in a few days for shipping stuff back
WORD: "BUEHLER?"

1430 GRANT'S 207 ARRIVES
PILOT = DAVE → VERY FRIENDLY!
UNLOAD PLANE & LOAD UP VEHICLE AT UELLAS SA'S TRUCK W/ JM
SA & JM HELP US BRING STUFF OVER TO THE HOUSE

1500 BEGIN SORTING GEAR & MAKING SAMPLE KITS

1520 CALIBRATE YSI & TURBIDIMETER

1615 HEAD TO OT001

1645 BEGIN SETTING UP @ RFS-MW-06

1748 OT001-RFSMW06-091722
OT001-RFSMW06-091722-MS
OT001-RFSMW06-091722-MSD

1827 BEGIN SETTING UP @ BLO-MW-05
DRAWDOWN DESPITE LOWEST PUMP SETTING

1851 pumped dry. Paused purging to recharge

1904 Water Level still insufficient

1909 Decision to let recharge overnight

Scale: 1 square = _____

Rite in the Rain

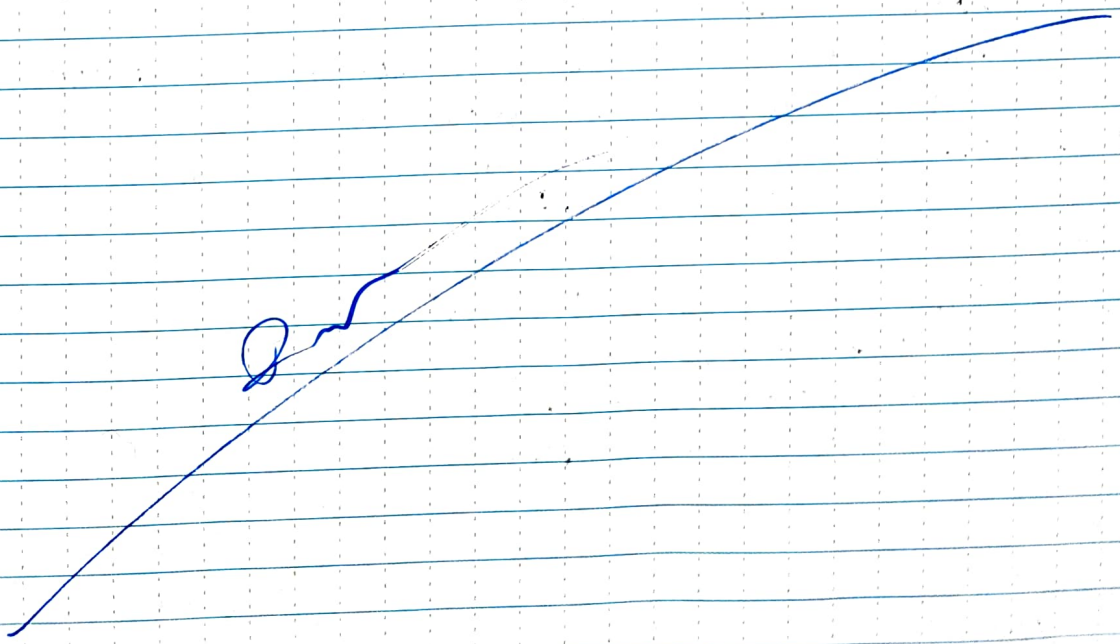
1910 Visitor shows up in white truck
Mike Pelka of Talarik - he's doing the PCB soil removal here - ongoing - staged soil bags near house
SAYS HE USED TO WORK FOR NORTH WIND @ TABLE LANDING

HE WARNS US: 3 BEARS just around the corner

HE LEAVES.

LOAD UP IN VEHICLE & DRIVE AROUND CORNER & SURE ENOUGH - a MAMA & 2 MATURE CUBS WITHIN SITE PERIMETER
N SIDE of WP002
HONK HORN & SCARE THEM AWAY TOWARDS BEACH

1922 BEGIN SETTING UP @ BLO-MW-07
1954 DRAWDOWN DESPITE LOWEST PUMP SETTING
pumped dry. paused purging to let recharge
2000 Water Level still insufficient
DECISION TO LET RECHARGE OVERNIGHT
PACK UP & LEAVE SITE.
MJ. Bring extra silicone (water quality meter) & fishing wire next year
2045 Return to house
PACK/CLEAN remaining GEAR & WP002 SETTLEBETS.
END OF DAY



Scale: 1 square =

PORT HEDEN 09-18-22

46-50°F, up to 15 mph, cloudy, foggy, LIGHT RAIN

D. CARDEN, S. SOUZA

GOAL: FINISH GW SAMPLING @ OTOOL + UP002

0830 : SAFETY TAILGATE

0900 : CALIBRATE YSI & TURBIDIMETER

0930 GO TO ZAY'S

CALL RENEE U/ UPDATE

1000 ARRIVE @ BLO-MW-05

RESUME PURGING AFTER LEAVING TO RECHARGE OVERNIGHT

1020 CANT GET ENOUGH WATER OUT TO COMPLETE STABILIZATION

PUMPED DRY

DECISION TO ABANDON TIL TOMORROW MORNING. WILL

COLLECT SAMPLE TOMORROW MORNING IMMEDIATELY FROM

WHATEVER IS PRODUCED U/O FINISHING PURGE/PROBES.

1030 RETURN TO BLO-MW-07

1050 STILL NOT ENOUGH WATER FOR SAMPLING OR FINISHING PURGING.

SIMILAR CONDITIONS AS YESTERDAY. DECISION TO RETURN TO

TOMORROW MORNING & IMMEDIATELY COLLECT SAMPLE.

1115 ARRIVE @ RRS-MW-05

1203 OTOOL-RRSMW05- 091822

1220 ARRIVE @ DSA-MW-01

1255 OTOOL-DSAMW01- 091822

1318 ARRIVE @ DSA-MW-05

1505 OTOOL-DSAMW05- 091822

1524 ATTEMPT TO REPLACE NDE JACKDOWN WELL DSA-MW-05 AFTER

SAMPLING. OBSTRUCTED BY BENTONITE MATERIAL.

DID NOT REPLACE TUBING

1535 ARRIVE @ GLO-MW-04

1416 OTOOL-GLOMW04- 091822

1650 ARRIVE @ DSA-MW-06

1730 OTOOL-DSAMW06- 091822

1737 ARRIVE @ DSA-MW-07

BEAT TENTS OBSERVED WITHIN 10'Ft of WELL

1745 Battery died (Marine battery)

1800 Go to ZAY'S

1845 Reach out to ML about MP- says he'll call tomorrow

Starting for DOMINKOWSKI

1900 RETURN to house

END OF DAY

Scale: 1 square = _____

PORTHEDEN 09-18-22

46-50°F, up to 15 mph, CLOUDY, FOGGY, LIGHT RAIN

D. CAMDEN, S. SOUZA

GOAL: FINISH GW SAMPLING @ OTOOI + UP002

0830 : SAFETY TAILGATE

0900 : CALIBRATE YSI & TURBIDIMETER

0930 GO TO ZAY'S
CALL ZEMEE U/ UPDATE

1000 ARRIVE @ BLO-MW-05
RESUME PURGING AFTER LEAVING TO RECHARGE OVERNIGHT

1020 CANT GET ENOUGH WATER OUT TO COMPLETE STABILIZATION
PUMPED DRY
DECISION TO ABANDON TIL TOMORROW MORNING. WILL
COLLECT SAMPLE TOMORROW MORNING IMMEDIATELY FROM
WHATEVER IS PRODUCED U/O FINISHING PURGE (TOLES).

1030 RETURN TO BLO-MW-07

1050 STILL NOT ENOUGH WATER FOR SAMPLING OR FINISHING PURGING.
SIMILAR CONDITIONS AS YESTERDAY. DECISION TO RETURN TO
TOMORROW MORNING & IMMEDIATELY COLLECT SAMPLE.

1115 ARRIVE @ FFS-MW-05

1203 OTOOI-FFSMW05-091822

1220 ARRIVE @ DSA-MW-01

1255 OTOOI-DSAMW01-091822

1318 ARRIVE @ DSA-MW-05

1505 OTOOI-DSAMW05-091822

1524 ATTEMPT TO REPLACE TUBE JACKDOWN WELL DSA-MW-05 AFTER
SAMPLING. OBSTRUCTED BY BENTONITE MATERIAL.
DID NOT REPLACE TUBING

1535 ARRIVE @ GLO-MW-04

1616 OTOOI-GLOMW04-091822

1650 ARRIVE @ DSA-MW-06

1730 OTOOI-DSAMW06-091822

1737 ARRIVE @ DSA-MW-07
BEAT PLANTS OBSERVED WITHIN 10'Ft of WELL

1745 Battery dies (Marine battery)

1800 Go to ZAY'S

1845 Reach out to ML about MP- says he'll call tomorrow
Staying for DZIENKOWSKI

1900 RETURN to house
END OF DAY

Scale: 1 square = _____

Rite in the Rain

PORT HEDEN 09-19-22
43-50°F, up to 14mph, CLOUDY, LIGHT RAIN
D. CARDEN, S. SOUZA

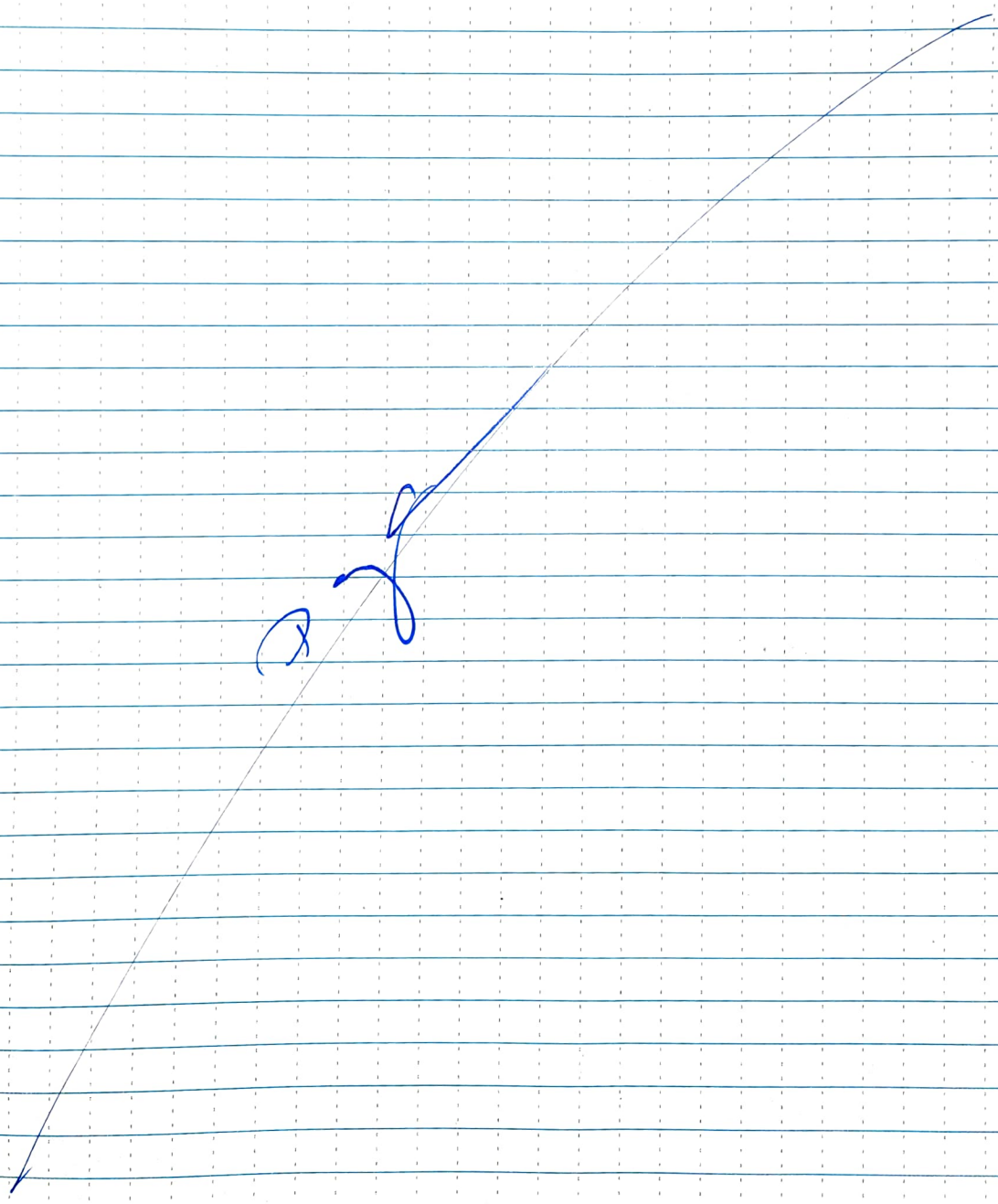
GOAL: FINISH GW SAMPLING @ OTOOL, WP002

0730: CALIBRATE YSI & TURBIDIMETER
0800: SAFETY TAILGATE
0830: ARRIVE @ RAY'S
STARTING CALLS
CALL LAKE CLARK TO NEGOTIATE PLACE SPACE
WORD: DUEHLER?
0900 LEAVE RAY'S
0920 RETURN TO DSA-MW-07
BATTERY GIVING ISSUES DESPITE CHARGING OVERNIGHT
DECISION TO POWER MONSOON OFF OF TRAILBLAZER VEHICLE
1030 MIGHT HAVE TRIED THE PUMP
PULL PUMP & ITS MELTS LIKE BURNING METAL
LESSON LEARNED: DON'T CRANK VOLTAGE ON CONTROLLER
REPLACE PUMP W/ SPARE
NEED TO ORDER NEW SPARE
PROACTIVE
SS MONSOON XL SER # Z113 C6
1038 START PURGING AGAIN
1056 Pumped dry again
DECISION TO ABANDON TIL TOMORROW MORNING. WILL COLLECT
SAMPLE IMMEDIATELY W/O FINISHING PURGE PROCESS.
1115 RETURN TO BLO-MW-07
1130 OTOOL-BLOMW07-091922
~~1240 ARRIVE @ DSA-MW-02~~
11:40 RETURN TO BLO-MW-05
12:10 OTOOL-BLOMW05-091922
12:40 ARRIVE @ DSA-MW-02
1315 OTOOL-DSAMW02-091922
1330 ARRIVE @ BLO-MW-06
1405 OTOOL-BLOMW06-091922
1410 DUPLICATE
OTOOL-BLOMW06-091922-FB
1430 COLLECT EQUIPMENT BLANK
OTOOL-EQBK01-091922
1445 ARRIVE @ BLO-MW-01
1520 WP002-BLOMW01-091922

Scale: 1 square = _____

PG. 26

1525 DUPLICATE
VP002-BLOMW01-091922-99
Downhole equip came up oily w/ a very strong odor.
Decontaminated pump & water level meter 4 times
w/ alconox and paper towels & a scrubbrush
1700 ARRIVED BAY'S
1745 CALL RENEE W/ UPDATE
1800 RETURN TO HOUSE
CLEAN UP EQUIPMENT
1900 END OF DAY



Scale: 1 square = _____

Rite in the Rain

PORT HELDEN 09-20-22

45-48°F, up to 22 mph, CLOUDY, WINDY, LIGHT RAIN

D CARLEN, S. SOUZA

GOAL: FINISH GW SAMPLING

0800 CALIBRATE YSI & TURBIDIMETER

0830 SAFETY TAILGATE

0900 RETURN TO DSA-MW-07

OT001-DSAMW07-092022

0930 VISITOR SHOWS UP. "JEFF BROWNLEY" WORKS FOR WESTON. A SUB TO Bethel & TALAZIK. HE'S ODD.

0945 BEGIN SETTING UP @ 215-MW-12

& REALIZE EVERY OTHER SS00G WELL HAS A 1.5-in CASING. TOO SMALL TO FIT MONSOON PUMP BARREL DOWN (2-in)

NO backup equipment to sample these remaining wells

1020 SS00G-215MW12-092022

SS00G-215MW12-092022-MS

SS00G-215MW12-092022-MSD

1025 DUPLICATE

SS00G-215MW12-092022-99

TOOK an hour almost to collect 4 sample sets.

Couldn't help but draw down

1200 Go to Ray's

Call Renee about CASING SIZES I HAVE

~~CALL LAKE CLARK~~ PZ

DECIDED TO FINISH UP WHAT WE CAN & RETURN AT A LATER DATE SO AS NOT TO INTERFERE W/ DRILLING & N. KOLOKI LOCATION

CALL LAKE CLARK TO NEGOTIATE PLANE SPACE

WORD: BUEHLER?

~~1700 ARRIVE PZ~~

CALL GRANT AVIATION (AKN) TO ASK IF PLANE IS COMING THIS AFTERNOON & IF IT CAN TAKE A SAMPLE COOLER

WORD: PLANE IS COMING THIS EVENING & IT DOES HAVE SPACE

1230 COMPLETE FILLING OUT COCs while at airport waiting for PLANE & PACKING UP GW SAMPLING EQUIP.

1245 KRISTEN CARLSON sends message that he dropped the SIGN WE LEFT there last week at the door of the house

1445 STAGE GW EQUIPMENT & 3 SAMPLE COOLERS @ AIRPORT

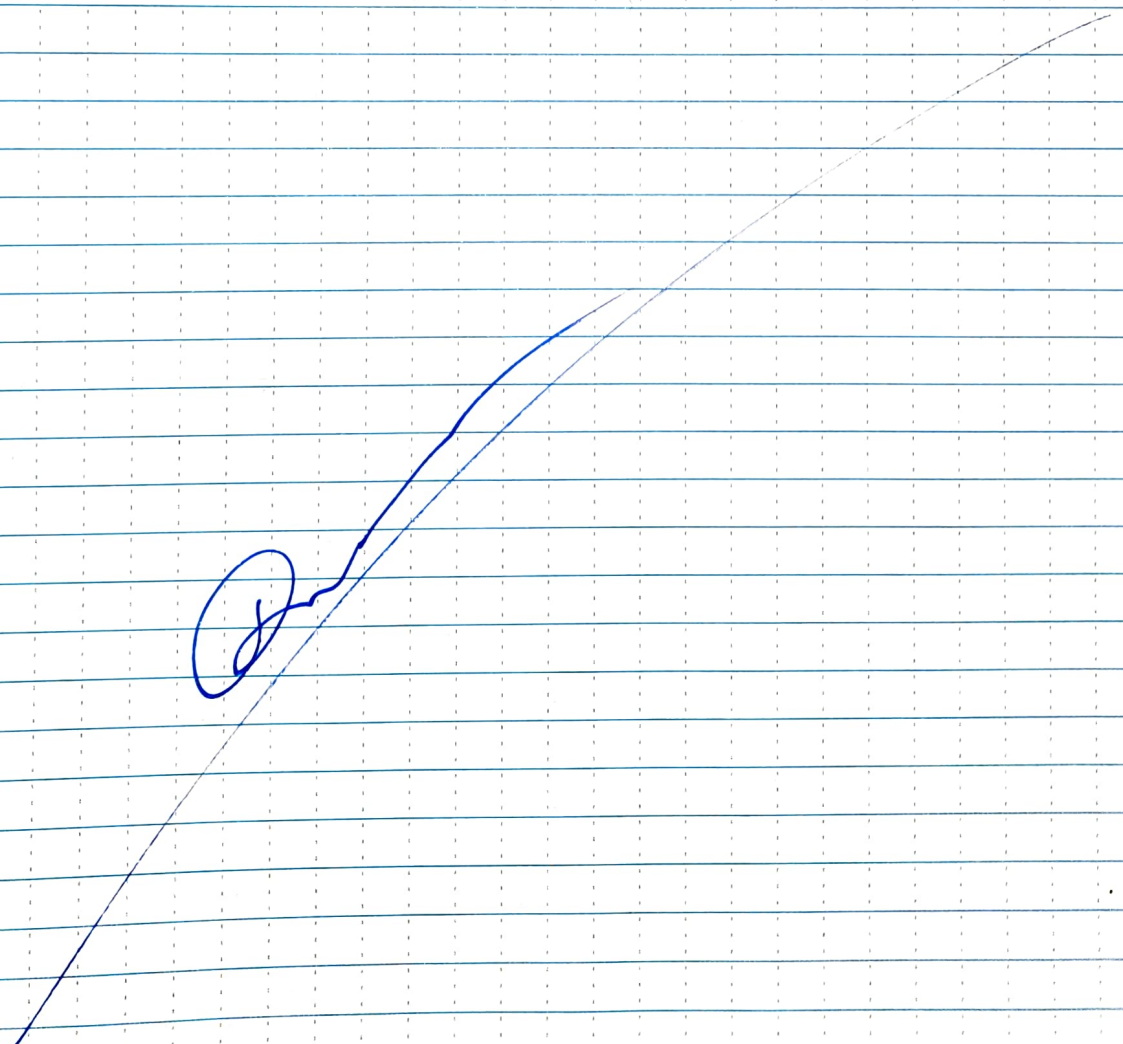
1500 ARRIVE @ RAY'S

Get attacked by village children

Call GRANT to ask about expected arrival

Scale: 1 square = _____

WORD: Expect around 6pm
Call Lake Clark about plane space
WORD: Buehler?
1700 ARRIVE @ 215-MW-08 for well repair
replace cap & lock (LOCKED)
1745 ARRIVE @ WPOOR to install signs
Issued drillbit. Need carbide or cobalt bit to
penetrate this thick of steel.
Mike Peika shows up again
1815 RETURN to Ray's and call SA about borrowing drillbit
1930 GRANT PLANE ARRIVES
DRIVE OVER & SHIP STUFF TO AKN to be returned to
ACE & shipped to ANC
2000 RETURN to house
END IT DAY



Scale: 1 square = _____

Rite in the Rain

PORT HEIDEN 09-21-22
39-50°F, 38mphwinds, CLOUDY, WINDY, LIGHT RAIN
D. CALDEN, S. SOUZA

GOAL: FINISH SIGN INSTALLATION, WELL REPAIR, & DEMOBILIZE

0900: SAFETY/TAILGATE
PACKUP HOUSE
0900 STOP BY SA'S SHOP TO BORROW CARBIDE BITS
0915 RETURN TO WP002 TO FINISH SIGN INSTALLATION (2 SIGNS)
0945 ARRIVE @ SS006 NEAR SCHOOL FOR WELL REPAIRS
OGGE-MW-05 - Replace well cap & Lock (6000)
OGGE-MW-07 - Replace well cap ~~cap~~
secured w/ zipties
OGGE-MW-04 Compression cap too tall for well cap
need to bring threaded 1.5-in PVC
cap - FLUSH
SS BREAKS THE BOLT CUTTERS
NTS. NOT ENOUGH LOCKS WERE BROUGHT. USED ZIPTIES IN PLACE.
1045 ARRIVE @ RAYS
CALL GRANT AEN ABOUT TRANSFERRING TO ACE
1110 Go back to WP002 & OTSS01 sites & take pictures of all wells
HEAR? LOVE LANDING - DRIVE TO AIRPORT
REALIZE IT'S OUR PLANE
CALL SA & have him meet us @ airport
SA tells us about a bear that ripped through his meat shed last night.
1200 BOARD PLANE
1245 ARRIVE IN PORT MOLLER
1315 Reboard plane & head for ANC
1520 ARRIVE IN ANC @ MERRILL FIELD
1539 PAY FOR PRIORITY EXCESS BAGGAGE (PTH → ANC)
146.6 lbs
$513.10 (NW-1061)
1545 MEET LT @ LCA AIRPORT
1600 Go pick up signs @ WARNING LITES
6 SIGNS
$792 (NW-1061)
TAKE SIGNS TO OFFICE
END OF DAY

Scale: 1 square = _____

12/06/22 29°F 0-10 mph winds

Location: Port Heiden RRS, AK
Objective: Groundwater Sampling Event; Collect 6 groundwater samples, one duplicate & one MS/MSD.
Equipment: Geotech Monitoring Pump with Bladder, Sample Bottle Kits, Bailers, YSI, & Turbidimeter

09:00 Safety Meeting at Port Heiden duplex. Dense fog and high winds are going to be colder for this morning.
10:00 Depart for sampling event; start at Port Heiden School.

11:04 Arrive at 25-MW09. Sample collected at 11:40, duplicate and blank.

11:55 Arrive at 25-MW08. Sample collected at 12:42pm.

Cont. next page

12/06/22 Port Heiden sampling event continued.

13:36 Arrive at 066-MW-05. Sample collected at 14:22

~~14:31 Arrive at 066-MW-04. Sample collected at~~ 14:31 Arrive at 066-MW-04. Sample collected at 15:14.

15:20 Arrive at 066MW-07. Primary, MS/MSD collected at 15:55 and 15:56 respectively.

16:03 Arrive at 066-MW-06. Sample collected at 16:50.

Returned to duplex after sampling concluded.

Jaycee Jones 12/06/22

28°F

12/07/22
Location: Port Heiden, AK
Objective: Wrap up well repair and sign check during groundwater sampling event.
Equipment: Various tools for minor repair.

08:00 Safety meeting & discussion of repair procedure.

10:00 Various small repairs on wells completed.

11:00 Checked in on flight status at Raup place. Return to duplex after.

13:00 Discussion of field activities and game plan for departure.

12/07/22 Jaycee Jones

FIELD INSTRUMENT CALIBRATION DATASHEET

Project Location: PORT HEDEN | Project Number: 06006 | Page 1 of 4

Calibration Event	1	2
Date & Time:	09-17-22 15:45	
Instrument	WATER QUALITY METER	TURBIDIMETER
Instrument Type	YSI 556	MICRO TPW, 2000
Instrument Make & Model Number:		
Serial Number:	14B1Ø0523	20140105J
Owner of Instrument:	NORTHWIND	NORTHWIND

Calibration Solution(s)	DO	ORP	Cond.	pH			Turbidity				DO	ORP	Cond.	pH			Turbidity			
				1st pt.	2nd pt.	3rd pt.	1st pt.	2nd pt.	3rd pt.	4th pt.				1st pt.	2nd pt.	3rd pt.	1st pt.	2nd pt.	3rd pt.	4th pt.
Solution Type(s):	DI WATER	240 mV	1413 µS/cm	4.01	7	10.01											0.02			
Solution Lot Number(s):		7352	212163	726626	730242	726453														
Solution Exp. Date:		01/27	Ø1/23	6-3-23	7-15-23	6-16-23														
Calibration Solution Temperature (°C):		24·C	24·C	24·C	24·C	24·C														
Solution Standard Value(s) @ Temp.		240 @ 25C	1.413	4.01	7.00	10.01														
Calibration Values																				
Calibration Value @ Temperature:	7.47 MG/L	240.4	1.409	4.01	7.02	10.01											.02			
Operator's Name:	D. CARDEN, S. SOUZA																			

Notes/Comments:

FIELD INSTRUMENT CALIBRATION DATASHEET

Project Location: PORTHEIDEN | Project Number: 060068.001 | Page 2 of 4

Calibration Event	1	2
Date & Time:	09-18-22 09:00	
Instrument	WATER QUALITY METER	TURBIDIMETER
Instrument Type	YSI 556	MICROTPW, 2020
Instrument Make & Model Number:		
Serial Number:	14B1A0523	20140153
Owner of Instrument:	NORTH WIND	NORTH WIND

Calibration Solution(s)	1 DO	1 ORP	1 Cond.	1 pH 1st pt.	1 pH 2nd pt.	1 pH 3rd pt.	1 Turbidity 1st pt.	1 Turbidity 2nd pt.	1 Turbidity 3rd pt.	1 Turbidity 4th pt.	2 DO	2 ORP	2 Cond.	2 pH 1st pt.	2 pH 2nd pt.	2 pH 3rd pt.	2 Turbidity 1st pt.	2 Turbidity 2nd pt.	2 Turbidity 3rd pt.	2 Turbidity 4th pt.
Solution Type(s):	DI WATER	240 MV	1413 µS/cm	4.01	7.00												0.02			
Solution Lot Number(s):		7352	212263	726666	230242															
Solution Exp. Date:		01/24	05/23	6-7-23	7-6-23															
Calibration Solution Temperature (°C):		25°C	25°C	25°C	25°C															
Solution Standard Value(s) @ Temp.		240 @25°C	1.413	4.01	7.00															
Calibration Values																				
Calibration Value @ Temperature:	7.46 mg/L	240.1	1.411	4.01	7.01												0.02			

Operator's Name:	S. SOUZA, D. CARDEN
Notes/Comments:	

FIELD INSTRUMENT CALIBRATION DATASHEET

Project Location: PORT HEDEN | Project Number: 060068 | Page 3 of 4

Calibration Event	1	2
Date & Time:	09-19-22 0730	
Instrument	Water Quality Meter	Turbidimeter
Instrument Type	YSI 556	Micro TPW, 2000
Instrument Make & Model Number:		
Serial Number:	14B100523	20140105 3
Owner of Instrument:	North Wind	North Wind

Calibration Solution(s)	DO	ORP	Cond.	pH			Turbidity				DO	ORP	Cond.	pH			Turbidity			
				1st pt.	2nd pt.	3rd pt.	1st pt.	2nd pt.	3rd pt.	4th pt.				1st pt.	2nd pt.	3rd pt.	1st pt.	2nd pt.	3rd pt.	4th pt.
Solution Type(s):	D.I. Water	240 mV	1413 µs/cm	4.01	7	[illegible]											0.02			
Solution Lot Number(s):		7352	212603	726024	730242															
Solution Exp. Date:		01127	05/23	6/3/23	7/15/23	[illegible]														
Calibration Solution Temperature (°C):		24°C	24°C	24°C	24°C	[illegible]														
Solution Standard Value(s) @ Temp.		240 @25°C	1.413	4.01	7.00															
Calibration Values																				
Calibration Value @ Temperature:	7.47 µg/L	240.4	1.409	4.01	7.02											0.02				
Operator's Name:	D. Carden, S. Souza																			

Notes/Comments:

FIELD INSTRUMENT CALIBRATION DATASHEET

Project Location: FORT HEDEN Project Number: 0600649 Page 4 of 4

Calibration Event	1	2
Date & Time:	09-20-22 0800	
Instrument		
Instrument Type	WATER QUALITY METER	TURBIDIMETER
Instrument Make & Model Number:	YSI 556	
Serial Number:	14B100523	20140105J
Owner of Instrument:	NORTH WIND	NORTH WIND

Calibration Solution(s)	DO	ORP	Cond.	pH			Turbidity				DO	ORP	Cond.	pH			Turbidity			
				1st pt.	2nd pt.	3rd pt.	1st pt.	2nd pt.	3rd pt.	4th pt.				1st pt.	2nd pt.	3rd pt.	1st pt.	2nd pt.	3rd pt.	4th pt.
Solution Type(s):	DI	ZoBell	1413	4.01	7												0.02			
Solution Lot Number(s):		7352	22263	7L0044	7L0045															
Solution Exp. Date:		01/27	5-23	6-23	7-23															
Calibration Solution Temperature (°C):		24.2	24.2	24.2	24.2															
Solution Standard Value(s) @ Temp.		240	1413	4.01	7															
Calibration Values																				
Calibration Value @ Temperature:	7.47 mg/L	240.3	1.411	4.01	7.01												0.02			
Operator's Name:	S. SOUZA, D. CARDEN																			

Notes/Comments:

NORTH WIND

Field Instrument Calibration Datasheet

Project Number:

Page of

Calibration Event	1										2									
Date and Time	12/06/22																			
Instrument																				
Instrument Type	451 556																			
Instrument Make & Model Number	" "																			
Serial Number	149100513																			
Owner of Instrument	NWSS																			
Calibration Solution(s)																				
	DO	ORP	Cond	pH			Turbidity				DO	ORP	Cond	pH			Turbidity			
				1st pt	2nd pt	3rd pt	1st pt	2nd pt	3rd pt	4th pt				1st pt	2nd pt	3rd pt	1st pt	2nd pt	3rd pt	4th pt
Solution Type(s)			1.320	3.31	3.69	4.01														
Solution Lot Number(s)	CC2126 3		Conductivity	6.11	6.76	7.02														
Solution Expiration Date			05/17/23	8.81	9.56	9.97														
Calibration Solution Temperature (°C)	CC2126 3																			
Solution Standard Value(s) @ Temperature	15°C →																			
Calibration Values																				
Calibration Value @ Temperature	1.147																			
Operator's Name	Lauren Jennings																			
Notes/Comments	PH Lot/Exp: PH 4 Lot CC7262226 Exp 06/03/23 PH 7 Lot CC730242 Exp 07/15/23										PH 10 Lot CC726653 Exp 06/10/23									

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
001	09/14/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 46° F Temp High 48° F Cloudy ☐ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 22 mph Precipitation ☐ No ☒ Yes

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☒ No ☐

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☐ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☐ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☐ No ☐

Have samples been properly labeled and packaged? Yes ☐ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☐ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.				
2.				
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	10.0
2.	Geologist	Sydney Souza	North Wind	10.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	20.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	NA	2	0	
2.	1	YSI & Flow-through Cell	09/07/21	0	0	
3.	1	100' water meter	09/07/21	0	0	
4.	1	Monsoon pump	09/07/21	0	0	
5.	1	Turbidity Meter	09/07/21	0	0	
6.	1	Marine battery	09/07/21	0	0	
7.	1	GAC	09/07/21	0	0	
8.						
9.						
10.						
11.						
			Total Hours	2	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field Team mobilized to Port Heiden via Lake Clark Air, Anchorage.

2 While field team spent time getting oriented in the village this afternoon, bear tracks were observed. Situational awareness and wildlife safety will be emphasized in the morning safety meetings.

3 Field Team awaiting cargo delivery (sampling equipment/sign materials) via Alaska Air in coordination with Grant Aviation out of King Salmon.

4

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/2/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
002	09/15/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 48° F Temp High 55° F Cloudy ☒ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 17 mph Precipitation ☐ No ☒ Yes Some dense fog; heavy precipitation.

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☐

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☐ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☐ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☐ No ☐

Have samples been properly labeled and packaged? Yes ☐ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference	Activity & Location	Quantity	Subcontractor

	(DFW #/Tech Spec #)			
1.				
2.				
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	7
2.	Geologist	Sydney Souza	North Wind	7
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	14

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	NA	2	0	
2.	1	YSI & Flow-through Cell	09/07/21	0	0	
3.	1	100' water meter	09/07/21	0	0	
4.	1	Monsoon pump	09/07/21	0	0	
5.	1	Turbidity Meter	09/07/21	0	0	
6.	1	Marine battery	09/07/21	0	0	
7.	1	GAC	09/07/21	0	0	
8.						
9.						
10.						
11.						
			Total Hours	2	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Cargo delay from King Salmon; field team waiting on gear/materials.

2 Rain showers and dense fog limited visibility in the field and the quality and clarity in which photos could be taken while performing LUC/IC inspections. Decision to wait for a better weather window to complete inspections in order to make better observation and take representative photographs.

3

4

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/2/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
003	09/16/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 51° F Temp High 61° F Cloudy ☒ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 26 mph Precipitation ☐ No ☒ Yes Mostly cloudy; light rain, windy.

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☐ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☐ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☐ No ☐

Have samples been properly labeled and packaged? Yes ☐ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

Evidence of bear activity was identified near many well sites around WP002 and OT001.

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	UFP-QAPP	LUC/IC Inspections at OT001, LF007, WP002, SS006	4	
2.				
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	10.0
2.	Geologist	Sydney Souza	North Wind	10.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	20.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	NA	2	0	
2.	1	YSI & Flow-through Cell	09/07/21	0	0	
3.	1	100' water meter	09/07/21	0	0	
4.	1	Monsoon pump	09/07/21	0	0	
5.	1	Turbidity Meter	09/07/21	0	0	
6.	1	Marine battery	09/07/21	0	0	
7.	1	GAC	09/07/21	0	0	
8.						
9.						
10.						
11.						
			Total Hours	2	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Cargo delay from King Salmon; field team waiting on gear/materials.

2 Around mid-afternoon, the weather shifted to party sunny. The Field Team was able to complete all of the LUC/IC inspections at Port Heiden.

3 The Field Team observed considerable corrosion as a result of salt spray on nearly all of the well locks, including those replaced last year. Further consideration will be put into determining the best material, device, or solution to secure these wells without having to replace locks annually.

4

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/2/2022

Project Manager Renee LaFata **Date**

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

Figure 1. Inspection of Radio Relay Station Landfill at LF007.

Figure 2. Active regrading and site restoration occurring at OT001.

Figure 3. Image of monitoring well BLO-MW-01 at WP002.

Figure 4. Picture taken from Well ID 066-MW-05 looking across Site SS006 FPC-066 towards the school.

Figure 5. Picture taken south of monitoring well 215-MW-09 facing north at Site SS006 FPC-215.

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
004	09/17/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 48° F Temp High 55° F Cloudy ☐ Partly Cloudy ☒ Clear ☐

Wind Speed Up to 12 mph Precipitation ☒ No ☐ Yes

Intermittent episodes of partly sunny and partly cloudy

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☐

III. Was Field Sampling and Testing Performed This Date? Yes ☒ No ☐

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☒ No ☐

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples
	DRO, VOCs, Fe/Mn, Sulfate, Alkalinity, TKN, Nitrate/Nitrite	AK102, 8260C, 6010C, 300, 2320B, SM4500, 353.2	OT001-RRSMW06-091722 [primary] OT001-RRSMW06-091722-MS [matrix spike] OT001-RRSMW06-091722-MSD [matrix spike duplicate]

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

Bears in the area while sampling at BLO-MW-05.

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	UFP-QAPP	Groundwater sampling at OT001 well RRSMW06	3	
2.	UFP-QAPP	Attempted groundwater sampling at BLO-MW05 and BLO-MW07		
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	12.0
2.	Geologist	Sydney Souza	North Wind	12.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	24.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Borrowed Vehicle	NA	6	0	
2.	1	YSI & Flow-through Cell	09/07/21	4	0	
3.	1	100' water meter	09/07/21	4	0	
4.	1	Monsoon pump	09/07/21	4	0	
5.	1	Turbidity Meter	09/07/21	4	0	
6.	1	Marine battery	09/07/21	4	0	
7.	1	GAC	09/07/21	0.5	0	
8.						
9.						
10.						
11.						
			Total Hours	26.5	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

North Wind-EA JV, LLC

Daily Quality Control Report

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field Team successfully collected a primary, MS, and MSD sample from the first well at RRS-MW-06.

2 Monitoring well BLO-MW-05 encountered drawdown and was slow to recharge. The decision was made to leave it overnight to recharge.

3 Monitoring well BLO-MW-7 also encountered drawdown and was slow to recharge despite using the lowest purge rate settings possible. It was also decided this well would be left overnight to recharge.

4 While the field team was at monitoring well BLO-MW-05, a geologist with the soil removal project – Mike Pelka – drove up to warn about 3 bears being just around the corner. Once the visitor left, the field team immediately jumped in vehicle and upon turning the corner, located the 3 bears on the NW side of WP002. The field team was able to scare them away and continue field sampling.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/02/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
005	09/18/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 46° F Temp High 50° F Cloudy ☒ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 15 mph Precipitation ☐ No ☒ Yes Cloudy, foggy, light rain showers

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☒ No ☐

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples
	DRO, VOCs, Fe/Mn, Sulfate, Alkalinity, TKN, Nitrate/Nitrite	AK102, 8260C, 6010C, 300, 2320B, SM4500, 353.2	OT001-RRSMW05-091822 [primary] OT001-DSAMW01-091822 [primary] OT001-DSAMW05-091822 [primary] OT001-GLOMW04-091822 [primary] OT001-DSAMW06-091822 [primary]

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☐ No ☒

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	UFP-QAPP	Groundwater sampling at OT001	5	NA
2.				
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	10.5
2.	Geologist	Sydney Souza	North Wind	10.5
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	21.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Borrowed vehicle	NA	6	0	
2.	1	YSI & Flow-through Cell	09/07/21	8	0	
3.	1	100' water meter	09/07/21	8	0	
4.	1	Monsoon pump	09/07/21	8	0	
5.	1	Turbidity Meter	09/07/21	8	0	
6.	1	Marine battery	09/07/21	8	0	
7.	1	GAC	09/07/21	1.5	0	
8.						
9.						
10.						
11.						
			Total Hours	47.5	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field team returned to monitoring well BLO-MW-05 to resume purging. Enough water still isn't being produced to finish stabilization without pumping dry. Decision made to abandon until following morning and collect sample after well has recharged.

2 Field team returned to monitoring well BLO-MW-07 to resume purging. Similar conditions exist once again where enough water still is not being produced to finish stabilization without pumping dry. Decision made to abandon until following morning and collect sample after well has recharged.

3 Field team successfully collected primary samples from five (5) wells at RRS-MW-05, DSA-MW-01, DSA-MW-05, GLO-MW-04, and DSA-MW-06. A field duplicate sample was planned for the next well to be sampled; however, the marine battery for the pump died immediately upon setting up at DSA-MW-07.

4

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/02/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
006	09/19/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 43° F Temp High 50° F Cloudy ☒ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 14 mph Precipitation ☐ No ☒ Yes Cloudy, light rain showers

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☒ No ☐

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples
	DRO, VOCs, Fe/Mn, Sulfate, Alkalinity, TKN, Nitrate/Nitrite	AK102, 8260C, 6010C, 300, 2320B, SM4500, 353.2	OT001-BLOMW07-091922 [primary] OT001-DSAMW02-091922 [primary] OT001-BLOMW06-091922 [primary] OT001-BLOMW06-091922-99 [duplicate] OT001-EQBK01-091922 [equipment blank] WP002-BLOMW01-091922 [primary] WP002-BLOMW01-091922-99 [duplicate]

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	UFP-QAPP	Groundwater sampling at Sites OT001 and WP002	4	NA
2.				
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	11.5
2.	Geologist	Sydney Souza	North Wind	11.5
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	23.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Borrowed vehicle	NA	6	0	
2.	1	YSI & Flow-through Cell	09/07/21	8	0	
3.	1	100' water meter	09/07/21	8	0	
4.	1	Monsoon pump	09/07/21	7	0	1
5.	1	Turbidity Meter	09/07/21	8	0	
6.	1	Marine battery	09/07/21	8	0	
7.	1	GAC	09/07/21	1.5	0	
8.						
9.						
10.						
11.						
			Total Hours	47.5	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

North Wind-EA JV, LLC

Daily Quality Control Report

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field team returned to monitoring well to DSA-MW-07 to begin purging. The marine battery is still not operating despite being charged overnight. Decision to power the monsoon pump from the vehicle. Begin purging and soon after, the pump malfunctioned and the well was pumped dry. The pump was pulled from well and replaced. Continued low-flow purging for 14 minute before being pumped dry again. Decision made to abandon until following morning and collect sample after well has recharged.

2 Field team returned to monitoring well BLO-MW-07 for the third time. A primary sample collected immediately from the water produced overnight.

3 Monsoon pump came back up well very oily; decontaminated pump several times.

4 Field team successfully collected a primary sample from monitoring well DSA-MW-02, a primary sample and a field duplicate sample at BLO-MW-06, an Equipment Blank sample, as well as a primary and field duplicate sample at BLO-MW-01.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/02/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
007	09/20/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 45° F Temp High 48° F Cloudy ☒ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 22 mph Precipitation ☐ No ☒ Yes Cloudy, light rain showers, windy

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☒ No ☐

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples
	DRO, VOCs, Fe/Mn, Sulfate, Alkalinity, TKN, Nitrate/Nitrite	AK102, 8260C, 6010C, 300, 2320B, SM4500, 353.2	OT001-DSAMW07-092022 [primary]
	DRO, BTEX, Fe/Mn, Sulfate, Alkalinity, TKN, Nitrate/Nitrite	AK102, 8260, 6010C, 300, 2320B, SM4500, 353.2	SS006-215MW12-092022 [primary] SS006-215MW12-092022-99 [duplicate] SS006-215MW12-092022-MS [matrix spike] SS006-215MW12-092022-MSD [matrix spike duplicate]

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	UFP-QAPP	Groundwater sampling at OT001 and SS006	2	
2.	2022 Sign Installation and Repair Plan	Replace signs at WP002	2	
3.	2022 Well Installation and Repair Plan	Replaced cap and lock at well 215-MW-08	1	
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	12.0
2.	Geologist	Sydney Souza	North Wind	12.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	24.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Borrowed vehicle	NA	6	0	
2.	1	YSI & Flow-through Cell	09/07/21	3	9	
3.	1	100' water meter	09/07/21	3	9	
4.	1	Monsoon pump	09/07/21	3	9	
5.	1	Turbidity Meter	09/07/21	3	9	
6.	1	Marine battery	09/07/21	3	9	
7.	1	GAC	09/07/21	0.5	11.5	
8.						
9.						
10.						
11.						
			Total Hours	21.5	56.5	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field team returned to monitoring well DSA-MW-07 for the third time. A primary sample is collected immediately from the recharged water.

2 Field team set up at SS006 FPC-215 wells near the airport. Discover well casings are 1.5” instead of 2” like the other wells. Onsite sampling pump is 2-inch. The only well at SS006 with a 2-in. well casing is 215-MW-12, which was sampled. The remaining wells will need to be revisited at a later date when a smaller diameter pump is acquired.

3 Signs installed at WP002.

4 Shipped all groundwater sampling equipment, tools and sample coolers from Port Heiden to King Salmon. From King Salmon, shipment to Anchorage if weather holds.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/02/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor’s Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
008	09/21/22	Port Heiden, AK (Souza/Carden)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 39° F Temp High 50° F Cloudy ☒ Partly Cloudy ☐ Clear ☐

Wind Speed Up to 38 mph Precipitation ☐ No ☒ Yes Cloudy, light rain showers, windy

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☒ Yes ☐ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☐ No ☒

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☐ No ☒

Have QA and QC samples been collected in the specified quantity? Yes ☐ No ☒

Have samples been properly labeled and packaged? Yes ☐ No ☒

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	2022 Well Installation and Repair Plan	Replaced caps and locks on 066-MW-05, 066-MW-07.	2	
2.				
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Geologist	Darion Carden	North Wind	12.0
2.	Geologist	Sydney Souza	North Wind	12.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	24.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented vehicle	NA	3	0	
2.	1	YSI & Flow-through Cell	09/07/21	0	0	
3.	1	100' water meter	09/07/21	0	0	
4.	1	Monsoon pump	09/07/21	0	0	
5.	1	Turbidity Meter	09/07/21	0	0	
6.	1	Marine battery	09/07/21	0	0	
7.	1	GAC	09/07/21	0	0	
8.						
9.						
10.						
11.						
			Total Hours	3	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field team returned to WP002 to finish installing two new signs on either side of WP002.

2 Field team performed minor well repairs at SS006 FPC-066 wells near the school.

3 Additional locks will need to be procured to secure wells; Well 066-MW-07 cap secured with ziptie.

4 Field team demobilized from site.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Darion Carden **Date** 11/02/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

Figure 1. Before well repair at Well ID 066-MW-07.

Figure 2. After well repair at 066-MW-07. Well cap was replaced. Rusted lock was removed. Cap is temporarily secured with ziptie until team returns with additional locks.

North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
009	12/05/22	Port Heiden, AK (Hansmeyer/Jennings)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 32° F Temp High 34° F Cloudy ☐ Partly Cloudy ☒ Clear ☐

Wind Speed 0-10 mph Precipitation ☐ No ☒ Yes

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☒ No ☐

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☐ Yes ☒ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference	Activity & Location	Quantity	Subcontractor

	(DFW #/Tech Spec #)			
1.	QAPP	Groundwater samples/Site	0	North Wind
2.		Paperwork/Home		
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Project Manager	Joseph Hansmeyer	North Wind	10.0
2.	Geologist II	Lauren Jennings	North Wind	10.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	20.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	12/05/22	2	0	
2.	1	YSI & Flow-through Cell	12/05/22	0	0	
3.	1	100' water meter	12/05/22	0	0	
4.	1	Bladder Pump	12/05/22	0	0	
5.	1	Turbidity Meter	12/05/22	0	0	
7.	1	GAC	12/05/22	0	0	
8.						
9.						
10.						
11.						
			Total Hours	2	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 The Field Team departed from Anchorage to Port Heiden through Lake Clarke Air.

2. Prior housing arrangements were secured through Scott Anderson of Port Heiden.

3. All cargo was transported via Lake Clarke Air. Field Team performed recon since daylight hours was extremely limited to begin as early as daylight allowed the following morning.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Joseph Hansmeyer **Date** 12/05/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
010	12/06/22	Port Heiden, AK (Hansmeyer/Jennings)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 29° F Temp High 34° F Cloudy ☐ Partly Cloudy ☒ Clear ☐

Wind Speed 0-10 mph Precipitation ☐ No ☒ Yes

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☒ No ☐

If yes, then complete the following:

	Type of test	Method/Matrix	Results
	Groundwater Sampling	GW/Grab	Pending Lab Results

Have Data Quality Objectives been achieved? N/A ☐ Yes ☒ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	QAPP & QAPP Update 1	Groundwater samples/Site		North Wind
2.	QAPP	LUC inspections/Site	0	North Wind
3.		Paperwork/Home		
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Project Manager	Joseph Hansmeyer	North Wind	10.0
2.	Geologist II	Lauren Jennings	North Wind	10.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	20.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	12/06/22	8	2	
2.	1	YSI & Flow-through Cell	12/06/22	6	4	
3.	1	100' water meter	12/06/22	1	9	
4.	1	Bladder Pump	12/06/22	6	4	
5.	1	Turbidity Meter	12/06/22	6	4	
7.	1	GAC	12/06/22	1	9	
8.						
9.						
10.						
11.						
			Total Hours	28	32	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 The Field Team successfully collected a primary, and duplicate sample from the first well at 215-MW-09. Samples were successfully collected from 215-MW-08, 066-MW-05, 066-MW-04, and 066-MW-06. A sample with MS/MSD was successfully collected from 066-MW-07.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Joseph Hansmeyer **Date** 12/06/22

Project Manager Renee LaFata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

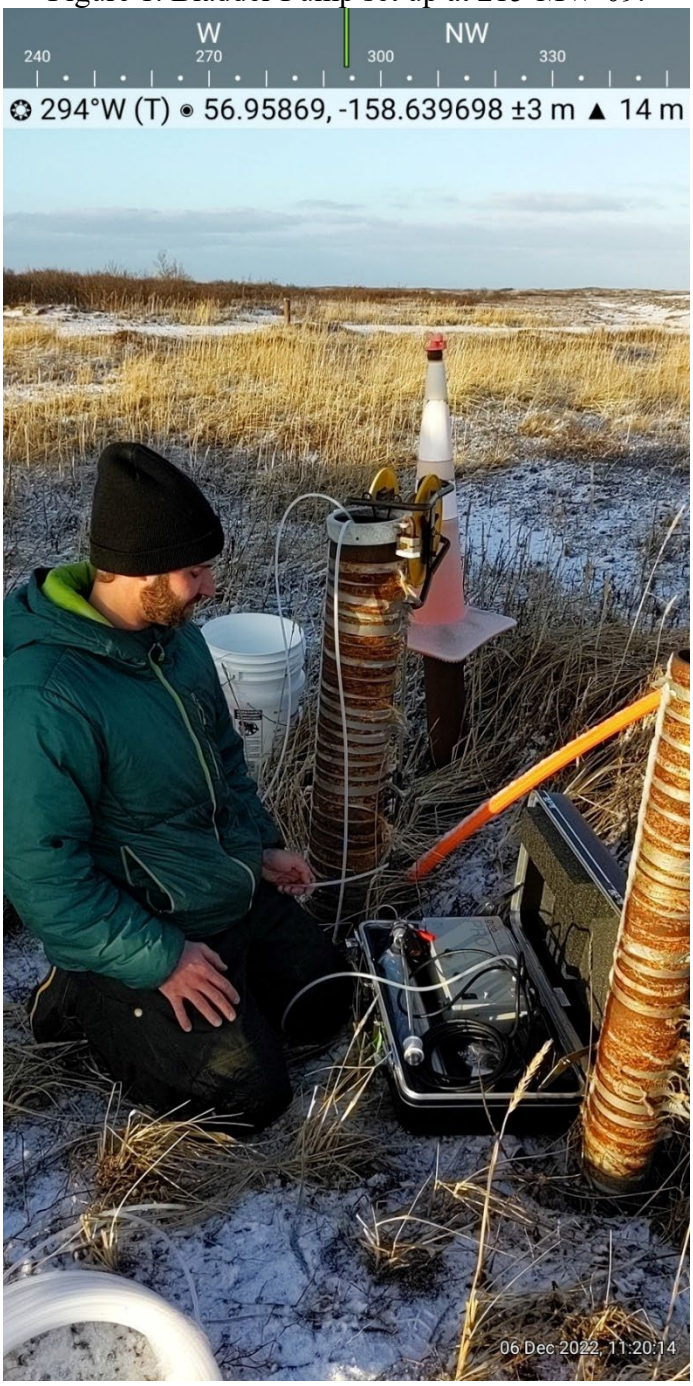
Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

Figure 1. Bladder Pump set up at 215-MW-09.



North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
011	12/07/22	Port Heiden, AK (Hansmeyer/Jennings)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 28° F Temp High 34° F Cloudy ☐ Partly Cloudy ☒ Clear ☐

Wind Speed 20-30 mph Precipitation ☐ No ☒ Yes Hail

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☐ Yes ☒ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference (DFW #/Tech Spec #)	Activity & Location	Quantity	Subcontractor
1.	QAPP & QAPP Update 1	Groundwater samples/Site	0	North Wind
2.		Paperwork/Home		
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Project Manager	Joseph Hansmeyer	North Wind	10.0
2.	Geologist II	Lauren Jennings	North Wind	10.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	20.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	12/05/22	4	0	
2.	1	YSI & Flow-through Cell	12/05/22	0	0	
3.	1	100' water meter	12/05/22	0	0	
4.	1	Bladder Pump	12/05/22	0	0	
5.	1	Turbidity Meter	12/05/22	0	0	
7.	1	GAC	12/05/22	0	0	
8.						
9.						
10.						
11.						
			Total Hours	4	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field Team went to perform final checks on well maintenance since extra day was scheduled in Port Heiden.

2. Field Team attempted to reschedule flight from Port Heiden to Anchorage on Wednesday, however weather prevented a flight out of Port Heiden early.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Joseph Hansmeyer **Date** 12/07/22

Project Manager Renee Lafata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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North Wind-EA JV, LLC

Daily Quality Control Report

W911KB20D0012/ W911KB-20-F-0120	North Wind-EA JV	611 CES S. ORC at Multiple Installations / 060068
Contract Number / Task Order Number	Contractor	Project Title / NWSS Project No.
012	12/08/22	Port Heiden, AK (Hansmeyer/Jennings)
CQC Report Number	Date or Time Period	Location and Team

I. Weather Conditions:

Temp Low 28° F Temp High 34° F Cloudy ☐ Partly Cloudy ☒ Clear ☐

Wind Speed 10-20 mph Precipitation ☐ No ☒ Yes Light Snow

II. Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed, and corrective action)

Preparatory ☐

Initial ☒

Follow-Up ☐

Was the construction deficiency tracking list updated this date? Yes ☐ No ☒

III. Was Field Sampling and Testing Performed This Date? Yes ☐ No ☒

If yes, then complete the following:

	Type of test	Method/Matrix	Results

Have Data Quality Objectives been achieved? N/A ☐ Yes ☒ No ☐

IV. Have Samples Been Collected for Laboratory Analysis? Yes ☐ No ☒

If yes, then complete the following:

	Type of Test	EPA Test Method/Matrix	Quantity of Samples

Have required amount of QC trip blanks and rinsates been achieved? Yes ☒ No ☐

Have appropriate QC laboratory tests been ordered? (matrix spikes, method blanks, surrogates, reference standards, etc.) Yes ☒ No ☐

Have QA and QC samples been collected in the specified quantity? Yes ☒ No ☐

Have samples been properly labeled and packaged? Yes ☒ No ☐

V. Health and Safety.

Worker protection levels this date: Level A ☐ Level B ☐ Level C ☐ Level D ☒

Was any work activity conducted within a confined space? Yes ☐ No ☒

Was any work activity conducted within an area determined to be immediately dangerous to life and health? Yes ☐ No ☒

Were approved decontamination procedures used on ~~workers and~~ equipment as required? Yes ☒ No ☐

Was a Job Safety Meeting held this date? Yes ☒ No ☐

Were there any lost time accidents this date? **(If YES, attach copy of completed accident report)** Yes ☐ No ☒

Was hazardous waste/material released into the environment? Yes ☐ No ☒

Safety comments: (Include any infractions of approved safety plan, and include instructions from Government personnel. Specify corrective action taken.)

VI. Work Activities Performed This Date.

	Reference	Activity & Location	Quantity	Subcontractor

	(DFW #/Tech Spec #)			
1.	QAPP	Groundwater samples/Site	0	North Wind
2.		Paperwork/Home		
3.				
4				
5				

VII. Labor & Manpower.

	Classification	Name	Employer	Hours
1.	Project Manager	Joseph Hansmeyer	North Wind	10.0
2.	Geologist II	Lauren Jennings	North Wind	10.0
3.				
4.				
5.				
6.				
7				
8				
9				
10				
			Total Hours	20.0

VIII. Equipment.

	No. of Units	Plant/Equipment	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
1.	1	Rented Vehicle	12/05/22	2	0	
2.	1	YSI & Flow-through Cell	12/05/22	0	0	
3.	1	100' water meter	12/05/22	0	0	
4.	1	Bladder Pump	12/05/22	0	0	
5.	1	Turbidity Meter	12/05/22	0	0	
7.	1	GAC	12/05/22	0	0	
8.						
9.						
10.						
11.						
			Total Hours	2	0	0

IX. Material Received to be Incorporated into Job. None ☒

	Acceptability	Stored Where?	Reference Plans/Drawings
1.			
2.			
3.			

X. Submittals Reviewed. None ☒

	Submittal No.	Spec/Plan Reference	By Whom	Action Taken
1.				
2.				
3.				

XI. Offsite Surveillance Activities. (include action taken) None ☒

XII. Instructions Given by the Government to the Contractor. (Include names, reactions, and remarks) Verbal ☐ Written ☐ None ☒

XIII. Work Progress.

1.	Are there any Contractor caused delays?	Yes ☐	No ☒
2.	Are there any Contractor-potential findings of fact?	Yes ☐	No ☒
3.	Are there any Government caused delays or potential finding of fact?	Yes ☐	No ☒
4.	Are there any Government-potential findings of fact?	Yes ☐	No ☒
5.	Are there any unforeseeable or weather related delays? Fog, lightning, hail, numerous tornado warnings	Yes ☒	No ☐

XIV. Deficiency List.

Tracking No.	Deficiencies Identified (Not corrected by COB)	Tracking No.	Deficiencies Corrected (From Deficiency Tracking List)
	None		

XV. Remarks. (Include any visitors to project and miscellaneous remarks pertinent to work.)

1 Field Team secured flight back to Anchorage from Port Heiden through Lake Clarke Air.

The above report is complete and correct, and all work reported is believed, to the best of my knowledge, to be in compliance with contract plans and specifications, except as noted above.

CQC Site Manager Joseph Hansmeyer **Date** 12/08/22

Project Manager Renee Lafata **Date** _____

XVI. Government Quality Assurance Comments. (if applicable)

Concurs with the QC report? Yes ☐ No ☐

Additional comments or exceptions:

QAR Signature _____ **Date** _____

Supervisor's Initial _____ **Date** _____

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APPENDIX C

Chemical Data Tables

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Table C- 1. 2022 Groundwater Sample Summary.

Location ID	Field Sample ID	Sample Depth	Collected	Analytical Method	Matrix	Container	NPDL Number	QC Type	Lab	SDG	Preservation	Cooler Name	Sampler	TAT
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, HNO3	URSULA	SS	Standard
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
RRS-MW06	OT001-RRSMW06-091722	NA	9/17/22 17:48	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, HNO3	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
RRS-MW05	OT001-RRSMW05-091822	NA	9/18/22 12:03	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, HNO3	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW01	OT001-DSAMW01-091822	NA	9/18/22 12:55	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, HNO3	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW05	OT001-DSAMW05-091822	NA	9/18/22 15:05	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, HNO3	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
GLO-MW04	OT001-GLOMW04-091822	NA	9/18/22 16:16	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, H2SO4	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C, HNO3	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
DSA-MW06	OT001-DSAMW06-091822	NA	9/18/22 17:30	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540980	0-6C	URSULA	SS	Standard

Location ID	Field Sample ID	Sample Depth	Collected	Analytical Method	Matrix	Container	NPDL Number	QC Type	Lab	SDG	Preservation	Cooler Name	Sampler	TAT
	OT001-TRIPBLANK-HCL-01_091822	NA	9/18/22 17:40	SW8260D	WG	40mL Amber Glass	21-034	TB	Pace Analytical	L1540980	0-6C, HCl	URSULA	SS	Standard
	SS006-TRIPBLANK-HCL-01	NA	9/19/22 9:00	SW8260D	WG	40mL Amber Glass	21-034	TB	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
	WP002-TRIPBLANK-HCL-01_09192022	NA	9/19/22 9:00	SW8260D	WG	40mL Amber Glass	21-034	TB	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW07	OT001-BLOMW07-091922	NA	9/19/22 11:30	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW05	OT001-BLOMW05-091922	NA	9/19/22 12:10	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
DSA-MW02	OT001-DSAMW02-091922	NA	9/19/22 13:15	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922	NA	9/19/22 14:05	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	AK102	WG	100mL Amber Glass	21-034	FD	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	E351.2	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	E353.2	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	SM2320B	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	SW6010D	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	SW8260D	WG	40mL Amber Glass	21-034	FD	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW06	OT001-BLOMW06-091922-99	NA	9/19/22 14:10	SW9056	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
	OT001-EQBLK01-091922	NA	9/19/22 14:30	AK102	WG	100mL Amber Glass	21-034	EB	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
	OT001-EQBLK01-091922	NA	9/19/22 14:30	E351.2	WG	250mL HDPE	21-034	EB	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
	OT001-EQBLK01-091922	NA	9/19/22 14:30	E353.2	WG	250mL HDPE	21-034	EB	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
	OT001-EQBLK01-091922	NA	9/19/22 14:30	SM2320B	WG	250mL HDPE	21-034	EB	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard

Location ID	Field Sample ID	Sample Depth	Collected	Analytical Method	Matrix	Container	NPDL Number	QC Type	Lab	SDG	Preservation	Cooler Name	Sampler	TAT
	OT001-EQBLK01-091922	NA	9/19/22 14:30	SW6010D	WG	250mL HDPE	21-034	EB	Pace Analytical	L1540948	0-6C, HNO3	CRUELLA	SS	Standard
	OT001-EQBLK01-091922	NA	9/19/22 14:30	SW8260D	WG	40mL Amber Glass	21-034	EB	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
	OT001-EQBLK01-091922	NA	9/19/22 14:30	SW9056	WG	250mL HDPE	21-034	EB	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922	NA	9/19/22 15:20	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	AK102	WG	100mL Amber Glass	21-034	FD	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	E351.2	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	E353.2	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C, H2SO4	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	SM2320B	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	SW6010D	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C, HNO3	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	SW8260D	WG	40mL Amber Glass	21-034	FD	Pace Analytical	L1540953	0-6C, HCl	MALEFICIENT	SS	Standard
BLO-MW01	WP002-BLOMW01-091922-99	NA	9/19/22 15:25	SW9056	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540953	0-6C	MALEFICIENT	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C, HNO3	CRUELLA	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
DSA-MW07	OT001-DSAMW07-092022	NA	9/20/22 9:15	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	E351.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	E353.2	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	SM2320B	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	SW6010D	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C, HNO3	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022	NA	9/20/22 10:20	SW9056	WG	250mL HDPE	21-034	N	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	AK102	WG	100mL Amber Glass	21-034	FD	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	E351.2	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	E353.2	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540948	0-6C, H2SO4	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	SM2320B	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	SW6010D	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540948	0-6C, HNO3	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	SW8260D	WG	40mL Amber Glass	21-034	FD	Pace Analytical	L1540948	0-6C, HCl	CRUELLA	SS	Standard
215-MW-12	SS006-215MW12-092022-99	NA	9/20/22 10:25	SW9056	WG	250mL HDPE	21-034	FD	Pace Analytical	L1540948	0-6C	CRUELLA	SS	Standard
	SS006-TRIPBLANK-HCL-01-120622	NA	12/6/22 9:00	SW8260D	WG	40mL Amber Glass	21-034	TB	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
215-MW-09	SS006-215MW09-120622	NA	12/6/22 11:34	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
215-MW-09	SS006-215MW09-120622	NA	12/6/22 11:34	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
215-MW-09	SS006-215MW99-120622	NA	12/6/22 11:35	AK102	WG	100mL Amber Glass	21-034	FD	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
215-MW-09	SS006-215MW99-120622	NA	12/6/22 11:35	SW8260D	WG	40mL Amber Glass	21-034	FD	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard

Location ID	Field Sample ID	Sample Depth	Collected	Analytical Method	Matrix	Container	NPDL Number	QC Type	Lab	SDG	Preservation	Cooler Name	Sampler	TAT
215-MW-08	SS006-215MW08-120622	NA	12/6/22 12:42	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
215-MW-08	SS006-215MW08-120622	NA	12/6/22 12:42	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-05	SS006-066MW05-120622	NA	12/6/22 14:22	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-05	SS006-066MW05-120622	NA	12/6/22 14:22	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-04	SS006-066MW04-120622	NA	12/6/22 15:14	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-04	SS006-066MW04-120622	NA	12/6/22 15:14	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-07	SS006-066MW07-120622	NA	12/6/22 15:55	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-07	SS006-066MW07-120622	NA	12/6/22 15:55	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-06	SS006-066MW06-120622	NA	12/6/22 16:50	AK102	WG	100mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard
066-MW-06	SS006-066MW06-120622	NA	12/6/22 16:50	SW8260D	WG	40mL Amber Glass	21-034	N	Pace Analytical	L1566427	0-6C, HCl	Maisy+Roxy	LJ	Standard

Notes:
C = Degree Celsius
EB = Equipment blank
FD = Field Duplicate
H2SO4 = Sulfuric acid
HCl = Hydrochloric acid
HDPE = High-density polyethylene
HNO3 = Nitric acid
ID = Identification
LJ = L. Jennings
mL = Milliliter
MS/MSD = Matrix spike/matrix spike duplicate
N = Normal
NA = Not Applicable
NPDL = North Pacific Division Laboratory
QC = Quality Control
SDG = sample delivery group
SS = S. Souza
TAT = Turnaround time
TB = Trip Blank
WG = Groundwater

Table C- 2. Summary of 2022 Analytical Results for OT001 and WP002 Groundwater Samples – Sample Delivery Group L1540953.

			Location ID	BLO-MW01	BLO-MW01	BLO-MW05	BLO-MW06	BLO-MW06	BLO-MW07	DSA-MW02	
			Sample ID	WP002-BLOMW01-091922	WP002-BLOMW01-091922-99	OT001-BLOMW05-091922	OT001-BLOMW06-091922	OT001-BLOMW06-091922-99	OT001-BLOMW07-091922	OT001-DSAMW02-091922	WP002-TRIPBLANK-HCL-01
			Laboratory Sample ID	L1540953-06	L1540953-07	L1540953-02	L1540953-04	L1540953-05	L1540953-01	L1540953-03	L1540953-08
			Collected Date / Time	9/19/22 15:20	9/19/22 15:25	9/19/22 12:10	9/19/22 14:05	9/19/22 14:10	9/19/22 11:30	9/19/22 13:15	9/19/22 9:00
			Matrix	WG	WG	WG	WG	WG	WG	WG	WG
Analytes	**Analytical Method**	**Units**	**PAL**		FD to WP002-BLOMW01-091922			FD to OT001-BLOMW06-091922			Trip Blank
TPH Diesel Range Organics (C10-C25)	AK102	ug/l	1500	13700 [400]	13600 [400]	ND [400]	ND [400]	ND [400]	ND [400]	ND [400]	–
Total Kjeldahl Nitrogen	E351.2	ug/l	–	612 [300] QL,QN	639 [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN	172 [300] J,QL,QN	–
Nitrate-Nitrite	E353.2	ug/l	–	ND [100]	ND [100]	776 [100]	60.5 [100] J	58.6 [100] J	69.0 [100] J	1830 [100]	–
Alkalinity, bicarbonate	SM2320B	ug/l	–	961000 [10000]	962000 [10000]	67500 [10000]	48500 [10000]	43300 [10000]	48300 [10000]	123000 [10000]	–
Alkalinity, carbonate	SM2320B	ug/l	–	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	–
Alkalinity, hydroxide	SM2320B	ug/l	–	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	–
Alkalinity, total	SM2320B	ug/l	–	961000 [10000]	962000 [10000]	67500 [10000]	48500 [10000]	43300 [10000]	48300 [10000]	123000 [10000]	–
Iron, total	SW6010D	ug/l	–	7690 [50.0] QN	6910 [50.0] QN	24800 [50.0] QN	11700 [50.0] QN	7580 [50.0] QN	11000 [50.0] QN	3720 [50.0] QN	–
Manganese	SW6010D	ug/l	430	15600 [25.0] QN	17900 [25.0] QN	748 [5.00] QN	377 [5.00] QN	173 [5.00] QN	283 [5.00] QN	62.1 [5.00] QN	–
Acetone	SW8260D	ug/l	14000	ND [1250] H,QN	ND [625] H,QN	14.5 [25.0] H,QN,B,J	13.2 [25.0] H,QN,B,J	15.3 [25.0] H,QN,B,J	14.8 [25.0] H,QN,B,J	12.7 [25.0] H,QN,B,J	15.3 [25.0] H,QN,QL,B,J
Acrolein	SW8260D	ug/l	–	ND [1250]	ND [625]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]
Acrylonitrile	SW8260D	ug/l	–	ND [250]	ND [125]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]
Benzene	SW8260D	ug/l	4.6	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	0.269 [0.500] J
Bromobenzene	SW8260D	ug/l	62	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Bromodichloromethane	SW8260D	ug/l	1.3	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Bromoform	SW8260D	ug/l	33	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Bromomethane	SW8260D	ug/l	7.5	ND [100]	ND [50.0]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]
n-Butylbenzene	SW8260D	ug/l	1000	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
sec-Butylbenzene	SW8260D	ug/l	2000	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
tert-Butylbenzene	SW8260D	ug/l	690	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Carbon Tetrachloride	SW8260D	ug/l	4.6	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Chlorobenzene	SW8260D	ug/l	78	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Dibromochloromethane	SW8260D	ug/l	8.7	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Chloroethane	SW8260D	ug/l	21000	ND [100]	ND [50.0]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]
Chloroform	SW8260D	ug/l	2.2	ND [100]	ND [50.0]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	0.185 [2.00] J	ND [2.00]
Chloromethane	SW8260D	ug/l	190	ND [100] H	ND [50.0] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H,QL
2-Chlorotoluene	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
4-Chlorotoluene	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,2-Dibromoethane	SW8260D	ug/l	0.075	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,2-dibromo-3-chloropropane	SW8260D	ug/l	–	ND [100] H,QN	ND [50.0] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN,QL
Dibromomethane	SW8260D	ug/l	8.3	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,2-Dichlorobenzene	SW8260D	ug/l	300	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,3-Dichlorobenzene	SW8260D	ug/l	300	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,4-Dichlorobenzene	SW8260D	ug/l	4.8	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Dichlorodifluoromethane	SW8260D	ug/l	200	ND [100]	ND [50.0]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]
1,1-Dichloroethane	SW8260D	ug/l	28	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,2-Dichloroethane	SW8260D	ug/l	1.7	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,1-Dichloroethene	SW8260D	ug/l	280	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]

			Location ID	BLO-MW01	BLO-MW01	BLO-MW05	BLO-MW06	BLO-MW06	BLO-MW07	DSA-MW02	
			Sample ID	WP002-BLOMW01-091922	WP002-BLOMW01-091922-99	OT001-BLOMW05-091922	OT001-BLOMW06-091922	OT001-BLOMW06-091922-99	OT001-BLOMW07-091922	OT001-DSAMW02-091922	WP002-TRIPBLANK-HCL-01
			Laboratory Sample ID	L1540953-06	L1540953-07	L1540953-02	L1540953-04	L1540953-05	L1540953-01	L1540953-03	L1540953-08
			Collected Date / Time	9/19/22 15:20	9/19/22 15:25	9/19/22 12:10	9/19/22 14:05	9/19/22 14:10	9/19/22 11:30	9/19/22 13:15	9/19/22 9:00
			Matrix	WG	WG	WG	WG	WG	WG	WG	WG
Analytes	**Analytical Method**	**Units**	**PAL**		FD to WP002-BLOMW01-091922			FD to OT001-BLOMW06-091922			Trip Blank
cis-1,2-Dichloroethene	SW8260D	ug/l	36	12.2 [25.0] J	12.3 [12.5] J	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
trans-1,2-Dichloroethene	SW8260D	ug/l	360	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,2-Dichloropropane	SW8260D	ug/l	8.2	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,3-Dichloropropane	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
2,2-Dichloropropane	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,1-Dichloropropene	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
cis-1,3-Dichloropropene	SW8260D	ug/l	4.7	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
trans-1,3-Dichloropropene	SW8260D	ug/l	4.7	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Diisopropyl Ether	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Ethylbenzene	SW8260D	ug/l	15	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Hexachloro-1,3-butadiene	SW8260D	ug/l	1.4	ND [37.5] H	ND [18.8] H	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750] H,QL
Isopropylbenzene	SW8260D	ug/l	450	ND [25.0]	5.02 [12.5] J	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
4-Isopropyltoluene	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
2-Butanone	SW8260D	ug/l	5600	ND [250]	ND [125]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]
Methylene chloride	SW8260D	ug/l	110	ND [100]	ND [50.0]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]
4-Methyl-2-Pentanone	SW8260D	ug/l	6300	ND [250] H	ND [125] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H,QL
Methyl Tert Butyl Ether (MTBE)	SW8260D	ug/l	140	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Naphthalene	SW8260D	ug/l	1.7	ND [100]	ND [50.0]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]
n-Propylbenzene	SW8260D	ug/l	660	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Styrene	SW8260D	ug/l	1200	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,1,1,2-Tetrachloroethane	SW8260D	ug/l	5.7	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,1,2,2-Tetrachloroethane	SW8260D	ug/l	0.76	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Tetrachloroethene	SW8260D	ug/l	41	ND [30.0]	ND [15.0]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]
Toluene	SW8260D	ug/l	1100	ND [30.0]	ND [15.0]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]
1,2,3-Trichlorobenzene	SW8260D	ug/l	7	ND [25.0] QL	ND [12.5] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL
1,2,4-Trichlorobenzene	SW8260D	ug/l	4	ND [50.0] H	ND [25.0] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H,QL
1,2,3-Trimethylbenzene	SW8260D	ug/l	–	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,2,4-Trimethylbenzene	SW8260D	ug/l	56	ND [50.0]	ND [25.0]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]
1,3,5-Trimethylbenzene	SW8260D	ug/l	60	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
1,1,1-Trichloroethane	SW8260D	ug/l	8000	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	1.19 [0.500]	ND [0.500]
1,1,2-Trichloroethane	SW8260D	ug/l	0.41	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Trichloroethene	SW8260D	ug/l	2.8	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500] H,QL	0.572 [0.500] H,J	ND [0.500]	410 [5.00] H	ND [0.500]
Trichlorofluoromethane	SW8260D	ug/l	5200	ND [100] H	ND [50.0] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	0.924 [2.00] H,J	ND [2.00] H,QL
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260D	ug/l	10000	ND [25.0] QN	ND [12.5] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN
1,2,3-Trichloropropane	SW8260D	ug/l	0.0075	ND [50.0]	ND [25.0]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]
Vinyl chloride	SW8260D	ug/l	0.19	ND [25.0]	ND [12.5]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]
Xylenes, (Total)	SW8260D	ug/l	190	ND [75.0]	ND [37.5]	ND [1.50]	0.190 [1.50] B,J	ND [1.50]	ND [1.50]	ND [1.50]	0.188 [1.50] J
Sulfate	SW9056	ug/l	–	2550 [2500] J	2190 [2500] J	3200 [2500] J	4600 [2500] J	5380 [2500]	3090 [2500] J	8120 [2500]	–

Notes

ADEC – 18 AAC 75 Table C Groundwater Cleanup Level (ADEC 2023)
[ ] – Laboratory Limit of Detection (LOD)
Solid Shade indicates cleanup level exceedance
ND – Not detected above the LOD
WG - Groundwater

Data Flag Explanations

Analyte detected at a concentration above the cleanup level.
Laboratory LOD is greater than the cleanup level.

Flags may be combined when more than one quality deficiency exists.

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Table C- 3. Summary of 2022 Analytical Results for OT001 and WP002 Groundwater Samples – Sample Delivery Groups L1540980 and L1540948.

			Location ID	DSA-MW01	DSA-MW05	DSA-MW06	GLO-MW04	RRS-MW05	RRS-MW06		DSA-MW07	
			Sample ID	OT001-DSAMW01-091822	OT001-DSAMW05-091822	OT001-DSAMW06-091822	OT001-GLOMW04-091822	OT001-RRSMW05-091822	OT001-RRSMW06-091722	OT001-TRIPBLANK-HCL-01	OT001-DSAMW07-092022	OT001-EQBLK01-091922
			Laboratory Sample ID	L1540980-03	L1540980-04	L1540980-06	L1540980-05	L1540980-02	L1540980-01	L1540980-07	L1540948-02	L1540948-01
			Collected Date / Time	9/18/22 12:55	9/18/22 15:05	9/18/22 17:30	9/18/22 16:16	9/18/22 12:03	9/17/22 17:48	9/18/22 17:40	9/20/22 9:15	9/19/22 14:30
			Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG
Analytes	**Analytical Method**	**Units**	**Project Action Limits**							Trip blank		Equipment Blank
TPH Diesel Range Organics (C10-C25)	AK102	ug/l	1500	ND [400]	ND [400]	ND [400]	ND [400]	ND [400]	ND [400]		ND [400]	ND [400]
Total Kjeldahl Nitrogen	E351.2	ug/l	–	ND [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN	ND [300] QL,QN		ND [300] QL,QN	ND [300] QL,QN
Nitrate-Nitrite	E353.2	ug/l	–	642 [100]	ND [100]	ND [100]	425 [100]	62.1 [100] J	1050 [100]		82.4 [100] J	ND [100]
Alkalinity, bicarbonate	SM2320B	ug/l	–	88800 [10000]	68300 [10000]	58700 [10000]	64200 [10000]	56200 [10000]	109000 [10000]		83600 [10000]	ND [10000]
Alkalinity, carbonate	SM2320B	ug/l	–	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]		ND [10000]	ND [10000]
Alkalinity, hydroxide	SM2320B	ug/l	–	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]	ND [10000]		ND [10000]	ND [10000]
Alkalinity, total	SM2320B	ug/l	–	88800 [10000]	68300 [10000]	58700 [10000]	64200 [10000]	56200 [10000]	109000 [10000]		83600 [10000]	ND [10000]
Iron, total	SW6010D	ug/l	–	35.6 [50.0] J,B	573 [50.0]	3050 [50.0]	556 [50.0]	833 [50.0]	100 [50.0] B		2430 [50.0]	ND [50.0]
Manganese	SW6010D	ug/l	430	1.57 [5.00] J,B	64.6 [5.00]	211 [5.00]	27.9 [5.00]	10.6 [5.00]	2.56 [5.00] J,B		59.9 [5.00]	ND [5.00]
Acetone	SW8260D	ug/l	14000	12.9 [25.0] H,QN,B,J	11.5 [25.0] H,QN,B,J	11.4 [25.0] H,QN,B,J	11.5 [25.0] H,QN,B,J	13.3 [25.0] H,QN,B,J	13.1 [25.0] H,QN,B,QH,J	ND [25.0]	ND [25.0] H,QN	15.9 [25.0] H,QN,B,J
Acrolein	SW8260D	ug/l	–	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0]	ND [25.0] H,QN	ND [25.0]
Acrylonitrile	SW8260D	ug/l	–	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00] H,QN	ND [5.00]
Benzene	SW8260D	ug/l	4.6	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	3.46 [0.500]
Bromobenzene	SW8260D	ug/l	62	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Bromodichloromethane	SW8260D	ug/l	1.3	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Bromoform	SW8260D	ug/l	33	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Bromomethane	SW8260D	ug/l	7.5	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	R	ND [2.00]
n-Butylbenzene	SW8260D	ug/l	1000	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
sec-Butylbenzene	SW8260D	ug/l	2000	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
tert-Butylbenzene	SW8260D	ug/l	690	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Carbon Tetrachloride	SW8260D	ug/l	4.6	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Chlorobenzene	SW8260D	ug/l	78	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Dibromochloromethane	SW8260D	ug/l	8.7	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Chloroethane	SW8260D	ug/l	21000	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00] H,QN	ND [2.00]
Chloroform	SW8260D	ug/l	2.2	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00] H	0.740 [2.00] J
Chloromethane	SW8260D	ug/l	190	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H
2-Chlorotoluene	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
4-Chlorotoluene	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,2-Dibromoethane	SW8260D	ug/l	0.075	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,2-dibromo-3-chloropropane	SW8260D	ug/l	–	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN	ND [2.00] H,QN
Dibromomethane	SW8260D	ug/l	8.3	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,2-Dichlorobenzene	SW8260D	ug/l	300	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,3-Dichlorobenzene	SW8260D	ug/l	300	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,4-Dichlorobenzene	SW8260D	ug/l	4.8	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Dichlorodifluoromethane	SW8260D	ug/l	200	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00] H	ND [2.00]

			Location ID	DSA-MW01	DSA-MW05	DSA-MW06	GLO-MW04	RRS-MW05	RRS-MW06		DSA-MW07	
			Sample ID	OT001-DSAMW01-091822	OT001-DSAMW05-091822	OT001-DSAMW06-091822	OT001-GLOMW04-091822	OT001-RRSMW05-091822	OT001-RRSMW06-091722	OT001-TRIPBLANK-HCL-01	OT001-DSAMW07-092022	OT001-EQBLK01-091922
			Laboratory Sample ID	L1540980-03	L1540980-04	L1540980-06	L1540980-05	L1540980-02	L1540980-01	L1540980-07	L1540948-02	L1540948-01
			Collected Date / Time	9/18/22 12:55	9/18/22 15:05	9/18/22 17:30	9/18/22 16:16	9/18/22 12:03	9/17/22 17:48	9/18/22 17:40	9/20/22 9:15	9/19/22 14:30
			Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG
Analytes	**Analytical Method**	**Units**	**Project Action Limits**							Trip blank		Equipment Blank
1,1-Dichloroethane	SW8260D	ug/l	28	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,2-Dichloroethane	SW8260D	ug/l	1.7	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,1-Dichloroethene	SW8260D	ug/l	280	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
cis-1,2-Dichloroethene	SW8260D	ug/l	36	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
trans-1,2-Dichloroethene	SW8260D	ug/l	360	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,2-Dichloropropane	SW8260D	ug/l	8.2	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,3-Dichloropropane	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
2,2-Dichloropropane	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,1-Dichloropropene	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
cis-1,3-Dichloropropene	SW8260D	ug/l	4.7	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
trans-1,3-Dichloropropene	SW8260D	ug/l	4.7	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Diisopropyl Ether	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H,QN	ND [0.500]
Ethylbenzene	SW8260D	ug/l	15	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	2.82 [0.500]
Hexachloro-1,3-butadiene	SW8260D	ug/l	1.4	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750] H	ND [0.750]	ND [0.750] H	ND [0.750] H
Isopropylbenzene	SW8260D	ug/l	450	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
4-Isopropyltoluene	SW8260D	ug/l		ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
2-Butanone	SW8260D	ug/l	5600	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00] H,QN	ND [5.00]
Methylene chloride	SW8260D	ug/l	110	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00] H	ND [2.00]
4-Methyl-2-Pentanone	SW8260D	ug/l	6300	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H	ND [5.00] H,QN	ND [5.00] H
Methyl Tert Butyl Ether (MTBE)	SW8260D	ug/l	140	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Naphthalene	SW8260D	ug/l	1.7	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00]	ND [2.00] H,QN,QL	ND [2.00]
n-Propylbenzene	SW8260D	ug/l	660	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	0.162 [0.500] J
Styrene	SW8260D	ug/l	1200	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,1,1,2-Tetrachloroethane	SW8260D	ug/l	5.7	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,1,2,2-Tetrachloroethane	SW8260D	ug/l	0.76	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H,QN	ND [0.500]
Tetrachloroethene	SW8260D	ug/l	41	ND [0.600]	ND [0.600]	0.521 [0.600] J	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600] H	ND [0.600]
Toluene	SW8260D	ug/l	1100	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	0.285 [0.600] H,QH,J	22.9 [0.600]
1,2,3-Trichlorobenzene	SW8260D	ug/l	7	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] QL	ND [0.500] H,QN	ND [0.500] QL
1,2,4-Trichlorobenzene	SW8260D	ug/l	4	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H	ND [1.00] H,QN	ND [1.00] H
1,2,3-Trimethylbenzene	SW8260D	ug/l	–	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,2,4-Trimethylbenzene	SW8260D	ug/l	56	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00] H	0.365 [1.00] J
1,3,5-Trimethylbenzene	SW8260D	ug/l	60	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,1,1-Trichloroethane	SW8260D	ug/l	8000	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
1,1,2-Trichloroethane	SW8260D	ug/l	0.41	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Trichloroethene	SW8260D	ug/l	2.8	10.5 [0.500]	3.30 [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Trichlorofluoromethane	SW8260D	ug/l	5200	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00] H	ND [2.00]	ND [2.00] H	ND [2.00] H

			Location ID	DSA-MW01	DSA-MW05	DSA-MW06	GLO-MW04	RRS-MW05	RRS-MW06		DSA-MW07	
			Sample ID	OT001-DSAMW01-091822	OT001-DSAMW05-091822	OT001-DSAMW06-091822	OT001-GLOMW04-091822	OT001-RRSMW05-091822	OT001-RRSMW06-091722	OT001-TRIPBLANK-HCL-01	OT001-DSAMW07-092022	OT001-EQBLK01-091922
			Laboratory Sample ID	L1540980-03	L1540980-04	L1540980-06	L1540980-05	L1540980-02	L1540980-01	L1540980-07	L1540948-02	L1540948-01
			Collected Date / Time	9/18/22 12:55	9/18/22 15:05	9/18/22 17:30	9/18/22 16:16	9/18/22 12:03	9/17/22 17:48	9/18/22 17:40	9/20/22 9:15	9/19/22 14:30
			Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG
Analytes	**Analytical Method**	**Units**	**Project Action Limits**							Trip blank		Equipment Blank
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260D	ug/l	10000	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] QN	ND [0.500] H	ND [0.500] QN
1,2,3-Trichloropropane	SW8260D	ug/l	0.0075	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00] H,QN	ND [1.00]
Vinyl chloride	SW8260D	ug/l	0.19	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H	ND [0.500]
Xylenes (Total)	SW8260D	ug/l	190	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50] H	9.44 [1.50]
Sulfate	SW9056	ug/l	–	6390 [2500]	12700 [2500]	4400 [2500] J	3790 [2500] J	3320 [2500] J	4560 [2500] J		3380 [2500] J	ND [2500]

Notes

ADEC – 18 AAC 75 Table C Groundwater Cleanup Level (ADEC 2023)
[ ] – Laboratory Limit of Detection (LOD)
Solid Shade indicates cleanup level exceedance
ND – Not detected above the LOD
WG - Groundwater

Data Flag Explanations

	Analyte detected at a concentration above the cleanup level.
	Laboratory LOD is greater than the cleanup level.
Qualifier	**Definition**
B	The same analyte is found in the associated blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
J	The identification of the analyte is acceptable; the reported value is an estimate.
QH	Analyte result is considered an estimated value biased high due to a quality control failure.
QL	Analyte result is considered an estimated value biased low due to a quality control failure.
QN	Analyte result is considered an estimated value with unknown bias due to a quality control failure.
R	Analyte result is rejected – result is not usable. Note that “R” replaces the chemical result (no result shall be reported with a “R” flag).

Flags may be combined when more than one quality deficiency exists.

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Table C- 4. Summary of 2022 Analytical Results for SS006 Groundwater Samples – Sample Delivery Groups L1566427 and L1540948.

				Location ID	066-MW-04	066-MW-05	066-MW-06	066-MW-07	215-MW-08	215-MW-09	215-MW-09	215-MW-12	215-MW-12		
				Sample ID	SS006-066MW04-120622	SS006-066MW05-120622	SS006-066MW06-120622	SS006-066MW07-120622	SS006-215MW08-120622	SS006-215MW09-120622	SS006-215MW99-120622	SS006-215MW12-092022	SS006-215MW12-092022-99	SS006-TRIPBLANK-HCL-01	SS006-TRIPBLANK-HCL-01
				Sample Delivery Group	L1566427	L1566427	L1566427	L1566427	L1566427	L1566427	L1566427	L1540948	L1540948	L1566427	L1540948
				Laboratory Sample ID	L1566427-07	L1566427-06	L1566427-02	L1566427-08	L1566427-05	L1566427-03	L1566427-04	L1540948-03	L1540948-04	L1566427-01	L1540948-05
				Collection Date/Time	12/6/22 15:14	12/6/22 14:22	12/6/22 16:50	12/6/22 15:55	12/6/22 12:42	12/6/22 11:34	12/6/22 11:35	9/20/22 10:20	9/20/22 10:25	12/6/22 9:00	9/19/22 9:00
				Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	TB
Analytes	**Analytical Method**	**Units**	**ADEC**										FD to SS006-215MW12-092022	Trip Blank	Trip Blank
TPH Diesel Range Organics (C10-C25)	AK102	ug/l	1500	ND [400]	2410 [400] QL	ND [400]	ND [400]	ND [400]	ND [400]	—	ND [400]	ND [400]	—	—
Benzene	SW8260D	ug/l	4.6	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] QL	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H
Ethylbenzene	SW8260D	ug/l	15	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500] H
Toluene	SW8260D	ug/l	1100	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600]	ND [0.600] H
Xylenes (Total)	SW8260D	ug/l	190	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50]	ND [1.50] H

Notes

ADEC – 18 AAC 75 Table C Groundwater Cleanup Level (ADEC 2023)
[ ] – Laboratory Limit of Detection (LOD)
Solid Shade indicates cleanup level exceedance
ND – Not detected above the LOD
WG - Groundwater

Data Flag Explanations

	Analyte detected at a concentration above the cleanup level.
	Laboratory LOD is greater than the cleanup level.

Qualifier	**Definition**
H	Analyte result is considered a low estimate due to holding time exceedance.
QL	Analyte result is considered an estimated value biased low due to a quality control failure.

Flags may be combined when more than one quality deficiency exists.

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APPENDIX D

Data Usability Assessment Report and ADEC Laboratory Data Review Checklist

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ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Sherrie Robinson Lyndsi Bourne	**CS Site Name:**	Port Heiden RRS	**Lab Name:**	Pace Analytical
Title:	Staff Scientist	**ADEC File No.:**	OT001: 2637.38.002.05 SS006: 2637.38.002.02 NPDL 21-034	**Lab Report No.:**	L1540948
Consulting Firm:	North Wind Site Services	**Hazard ID No.:**	OT001: 185 SS006: 179	**Lab Report Date:**	10/27/2022

Note: *Any N/A or No box checked must have an explanation in the comments box.*

1. **Laboratory**

   a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
   Yes ☒ No ☐ N/A ☐
   Comments: Pace analytical (Mount Juliet, TN) performed the analyses of these samples.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
   Yes ☐ No ☐ N/A ☒
   Comments: Samples were not subcontracted.

2. **Chain of Custody (CoC)**

   a. Is the CoC information completed, signed, and dated (including released/received by)?
   Yes ☒ No ☐ N/A ☐
   Comments: Click or tap here to enter text.

   b. Were the correct analyses requested?
   Yes ☒ No ☐ N/A ☐
   Analyses requested: AK 102, 8260D, USEPA 6010D, 351.2, 353.2, 9056A, SM 2320B
   Comments: Click or tap here to enter text.

3. **Laboratory Sample Receipt Documentation**

   a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?
   Yes ☒ No ☐ N/A ☐

Cooler temperature(s): 4.7°C
Sample temperature(s): Click or tap here to enter text.
Comments: Click or tap here to enter text.

b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?
Yes ☒ No ☐ N/A ☐
Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?
Yes ☐ No ☐ N/A ☒
Comments: No discrepancies were noted.

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

4. Case Narrative

a. Is the case narrative present and understandable?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are there discrepancies, errors, or QC failures identified by the lab?
Yes ☒ No ☐ N/A ☐
Comments: The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values- L1540948-01, 8260D
The sample matrix interfered with the ability to make any accurate determination; spike value is low- (MSD) R3844701-5, L1540948-03
The associated batch QC was outside the established quality control range for precision- (MSD) R3844701-5, L1540948-03 Kjeldahl Nitrogen, TKN
The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result- L1540948-01- 1,2-Dibromo-3-Chloropropane
L1540948-02- 1,2,3-Trichlorobenzene, Bromomethane, Chloroethane and Naphthalene
L1540948-05- 1,2,3-Trichlorobenzene, Bromomethane, Chloroethane and Naphthalene

Surrogate recovery limits have been exceeded; values are outside upper control limits- Toluene-d8- L1540948-02, 05
The same analyte is found in the associated blank- Acetone, L1540948-01
The associated batch QC was above the established quality control range for accuracy- (LCS) R3845564-1, (LCSD) R3845564-3, L1540948-02, 05
1,1,2,2-Tetrachloroethane, 1,2,3-Trichloropropane, 4-Methyl-2-pentanone (MIBK), Acrolein and Di-isopropyl ether
The associated batch QC was below the established quality control range for accuracy- (LCSD) R3843739-2, L1540948-01- 1,2,3-Trichlorobenzene, (LCS) R3845564-1, (LCSD) R3845564-3, L1540948-02, 05- Bromomethane and Naphthalene
The associated batch QC was outside the established quality control range for precision- (LCSD) R3843739-2, L1540948-01- 1,2,3-Trichlorobenzene and Naphthalene, (LCSD) R3845564-3, L1540948-02, 05- Bromomethane
The sample matrix interfered with the ability to make any accurate determination; spike value is high- (MS) R3843739-6, (MS) R3843739-4,
(MSD) R3843739-5, (MSD) R3843739-7- 44 analytes
(MS) R3845570-3, (MSD) R3845570-4, L1540948-03- Benzene, Ethylbenzene, Toluene, Total Xylenes and Xylenes, Total
(MS) R3845564-5, (MS) R3845564-7, (MSD) R3845564-6, (MSD) R3845564-8- 27 analytes
The sample matrix interfered with the ability to make any accurate determination; spike value is low- (MS) R3845564-5, (MS) R3845564-7, (MSD) R3845564-6, (MSD) R3845564-8- Bromomethane and Naphthalene
The sample concentration is too high to evaluate accurate spike recoveries- (MS) R3843739-4, (MSD) R3843739-5- Naphthalene
The associated batch QC was outside the established quality control range for precision. (MSD) R3843739-5- Naphthalene, (MSD) R3845564-6- Bromomethane and Naphthalene

c. Were all the corrective actions documented?
Yes ☒ No ☐ N/A ☐
Comments: Corrective actions were documented.

d. What is the effect on data quality/usability according to the case narrative?
Comments: See sections 5, 6.c, and 6.d for effected samples.

5. Sample Results

a. Are the correct analyses performed/reported as requested on CoC?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are all applicable holding times met?
Yes ☐ No ☒ N/A ☐

Comments: AK 102- The samples were collected on 09/19/22 and 09/20/22 and were received by the laboratory on 09/29/22 at 4.7°C. The samples were extracted on 09/30/22 within 10-11 days of collection. The extracts were analyzed on 10/01/22 within 1 day of extraction. All AK 102 preservation and holding time criteria were met.

8260D- The samples were collected on 09/19/22 and 09/20/22 and were received by the laboratory on 09/29/22 at 4.7°C. Samples OT001-DSAMW07-092022 and SS006-TRIPBLANK-HCL-01 were analyzed on 10/05/22 and sample OT001-EQBLK01-091922 (lab ID 1003_49) was analyzed on 10/04/22, within 15-16 days of collection, but outside the 14-day collection to analysis holding time. All OT001-DSAMW07-092022 and SS006-TRIPBLANK-HCL-01 sample results and the 10/04/22 analysis of OT001-EQBLK01-091922 (lab ID 1003_49) sample results have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining samples were analyzed on 10/01/22 and 10/04/22, within 12-14 days of collection. All preservation criteria and the remaining holding time criteria were met. No further qualifications were warranted.

The 6010D samples were analyzed on 10/19/22 within 180 days of extraction. All preservation and holding time criteria were met

c. Are all soils reported on a dry weight basis?
Yes ☐ No ☐ N/A ☒
Comments: All samples were aqueous.

d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?
Yes ☐ No ☒ N/A ☐
Comments: The LODs for 1,2-dibromoethane, naphthalene, 1,1,2-trichloroethane, 1,2,3-trichloropropane, and vinyl chloride in samples OT001-EQBLK01-091922, SS006-TRIPBLANK-HCL-01, and OT001-DSAMW07-092022 reported by the laboratory were elevated and over the ADEC clean up limits. Users are cautioned that there are elevated LODs.

e. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- All OT001-DSAMW07-092022 and SS006-TRIPBLANK-HCL-01 sample results and the 10/04/22 analysis of OT001-EQBLK01-091922 (lab ID 1003_49) sample results have been qualified with a 'H' validation flag due to the exceeded holding time.

6. QC Samples

a. Method Blank

i. Was one method blank reported per matrix, analysis, and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all method blank results less than LOQ (or RL)?
Yes ☐ No ☒
Comments: Hexachloro-1,3-butadiene (0.469 ug/l, J) and 1,2,3-trichlorobenzene (0.759 ug/l, J) were present in the method blank (lab ID R3845564-4) associated with samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 and acetone (16.3 ug/l, J) was present in the method blank (lab ID R3845009-3) associated with sample OT001-EQBLK01-091922.

A positive detection was noted in the continuing calibration blank (CCB) for alkalinity, and a negative blank detection was noted in the CCB for TKN and nitrate/nitrite.

iii. If above LoQ or RL, what samples are affected?
Comments: Acetone in sample OT001-EQBLK01-091922 was detected at a concentration <LOQ and has been qualified with a 'B' validation flag due to the method blank detection.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

v. Data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: Acetone in sample OT001-EQBLK01-091922 has been qualified with a 'B' validation flag due to the method blank detection.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – Are one LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- The following table shows the LCS recoveries that exceeded the acceptance criteria.

LCS/LCSD	Associated samples	Analyte	%Recovery	Acceptance limits	RPD>20%
R3843739-1/2	OT001-EQBLK01-091922	Naphthalene			**23.1%**
		1,2,3-Trichlorobenzene	**67.0%**	69-129%	**27.3%**
R3845564-1/3	SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022	Acrolein	**159%**	39-155%	
		Bromomethane	**9.33%/ 16.1%**	53-141%	**200%**
		Di-isopropyl ether	**136%/ 137%**	67-128%	
		4-Methyl-2-pentanone (MIBK)	**136%/ 141%**	67-130%	
		Naphthalene	**40.0%/ 48.4%**	61 – 128%	
		1,1,2,2-Tetrachloroethane	**123%**	71-121%	
		1,2,3-Trichloropropane	**123%/ 126%**	73-122%	

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the RPD reported from LCS/LCSD, and or sample/sample duplicate? (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
Yes ☐ No ☒ N/A ☐
Comments: See table above.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: 8260D- Bromomethane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 was non-detect and has been qualified with an 'R', rejected, validation flag as the LCS recovery was <10% and as the CCV%R was <10%.
The following sample results were non-detect and have been qualified with a 'QL' validation flag due to low LCS/LCSD recovery:

- 1,2,3-Trichlorobenzene in sample OT001-EQBLK01-091922.
- Naphthalene in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Bromomethane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 was non-detect and has been qualified with an 'R', rejected, validation flag as the LCS recovery was <10% and as the CCV%R was <10%.
The following sample results were non-detect and have been qualified with a 'QL' validation flag due to low LCS/LCSD recovery:
- 1,2,3-Trichlorobenzene in sample OT001-EQBLK01-091922.
- Naphthalene in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Sample SS006-215MW12-092022 (lab ID L1540948-03) was the parent sample for the MS/MSD analysis.

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments:

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?
Yes ☐ No ☒ N/A ☐
Comments: 8260D- In the MS/MSD, benzene (157% & 146%), ethylbenzene (142% & 133%), toluene (129%), and total xylenes (137% & 135%) were outside of the 79.0-120%, 79.0-121%, 80.0-121%, and 79.0-121% recovery criteria.

The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.
Yes ☒ No ☐ N/A ☐
Comments: The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: 8260D- All SS006-215MW12-092022 sample results were non-detect and warrant no qualifications due to the high MS/MSD recoveries.

All TKN results were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were <5x the LOQ, but the absolute difference between the sample and duplicate was >LOQ.

The lab used the following data qualifiers, as referenced from the Glossary of Terms in the laboratory data package:
B The same analyte is found in the associated blank.
C4 The reported concentration is an estimate. The continuing calibration standard associated with this data responded low.
Data is likely to show a low bias concerning the result.
J The identification of the analyte is acceptable; the reported value is an estimate.
J1 Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3 The associated batch QC was outside the established quality control range for precision.
J4 The associated batch QC was outside the established quality control range for accuracy.
J5 The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6 The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1 RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8 Sample(s) received past/too close to holding time expiration.
U Below Detectable Limits: Indicates that the analyte was not detected.
V The sample concentration is too high to evaluate accurate spike recoveries.

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- All SS006-215MW12-092022 sample results were non-detect and warrant no qualifications due to the high MS/MSD recoveries.

All TKN results have been qualified with a 'QN' validation flag.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC, and laboratory samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- Surrogate toluene-d8 in samples OT001-DSAMW07-092022 (114%) and SS006 TRIPBLANK-HCL-01 (114%) exceeded the 89.0-112% recovery criteria.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

iv. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Toluene in sample OT001-DSAMW07-092022 was reported above the detection limit and has been qualified with a "QH" validation flag due to the high surrogate recovery.

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all results less than LoQ or RL?
Yes ☒ No ☐ N/A ☐
Comments: All trip blank results were non-detect.

iii. If above LoQ or RL, what samples are affected?
Comments: Not applicable, no trip blanks were required.

iv. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

f. Field Duplicate

i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?
Yes ☒ No ☐ N/A ☐
Comments: The field duplicate pair for this SDG was SS006-215MW12-092022 and SS006-215MW12-092022-99.

ii. Was the duplicate submitted blind to lab?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD\ (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| X\ 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes ☐ No ☒ N/A ☐
Comments: TKN (32.1%) was outside of the prescribed acceptance criteria.

iv. Is the data quality or usability affected? (Explain)
Yes ☐ No ☒ N/A ☐
Comments: TKN was outside of the 30% acceptance criteria for aqueous samples. TKN has been left unqualified as the sample and duplicate results were <5x the LOQ and the absolute difference between the sample and duplicate was < LOQ. The remaining field duplicates exhibited acceptable precision with RPDs <30%..

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?
Yes ☐ No ☒ N/A ☐

Comments: Equipment blanks were not collected for this SDG.

ii. Are all results less than LoQ or RL?
Yes ☐ No ☐ N/A ☒
Comments: Equipment blanks were not collected for this SDG.

iii. If above LoQ or RL, specify what samples are affected.
Comments: Not applicable, equipment blanks were not collected for this SDG.

iv. Are data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?
Yes ☒ No ☐ N/A ☐
Comments: Several sample results have been qualified with a 'J' validation flag as the results were reported between the detection limit (DL) and the limit of quantitation (LOQ) and are estimates. The remaining sample results were either non-detect or reported above the LOQ.

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Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

This review is based on Project requirements, the requirements of Method 8015, Base Method 8000, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE)Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- Method AK101, *Determination of Gasoline Range Organics*, Version 12/21/16.
- Method AK102, *Determination of Diesel Range Organics*, Version 12/21/16.
- Method AK103, *Determination of Residual Range Organics,* Version 12/21/16.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested.

Sample ID	Lab ID	Type	Matrix	Date Collected	Extraction Date	Analysis Date
OT001-EQBLK01-091922	L1540948-01	Equipment Blank	Ground Water	09/19/22	09/30/22	10/01/22
OT001-DSAMW07-092022	L1540948-02	Field Sample	Ground Water	09/20/22	09/30/22	10/01/22
SS006-215MW12-092022	L1540948-03	Field Sample	Ground Water	09/20/22	09/30/22	10/01/22
SS006-215MW12-092022-99	L1540948-04	Field Duplicate of SS006-215MW12-092022	Ground Water	09/20/22	09/30/22	10/01/22

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [X] Level III (Level 2b) [] Level II (Level 2a)
Confirm that narrative is present and complete; note overall initial indications.

Four (4) groundwater samples were received by received by Pace Analytical on 09/29/22 at 4.7°C. The samples were analyzed for diesel range organics (DRO) by Method AK102. The data was validated to a Level 2b.

3. Custody of Samples	**Y**	**N**
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	

Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.

Reviewer Comments: Field and internal custody forms are complete and accurate.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

4. Holding Times and Preservation	Y	N	NA
Were samples preserved at ≤6° C?	X		
AK 101			
Were aqueous samples analyzed within 14 days of collection?			X
Were soil/solid samples analyzed within 28 days of collection?			X
AK102/AK103			
For AK102, were aqueous samples acidified to pH 2 or less with HCl?	X		
Were aqueous and soil/solid samples extracted within 14-days of collection?	X		
Were extracts analyzed within 40-days of extraction?	X		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	X		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 09/19/22 and 09/20/22 and were received by the laboratory on 09/29/22 at 4.7°C. The samples were extracted on 09/30/22 within 10-11 days of collection. The extracts were analyzed on 10/01/22 within 1 day of extraction. All preservation and holding time criteria were met. No qualifications were warranted.

5. Preparation Technique

	Y	N	NA
Are preparation logs for all samples present in the data package?	X		
Are cleanup data present in the data submittal?			X

Identify the preparation method(s) used:

	Matrix	Preparation Method(s) *(record # or NA)*	Cleanup Method(s) *(record # or NA)*
	Water	*SW3510C*	*NA*
	Soil/Solid	*NA*	*NA*
	Oil	*NA*	*NA*
	Air	*NA*	*NA*

Reviewer Comments: The samples were prepared in accordance with Method SW3510C.

6. Instrumentation QA/QC	Y	N	NA
Were the following instrumentation criteria met?			
Was all retention time criteria met per the analytical method?	X		
Was all initial calibration criteria met (i.e. %RSD <25% or r^2<0.995)?	X		
Was all initial calibration verification (ICV) criteria met (%D<25% **or** method required criteria)?	X		
Was all continuing calibration verification (CCV) criteria met (%D<25% **or** method required criteria)?	X		

Reviewer Comments: All retention time criteria, initial calibration criteria, and continuing calibration criteria were met. No qualifications were warranted.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

7. Method Blank	Y	N	NA
Are method blank results present?	**X**		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix? (**Method 8000B**, Section 8.2.6.1;)	**X**		
Is the method blank subjected to the same cleanup procedures as the associated samples? (**Method 8000B**, Section 8.2.6.4)	**X**		
Is the method blank run after initial calibration or calibration verification? (**Method 8000B**, Sections 7.7.7 and 8.2.6.3)	**X**		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	**X**		
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000**, Section 8.2.6.7)			**X**
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			**X**
Were any target analytes detected in the method, instrument, and/or solvent blanks?		**X**	
Is gross contamination present in the method, instrument, or solvent blank?		**X**	
If gross contamination is present, are associated samples reanalyzed?			**X**
Are blank results **not** subtracted from associated sample results? (**Method 8000**, Section 8.2.6.6)	**X**		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All method blank results were non-detect. No qualifications were warranted.

8. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? **(Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1; **Method 8015**, Section 9.6)	**X**		
Has the laboratory developed control limits for surrogates?	**X**		
Are recoveries within the laboratory-generated limits?	**X**		
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All surrogate recoveries were within the acceptance criteria. No qualifications were warranted.

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)	**X**		
Are RPDs within MSD control criteria (or lab-generated limits)?	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Sample SS006-215MW12-092022 (lab ID L1540948-03) and non-SDG sample L1540980-01 were the parent samples for the MS/MSD analyses. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries and precision criteria were met. No qualifications were warranted.

10. Field Duplicate	Y	N	NA	Q(D/ND)
Was a field duplicate pair collected for this SDG?	**X**			*
Were field duplicate samples collected at a frequency of of one for every 20 primary samples? (**Per Project QAPP)**	**X**			
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**	**X**			
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.				

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP. The field duplicate pair for this SDG was SS006-215MW12-092022 and SS006-215MW12-092022-99. All SS006-215MW12-092022 and SS006-215MW12-092022-99 sample results were non-detect which meets the field duplicate criteria. No qualifications were warranted.

11. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Is an LCS included with each batch of ≤20 samples on a per-matrix basis? (**Method 8000**, Section 8.5 and **Method 8015**, Section 9.6.2)	**X**		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5; **Method 8015**, Section 9.6.2)	**X**		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4; **Method 8015**, Section 9.6.2)	**X**		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, within the method-specified range of 70-130%)? (**Method 8000B**, Section 8.5.4)	**X**		
If prepared in duplicate, are RPDs within limits?	**X**		
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality ** Evaluate other QC prior to qualifying "R". *** Use professional judgment			

Reviewer Comments: All laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and precision criteria were met. No qualifications were warranted.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

12. Confirming Column	Y	N	NA
Since most samples are not well-characterized, is each sample analysis confirmed on a dissimilar column for all single-peak target compounds (non-DRO and GRO) (i.e. is second-column confirmation performed)? (**Method 8000**, Section 7.9 and **Method 8015**, 11.6.5)			**X**
For DRO and GRO, if analytical interferences are indicated is confirmatory analysis performed? (**Method 8015**, Section 11.6.5)			**X**
Is the RPD between primary and confirming column results <40%? (**Method 8000B**, Section 7.10.4.1 and **Method 8000C**, Section 11.10.4.1)			**X**
If confirmatory analysis is not present, all single-peak target compound results should be qualified "J" or "UJ", since flame-ionization detection (FID) is non-specific and subject to numerous positive interferences.			

Reviewer Comments: No comments.

13. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	**X**		
Action: *Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: All sample results were non-detect.

14. Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

15. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

All sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/01/2023	Date: 03/06/2023

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	1001_026	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 21:20
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

3/1/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	1001_027	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 21:43
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

3/1/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	1001_020	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 19:02
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	110 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

Sw 3/1/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	1001_028	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 22:06
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

Sr 3/1/23

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

This review is based on Project requirements, the requirements of the analytical method(s), and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). *Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories*, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted

Sample ID	Lab ID	Type	Matrix	Date Collected	DF	Date Analyzed
OT001-EQBLK01-091922	L1540948-01	Equipment Blank	Ground Water	09/19/22	1	10/01/22 *10/04/22
OT001-DSAMW07-092022	L1540948-02	Field Sample	Ground Water	09/20/22	1	*10/05/22
SS006-215MW12-092022	L1540948-03	Field Sample	Ground Water	09/20/22	1	10/04/22
SS006-215MW12-092022-99	L1540948-04	Field Duplicate of SS006-215MW12-092022	Ground Water	09/20/22	1	10/04/22
SS006-TRIPBLANK-HCL-01	L1540948-05	Trip Blank	Ground Water	09/19/22	1	*10/05/22

DF: Dilution Factor
* Denotes exceeded holding time

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [x] Level III (Level 2B) []Level II (Level 2a)

Five (5) ground water samples were received by received Pace Analytical on 09/29/22 at 4.7°C. Of these samples two (2) were analyzed for benzene, ethylbenzene, toluene, and total xylenes (BTEX) and three (3) were analyzed for volatile organic compounds by EPA Method SW8260D. The data was validated to a Level 2b.

3. Custody of Samples	**Y**	**N**
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	

Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
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Reviewer Comments: Field and internal custody forms are complete and accurate.

4. Holding Times and Preservation	**Y**	**N**	**NA**
Have aqueous samples been preserved at ≤6°C (**SW846**-Table 2-40A)	**X**		
Have solid samples been preserved at ≤6°C (**SW846**-Table 2-40A)			**X**
Have aqueous samples been preserved with H2SO4, HCl, or solid NaHSO4? (**SW846**-Table 2-40A)	**X**		
Are preserved samples, solids, and wastes analyzed with 14 days of collection? (**SW846**-Table 2-40A)		**X**	
Are unpreserved samples analyzed with 7 days of collection? (**SW846**-Table 2-40A)			**X**
If residual chlorine is present, are samples treated with sodium thiosulfate? (**SW846**-Table 2-40A)			**X**
Inspect narrative, receipt logs, etc. Does the information indicate there were **no** significant problems with sample handling/naming?	**X**		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 09/19/22 and 09/20/22 and were received by the laboratory on 09/29/22 at 4.7°C. Samples OT001-DSAMW07-092022 and SS006-TRIPBLANK-HCL-01 were analyzed on 10/05/22 and sample OT001-EQBLK01-091922 (lab ID 1003_49) was analyzed on 10/04/22, within 15-16 days of collection, but outside the 14-day collection to analysis holding time. All OT001-DSAMW07-092022 and SS006-TRIPBLANK-HCL-01 sample results and the 10/04/22 analysis of OT001-EQBLK01-091922 (lab ID 1003_49) sample results have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining samples were analyzed on 10/01/22 and 10/04/22, within 12-14 days of collection. All preservation criteria and the remaining holding time criteria were met. No further qualifications were warranted.

5. Preparation Technique				
		Y	**N**	**NA**
Are preparation logs for all samples present in the data package?				
Identify the preparation method(s) used:				
	Matrix	**Method(s)** *(record # or NA)*		
	Water	*EPA Method SW8260D*		
	Soil/Solid	*NA*		
	Oil	*NA*		
	Air	*NA*		

Reviewer Comments: The samples were prepared in accordance with EPA Method SW8260D.

6. GC/MS Performance Check	**Y**	**N**
Are performance check data present in the data submittal?	**X**	
Is the GC/MS hardware-tuned to meet BFB criteria prior to the initial calibration and for each 12-hr period during which analyses are performed? (**Method 8260B**, Sections 4.9.3, 5.11, 7.3.1, 7.4.1, 7.5.2, 8.2.1, and 11.4.1)	**X**	
Are mass spectral relative abundances acceptable according to the method criteria? (**Method 8260B**, Table 4**)**	**X**	
Was there correct assignment of ions?	**X**	
Raw Data Confirmation		
Raw data show proper averaging of scans according to method recommendations.	**X**	
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate		

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

Reviewer Comments: All tune criteria were met. No qualifications were warranted.

7. Initial Calibration	Y	N	NA
Are initial calibration data present in the data submittal?	**X**		
Does the initial calibration curve consist of a least 5 standards? (**Method 8260B**, Sections 5.7.6.10, 5.7.6.11, 5.12.1 and 7.3.2; and **Method 8000B**, Section 7.4)	**X**		
Are all target analytes present in the initial calibration? (**Method 8260B**, Section 5.12.3)	**X**		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the RSD ≤30%? (**Method 8260B**, Section 7.3.6.3 and 8.2.3) **[Note: Method 8260 requires an RSD of ≤15% and Method 8260C/D requires an RSD of 20% for all compounds or another type of curve must be used]**	**X**		
For the system performance check compounds, are the response factors 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Section 7.3.5.4 and 8.2.3)	**X**		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	**X**		
For other compounds, is the response factor ≥0.01 (or method criteria)?	**X**		
If the RSD does not meet the 20% (15% for **Method 8260**) criterion, is a linear (or quadratic) regression equation used for target compound quantitation? (**Method 8260B**, Sections 7.3.8.2)	**X**		
If linear and/or quadradic regressions, are used, is r ≥0.99 or r^2≥0.98 (**Method 8000B**, Sections 7.5.2 and 8.3.2)	**X**		
Is the origin not forced and not included in the calibration curve for linear regression? (**Method 8000**, Section 7.5.2)	**X**		
QC Check Standard (ICV)			
Are QC Check Standard Results present in the data submittal?	**X**		
Is the check standard run on an ongoing basis? (**Method 8260B**, Section 8.7-referred to as a standard reference material)	**X**		
Are check standard results within 30% of reference value?		**X**	
Raw Data Confirmation			
Raw data have been examined for anomalies	**X**		
The quantitation ions for 2 compounds have been confirmed as the correct ions for quantitation.	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate *** Qualify only peaks outside linear portion			

Reviewer Comments: All initial calibration criteria were met.

The following ICV compounds were outside of the 30%D acceptance criteria; however, the ICVs only bracketed the associated ICAL and no qualifications were warranted:

- 1,2,4-Trichlorobenzene (68.10%) and acrolein (164%) in the ICV analyzed on 08/26/22 at 22:56.
- Acrolein (147%) and bromomethane (212%) in the ICV analyzed on 08/18/22 at 15:17.
- The remaining ICV criteria were met. No qualifications were warranted.

8. Continuing Calibration	Y	N	NA
Are continuing calibration data present in the data submittal?	**X**		
Are all target analytes present in the continuing calibration (verification)? (**Method 8260B**, Section 5.12.3)	**X**		

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

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8. Continuing Calibration	Y	N	NA
Has continuing calibration verification been performed within 12 hours of the time of associated sample analysis? (**Method 8260B**, Sections 7.4.2 and 8.2.3)	**X**		
For the system performance check compounds, are the response factors in the calibration verification 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Sections 7.3.5.4, 7.4.4.1, 7.4.4.2, and 8.2.3)	**X**		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	**X**		
For other compounds, is the response factor ≥0.01?	**X**		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the %D ≤20%? (**Method 8260B**, Sections 7.3.6.3, 7.4.5.1, 7.4.5.2, and 8.2.3)	**X**		
For other compounds, is %D ≤ 20%? (**Method 8260B**, Section 7.4.5.2)	**X**		
Is a closing CCV performed? (**DOD QSM 5.3** Table B-4)	**X**		
Is the closing CCV %D ≤ 50%? (**DOD QSM 5.3** Table B-4)	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected.			

Reviewer Comments: The following table shows the CCV %Rs that exceeded the opening CCV 80-120% recovery or the closing CCV 50%-150% acceptance criteria and the affected samples.

Continuing Calibration Date/Time	Samples Bracketed	Analyte	CCV%R >Opening 80-120%R/ Closing 50-150%R
VOCMS33 Opening CCV 10/01/22, 08:51	Sample OT001-EQBLK01-091922 and associated QA/QC	1,1,2-Trichlorotrifluoroethane	125%
		1,2,4-Trichlorobenzene	78.7%
		1,2-Dibromo-3-chloropropane	79.8%
		4-Methyl-2-pentanone (MIBK)	79.2%
		Chloromethane (SPCC)	72.6%
VOCMS6 Opening CCV 10/03/22, 23:30	Sample OT001-EQBLK01-091922 and associated LCS/LCSD	1,1,2,2-Tetrachloroethane (SPCC)	76.8%
		1,2-Dibromo-3-chloropropane	73.5%
		Acetone	140%
		Bromomethane	12.8%
		Naphthalene	68.0%
		Trichloroethene	124%
VOCMS6 Closing CCV 10/04/22, 09:27		Bromomethane	21.0%
VOCMS23 Opening CCV 10/04/22, 21:50	Samples SS006-TRIPBLANK-HCL-01, OT001-DSAMW07-092022, and associated QA/QC	1,1,2,2-Tetrachloroethane	121%
		1,2,3-Trichlorobenzene	60.8%
		1,2,3-Trichloropropane	123%
		1,2,4-Trichlorobenzene	66.2%
		1,2-Dibromo-3-chloropropane	78.7%
		2-Butanone (MEK)	138%
		4-Methyl-2-pentanone (MIBK)	136%
		Acetone	139%
		Acrolein	159%
		Acrylonitrile	132%

		Bromomethane	9.33%
		Chloroethane	79.3%
		Di-isopropyl ether	136%
		Naphthalene	42.3%
VOCMS23 Closing CCV 10/05/22, 10:52		Bromomethane	15.3%
VOCMS33 Opening CCV 10/04/22, 20:54	Samples SS006-215MW12-092022, SS006-215MW12-092022-99, and associated QA/QC	1,1,2-Trichlorotrifluoroethane	125%
		1,2,3-Trichlorobenzene	64.5%
		1,2,4-Trichlorobenzene	61.0%
		1,2-Dibromo-3-chloropropane	75.5%
		Acrolein	121%
		Chloroethane	123%
		Hexachloro-1,3-butadiene	72.1%
		Methylene chloride	123%
		Naphthalene	62.4%

Note: SPCC = System performance check compound

Qualifications are as follows:

- Bromomethane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 was non-detect and has been qualified with an 'R', rejected, validation flag as the CCV%R was <10%, and as the LCS recovery was <10% *(See section 13 for further qualification of these results)*.
- The following sample results have been qualified with a 'QN' validation flag as the CCV %R criteria was exceeded:
  - 1,1,2-Trichlorotrifluoroethane, 1,2-dibromo-3-chloropropane, and acetone in sample OT001-EQBLK01-091922.
  - 1,1,2,2-Tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 1,2-dibromo-3-chloropropane, 2-butanone (MEK), 4-methyl-2-pentanone (MIBK), acetone, acrolein, acrylonitrile, chloroethane, di-isopropyl ether, and naphthalene in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022.
- The following SPCC compounds were not target compounds. No qualifications were warranted as the SPCC criterion was met:
  - Chloromethane in the CCV analyzed 10/01/22 at 08:51.
  - 1,1,2,2-Tetrachloroethane in the CCV analyzed 10/03/22 at 23:30.
- 1,2,4-Trichlorobenzene, 1,2-dibromo-3-chloropropane, and 4-methyl-2-pentanone (MIBK) were not reported from the CCV analyzed 10/01/22 at 08:51. No qualifications were warranted.
- Bromomethane, naphthalene, and trichloroethene were not reported from the CCVs analyzed 10/03/22 at 23:30 and 10/04/22 at 09:27. No qualifications were warranted.
- Only benzene, ethylbenzene, toluene, and total xylenes (BTEX) were reported from the CCV analyzed 10/04/22 at 20:54. No qualifications were warranted due to the exceeded CCV %R criteria.
- The remaining CCV criteria were met. No further qualifications were warranted.

9. Method Blank	**Y**	**N**	**NA**
Are method blank results present?	**X**		
Is the method blank run after initial calibration or calibration verification? (**Method 8260B**, Section 7.4.3 and **Method 8000B**, Sections 7.7.7 and 8.2.6.3)	**X**		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix or on a per batch basis? (**Method 8260B**, Section 8.4 and **Method 8000B**, Section 8.2.6.1)	**X**		

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9. Method Blank	Y	N	NA
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	**X**		
Is the method blank subjected to the same preparation and cleanup procedures as the associated samples? (**Method 8260B**, Section 8.4.1 and **Method 8000B**, Section 8.2.6.4)	**X**		
Are solvent or instrument blanks interspersed through the analytical run or as necessary? (Method 8260B, Section 7.4.3 and **Method 8000B**, Section 8.2.1)			**X**
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			**X**
Were any target analytes detected in the method, instrument, and/or solvent blanks?	**X**		
Is gross contamination present in the method, instrument, or solvent blank?			**X**
If gross contamination is present, are associated samples reanalyzed			**X**
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000B**, Section 8.2.6.7)			**X**
Are blank results **not** subtracted from associated sample results? (**Method 8000B**, Section 8.2.6.6)	**X**		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: Hexachloro-1,3-butadiene (0.469 ug/l, J) and 1,2,3-trichlorobenzene (0.759 ug/l, J) were present in the method blank (lab ID R3845564-4) associated with samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 and acetone (16.3 ug/l, J) was present in the method blank (lab ID R3845009-3) associated with sample OT001-EQBLK01-091922. Qualifications are as follows:

- Acetone in sample OT001-EQBLK01-091922 was detected at a concentration <LOQ and has been qualified with a 'B' validation flag due to the method blank detection.
- Hexachloro-1,3-butadiene and 1,2,3-trichlorobenzene were non-detect in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 and warrant no qualification due to the method blank detection.
- All trip blank SS006-TRIPBLANK-HCL-01 results and the remaining method blank results were non-detect. No further qualifications were warranted.

10. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? (**Method 8260B**, Section 5.9 and **Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1)	**X**		
Are surrogate recoveries within the lab-generated or default (70-130%R) acceptance limits?		**X**	
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Use technical judgment in recoveries, allowing 0 outliers for VOA, possibly 1 for SVOA.			

Reviewer Comments: Surrogate toluene-d8 in samples OT001-DSAMW07-092022 (114%) and SS006-TRIPBLANK-HCL-01 (114%) exceeded the 89.0-112% recovery criteria. Qualifications are as follows:

- Toluene in sample OT001-DSAMW07-092022 was reported above the detection limit and has been qualified with a "QH" validation flag due to the high surrogate recovery.
- All SS006 TRIPBLANK-HCL-01 sample results and the remaining OT001-DSAMW07-092022 sample results were non-detect and warrant no qualification due to the high surrogate recovery.

- The remaining surrogate recoveries were within the acceptance criteria. No further qualifications were warranted.

11. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix or on a per-batch basis? (**Method 8260B**, Sections 8.4 and 8.4.2 and **Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)		**X**	
Are RPDs within MSD control criteria (or lab-generated limits)?		**X**	
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Sample SS006-215MW12-092022 (lab ID L1540948-03) was the parent sample for the MS/MSD analysis. In the MS/MSD, benzene (157% & 146%), ethylbenzene (142% & 133%), toluene (129%), and total xylenes (137% & 135%) were outside of the 79.0-120%, 79.0-121%, 80.0-121%, and 79.0-121% recovery criteria, respectively. Per the USEPA Functional Guidelines, only the parent sample shall be qualified due to MS/MSD considerations. Data assessment is as follows:

- All SS006-215MW12-092022 sample results were non-detect and warrant no qualifications due to the high MS/MSD recoveries.
- All precision criteria were met. No qualifications were warranted.

In the non-SDG L1540401, non-SDG L1540980, non-SDG L1540865, and non-SDG L1540970 MS/MSDs, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria. However, no qualifications were warranted as the MS/MSD parent samples were **not** from this SDG and only the parent sample shall be qualified due to MS/MSD considerations per the USEPA Functional Guidelines.

12. Field Duplicate	Y	N	NA
Was a field duplicate pair collected for this SDG?	**X**		
Were field duplicate samples collected at a frequency of of one for every 10 primary samples? (**Per Project QAPP)**	**X**		
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP. The field duplicate pair for this SDG was SS006-215MW12-092022 and SS006-215MW12-092022-99. All SS006-215MW12-092022 and SS006-215MW12-092022-99 sample results were non-detect which meets the field duplicate criteria. No qualifications were warranted.

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13. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Has at least one LCS been prepared with each analytical batch up to 20 samples? (**Method 8260B**, Sections 8.4 and 8.4.3)	**X**		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5)	**X**		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4)	**X**		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, the method-specified range of 70-130)? (**Method 8000B**, Section 8.5.4)	**X**		
If prepared in duplicate, are RPDs within limits?	**X**		
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality. ** Evaluate other QC prior to qualifying "R".			

Reviewer Comments: The following table shows the LCS/LCSD compounds that exceeded the acceptance criteria, and the affected samples.

LCS/LCSD	Associated samples	Analyte	%Recovery	Acceptance limits	RPD>20%
R3843739-1/2	OT001-EQBLK01-091922	Naphthalene			**23.1%**
		1,2,3-Trichlorobenzene	**67.0%**	69-129%	**27.3%**
R3845564-1/3	SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022	Acrolein	**159%**	39-155%	
		Bromomethane	**9.33%/ 16.1%**	53-141%	**200%**
		Di-isopropyl ether	**136%/ 137%**	67-128%	
		4-Methyl-2-pentanone (MIBK)	**136%/ 141%**	67-130%	
		Naphthalene	**40.0%/ 48.4%**	61 – 128%	
		1,1,2,2-Tetrachloroethane	**123%**	71-121%	
		1,2,3-Trichloropropane	**123%/ 126%**	73-122%	

Data assessment is as follows:

- Bromomethane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 was non-detect and has been qualified with an 'R', rejected, validation flag as the LCS recovery was <10% and as the CCV%R was <10% *(See section 8 for further qualification of these results).*
- The following sample results were non-detect and have been qualified with a 'QL' validation flag due to low LCS/LCSD recovery:
  - 1,2,3-Trichlorobenzene in sample OT001-EQBLK01-091922.
  - Naphthalene in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022.
- Acrolein, di-isopropyl ether, 4-methyl-2-pentanone (MIBK), 1,1,2,2-tetrachloroethane, and 1,2,3-trichloropropane in samples SS006-TRIPBLANK-HCL-01 and OT001-DSAMW07-092022 were non-detect and warrant no qualification due to the high LCS/LCSD recoveries.
- No qualifications were warranted due to the high LCSD RPDs as the sample results were non-detect.
- The remaining LCS recoveries were within the acceptance criteria. No further qualifications were warranted.

14. Internal Standards	Y	N	NA
Are internal standard data present in the data submittal?	**X**		
Were method-appropriate internal standards (ISs) used for the reported analyses?	**X**		

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

14. Internal Standards	Y	N	NA
Are internal standards added to each calibration standard? (**Method 8260B**, Section 5.12.4 and 7.5.10.2)	**X**		
Do internal standard retention times **not** vary by more than 30 seconds from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.6)	**X**		
Does the EICP area of any internal standard **not** vary by more than a factor of two (-50 to +100%) from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.7)	**X**		
Do area counts appear to be at least minimally adequate?	**X**		
Note: Internal standard assessment is **not** required for a Level 2a data validation. Action: Indicate affected samples in validation comments, primarily if data were rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All internal standard criteria were met. No qualifications were warranted.

15. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f) and 5.5.2.2.1.g)) (**Method 8000**, Section 7.4) (**All data below LOQ qualified with a J**)		**X**	
Action: Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: Several sample results have been qualified with a 'J' validation flag to denote the reported results are estimated due to sample results reported at levels between the detection limit (DL) and the limit of quantitation (LOQ)

The remaining sample results were either non-detect or reported above the LOQ.

16. Tentatively Identified Compounds	Y	N	NA
Are TICs reported in the data submittal?			**X**
If requested, does the TIC report include up to 20 compounds?			**X**
Action: Indicate non-correctable contract compliance deviations below. Indicate missed TICs (if this part of analysis requested)			

Reviewer Comments: TICs were not required.

17. Sample Data Evaluation -Validation with Raw Data Confirmation
1. For one compound in each sample, determine whether CRQLs have been modified to SQLs. **Yes.**
2. Sample-specific evaluation - these evaluations are performed one sample in each batch (excluding QC).
-Evaluate whether the correct quantitation ions were used. **The correct ions were used.**
-Evaluate adequacy of manual integrations of peak areas. (**AMS**, Section 3.5.5.g)) **Manual integrations were straightforward**
-Evaluate the presence of carryover. **NA**

17. Sample Data Evaluation -Validation with Raw Data Confirmation
-Evaluate the validity of dilutions and reanalyses. **NA**
-Evaluate interferences that may preclude accurate quantitation of compounds. **NA**
3. Manually recalculate 2 or more selected results from a sample in the SDG. **NA** 4. Did recalculation confirm reported results? **NA** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
5. Qualify all non-rejected TIC as "NJ" **NA**
6. Evaluate all TICs according to EPA Functional Guidelines VOA verification/validation procedure. **NA**
Action: Indicate in comments instances of manual calculations not confirming reported results. Where samples have been reanalyzed, and both reanalyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.
Description of Sample-specific Evaluation Problems**: NA**

Reviewer Comments: No comments as the samples have undergone a Level 2b review.

18. Method 8260 Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

19. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table

Sample ID	Analyte	Validation Flag	Qualification Reason(s)
OT001-EQBLK01-091922 (10/04/22 analysis)	Chloromethane	H	Exceeded holding time
	1,2-Dibromo-3-Chloropropane		
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-dibromo-3-chloropropane		
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCS/LCSD recovery
	Chloroform	J	Result ≥DL but <LOQ
	n-Propylbenzene		
	1,2,4-Trimethylbenzene		
OT001-DSAMW07-092022	All compounds	H	Exceeded holding time
	Bromomethane	R	CCV%R <10% LCS recovery <10%
	1,1,2,2-Tetrachloroethane	QN	CCV %R >20%
	1,2,3-Trichlorobenzene		
	1,2,3-Trichloropropane		
	1,2,4-Trichlorobenzene		
	1,2-Dibromo-3-chloropropane		
	2-Butanone (MEK)		
	4-Methyl-2-pentanone (MIBK)		
	Acetone		
	Acrolein		
	Acrylonitrile		
	Chloroethane		
	Di-isopropyl ether		
	Naphthalene		
	Toluene	QH, J	High surrogate recovery Result ≥DL but <LOQ
	Naphthalene	QL	Low LCS/LCSD recovery
SS006-TRIPBLANK-HCL-01	All compounds	H	Exceeded holding time
	Bromomethane	R	CCV%R <10% LCS recovery <10%
	1,1,2,2-Tetrachloroethane	QN	CCV %R >20%

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540948**

Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
	1,2,3-Trichlorobenzene		
	1,2,3-Trichloropropane		
	1,2,4-Trichlorobenzene		
	1,2-Dibromo-3-chloropropane		
	2-Butanone (MEK)		
	4-Methyl-2-pentanone (MIBK)		
	Acetone		
	Acrolein		
	Acrylonitrile		
	Chloroethane		
	Di-isopropyl ether		
	Naphthalene		
	Naphthalene	QL	Low LCS/LCSD recovery

Note: See Section 18 for Validation Flag Definitions

Several sample results were reported above the LOQ, have been assessed, and remain unqualified.

The remaining sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/01/2023	Date: 03/01/2023

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	1001_08	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 12:48
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 12:48
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	4.28	3.46		0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3 J	3.94	0.740	J	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	6.47	2.82		0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1 J	7.39	0.162	J	0.0993	0.500	1.00

JW 3/1/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	1001_08	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 12:48
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 12:48
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	6.92	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	22.9		0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	8.17	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6 J	7.83	0.365	J	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	7.52	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13- QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	6.87	9.44		0.174	1.50	3.00

SV 3/1/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	1003_49	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 04:02
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 04:02
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QN BJ	3.12	15.9	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3	0	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	1004_37	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS23	**Preparation Date/Time:**	10/05/22 00:31
Analytical Batch:	WG1937343	**Analysis Date/Time:**	10/05/22 00:31
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		ug/l	ug/l	ug/l
Acetone	67-64-1	H QN	3.15	25.0	U	11.3	25.0	50.0
Acrolein	107-02-8		0	25.0	J4 U	2.54	25.0	50.0
Acrylonitrile	107-13-1		0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2		0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1		0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4		0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2		0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	R	0	2.00	C4 J3 J4 U	0.605	2.00	5.00
n-Butylbenzene	104-51-8		0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8		0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6		0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5		0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7		0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1		0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	QN	0	2.00	C4 U	0.192	2.00	5.00
Chloroform	67-66-3		0	2.00	U	0.111	2.00	5.00
Chloromethane	74-87-3		0	2.00	U	0.960	2.00	4.00
2-Chlorotoluene	95-49-8		0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4		0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4		0	0.500	U	0.126	0.500	1.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	U	0.276	2.00	5.00
Dibromomethane	74-95-3		0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1		0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1		0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7		0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8		0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3		0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2		0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4		0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2		0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5		0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5		0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9		0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7		0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6		0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5		0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6		0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	QN	0	0.500	J4 U	0.105	0.500	1.00
Ethylbenzene	100-41-4		0	0.500	U	0.137	0.500	1.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	U	0.337	0.750	1.50
Isopropylbenzene	98-82-8		0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6		0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	QN	0	5.00	U	1.19	5.00	10.0

SW 3/1/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	1004_37	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS23	**Preparation Date/Time:**	10/05/22 00:31
Analytical Batch:	WG1937343	**Analysis Date/Time:**	10/05/22 00:31
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Methylene Chloride	75-09-2	H	0	2.00	U	0.430	2.00	5.00
4-Methyl-2-pentanone (MIBK)	108-10-1	QN	0	5.00	J4 U	0.478	5.00	10.0
Methyl tert-butyl ether	1634-04-4		0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	QL	0	2.00	C4 J4 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1		0	0.500	U	0.0993	0.500	1.00
Styrene	100-42-5		0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6		0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	QN	0	0.500	J4 U	0.133	0.500	1.00
Tetrachloroethene	127-18-4		0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	QHJ	5.53	0.285	J	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6	QN	0	0.500	C4 U	0.230	0.500	1.00
1,2,4-Trichlorobenzene	120-82-1	QN	0	1.00	U	0.481	1.00	2.00
1,2,3-Trimethylbenzene	526-73-8		0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6		0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8		0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6		0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5		0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6		0	0.500	U	0.190	0.500	1.00
Trichlorofluoromethane	75-69-4		0	2.00	U	0.160	2.00	5.00
1,1,2-Trichlorotrifluoroethane	76-13-1		0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	QN	0	1.00	J4 U	0.237	1.00	2.50
Vinyl chloride	75-01-4		0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7		0	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	1004_35	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/04/22 23:14
Analytical Batch:	WG1937331	**Analysis Date/Time:**	10/04/22 23:14
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	J5 U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	J5 U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	J5 U	0.278	0.600	1.20
Total Xylenes	1330-20-7	6.57	1.50	J5 U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	1004_36	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/04/22 23:35
Analytical Batch:	WG1937331	**Analysis Date/Time:**	10/04/22 23:35
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-TRIPBLANK-HCL-01

Lab Sample ID:	L1540948-05	**SDG:**	L1540948
Client Sample ID:	SS006-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	1004_35	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS23	**Preparation Date/Time:**	10/05/22 00:01
Analytical Batch:	WG1937343	**Analysis Date/Time:**	10/05/22 00:01
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		ug/l	ug/l	ug/l
Acetone	67-64-1	H QN	3.15	25.0	U	11.3	25.0	50.0
Acrolein	107-02-8		0	25.0	J4 U	2.54	25.0	50.0
Acrylonitrile	107-13-1		0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2		0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1		0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4		0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2		0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	R	0	2.00	C4 J3 J4 U	0.605	2.00	5.00
n-Butylbenzene	104-51-8		0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8		0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6		0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5		0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7		0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1		0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	QN	0	2.00	C4 U	0.192	2.00	5.00
Chloroform	67-66-3		0	2.00	U	0.111	2.00	5.00
Chloromethane	74-87-3		0	2.00	U	0.960	2.00	4.00
2-Chlorotoluene	95-49-8		0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4		0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4		0	0.500	U	0.126	0.500	1.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	U	0.276	2.00	5.00
Dibromomethane	74-95-3		0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1		0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1		0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7		0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8		0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3		0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2		0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4		0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2		0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5		0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5		0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9		0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7		0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6		0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5		0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6		0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	QN	0	0.500	J4 U	0.105	0.500	1.00
Ethylbenzene	100-41-4		0	0.500	U	0.137	0.500	1.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	U	0.337	0.750	1.50
Isopropylbenzene	98-82-8		0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6		0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	QN	0	5.00	U	1.19	5.00	10.0

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-TRIPBLANK-HCL-01

Lab Sample ID:	L1540948-05	**SDG:**	L1540948
Client Sample ID:	SS006-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	1004_35	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS23	**Preparation Date/Time:**	10/05/22 00:01
Analytical Batch:	WG1937343	**Analysis Date/Time:**	10/05/22 00:01
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		ug/l	ug/l	ug/l
Methylene Chloride	75-09-2	H	3.11	2.00	U	0.430	2.00	5.00
4-Methyl-2-pentanone (MIBK)	108-10-1	QN	0	5.00	J4 U	0.478	5.00	10.0
Methyl tert-butyl ether	1634-04-4		0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	QL	0	2.00	C4 J4 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1		0	0.500	U	0.0993	0.500	1.00
Styrene	100-42-5		0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6		0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	QN	0	0.500	J4 U	0.133	0.500	1.00
Tetrachloroethene	127-18-4		0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3		0	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6	QN	0	0.500	C4 U	0.230	0.500	1.00
1,2,4-Trichlorobenzene	120-82-1	QN	0	1.00	U	0.481	1.00	2.00
1,2,3-Trimethylbenzene	526-73-8		0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6		0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8		0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6		0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5		0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6		0	0.500	U	0.190	0.500	1.00
Trichlorofluoromethane	75-69-4		0	2.00	U	0.160	2.00	5.00
1,1,2-Trichlorotrifluoroethane	76-13-1		0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	QN	0	1.00	J4 U	0.237	1.00	2.50
Vinyl chloride	75-01-4		0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7		0	1.50	U	0.174	1.50	3.00

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Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

This review is based on Project requirements, the requirements of the analytical methods, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS (Final, 31 Aug 2021)*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- USEPA Office of Research and Development., 1993 and Updates, Methods for the Determination of Inorganic Substances in Environmental Samples, EPA 600-R-93-100, August.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	DL	Sample Date	Method(s)	Analysis Date(s)
OT001-EQBLK01-091922	L1540948-01	Field	GW	1	08/08/22	6010D	10/19/22
OT001-DSAMW07-092022	L1540948-02	Field	GW	1	08/08/22	6010D	10/19/22
SS006-215MW12-092022	L1540948-03	Field	GW	1	08/08/22	6010D	10/19/22
SS006-215MW12-092022-99	L1540948-04	DUP	GW	1	08/09/22	6010D	10/19/22

2. Reviewer Preliminary Comments

Review Type: Review Type: [X] Level IV (Level 3/4) [] Level III (Level 2b)

Four (4) ground water samples were submitted to Pace Analytical for metals, mercury, and total solids by EPA Method 6010D. The samples were received intact by the lab on 09/29/22 at 4.7°C. The data has been validated to a Level 2b.

3. Custody of Samples	**Y**	**N**
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	

Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities and where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in validation comments.

Reviewer's Comments: Field and internal custody appear to be complete and are traceable.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

4. Holding Times and Sample Preservation	Y	N	NA
Were aqueous samples preserved to a pH <2 for all metals?	X		
Were samples identified for mercury analysis maintained at ≤6° C for aqueous or solid matrices, and 4° C for total solids?	X		
Were samples for total solids prepared and analyzed within 7 days?	X		
Were samples for metals other than mercury prepared and analyzed within 180 days?	X		
Were samples for mercury prepared and analyzed within 28 days?	X		
Inspect narrative, receipt logs, etc. Does the information indicate that there were **no** significant problems with sample handling/naming? Were soils <50% moisture?	X		
Action: Indicate affected samples in validation comments.			

Reviewer's Comments: Receipt logs indicate that samples were received intact, and cooler temperatures were acceptable upon receipt for metals samples and the samples were received intact. Holding times were met for all preparatory and analytical processes. No qualifications were appended to the associated sample results due to holding time and preservation considerations.

5. Preparation Technique

	Y	N	NA
Are preparation logs for all samples present in the data package?	X		

Identify the preparation method(s) used:

	Matrix	Preparation Method(s) *(record # or NA)*
	Water	***EPA Method 3015***
	Soil/Solid	*NA*
	Oil	*NA*
	Air	*NA*

Reviewer Comments: The sample was prepared in accordance with Methods 3015. No qualifications were warranted.

6. ICP Calibration	Y	N	NA
Are calibration data for ICP present in the data submittal?	X		
If **not** present, has all ICP calibration criteria (i.e. ICV, CCV, LLC, etc.) been met per the case narrative?			X
If present, is the ICV recovery within ±10% of reference value? (**Method 6010C**, Section 10.3.2.1)	X		
If present, is the lower limit of quantitation check sample recovery (LLC or CRDL standard) within ±30% of reference value? (Method 6010C, Sections 10.1.3.1, 10.3.2.1, and 10.3.4)	X		
If present, is a mid-level Continuing Calibration Verification (CCV) standard recovery within ±10% of reference value? (**Method 6010C**, Sections 10.3.4)	X		

Reviewer Comments: All initial calibration verification (ICV), continuing calibration verification (CCV), and low-level concentration (LLC) criteria were met per the case narrative.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

8. Blanks	Y	N	NA
Are method blank and calibration blank data present in the data submittal?	**X**		
Was a method blank (or preparation blank) prepared for each batch of samples prepared? (**Method 6010C**, Section 9.6, **Method 6020A**, Section 9.8, **Method 7471B**, Section 9.3)	**X**		
Is the method blank (or preparation blank) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.1; **Method 6020A**, Section 9.8; and **Method 7471B**, Section 9.3)	**X**		
Was the method blank (or preparation blank) the same matrix as the analytical samples?	**X**		
Are calibration blanks run for every 10 samples in an analytical sequence?			
Were sample results verified as uncorrected for blank concentrations?	**X**		
Were all positive and negative blanks (ICB, CCB, PB or MB) evaluated for contamination?	**X**		
Were any target analytes detected above the detection limit (DL) or method detection limit (MDL) ICB/CCBs/PB or MB?			

Action: Apply rules from table below. Indicate affected samples in validation comments.
* Qualify only if the deviation indicates an adverse effect on data quality.
** Use professional judgment, and table below:

Reviewer Comments: The results were non-detect. No qualifications were warranted.

9. Interference Check Sample	Y	N	NA
Are interference check standard data present in the data submittal?	**X**		
If not present, was the interference check standard criteria met per the case narrative?			**X**
Were the ICSAB recoveries within acceptance criteria of 80-120%? (**Method 6010C**, Section 4.2.10.2)	**X**		

Action: Use technical judgment to assess any potential interferences. Indicate affected samples in validation comments. For additional aid in assessing potential effects, consult general tables of interelement contributions at critical wavelengths; e.g. as in reference SW-846 6010B (and for atypical metals, other references). ICP-MS interferences in m/e regions may often be evaluated by comparing more differing quantitative ions for the same element.
* Qualify only if the deviation indicates an adverse effect on data quality.
** Discuss impact of high concentrations on results.

Reviewer Comments: All ICS criteria was met per the case narrative. No qualifications were warranted.

10. Matrix Spike (Pre-digestion Spike)	Y	N	NA
Are matrix spike data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the matrix spike analysis?	**X**		
Was a matrix spike prepared for each batch of samples prepared? (**Method 6010C**, Section 9.8 8; **Method 6020A**, Section 9.19; **Method 7471B**, Section 9.5)	**X**		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

10. Matrix Spike (Pre-digestion Spike)	Y	N	NA
Is the matrix spike (MS) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.18; **Method 6020A**, Section 9.10; and **Method 7471B**, Section 9.5)	**X**		
Was the matrix spike recovery within ±25% of known value? (**Method 6010C**, Section 9.8 and 9.8.28; **Method 6020A**, Section 9.10)	**X**		
For mercury, was the matrix spike recovery within ±20% of known value? (**Method 7471B**, Section 9.5)	**X**		
Post-Digestion Spike			
If matrix spike recovery was not within ±25% (or ±20% for mercury) was a post-digestion spike analyzed? (**Method 6010C**, Section 9.9.18; **Method 6020A**, Section 9.11.1)	**X**		
Was the recovery of the post-digest spike within ±25% of reference value? (**Method 6010C**, Section 9.9.18; **Method 6020A**, Section 9.11.1))	**X**		
If the post-digest spike fails, it a dilution test run on the sample? (**Method 6010C,** Section 9.9.18; **Method 6020A**, Section 9.11.2)			**X**
Acceptance criteria are 75-125% for metals unless otherwise indicated. Action: Indicate affected samples in validation comments. ** Use technical judgment in determining data impact. Extremely low recoveries with the associated sample result being a non-detect warrant rejection.			

Reviewer Comments: The MS/MSD results were within the acceptance criteria and no qualifications are warranted.

11. Duplicates (MSD or Laboratory)	Y	N	NA
Are laboratory or matrix spike duplicate data present in the data submittal?	**X**		
Have field or equipment blanks <u>not</u> been used for the duplicate analysis?	**X**		
Was the laboratory duplicate (or matrix spike duplicate) prepared for each batch of samples prepared (up to a maximum of 10 samples)? (**Method 6010C**, Section 9.8, **Method 6020A**, Section 9.10, **Method 7471B**, Section 9.5)	**X**		
Is the laboratory duplicate (or MSD) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.18 and **Method 7471B**, Section 9.5)	**X**		
Were reported precision estimates within acceptance criteria (for aqueous RPD ≤30%? (**Method 6010C**, Sections 9.8 and 9.8.18, **Method 6020C**, Section 9.10, and **Method 7000B**, Section 9.7)	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All MSD RPD results met the +/- 20% RPD precision criteria for aqueous samples. No qualifications were warranted.

12. Field Duplicate	Y	N	NA
Was field duplicate pair collected for this SDG?	**X**		
Were field duplicate samples collected at a frequency of of one for every 10 primary samples?	**X**		
Were reported precision estimates within project acceptance criteria RPD ≤30%?	**X**		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

12. Field Duplicate	Y	N	NA
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Samples SS006-215MW12-092022 and SS006-215MW12-092022-99 were the field duplicates for this SDG. The field duplicate results were within the 30% RPD acceptance criteria.

Analyte	Sample	Duplicate	RPD
Fe	4520	4810	6.22%
Mn	121	104	15.1%

RPD = [|S-D| / (S+D)] × 200%

13. Laboratory Control Sample	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Was a laboratory control sample prepared for each batch of samples prepared? (**Method 6010C**, Section 9.7; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4)	**X**		
Is the LCS taken through a process identical to that of the associated samples? (**Method 6010C**, Sections 9.7 and 11.1; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4)	**X**		
Were percent recoveries within the 80-120% acceptance criteria? (Note: manufacturer's control limits for solid standards may be used for solid matrices)? (**Method 6010C**, Section 9.7; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4;)	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All LCS recoveries were within the acceptance criteria. No qualifications were warranted.

14. Serial Dilution Analysis	Y	N	NA
Are serial dilution data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the serial dilution analysis?			**X**
Is one serial dilution analysis performed for each matrix in every batch with a minimum of one serial dilution per twenty samples?	**X**		
Is a dilution test run on a sample that fails both pre- and post-digestion spike analysis? (**Method 6010C**, Section 9.9.1; **Method 6020A**, Section 9.11.2; and **Method 7000B**, Section 9.8.1)	**X**		
For samples with concentrations that are minimally a factor of 50x above the method detection limit (MDL) (or detection limit) before a 1:4 dilution, was the serial dilution %D criterion of 10% met (**Method 6010C**, Section 9.9.2 and **Method 6020A**, Section 9.11.2)	**X**		
(**Hg**) For samples with concentrations that are minimally a factor of 10x above the method detection			**X**

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

14. Serial Dilution Analysis	**Y**	**N**	**NA**
limit (MDL) (or detection limit DL) limit after a 1:5 dilution, was the serial dilution %D criterion of 10% met (**Method 7000B**, Section 9.8.2)			
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The SDS %D results were within the prescribed acceptance criteria. No qualifications warranted.

15. Method Quantitation Limits	**Y**	**N**	**NA**
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	**X**		
Action: Indicate non-correctable contract compliance deviations below If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: The results were either non-detect or were >LOQ.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

16. Metals/Inorganics Analytical Data Flags:

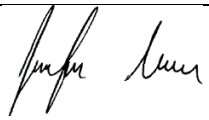
The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

17. Overall Comments:

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

The sample results were reported above the limit of quantitation, have been assessed and remain unqualified.

Data Validator	Data Validation Reviewer
Name: Lyndsi Bourne	Name: Jennifer Norman
Title: Staff Scientist	Title: Data Quality Program Manager
Company: North Wind Portage	Company: North Wind Group
Signature:	Signature: 
Date: 02/13/2023	Date: 02/27/2023

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	20221019153743	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:37
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	50.0	U	20.5	50.0	100
Manganese	7439-96-5	5.00	U	0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	20221019154036	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:40
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	2430		20.5	50.0	100
Manganese	7439-96-5	59.9		0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	20221019152633	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:26
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	4520		20.5	50.0	100
Manganese	7439-96-5	121		0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	20221019154328	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:43
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	4810		20.5	50.0	100
Manganese	7439-96-5	104		0.855	5.00	10.0

LSB 02/17/23

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

This review is based on Project requirements, the requirements of the analytical methods, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS (Final, 31 Aug 2021)*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- USEPA Office of Research and Development., 1993 and Updates, Methods for the Determination of Inorganic Substances in Environmental Samples, EPA 600-R-93-100, August.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	Sample Date	Analysis Method	Analysis Date
OT001-EQBLK01-091922	L1540948-01	Field	GW	09/19/22 & 09/20/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	09/30/22
OT001-DSAMW07-092022	L1540948-02	Field	GW	09/20/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	09/30/22
SS006-215MW12-092022	L1540948-03	Field	GW	09/20/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/03/22
SS006-215MW12-092022-99	L1540948-04	DUP	GW	09/20/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/03/22

(*) Denotes an exceeded holding time
DL: Dilution

2. Reviewer Preliminary Comments

Review Type: [X] Level IV (Level 3 or 4) [] Level III (Level 2b) [] Level II (Level 2a)
Confirm that narrative is present and complete; note overall initial indications.

Four (4) ground water samples were submitted to Pace Analytical National and were received intact by the lab on 09/29/22 at 4.7°C. They were analyzed for the following:

- Alkalinity by SM 2320B

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

2. Reviewer Preliminary Comments
• TKN by EPA 351.2 • Nitrate/Nitrite by EPA 353.2 • Sulfate by SW-846 9056A

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	X	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities below and where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected below.		

Reviewer's comments: Field and internal custody forms appear to be complete and are traceable.

4. Holding Times and Sample Preservation	Y	N	NA
Anions by Method 9056A			
Are the following analytes analyzed within 28 days of collection? (Method 9056, Section 8.2) Bromide Chloride Fluoride Sulfate	X		
Are sample shipped to the lab at ≤6 °C? (Method 9056, Section 8.2)	X		
TKN By EPA 351.2 and Nitrate/Nitrite by 353.2			
Are samples maintained at <6°C?	X		
Were samples analyzed for TKN and combined Nitrate/Nitrite within 28 days of collection?	X		
Were samples for combined Nitrate-Nitrite (NO3/NO2) and TKN preserved to pH <2 with H2SO4?	X		
Total Alkalinity			
Are samples maintained at <4°C?	X		
Were samples analyzed for Total Alkalinity within 14-days of collection?	X		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	X		
Action: Indicate affected samples below. * Use Professional Judgment in judging impact on samples.			

Reviewer Comments: The holding times were met as outlined in the sample identification table in Section 1 of this report.

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

5. Preparation Technique			
	Y	**N**	**NA**
Are preparation logs for all samples present in the data package?	**X**		

Identify the preparation method(s) used:

	Matrix	**Preparation Method(s)** *(record # or NA)*
	Water	***USEPA 351.2/365.4/353.2/9056A SM 2320 B-2011***
	Soil/Solid	*NA*
	Oil	*NA*
	Air	*NA*

Reviewer Comments: The sample was prepared in accordance with USEPA 351.2/365.4/353.2/9056A, and SM 2320 B-2011.

6. Calibration	**Y**	**N**	**NA**
Are calibration data present in the data submittal?	**X**		
Anions			
Was initial calibration (IC) performed prior to the sample analyses?	**X**		
Were at least 4 standard concentrations used for each analyte of interest in the IC?	**X**		
Were appropriate IC standard concentrations used?	**X**		
Is the IC correlation coefficient (linear regression) for each analyte ≥0.995?	**X**		
Was an initial calibration verification (ICV) standard (second source) run immediately after IC?	**X**		
Are analyte recoveries in the ICV within ±10% of reference values?	**X**		
Was a calibration check standard (CCV) run after every 10th sample and at the end of the sequence?	**X**		
Are analyte recoveries in the CCVs within ±10% of the reference values?	**X**		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?	**X**		
Were retention times (RTs) of individual anions consistent throughout the reported analyses?			**X**
TKN			
Are initial and continuing calibration results included in the data package?	**X**		
Were at least 4 standards used to calibrate the instrument?	**X**		
Were the IC standards run in order of decreasing concentration?	**X**		
Were appropriate IC standard concentrations used?	**X**		
Is the IC correlation coefficient (linear regression) ≥0.995?	**X**		
Was an ICV standard (second source) run immediately after IC?	**X**		
Was the target analyte recovery in the ICV within ±10% of reference value?	**X**		
Was a CCV run after every 10 samples, or at least once every two hours?	**X**		
Were CCV recoveries within ±10% of the reference value?	**X**		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?			**X**
Nitrate/Nitrite			
Are initial and continuing calibration results included in the data package?	**X**		
Were at least 4 standards used to calibrate the instrument?	**X**		
Were the initial calibration standards run in order of decreasing concentration?	**X**		
Were appropriate initial calibration standard concentrations used?	**X**		
Is the initial calibration correlation coefficient (linear regression) ≥0.995?	**X**		

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

6. Calibration	Y	N	NA
Was an ICV standard (second source) run immediately after initial calibration?	X		
Was the target analyte recovery in the ICV within ±10% of reference value?	X		
Was a CCV run after every 10 samples, or at least once every two hours?	X		
Were CCV recoveries within ±10% of the reference value?	X		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?			X
Standardization for Total Alkalinity			
Are standardization data present in the package?	X		
Were the 0.02N and 0.1N H2SO4 solutions standardized against a primary sodium bicarbonate standard?	X		
For potentiometric titrations, was the pH meter calibrated prior to titration?	X		
Is the initial pH documented for each sample or QC sample analyzed?	X		
Is the titrant volume used to reach pH 8.3 recorded for each sample or QC sample analyzed?	X		
Is the titrant volume used to reach pH 4.5 recorded for each sample or QC sample analyzed?	X		
Is the titrant volume used to reach pH 4.2 recorded for each sample or QC sample analyzed?	X		
Action: Sample results associated with unacceptable calibration results, especially when the responses suggest high variability or sensitivity problems should be J/UJ qualified. Use professional judgment to determine if sample results warrant rejection or if qualifiers are not necessary – explain.			

Reviewer Comments: All calibration verification data was acceptable.

7. Blanks	Y	N	NA
Are method blank and calibration blank data present in the data submittal?	X		
Was a method blank (or preparation blank) prepared for each batch of samples prepared?	X		
Is the method blank (or preparation blank) taken through a process identical to that of the associated samples?	X		
Was the method blank (or preparation blank) the same matrix as the analytical samples?	X		
Are calibration blanks run for every 10 samples in an analytical sequence?	X		
Were sample results verified as uncorrected for blank concentrations?	X		
Were all positive and negative blanks (ICB, CCB, PB or MB) evaluated for contamination?	X		
Were any target analytes detected above the detection limit (DL) or method detection limit (MDL) ICB/CCBs/PB or MB?			
Action: Apply rules from table below. Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality. ** Use professional judgment, and table below:			

Reviewer Comments: A positive detection was noted in the continuing calibration blank (CCB) for alkalinity, and a negative blank detection was noted in the CCB for TKN and nitrate/nitrite. Qualifications are as follows:

- The alkalinity results have been left unqualified as the sample results were either non-detect or >5x the blank concentration.
- The TKN and nitrate/nitrite results have been left unqualified as the sample results were either non-detect or >2x the negative blank concentration.
- All initial calibration blank, the remaining continuing calibration blank, and method blank results were non-detect.

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

8. Laboratory-Fortified Matrix or Matrix Spike (MS)	Y	N	NA
Are LFM (MS) results included in the data package?	**X**		
Have field or equipment blanks **not** been used for the MS/MSD analysis?	**X**		
Have LFMs been prepared and analyzed at a frequency of 1 for every 20 samples?	**X**		
Is the matrix spike (MS) taken through a process identical to that of the associated samples?	**X**		
Did the MS/MSD meet the method-specified or laboratory-generated acceptance criteria for the remaining analyses?		**X**	
Action: Indicate affected samples and resulting data qualification. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QL' validation flag as the MS%R was <90%.
The remaining MS recoveries were within the method prescribed acceptance limits.

9. Duplicates (MSD or Laboratory)	Y	N	NA
Are laboratory or matrix spike duplicate data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the duplicate analysis?	**X**		
Was the laboratory duplicate (or matrix spike duplicate) prepared for each batch of samples prepared (up to a maximum of 20 samples)?	**X**		
Is the laboratory duplicate (or MSD) taken through a process identical to that of the associated samples?	**X**		
Were reported precision estimates within acceptance criteria (for aqueous RPD ≤30% and for soils ≤50%)?		**X**	
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were <5x the LOQ, but the absolute difference between the sample and duplicate was >LOQ. The remaining duplicate RPDS were acceptable.

10. Field Duplicate	Y	N	NA
Was field duplicate pair collected for this SDG?		**X**	
Were field duplicate samples collected at a frequency of of one for every 10 primary samples?			**X**
Were reported precision estimates within project acceptance criteria RPD ≤35%?			**X**
Action: Indicate affected samples and resulting data qualification. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Samples SS006-215MW12-092022 and SS006-215MW12-092022-99 were the field duplicates for this SDG. TKN was outside of the 30% acceptance criteria for aqueous samples. TKN has been left unqualified as the sample and duplicate results were <5x the LOQ and the absolute difference between the sample and duplicate was < LOQ. The remaining field duplicate RPDs were within the 30% acceptance criteria.

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

Analyte	Sample	Duplicate	RPD
Alkalinity	57700	59100	2.40%
Carbonate	57700	59100	2.40%
Bicarbonate	ND	ND	0.00%
Hydroxide	ND	ND	0.00%
Nitrate/Nitrite	402	402	0.00%
Sulfate	3720	4220	12.6%
TKN	217	300	**32.1%**

RPD = [|S-D| / (S+D)] × 200%

11. Laboratory Fortified Blank (or LCS)	Y	N	NA
Are LCS results included in the data package?	**X**		
Is one LCS analyzed with each batch of samples?	**X**		
Is the LFB taken through the same preparatory and analytical process as the associated samples?	**X**		
For anions was the recovery within laboratory control limits for recovery or within ±10% of reference value? (**Method 300.0**, Sections 9.3.2 and 9.3.3)	**X**		
Did the LCS meet the method-specified or laboratory-generated acceptance criteria for the remaining analyses?		**X**	
Action: Indicate affected samples and resulting data qualifications. *Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The LCS results were acceptable.

12. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f and 5.5.2.2.1.g, and **Method 8000**, Section 7.4)		**X**	
Action: Indicate non-correctable contract compliance deviations below If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:

- TKN in sample SS006-215MW12-092022
- Nitrate/Nitrite in sample OT001-DSAMW07-092022
- Sulfate in samples OT001-DSAMW07-092022, SS006-215MW12-092022, and SS006-215MW12-092022-99

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

13. Sample Result Verification
Validation Step
For the following evaluation, some qualification of sample data may be possible. For contractual noncompliance, a validation code is placed if the occurrence is non-correctable.
1. For each analysis, recalculate 2 or more selected results from the raw data. **NA.**
2. Did recalculation confirm reported results? **NA.** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
3. Were results from diluted samples corrected for the dilution factor? **NA.**
Action: Indicate instances of manual calculations not confirming reported results. Where samples have been reanalyzed, and both analyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.

14. Inorganics Analytical Data Flags:

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

Level 2b Data Review -Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540948**

15. Overall Comments:

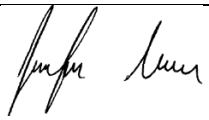
Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table

Sample ID	Analyte	Validation Flag	Qualification Reason(s)
All	TKN	QL	Low MS Recovery
All	TKN	QN	High MSD RPD
SS006-215MW12-092022	TKN	J	Results between the MDL and LOQ
OT001-DSAMW07-092022	Nitrate/Nitrite	J	Results between the MDL and LOQ
OT001-DSAMW07-092022, SS006-215MW12-092022, SS006-215MW12-092022-99	Sulfate	J	Results between the MDL and LOQ

See Section 14 for Validation Flag Definitions.

Numerous results were reported above the limit of quantitation, have been assessed and remain unqualified.

Data Validator	Data Validation Reviewer
Name: Lyndsi Bourne	Name: Jennifer Norman
Title: Staff Scientist	Title: Data Quality Program Manager
Company: North Wind Portage	Company: North Wind Group
Signature:	Signature: 
Date: 02/13/2023	Date: 02/27/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	20221001114552	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:45
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:45
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		10000	U	8450	10000	20000
Alkalinity,Bicarbonate		10000	U	8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	20221001114817	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:48
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:48
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		83600		8450	10000	20000
Alkalinity,Bicarbonate		83600		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	20221001113014	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:30
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:30
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		57700		8450	10000	20000
Alkalinity,Bicarbonate		57700		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	20221001113814	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:38
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:38
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		59100		8450	10000	20000
Alkalinity,Bicarbonate		59100		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	20221004164933	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 16:49
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 16:49
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	20221004165050	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 16:50
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 16:50
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite J	7727-37-9	82.4	J	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	20221004165558	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 16:55
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 16:55
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	402		50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	20221004170102	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 17:01
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 17:01
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	402		50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	24.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-20	**Preparation Date/Time:**	09/30/22 01:50
Analytical Batch:	WG1934792	**Analysis Date/Time:**	09/30/22 01:50
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	14808-79-8	2500	U	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	30.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-20	**Preparation Date/Time:**	09/30/22 03:09
Analytical Batch:	WG1934792	**Analysis Date/Time:**	09/30/22 03:09
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte		CAS	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	J	14808-79-8	3380	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	15.0000.TXT	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-10	**Preparation Date/Time:**	10/03/22 23:40
Analytical Batch:	WG1935036	**Analysis Date/Time:**	10/03/22 23:40
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	3720	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	16.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/03/22 23:07
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/03/22 23:07
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	4220	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-EQBLK01-091922

Lab Sample ID:	L1540948-01	**SDG:**	L1540948
Client Sample ID:	OT001-EQBLK01-091922	**Collected Date/Time:**	09/19/22 14:30
Lab File ID:	20221004220338	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 22:03
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW07-092022

Lab Sample ID:	L1540948-02	**SDG:**	L1540948
Client Sample ID:	OT001-DSAMW07-092022	**Collected Date/Time:**	09/20/22 09:15
Lab File ID:	20221004212130	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:21
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022

Lab Sample ID:	L1540948-03	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022	**Collected Date/Time:**	09/20/22 10:20
Lab File ID:	20221004212251	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:22
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN J, QL,QN	7727-37-9	217	J J3 J6 P1	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-215MW12-092022-99

Lab Sample ID:	L1540948-04	**SDG:**	L1540948
Client Sample ID:	SS006-215MW12-092022-99	**Collected Date/Time:**	09/20/22 10:25
Lab File ID:	20221004213100	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:31
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Sherrie Robinson Lyndsi Bourne	**CS Site Name:**	Port Heiden RRS	**Lab Name:**	Pace Analytical
Title:	Staff Scientist	**ADEC File No.:**	OT001: 2637.38.002.05 WP002: 2637.38.002.08 NPDL 21-034	**Lab Report No.:**	L1540953
Consulting Firm:	North Wind Site Services	**Hazard ID No.:**	OT001: 185 WP002: 186	**Lab Report Date:**	10/25/2022

Note: *Any N/A or No box checked must have an explanation in the comments box.*

1. **Laboratory**

   a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
   Yes ☒ No ☐ N/A ☐
   Comments: Pace analytical (Mount Juliet, TN) performed the analyses of these samples.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
   Yes ☐ No ☐ N/A ☒
   Comments: Samples were not subcontracted.

2. **Chain of Custody (CoC)**

   a. Is the CoC information completed, signed, and dated (including released/received by)?
   Yes ☒ No ☐ N/A ☐
   Comments: Click or tap here to enter text.

   b. Were the correct analyses requested?
   Yes ☒ No ☐ N/A ☐
   Analyses requested: AK 102, SW8260D, USEPA 6010D, 351.2, 353.2, 9056A, SM 2320B
   Comments: Click or tap here to enter text.

3. **Laboratory Sample Receipt Documentation**

   a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?
   Yes ☒ No ☐ N/A ☐

Cooler temperature(s): 5.6°C
Sample temperature(s): Click or tap here to enter text.
Comments: Click or tap here to enter text.

b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- The case narrative noted, "Samples OT001-BLOMW06-091922 (lab ID L1540953-04- batch WG1937829) and WP002-TRIPBLANK-HCL-01 (lab ID L1540953-08- batch WG1935909) were analyzed from a headspace vial." Samples OT001-BLOMW06-091922 (batch WG1937829) and WP002-TRIPBLANK-HCL-01 (batch WG1935909) have been qualified with a 'QL' validation flag due to improper sample preservation. The remaining preservation criteria were met.

All preservation and holding time criteria were met for the metals and wet chemistry data.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?
Yes ☒ No ☐ N/A ☐
Comments:

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: 8260D- Samples OT001-BLOMW06-091922 (batch WG1937829) and WP002-TRIPBLANK-HCL-01 (batch WG1935909) have been qualified with a 'QL' validation flag due to improper sample preservation.

4. Case Narrative

a. Is the case narrative present and understandable?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are there discrepancies, errors, or QC failures identified by the lab?
Yes ☐ No ☒ N/A ☐
Comments: No discrepancies were identified.

c. Were all the corrective actions documented?
Yes ☐ No ☐ N/A ☒
Comments: No corrective actions were noted.

d. What is the effect on data quality/usability according to the case narrative?
Comments: The data quality/usability was not affected.

5. Sample Results

a. Are the correct analyses performed/reported as requested on CoC?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are all applicable holding times met?
Yes ☒ No ☐ N/A ☐
Comments: AK 102- The samples were collected on 09/19/22 and were received by the laboratory on 09/29/22 at 5.6°C. The samples were extracted on 09/30/22 within 11 days of collection. The extracts were analyzed on 10/01/22 and 10/02/22 within 1-2 days of extraction. All preservation and holding time criteria were met.

8260D- The samples were collected on 09/19/22 and were received by the laboratory on 09/29/22 at 5.6°C. The samples were analyzed on 10/01/22, 10/04/22, and 10/06/22. The samples analyzed on 10/04/22 and 10/06/22 were analyzed within 15-17 days of collection, but outside the 14-day collection to analysis holding time. All sample results analyzed on 10/04/22 and 10/06/22 have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining sample results were analyzed on 10/01/22 within 12 days of collection, and no further qualifications were warranted due to holding times.

c. Are all soils reported on a dry weight basis?
Yes ☐ No ☐ N/A ☒
Comments: All samples were aqueous.

d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

e. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- All sample results analyzed on 10/04/22 and 10/06/22 have been qualified with a 'H' validation flag due to the exceeded holding time.

6. QC Samples

a. Method Blank

i. Was one method blank reported per matrix, analysis, and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all method blank results less than LOQ (or RL)?
Yes ☐ No ☒
Comments: 8260D- Acetone (16.3 ug/l, J) was present in the method blank and benzene (0.269 ug/l, J), total xylenes (0.188 ug/l, J), and acetone (15.3 ug/l, J) were present in trip blank WP002-TRIPBLANK-HCL-01.

iii. If above LoQ or RL, what samples are affected?
Comments: 8260D- Total xylenes in sample OT001-BLOMW06-091922, and all acetone results, except in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 have been qualified with a 'B' validation flag due to the method blank detection.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

v. Data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Total xylenes in sample OT001-BLOMW06-091922, and all acetone results, except in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 have been qualified with a 'B' validation flag due to the method blank and trip blank detections.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – Are one LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments:

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- Naphthalene (23.1%RPD) and 1,2,3-trichlorobenzene (67.0%R & 27.3%RPD) in the LCSD were outside of the 69-129 % acceptance criteria and 20%RPD criteria.

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the RPD reported from LCS/LCSD, and or sample/sample duplicate? (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- Naphthalene (23.1%RPD) and 1,2,3-trichlorobenzene (67.0%R & 27.3%RPD) in the LCSD were outside of the 69-129 % acceptance criteria and 20%RPD criteria.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: 8260D- All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a 'QL' validation flag due to low LCSD recovery. No qualifications were warranted due to the high LCSD RPDs as the sample results were non-detect.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a 'QL' validation flag due to low LCSD recovery.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Non-SDG sample L1540401 and non-SDG sample L1540980 were the parent samples for the MS/MSD analyses.

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒
Comments: Not applicable, metals/inorganics were not included in this report.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?
Yes ☐ No ☒ N/A ☐
Comments: 8260D- In the non-SDG L1540401 and non-SDG L1540980 MS/MSDs, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria.

The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.
Yes ☐ No ☒ N/A ☐
Comments: 8260D- In the non-SDG L1540401 and non-SDG L1540980 MS/MSDs, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria.

The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: MS/MSD parent samples were not from this SDG, no sample results were qualified.

All TKN sample results were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: All TKN results have been qualified with a 'QL' validation flag as the MS%R was <90%.
All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were <5x the LOQ, but the absolute difference between the sample and duplicate was >LOQ.

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐

Comments: All TKN results have been qualified with a 'QL' validation flag due to low MS recovery.
All TKN results have been qualified with a 'QN' validation flag due to high laboratory duplicate RPD.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC, and laboratory samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)
Yes ☒ No ☐ N/A ☐
Comments: All surrogate recoveries were within the acceptance criteria.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?
Yes ☐ No ☐ N/A ☒
Comments: Not applicable, all surrogate recoveries were within the acceptance criteria.

iv. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all results less than LoQ or RL?
Yes ☐ No ☒ N/A ☐
Comments: 8260D- Benzene (0.269 ug/l, J), total xylenes (0.188 ug/l, J), and acetone (15.3 ug/l, J) were present in trip blank WP002-TRIPBLANK-HCL-01.

iii. If above LoQ or RL, what samples are affected?
Comments: 8260D- Total xylenes in sample OT001-BLOMW06-091922, and all acetone results, except in samples WP002-BLOMW01-091922

and WP002-BLOMW01-091922-99 have been qualified with a 'B' validation flag due to the method blank and trip blank detections.

iv. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Total xylenes in sample OT001-BLOMW06-091922, and all acetone results, except in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 have been qualified with a 'B' validation flag due to the method blank and trip blank detections.

f. Field Duplicate

i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?
Yes ☒ No ☐ N/A ☐
Comments: The field duplicate pairs for this SDG were OT001-BLOMW06-091922 and OT001 BLOMW06-091922-99 and WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99.

ii. Was the duplicate submitted blind to lab?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD\ (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| X\ 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes ☐ No ☒ N/A ☐
Comments: 8260D- Total xylenes (155%RPD) in samples OT001-BLOMW06-091922 and OT001-BLOMW06-091922-99, and isopropylbenzene (133%RPD) in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 exceeded the >30%RPD criteria.

The field duplicate results for iron (41.5%) and manganese (74.2%) in samples OT001-BLOMW06-091922 and OT001-BLOMW06-091922-99 were outside of the 30% RPD acceptance criteria. The iron and manganese results have been qualified with a 'QN' validation flag as the sample and duplicate results were >5x the LOQ. The remaining field

duplicates exhibited acceptable precision with RPDs <30%

iv. Is the data quality or usability affected? (Explain)
Yes ☒ No ☐ N/A ☐
Comments: 8260D- All field duplicate results that exceeded the >30%RPD criteria had results that were either non detect or <RL and warrant no qualifications due to the high field duplicate RPDs.

The iron and manganese results have been qualified with a 'QN' validation flag due to high field duplicate RPD.

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?
Yes ☐ No ☒ N/A ☐
Comments: Equipment blanks were not collected for this SDG.

ii. Are all results less than LoQ or RL?
Yes ☐ No ☐ N/A ☒
Comments: Equipment blanks were not collected for this SDG.

iii. If above LoQ or RL, specify what samples are affected.
Comments: Not applicable, equipment blanks were not collected for this SDG.

iv. Are data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?
Yes ☒ No ☐ N/A ☐
Comments: Several sample results have been qualified with a 'J' validation flag as the results were reported between the detection limit (DL) and the limit of quantitation (LOQ) and are estimates. The remaining sample results were either non-detect or reported above the LOQ.

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Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

This review is based on Project requirements, the requirements of Method 8015, Base Method 8000, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- Method AK101, *Determination of Gasoline Range Organics*, Version 12/21/16.
- Method AK102, *Determination of Diesel Range Organics*, Version 12/21/16.
- Method AK103, *Determination of Residual Range Organics,* Version 12/21/16.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested.

Sample ID	Lab ID	Type	Matrix	Date Collected	Extraction Date	Analysis Date
OT001-BLOMW07-091922	L1540953-01	Field Sample	Ground Water	09/19/22	09/30/22	10/01/22
OT001-BLOMW05-091922	L1540953-02	Field Sample	Ground Water	09/19/22	09/30/22	10/01/22
OT001-DSAMW02-091922	L1540953-03	Field Sample	Ground Water	09/19/22	09/30/22	10/01/22
OT001-BLOMW06-091922	L1540953-04	Field Sample	Ground Water	09/19/22	09/30/22	10/02/22
OT001-BLOMW06-091922-99	L1540953-05	Field Duplicate of OT001-BLOMW06-091922	Ground Water	09/19/22	09/30/22	10/02/22
WP002-BLOMW01-091922	L1540953-06	Field Sample	Ground Water	09/19/22	09/30/22	10/02/22
WP002-BLOMW01-091922-99	L1540953-07	Field Duplicate of WP002-BLOMW01-091922	Ground Water	09/19/22	09/30/22	10/02/22

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [X] Level III (Level 2b) [] Level II (Level 2a)
Confirm that narrative is present and complete; note overall initial indications.

Seven (7) groundwater samples were received by received by Pace Analytical on 09/29/22 at 5.6°C. The samples were analyzed for diesel range organics (DRO) by EPA Method AK102. The data was validated to a Level 2b.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	X	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.		

Reviewer Comments: Field and internal custody forms are complete and accurate.

4. Holding Times and Preservation	Y	N	NA
Were samples preserved at ≤6° C?	X		
AK 101			
Were aqueous samples analyzed within 14 days of collection?			X
Were soil/solid samples analyzed within 28 days of collection?			X
AK102/AK103			
For AK102, were aqueous samples acidified to pH 2 or less with HCl?	X		
Were aqueous and soil/solid samples extracted within 14-days of collection?	X		
Were extracts analyzed within 40-days of extraction?	X		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	X		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 09/19/22 and were received by the laboratory on 09/29/22 at 5.6°C. The samples were extracted on 09/30/22 within 11 days of collection. The extracts were analyzed on 10/01/22 and 10/02/22 within 1-2 days of extraction. All preservation and holding time criteria were met. No qualifications were warranted.

5. Preparation Technique

	Y	N	NA
Are preparation logs for all samples present in the data package?	X		
Are cleanup data present in the data submittal?			X

Identify the preparation method(s) used:

	Matrix	Preparation Method(s) *(record # or NA)*	Cleanup Method(s) *(record # or NA)*
	Water	*SW3510C*	*NA*
	Soil/Solid	*NA*	*NA*
	Oil	*NA*	*NA*
	Air	*NA*	*NA*

Reviewer Comments: The samples were prepared in accordance with Method SW3510C.

6. Instrumentation QA/QC	Y	N	NA
Were the following instrumentation criteria met?			
Was all retention time criteria met per the analytical method?	X		
Was all initial calibration criteria met (i.e. %RSD <25% or r^2<0.995)?	X		

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

6. Instrumentation QA/QC	Y	N	NA
Was all initial calibration verification (ICV) criteria met (%D<25% **or** method required criteria)?	X		
Was all continuing calibration verification (CCV) criteria met (%D<25% **or** method required criteria)?	X		

Reviewer Comments: All retention time criteria, initial calibration criteria, and continuing calibration criteria were met. No qualifications were warranted.

7. Method Blank	Y	N	NA
Are method blank results present?	X		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix? (**Method 8000B**, Section 8.2.6.1;)	X		
Is the method blank subjected to the same cleanup procedures as the associated samples? (**Method 8000B**, Section 8.2.6.4)	X		
Is the method blank run after initial calibration or calibration verification? (**Method 8000B**, Sections 7.7.7 and 8.2.6.3)	X		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	X		
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000**, Section 8.2.6.7)			X
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			X
Were any target analytes detected in the method, instrument, and/or solvent blanks?		X	
Is gross contamination present in the method, instrument, or solvent blank?		X	
If gross contamination is present, are associated samples reanalyzed?			X
Are blank results **not** subtracted from associated sample results? (**Method 8000**, Section 8.2.6.6)	X		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All method blank results were non-detect. No qualifications were warranted.

8. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	X		
Were method-appropriate surrogate standards used for the reported analyses?	X		
Were the surrogates added to all standards, QC samples, and project samples? **(Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1; **Method 8015**, Section 9.6)	X		
Has the laboratory developed control limits for surrogates?	X		
Are recoveries within the laboratory-generated limits?	X		
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All surrogate recoveries were within the acceptance criteria. No qualifications were warranted.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)	**X**		
Are RPDs within MSD control criteria (or lab-generated limits)?	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Non-SDG sample L1540948 and non-SDG sample L1540980 were the parent samples for the MS/MSD analyses. All non-SDG matrix spike (MS) and matrix spike duplicate (MSD) recoveries and precision criteria were met. No qualifications were warranted.

10. Field Duplicate	Y	N	NA	Q(D/ND)
Was a field duplicate pair collected for this SDG?	**X**			*
Were field duplicate samples collected at a frequency of of one for every 20 primary samples? (**Per Project QAPP)**	**X**			
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**	**X**			
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.				

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP. The field duplicate pairs for this SDG were OT001-BLOMW06-091922 and OT001-BLOMW06-091922-99 and WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99. The following table shows the compounds that were detected in the samples and the resulting field duplicate RPD. The remaining results in the field duplicate pairs were non-detect. All field duplicate criteria were met.

Analyte	WP002-BLOMW01-091922 (ug/l)	WP002-BLOMW01-091922-99 (ug/l)	%RPD
AK102 DRO C10-C25	13700	13600	0.73%

Note: Non-detect results were reported at the LOD; therefore, the LOD has been utilized in the field duplicate RPD calculation.

$$RPD = [|S-D| / (S+D)] \times 200\%$$

11. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Is an LCS included with each batch of ≤20 samples on a per-matrix basis? (**Method 8000**, Section 8.5 and **Method 8015**, Section 9.6.2)	**X**		

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

11. Laboratory Control Sample (LCS)	Y	N	NA
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5; **Method 8015**, Section 9.6.2)	X		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4; **Method 8015**, Section 9.6.2)	X		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, within the method-specified range of 70-130%)? (**Method 8000B**, Section 8.5.4)	X		
If prepared in duplicate, are RPDs within limits?	X		
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality ** Evaluate other QC prior to qualifying "R". *** Use professional judgment			

Reviewer Comments: All laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and precision criteria were met. No qualifications were warranted.

12. Confirming Column	Y	N	NA
Since most samples are not well-characterized, is each sample analysis confirmed on a dissimilar column for all single-peak target compounds (non-DRO and GRO) (i.e. is second-column confirmation performed)? (**Method 8000**, Section 7.9 and **Method 8015**, 11.6.5)			X
For DRO and GRO, if analytical interferences are indicated is confirmatory analysis performed? (**Method 8015**, Section 11.6.5)			X
Is the RPD between primary and confirming column results <40%? (**Method 8000B**, Section 7.10.4.1 and **Method 8000C**, Section 11.10.4.1)			X
If confirmatory analysis is not present, all single-peak target compound results should be qualified "J" or "UJ", since flame-ionization detection (FID) is non-specific and subject to numerous positive interferences.			

Reviewer Comments: No comments.

13. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	X		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	X		
Action: *Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: All sample results were non-detect or reported above the LOQ.

14. Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

15. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

AK102 DRO C10-C25 in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 was reported above the LOQ, has been assessed, and remains unqualified.

The remaining sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/02/2023	Date: 03/06/2023

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	1001_029	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 22:29
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	110 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

JW 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	1001_030	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 22:52
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

SR 3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	1001_031	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/01/22 23:15
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

3r 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	1001_037	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 01:50
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

SM 3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	1001_038	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 02:13
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

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1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	1001_039	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 02:36
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	110 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	13700		170	400	800

3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	1001_040	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 02:58
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):	_____	**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	13600		170	400	800

SK 3/2/23

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Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

This review is based on Project requirements, the requirements of the analytical method(s), and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted

Sample ID	Lab ID	Type	Matrix	Date Collected	DF	Date Analyzed
OT001-BLOMW07-091922	L1540953-01	Field Sample	Ground Water	09/19/22	1	10/01/22 *10/04/22
OT001-BLOMW05-091922	L1540953-02	Field Sample	Ground Water	09/19/22	1	10/01/22 *10/04/22
OT001-DSAMW02-091922	L1540953-03	Field Sample	Ground Water	09/19/22	1 1 10	10/01/22 *10/04/22 *10/06/22
OT001-BLOMW06-091922	L1540953-04	Field Sample	Ground Water	09/19/22	1	10/01/22 *10/04/22 *10/06/22
OT001-BLOMW06-091922-99	L1540953-05	Field Duplicate of OT001-BLOMW06-091922	Ground Water	09/19/22	1	10/01/22 *10/04/22 *10/06/22
WP002-BLOMW01-091922	L1540953-06	Field Sample	Ground Water	09/19/22	50	10/01/22 *10/04/22
WP002-BLOMW01-091922-99	L1540953-07	Field Duplicate of WP002-BLOMW01-091922	Ground Water	09/19/22	25	10/01/22 *10/04/22
WP002-TRIPBLANK-HCL-01	L1540953-08	Trip Blank	Ground Water	09/19/22	1	10/01/22 *10/04/22

DF: Dilution Factor

* Denotes exceeded holding time

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

2. Reviewer Preliminary Comments
Review Type: [] Level IV (Level 3 or 4) [x] Level III (Level 2B) []Level II (Level 2a)
Eight (8) ground water samples were received by received Pace Analytical on 09/29/22 at 5.6°C. The samples were analyzed for volatile organic compounds by EPA Method SW8260D. The data was validated to a Level 2b. The sample narratives on the Form 1s for samples WP002-BLOMW01-091922 (50x DL) and WP002-BLOMW01-091922-99 (25x DL) noted, *"Lowest possible dilution due to sample foaming."*

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.		

Reviewer Comments: Field and internal custody forms are complete and accurate.

4. Holding Times and Preservation	Y	N	NA
Have aqueous samples been preserved at ≤6°C (**SW846**-Table 2-40A)	**X**		
Have solid samples been preserved at ≤6°C (**SW846**-Table 2-40A)			**X**
Have aqueous samples been preserved with H2SO4, HCl, or solid NaHSO4? (**SW846**-Table 2-40A)	**X**		
Are preserved samples, solids, and wastes analyzed with 14 days of collection? (**SW846**-Table 2-40A)		**X**	
Are unpreserved samples analyzed with 7 days of collection? (**SW846**-Table 2-40A)			**X**
If residual chlorine is present, are samples treated with sodium thiosulfate? (**SW846**-Table 2-40A)			**X**
Inspect narrative, receipt logs, etc. Does the information indicate there were **no** significant problems with sample handling/naming?	**X**		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 09/19/22 and were received by the laboratory on 09/29/22 at 5.6°C. The samples were analyzed on 10/01/22, 10/04/22, and 10/06/22. The samples analyzed on 10/04/22 and 10/06/22 were analyzed within 15-17 days of collection, but outside the 14-day collection to analysis holding time. All sample results analyzed on 10/04/22 and 10/06/22 have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining sample results were analyzed on 10/01/22 within 12 days of collection, and no further qualifications were warranted due to holding times.

The case narrative noted, *"Samples OT001-BLOMW06-091922 (lab ID L1540953-04- batch WG1937829) and WP002-TRIPBLANK-HCL-01 (lab ID L1540953-08- batch WG1935909) were analyzed from a headspace vial."* Samples OT001-BLOMW06-091922 (batch WG1937829) and WP002-TRIPBLANK-HCL-01 (batch WG1935909) have been qualified with a 'QL' validation flag due to improper sample preservation. The remaining preservation criteria were met. No further qualifications were warranted.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

5. Preparation Technique				
		Y	**N**	**NA**
Are preparation logs for all samples present in the data package?				
Identify the preparation method(s) used:				
	Matrix	**Method(s)** *(record # or NA)*		
	Water	*EPA Method SW8260D*		
	Soil/Solid	*NA*		
	Oil	*NA*		
	Air	*NA*		

Reviewer Comments: The samples were prepared in accordance with EPA Method SW8260D.

6. GC/MS Performance Check	**Y**	**N**
Are performance check data present in the data submittal?	**X**	
Is the GC/MS hardware-tuned to meet BFB criteria prior to the initial calibration and for each 12-hr period during which analyses are performed? (**Method 8260B**, Sections 4.9.3, 5.11, 7.3.1, 7.4.1, 7.5.2, 8.2.1, and 11.4.1)	**X**	
Are mass spectral relative abundances acceptable according to the method criteria? (**Method 8260B**, Table 4**)**	**X**	
Was there correct assignment of ions?	**X**	
Raw Data Confirmation		
Raw data show proper averaging of scans according to method recommendations.	**X**	
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate		

Reviewer Comments: All tune criteria were met. No qualifications were warranted.

7. Initial Calibration	**Y**	**N**	**NA**
Are initial calibration data present in the data submittal?	**X**		
Does the initial calibration curve consist of a least 5 standards? (**Method 8260B**, Sections 5.7.6.10, 5.7.6.11, 5.12.1 and 7.3.2; and **Method 8000B**, Section 7.4)	**X**		
Are all target analytes present in the initial calibration? (**Method 8260B**, Section 5.12.3)	**X**		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the RSD ≤30%? (**Method 8260B**, Section 7.3.6.3 and 8.2.3) **[Note: Method 8260 requires an RSD of ≤15% and Method 8260C/D requires an RSD of 20% for all compounds or another type of curve must be used]**	**X**		
For the system performance check compounds, are the response factors 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Section 7.3.5.4 and 8.2.3)	**X**		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	**X**		
For other compounds, is the response factor ≥0.01 (or method criteria)?	**X**		
If the RSD does not meet the 20% (15% for **Method 8260**) criterion, is a linear (or quadratic) regression equation used for target compound quantitation? (**Method 8260B**, Sections 7.3.8.2)	**X**		
If linear and/or quadradic regressions, are used, is r ≥0.99 or r^2≥0.98 (**Method 8000B**, Sections 7.5.2 and 8.3.2)	**X**		
Is the origin not forced and not included in the calibration curve for linear regression? (**Method 8000**, Section 7.5.2)	**X**		
QC Check Standard (ICV)			

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

7. Initial Calibration	Y	N	NA
Are QC Check Standard Results present in the data submittal?	**X**		
Is the check standard run on an ongoing basis? (**Method 8260B**, Section 8.7-referred to as a standard reference material)	**X**		
Are check standard results within 30% of reference value?		**X**	
Raw Data Confirmation			
Raw data have been examined for anomalies	**X**		
The quantitation ions for 2 compounds have been confirmed as the correct ions for quantitation.	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate *** Qualify only peaks outside linear portion			

Reviewer Comments: All initial calibration criteria were met.

The following ICV compounds were outside of the 30%D acceptance criteria; however, the ICVs only bracketed the associated ICAL and no qualifications were warranted:

- 1,2,4-Trichlorobenzene (68.10%) and acrolein (164%) in the ICV analyzed on 08/26/22 at 22:56.
- Acrolein (147%) and bromomethane (212%) in the ICV analyzed on 08/18/22 at 15:17.
- The remaining ICV criteria were met. No qualifications were warranted.

8. Continuing Calibration	Y	N	NA
Are continuing calibration data present in the data submittal?	**X**		
Are all target analytes present in the continuing calibration (verification)? (**Method 8260B**, Section 5.12.3)	**X**		
Has continuing calibration verification been performed within 12 hours of the time of associated sample analysis? (**Method 8260B**, Sections 7.4.2 and 8.2.3)	**X**		
For the system performance check compounds, are the response factors in the calibration verification 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Sections 7.3.5.4, 7.4.4.1, 7.4.4.2, and 8.2.3)	**X**		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	**X**		
For other compounds, is the response factor ≥0.01?	**X**		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the %D ≤20%? (**Method 8260B**, Sections 7.3.6.3, 7.4.5.1, 7.4.5.2, and 8.2.3)	**X**		
For other compounds, is %D ≤ 20%? (**Method 8260B**, Section 7.4.5.2)		**X**	
Is a closing CCV performed? (**DOD QSM 5.3** Table B-4)	**X**		
Is the closing CCV %D ≤ 50%? (**DOD QSM 5.3** Table B-4)		**X**	
Action: Indicate affected samples in validation comments, primarily if data are rejected.			

Reviewer Comments: The following table shows the CCV %Rs that exceeded the opening CCV 80-120% recovery or the closing CCV 50%-150% acceptance criteria and the affected samples.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

Continuing Calibration Date/Time	Samples Bracketed	Analyte	CCV%R >Opening 80-120%R/ Closing 50-150%R
VOCMS33 Opening CCV 10/01/22, 08:51	All samples and associated QA/QC	1,1,2-Trichlorotrifluoroethane	125%
		1,2,4-Trichlorobenzene	78.7%
		1,2-Dibromo-3-chloropropane	79.8%
		4-Methyl-2-pentanone (MIBK)	79.2%
		Chloromethane (SPCC)	72.6%
VOCMS6 Opening CCV 10/03/22, 23:30	All samples and associated LCS/LCSD and MB	1,1,2,2-Tetrachloroethane (SPCC)	76.8%
		1,2-Dibromo-3-chloropropane	73.5%
		Acetone	140%
		Bromomethane	12.8%
		Naphthalene	68.0%
		Trichloroethene	124%
VOCMS6 Closing CCV 10/04/22, 09:27		Bromomethane	21.0%
VOCMS41 Opening CCV 10/05/22, 19:58	Samples OT001-BLOMW06-091922, OT001-BLOMW06-091922-99, OT001-DSAMW02-091922, and associated LCS LCSD and MB (only Trichloroethene reported)	Numerous compounds	53.1%-197%
VOCMS41 Closing CCV 10/06/22, 06:32		Acetone	230%

Note: SPCC = System performance check compound

Qualifications are as follows:

- All 1,1,2-trichlorotrifluoroethane, 1,2-dibromo-3-chloropropane, and acetone results have been qualified with a 'QN' validation flag as the CCV %R criteria was exceeded.
- The following SPCC compounds were not target compounds. No qualifications were warranted as the SPCC criterion was met:
  - Chloromethane in the CCV analyzed 10/01/22 at 08:51.
  - 1,1,2,2-Tetrachloroethane in the CCV analyzed 10/03/22 at 23:30.
- 1,2,4-Trichlorobenzene, 1,2-dibromo-3-chloropropane, and 4-methyl-2-pentanone (MIBK) were not reported from the CCV analyzed 10/01/22 at 08:51. No qualifications were warranted.
- Bromomethane, naphthalene, and trichloroethene were not reported from the CCVs analyzed 10/03/22 at 23:30 and 10/04/22 at 09:27. No qualifications were warranted.
- Numerous compounds in the CCVs analyzed 10/05/22 at 19:58 and 10/06/22 at 06:32 exceeded the CCV %R criteria; however, only trichloroethene was reported from the analysis and no qualifications were warranted.
- The remaining CCV criteria were met. No further qualifications were warranted.

9. Method Blank	**Y**	**N**	**NA**
Are method blank results present?	**X**		
Is the method blank run after initial calibration or calibration verification? (**Method 8260B**, Section 7.4.3 and **Method 8000B**, Sections 7.7.7 and 8.2.6.3)	**X**		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix or on a per batch basis? (**Method 8260B**, Section 8.4 and **Method 8000B**, Section 8.2.6.1)	**X**		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	**X**		

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

9. Method Blank	Y	N	NA
Is the method blank subjected to the same preparation and cleanup procedures as the associated samples? (**Method 8260B**, Section 8.4.1 and **Method 8000B**, Section 8.2.6.4)	**X**		
Are solvent or instrument blanks interspersed through the analytical run or as necessary? (Method 8260B, Section 7.4.3 and **Method 8000B**, Section 8.2.1)			**X**
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			**X**
Were any target analytes detected in the method, instrument, and/or solvent blanks?	**X**		
Is gross contamination present in the method, instrument, or solvent blank?			**X**
If gross contamination is present, are associated samples reanalyzed			**X**
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000B**, Section 8.2.6.7)			**X**
Are blank results **not** subtracted from associated sample results? (**Method 8000B**, Section 8.2.6.6)	**X**		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: Acetone (16.3 ug/l, J) was present in the method blank and benzene (0.269 ug/l, J), total xylenes (0.188 ug/l, J), and acetone (15.3 ug/l, J) were present in trip blank WP002-TRIPBLANK-HCL-01. Qualifications are as follows:

- The following sample results were detected at a concentration <LOQ and have been qualified with a 'B' validation flag due to the method blank and/or trip blank detections:
  - Total xylenes in sample OT001-BLOMW06-091922.
  - All acetone results, **except** in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99.
- The remaining benzene and total xylenes results, and acetone in samples WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99 were non-detect and warranted no qualification due to the trip blank and method blank detections.
- The remaining method blank and trip blank WP002-TRIPBLANK-HCL-01 results were non-detect. No further qualifications were warranted.

10. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? (**Method 8260B**, Section 5.9 and **Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1)	**X**		
Are surrogate recoveries within the lab-generated or default (70-130%R) acceptance limits?	**X**		
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Use technical judgment in recoveries, allowing 0 outliers for VOA, possibly 1 for SVOA.			

Reviewer Comments: All surrogate recoveries were within the acceptance criteria. No qualifications were warranted.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

11. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix or on a per-batch basis? (**Method 8260B**, Sections 8.4 and 8.4.2 and **Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)		**X**	
Are RPDs within MSD control criteria (or lab-generated limits)?		**X**	
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: In the non-SDG L1540401 and non-SDG L1540980 MS/MSDs, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria. However, no qualifications were warranted as the MS/MSD parent samples were **not** from this SDG and only the parent sample shall be qualified due to MS/MSD considerations per the USEPA Functional Guidelines.

12. Field Duplicate	Y	N	NA
Was a field duplicate pair collected for this SDG?	**X**		
Were field duplicate samples collected at a frequency of of one for every 10 primary samples? (**Per Project QAPP)**	**X**		
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**		**X**	
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP. The field duplicate pairs for this SDG were OT001-BLOMW06-091922 and OT001-BLOMW06-091922-99 and WP002-BLOMW01-091922 and WP002-BLOMW01-091922-99. The following table shows the compounds that were detected in the samples and the resulting field duplicate RPD. The remaining results in the field duplicate pair were non-detect. Data assessment is as follows:

- All field duplicate results that exceeded the >30%RPD criteria had results that were either non-detect or <RL and warrant no qualifications due to the high field duplicate RPDs.
- The remaining field duplicate criteria were met.

Analyte	OT001-BLOMW06-091922 (ug/l)	OT001-BLOMW06-091922-99 (ug/l)	%RPD
Xylenes, Total	0.190, J	1.50, U	**155%**
Acetone	13.2, J	15.3, J	14.7%
Trichloroethene	0.500, U	0.572, J	13.4%

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

	WP002-BLOMW01-091922	WP002-BLOMW01-091922-99	
cis-1,2-Dichloroethene	12.2, J	12.3, J	0.87%
Isopropylbenzene	25.0, U	5.02, J	**133%**

Note: Non-detect results were reported at the LOD; therefore, the LOD has been utilized in the field duplicate RPD calculation.
RPD = [|S-D| / (S+D)] × 200%

13. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Has at least one LCS been prepared with each analytical batch up to 20 samples? (**Method 8260B**, Sections 8.4 and 8.4.3)	**X**		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5)	**X**		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4)	**X**		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, the method-specified range of 70-130)? (**Method 8000B**, Section 8.5.4)		**X**	
If prepared in duplicate, are RPDs within limits?		**X**	
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality. ** Evaluate other QC prior to qualifying "R".			

Reviewer Comments: Naphthalene (23.1%RPD) and 1,2,3-trichlorobenzene (67.0%R & 27.3%RPD) in the LCSD were outside of the 69-129 % acceptance criteria and 20%RPD criteria. Data qualifications are as follows:

- All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a 'QL' validation flag due to low LCSD recovery.
- No qualifications were warranted due to the high LCSD RPDs as the sample results were non-detect.
- The remaining LCS/LCSD recoveries and precision criteria were within the acceptance criteria. No further qualifications were warranted.

14. Internal Standards	Y	N	NA
Are internal standard data present in the data submittal?	**X**		
Were method-appropriate internal standards (ISs) used for the reported analyses?	**X**		
Are internal standards added to each calibration standard? (**Method 8260B**, Section 5.12.4 and 7.5.10.2)	**X**		
Do internal standard retention times **not** vary by more than 30 seconds from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.6)	**X**		
Does the EICP area of any internal standard **not** vary by more than a factor of two (-50 to +100%) from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.7)	**X**		
Do area counts appear to be at least minimally adequate?	**X**		
Note: Internal standard assessment is **not** required for a Level 2a data validation. Action: Indicate affected samples in validation comments, primarily if data were rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All internal standard criteria were met. No qualifications were warranted.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540953**

15. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f) and 5.5.2.2.1.g)) (**Method 8000**, Section 7.4) (**All data below LOQ qualified with a J**)		**X**	
Action: Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: Several sample results have been qualified with a 'J' validation flag to denote the reported results are estimated due to sample results reported at levels between the detection limit (DL) and the limit of quantitation (LOQ)

The remaining sample results were either non-detect or reported above the LOQ.

16. Tentatively Identified Compounds	Y	N	NA
Are TICs reported in the data submittal?			**X**
If requested, does the TIC report include up to 20 compounds?			**X**
Action: Indicate non-correctable contract compliance deviations below. Indicate missed TICs (if this part of analysis requested)			

Reviewer Comments: TICs were not required.

17. Sample Data Evaluation -Validation with Raw Data Confirmation
1. For one compound in each sample, determine whether CRQLs have been modified to SQLs. **NA.**
2. Sample-specific evaluation - these evaluations are performed one sample in each batch (excluding QC).
-Evaluate whether the correct quantitation ions were used. **NA.**
-Evaluate adequacy of manual integrations of peak areas. (**AMS**, Section 3.5.5.g)) **NA.**
-Evaluate the presence of carryover. **NA**
-Evaluate the validity of dilutions and reanalyses. **NA**
-Evaluate interferences that may preclude accurate quantitation of compounds. **NA**
3. Manually recalculate 2 or more selected results from a sample in the SDG. **NA** 4. Did recalculation confirm reported results? **NA** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
5. Qualify all non-rejected TIC as "NJ" **NA**
6. Evaluate all TICs according to EPA Functional Guidelines VOA verification/validation procedure. **NA**
Action: Indicate in comments instances of manual calculations not confirming reported results. Where samples have been reanalyzed, and both reanalyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.
Description of Sample-specific Evaluation Problems**: NA**

Reviewer Comments: No comments as the samples have undergone a Level 2b review.

18. Method 8260 Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

19. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table

Sample ID	Analyte	Validation Flag	Qualification Reason(s)
OT001-BLOMW07-091922	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank/trip blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
OT001-BLOMW05-091922	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank/trip blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
OT001-DSAMW02-091922	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Trichloroethene		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank/trip blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
	Chloroform	J	Result ≥DL but <LOQ
	Trichlorofluoromethane		
OT001-BLOMW06-091922	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		

	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Trichloroethene	H, QL	Exceeded holding time Improper sample preservation
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank/trip blank considerations Result ≥DL but <LOQ
	Total xylenes	B, J	Trip blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
OT001-BLOMW06-091922-99	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Trichloroethene		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank/trip blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
	Trichloroethene	J	Result ≥DL but <LOQ
WP002-BLOMW01-091922	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone		
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
	cis-1,2-Dichloroethene	J	Result ≥DL but <LOQ
WP002-BLOMW01-091922-99	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN	Exceeded holding time CCV %R >20%
	Acetone		
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
	cis-1,2-Dichloroethene	J	Result ≥DL but <LOQ
	Isopropylbenzene		
WP002-TRIPBLANK-HCL-01	Chloromethane	H, QL	Exceeded holding time Improper sample preservation
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		

	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2-Dibromo-3-chloropropane	H, QN, QL	Exceeded holding time CCV %R >20% Improper sample preservation
	Acetone	H, QN, QL, B, J	Exceeded holding time CCV %R >20% Improper sample preservation Method blank considerations Result ≥DL but <LOQ
	1,2,3-Trichlorobenzene	QL	Low LCSD recovery
	Benzene	J	Result ≥DL but <LOQ
	Total xylenes		

Note: See Section 18 for Validation Flag Definitions

Several sample results were reported above the LOQ, have been assessed, and remain unqualified.

The remaining sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/02/2023	Date: 03/06/2023

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	1001_13	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 14:31
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 14:31
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

SW 3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	1001_13	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 14:31
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 14:31
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	6.57	1.50	U	0.174	1.50	3.00

SW 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	1003_50	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 04:23
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 04:23
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QN BJ	3.12	14.8	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3	0	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	T8 U	0.160	2.00	5.00

qw 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	1001_14	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 14:53
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 14:53
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	1001_14	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 14:53
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 14:53
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	6.57	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	1003_51	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 04:45
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 04:45
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN BJ	3.12	14.5	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3		1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1		0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1		0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4		0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.: OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	1001_15	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 15:13
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 15:13
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3 J	3.94	0.185	J	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	3.05	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	1001_15	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 15:13
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 15:13
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	4.07	1.19		0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	5.83	0.500	U	0.158	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	6.57	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	1005_33	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS41	**Preparation Date/Time:**	10/06/22 01:10
Analytical Batch:	WG1937829	**Analysis Date/Time:**	10/06/22 01:10
Dilution Factor:	10	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	0.5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Trichloroethene	79-01-6 H	4.52	410	T8	1.90	5.00	10.0

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	1003_52	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 05:06
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 05:06
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN BJ	3.12	12.7	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3		1.91	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1		0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1		0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	J	2.40	0.924	J T8	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	1001_16	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 15:34
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 15:34
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	1001_16	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 15:34
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 15:34
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7 BJ	6.57	0.190	J	0.174	1.50	3.00

SV 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	1005_31	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS41	**Preparation Date/Time:**	10/06/22 00:33
Analytical Batch:	WG1937829	**Analysis Date/Time:**	10/06/22 00:33
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Trichloroethene	79-01-6 H QL	4.53	0.500	T8 U	0.190	0.500	1.00

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1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	1003_53	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 05:28
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 05:28
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QN BJ	3.12	13.2	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3	1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	T8 U	0.160	2.00	5.00

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1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	1001_17	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 15:55
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 15:55
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

SK 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	1001_17	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 15:55
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 15:55
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	6.57	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	1005_32	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS41	**Preparation Date/Time:**	10/06/22 00:51
Analytical Batch:	WG1937829	**Analysis Date/Time:**	10/06/22 00:51
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Trichloroethene	79-01-6 H J	4.53	0.572	J T8	0.190	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	1003_54	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 05:50
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 05:50
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN BJ	3.12	15.3	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3		1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1		0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1		0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4		0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	1001_24	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 18:22
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 18:22
Dilution Factor:	50	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.1 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	1250	U	127	1250	2500
Acrylonitrile	107-13-1	0	250	U	33.6	250	500
Benzene	71-43-2	0	25.0	U	4.71	25.0	50.0
Bromobenzene	108-86-1	0	25.0	U	5.90	25.0	50.0
Bromodichloromethane	75-27-4	0	25.0	U	6.80	25.0	50.0
Bromoform	75-25-2	0	25.0	U	6.45	25.0	50.0
Bromomethane	74-83-9	0	100	U	30.3	100	250
n-Butylbenzene	104-51-8	0	25.0	U	7.85	25.0	50.0
sec-Butylbenzene	135-98-8	0	25.0	U	6.25	25.0	50.0
tert-Butylbenzene	98-06-6	0	25.0	U	6.35	25.0	50.0
Carbon tetrachloride	56-23-5	0	25.0	U	6.40	25.0	50.0
Chlorobenzene	108-90-7	0	25.0	U	5.80	25.0	50.0
Chlorodibromomethane	124-48-1	0	25.0	U	7.00	25.0	50.0
Chloroethane	75-00-3	0	100	U	9.60	100	250
Chloroform	67-66-3	0	100	U	5.55	100	250
2-Chlorotoluene	95-49-8	0	25.0	U	5.30	25.0	50.0
4-Chlorotoluene	106-43-4	0	25.0	U	5.70	25.0	50.0
1,2-Dibromoethane	106-93-4	0	25.0	U	6.30	25.0	50.0
Dibromomethane	74-95-3	0	25.0	U	6.10	25.0	50.0
1,2-Dichlorobenzene	95-50-1	0	25.0	U	5.35	25.0	50.0
1,3-Dichlorobenzene	541-73-1	0	25.0	U	5.50	25.0	50.0
1,4-Dichlorobenzene	106-46-7	0	25.0	U	6.00	25.0	50.0
Dichlorodifluoromethane	75-71-8	0	100	U	18.7	100	250
1,1-Dichloroethane	75-34-3	0	25.0	U	5.00	25.0	50.0
1,2-Dichloroethane	107-06-2	0	25.0	U	4.09	25.0	50.0
1,1-Dichloroethene	75-35-4	0	25.0	U	9.40	25.0	50.0
cis-1,2-Dichloroethene	156-59-2 J	3.80	12.2	J	6.30	25.0	50.0
trans-1,2-Dichloroethene	156-60-5	0	25.0	U	7.45	25.0	50.0
1,2-Dichloropropane	78-87-5	0	25.0	U	7.45	25.0	50.0
1,3-Dichloropropane	142-28-9	0	25.0	U	5.50	25.0	50.0
2,2-Dichloropropane	594-20-7	0	25.0	U	8.05	25.0	50.0
1,1-Dichloropropene	563-58-6	0	25.0	U	7.10	25.0	50.0
cis-1,3-Dichloropropene	10061-01-5	0	25.0	U	5.55	25.0	50.0
trans-1,3-Dichloropropene	10061-02-6	0	25.0	U	5.90	25.0	50.0
Di-isopropyl ether	108-20-3	0	25.0	U	5.25	25.0	50.0
Ethylbenzene	100-41-4	0	25.0	U	6.85	25.0	50.0
Isopropylbenzene	98-82-8	0	25.0	U	5.25	25.0	50.0
p-Isopropyltoluene	99-87-6	0	25.0	U	6.00	25.0	50.0
2-Butanone (MEK)	78-93-3	0	250	U	59.5	250	500
Methylene Chloride	75-09-2	3.04	100	U	21.5	100	250
Methyl tert-butyl ether	1634-04-4	0	25.0	U	5.05	25.0	50.0
Naphthalene	91-20-3	0	100	J3 U	50.0	100	250
n-Propylbenzene	103-65-1	0	25.0	U	4.97	25.0	50.0

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	1001_24	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 18:22
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 18:22
Dilution Factor:	50	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.1 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Styrene	100-42-5	0	25.0	U	5.90	25.0	50.0
1,1,1,2-Tetrachloroethane	630-20-6	0	25.0	U	7.35	25.0	50.0
1,1,2,2-Tetrachloroethane	79-34-5	0	25.0	U	6.65	25.0	50.0
Tetrachloroethene	127-18-4	0	30.0	U	15.0	30.0	60.0
Toluene	108-88-3	5.47	30.0	U	13.9	30.0	60.0
1,2,3-Trichlorobenzene	87-61-6 QL	0	25.0	J3 J4 U	11.5	25.0	50.0
1,2,3-Trimethylbenzene	526-73-8	0	25.0	U	5.20	25.0	50.0
1,2,4-Trimethylbenzene	95-63-6	0	50.0	U	16.1	50.0	100
1,3,5-Trimethylbenzene	108-67-8	0	25.0	U	5.20	25.0	50.0
1,1,1-Trichloroethane	71-55-6	0	25.0	U	7.45	25.0	50.0
1,1,2-Trichloroethane	79-00-5	0	25.0	U	7.90	25.0	50.0
Trichloroethene	79-01-6	0	25.0	U	9.50	25.0	50.0
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	25.0	U	9.00	25.0	50.0
1,2,3-Trichloropropane	96-18-4	0	50.0	U	11.9	50.0	125
Vinyl chloride	75-01-4	0	25.0	U	11.7	25.0	50.0
Xylenes, Total	1330-20-7	0	75.0	U	8.70	75.0	150

gw 3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	1003_61	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 08:22
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 08:22
Dilution Factor:	50	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.1 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN	3.12	1250	T8 U	565	1250	2500
Chloromethane	74-87-3		1.90	100	T8 U	48.0	100	200
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	100	C4 T8 U	13.8	100	250
Hexachloro-1,3-butadiene	87-68-3		0	37.5	T8 U	16.9	37.5	75.0
4-Methyl-2-pentanone (MIBK)	108-10-1		0	250	T8 U	23.9	250	500
1,2,4-Trichlorobenzene	120-82-1		0	50.0	T8 U	24.1	50.0	100
Trichlorofluoromethane	75-69-4		0	100	T8 U	8.00	100	250

Sample Narrative:
Lowest possible dilution due to sample foaming.

3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	1001_25	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 18:43
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 18:43
Dilution Factor:	25	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.2 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	625	U	63.5	625	1250
Acrylonitrile	107-13-1	0	125	U	16.8	125	250
Benzene	71-43-2	0	12.5	U	2.35	12.5	25.0
Bromobenzene	108-86-1	0	12.5	U	2.95	12.5	25.0
Bromodichloromethane	75-27-4	0	12.5	U	3.40	12.5	25.0
Bromoform	75-25-2	0	12.5	U	3.22	12.5	25.0
Bromomethane	74-83-9	0	50.0	U	15.1	50.0	125
n-Butylbenzene	104-51-8	0	12.5	U	3.93	12.5	25.0
sec-Butylbenzene	135-98-8	0	12.5	U	3.13	12.5	25.0
tert-Butylbenzene	98-06-6	0	12.5	U	3.18	12.5	25.0
Carbon tetrachloride	56-23-5	0	12.5	U	3.20	12.5	25.0
Chlorobenzene	108-90-7	0	12.5	U	2.90	12.5	25.0
Chlorodibromomethane	124-48-1	0	12.5	U	3.50	12.5	25.0
Chloroethane	75-00-3	0	50.0	U	4.80	50.0	125
Chloroform	67-66-3	0	50.0	U	2.78	50.0	125
2-Chlorotoluene	95-49-8	0	12.5	U	2.65	12.5	25.0
4-Chlorotoluene	106-43-4	0	12.5	U	2.85	12.5	25.0
1,2-Dibromoethane	106-93-4	0	12.5	U	3.15	12.5	25.0
Dibromomethane	74-95-3	0	12.5	U	3.05	12.5	25.0
1,2-Dichlorobenzene	95-50-1	0	12.5	U	2.68	12.5	25.0
1,3-Dichlorobenzene	541-73-1	0	12.5	U	2.75	12.5	25.0
1,4-Dichlorobenzene	106-46-7	0	12.5	U	3.00	12.5	25.0
Dichlorodifluoromethane	75-71-8	0	50.0	U	9.35	50.0	125
1,1-Dichloroethane	75-34-3	0	12.5	U	2.50	12.5	25.0
1,2-Dichloroethane	107-06-2	0	12.5	U	2.05	12.5	25.0
1,1-Dichloroethene	75-35-4	0	12.5	U	4.70	12.5	25.0
cis-1,2-Dichloroethene	156-59-2 J	3.80	12.3	J	3.15	12.5	25.0
trans-1,2-Dichloroethene	156-60-5	0	12.5	U	3.73	12.5	25.0
1,2-Dichloropropane	78-87-5	0	12.5	U	3.73	12.5	25.0
1,3-Dichloropropane	142-28-9	0	12.5	U	2.75	12.5	25.0
2,2-Dichloropropane	594-20-7	0	12.5	U	4.03	12.5	25.0
1,1-Dichloropropene	563-58-6	0	12.5	U	3.55	12.5	25.0
cis-1,3-Dichloropropene	10061-01-5	0	12.5	U	2.78	12.5	25.0
trans-1,3-Dichloropropene	10061-02-6	0	12.5	U	2.95	12.5	25.0
Di-isopropyl ether	108-20-3	0	12.5	U	2.63	12.5	25.0
Ethylbenzene	100-41-4	6.47	12.5	U	3.43	12.5	25.0
Isopropylbenzene	98-82-8 J	7.09	5.02	J	2.63	12.5	25.0
p-Isopropyltoluene	99-87-6	0	12.5	U	3.00	12.5	25.0
2-Butanone (MEK)	78-93-3	0	125	U	29.8	125	250
Methylene Chloride	75-09-2	3.04	50.0	U	10.7	50.0	125
Methyl tert-butyl ether	1634-04-4	0	12.5	U	2.53	12.5	25.0
Naphthalene	91-20-3	0	50.0	J3 U	25.0	50.0	125
n-Propylbenzene	103-65-1	0	12.5	U	2.48	12.5	25.0

gr 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	1001_25	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 18:43
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 18:43
Dilution Factor:	25	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.2 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	12.5	U	2.95	12.5	25.0
1,1,1,2-Tetrachloroethane	630-20-6	0	12.5	U	3.68	12.5	25.0
1,1,2,2-Tetrachloroethane	79-34-5	0	12.5	U	3.33	12.5	25.0
Tetrachloroethene	127-18-4	0	15.0	U	7.50	15.0	30.0
Toluene	108-88-3	5.47	15.0	U	6.95	15.0	30.0
1,2,3-Trichlorobenzene	87-61-6 QL	0	12.5	J3 J4 U	5.75	12.5	25.0
1,2,3-Trimethylbenzene	526-73-8	0	12.5	U	2.60	12.5	25.0
1,2,4-Trimethylbenzene	95-63-6	0	25.0	U	8.05	25.0	50.0
1,3,5-Trimethylbenzene	108-67-8	0	12.5	U	2.60	12.5	25.0
1,1,1-Trichloroethane	71-55-6	0	12.5	U	3.73	12.5	25.0
1,1,2-Trichloroethane	79-00-5	0	12.5	U	3.95	12.5	25.0
Trichloroethene	79-01-6	4.61	12.5	U	4.75	12.5	25.0
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	12.5	U	4.50	12.5	25.0
1,2,3-Trichloropropane	96-18-4	0	25.0	U	5.93	25.0	62.5
Vinyl chloride	75-01-4	0	12.5	U	5.85	12.5	25.0
Xylenes, Total	1330-20-7	0	37.5	U	4.35	37.5	75.0

gr 3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	1003_62	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 08:43
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 08:43
Dilution Factor:	25	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	0.2 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN	3.12	625	T8 U	282	625	1250
Chloromethane	74-87-3		1.90	50.0	T8 U	24.0	50.0	100
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	50.0	C4 T8 U	6.90	50.0	125
Hexachloro-1,3-butadiene	87-68-3		0	18.8	T8 U	8.43	18.8	37.5
4-Methyl-2-pentanone (MIBK)	108-10-1		0	125	T8 U	12.0	125	250
1,2,4-Trichlorobenzene	120-82-1		0	25.0	T8 U	12.0	25.0	50.0
Trichlorofluoromethane	75-69-4		0	50.0	T8 U	4.00	50.0	125

Sample Narrative:
Lowest possible dilution due to sample foaming.

3/2/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-TRIPBLANK-HCL-01

Lab Sample ID:	L1540953-08	**SDG:**	L1540953
Client Sample ID:	WP002-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/19/22 09:00
Lab File ID:	1001_06	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 12:06
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 12:06
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2 J	4.28	0.269	J	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

SW 3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-TRIPBLANK-HCL-01

Lab Sample ID:	L1540953-08	**SDG:**	L1540953
Client Sample ID:	WP002-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/19/22 09:00
Lab File ID:	1001_06	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 12:06
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 12:06
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7 J	6.57	0.188	J	0.174	1.50	3.00

SL 3/2/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-TRIPBLANK-HCL-01

Lab Sample ID:	L1540953-08	**SDG:**	L1540953
Client Sample ID:	WP002-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/19/22 09:00
Lab File ID:	1003_43	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 01:52
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 01:52
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QL QN BJ	3.12	15.3	B J	11.3	25.0	50.0
Chloromethane	74-87-3	1.90	2.00	U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	U	0.160	2.00	5.00

SW 3/2/23

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

This review is based on Project requirements, the requirements of the analytical methods, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS (Final, 31 Aug 2021)*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- USEPA Office of Research and Development., 1993 and Updates, Methods for the Determination of Inorganic Substances in Environmental Samples, EPA 600-R-93-100, August.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	DL	Sample Date	Method(s)	Analysis Date(s)
OT001-BLOMW07-091922	L1540953-01	Field	GW	1	09/19/22	6010D	10/19/22
OT001-BLOMW05-091922	L1540953-02	Field	GW	1	09/19/22	6010D	10/19/22
OT001-DSAMW02-091922	L1540953-03	Field	GW	1	09/19/22	6010D	10/19/22
OT001-BLOMW06-091922	L1540953-04	Field	GW	1	09/19/22	6010D	10/19/22
OT001-BLOMW06-091922-99	L1540953-05	DUP	GW	1	09/19/22	6010D	10/19/22
WP002-BLOMW01-091922	L1540953-06	Field	GW	1	09/19/22	6010D	10/19/22
WP002-BLOMW01-091922-99	L1540953-07	DUP	GW	1	09/19/22	6010D	10/20/22

2. Reviewer Preliminary Comments

Data Package Provided: [X] Level IV (Level 4) and/or [X]Level II (Level 2)

Seven (7) ground water samples were submitted to Pace Analytical for metals, mercury, and total solids by EPA Method 6010D. The samples were received intact by the lab on 09/29/22 at 5.1°C. The data has been validated to a Level 2a.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	X	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities and where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in validation comments.		

Reviewer's Comments: Field and internal custody appear to be complete and are traceable.

4. Holding Times and Sample Preservation	Y	N	NA
Were aqueous samples preserved to a pH <2 for all metals?	X		
Were samples identified for mercury analysis maintained at ≤6° C for aqueous or solid matrices, and 4° C for total solids?	X		
Were samples for total solids prepared and analyzed within 7 days?	X		
Were samples for metals other than mercury prepared and analyzed within 180 days?	X		
Were samples for mercury prepared and analyzed within 28 days?	X		
Inspect narrative, receipt logs, etc. Does the information indicate that there were **no** significant problems with sample handling/naming? Were soils <50% moisture?	X		
Action: Indicate affected samples in validation comments.			

Reviewer's Comments: Receipt logs indicate that samples were received intact, and cooler temperatures were acceptable upon receipt for metals samples and the samples were received intact. Holding times were met for all preparatory and analytical processes. No qualifications were appended to the associated sample results due to holding time and preservation considerations.

5. Preparation Technique

	Y	N	NA
Are preparation logs for all samples present in the data package?	X		

Identify the preparation method(s) used:

	Matrix	Preparation Method(s) *(record # or NA)*
	Water	***EPA Method 3015***
	Soil/Solid	*NA*
	Oil	*NA*
	Air	*NA*

Reviewer Comments: The sample was prepared in accordance with Methods 3015. No qualifications were warranted.

6. ICP Calibration	Y	N	NA
Are calibration data for ICP present in the data submittal?	X		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

6. ICP Calibration	Y	N	NA
If **not** present, has all ICP calibration criteria (i.e. ICV, CCV, LLC, etc.) been met per the case narrative?			**X**
If present, is the ICV recovery within ±10% of reference value? (**Method 6010C**, Section 10.3.2.1)	**X**		
If present, is the lower limit of quantitation check sample recovery (LLC or CRDL standard) within ±30% of reference value? (Method 6010C, Sections 10.1.3.1, 10.3.2.1, and 10.3.4)	**X**		
If present, is a mid-level Continuing Calibration Verification (CCV) standard recovery within ±10% of reference value? (**Method 6010C**, Sections 10.3.4)	**X**		

Reviewer Comments: All initial calibration verification (ICV), continuing calibration verification (CCV), and low-level concentration (LLC) criteria were met per the case narrative.

8. Blanks	Y	N	NA
Are method blank and calibration blank data present in the data submittal?	**X**		
Was a method blank (or preparation blank) prepared for each batch of samples prepared? (**Method 6010C**, Section 9.6, **Method 6020A**, Section 9.8, **Method 7471B**, Section 9.3)	**X**		
Is the method blank (or preparation blank) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.1; **Method 6020A**, Section 9.8; and **Method 7471B**, Section 9.3)	**X**		
Was the method blank (or preparation blank) the same matrix as the analytical samples?	**X**		
Are calibration blanks run for every 10 samples in an analytical sequence?			
Were sample results verified as uncorrected for blank concentrations?	**X**		
Were all positive and negative blanks (ICB, CCB, PB or MB) evaluated for contamination?	**X**		
Were any target analytes detected above the detection limit (DL) or method detection limit (MDL) ICB/CCBs/PB or MB?			

Action: Apply rules from table below. Indicate affected samples in validation comments.

* Qualify only if the deviation indicates an adverse effect on data quality.

** Use professional judgment, and table below:

Reviewer Comments: The results were non-detect. No qualifications were warranted.

9. Interference Check Sample	Y	N	NA
Are interference check standard data present in the data submittal?	**X**		
If not present, was the interference check standard criteria met per the case narrative?			**X**
Were the ICSAB recoveries within acceptance criteria of 80-120%? (**Method 6010C**, Section 4.2.10.2)	**X**		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

9. Interference Check Sample	Y	N	NA
Action: Use technical judgment to assess any potential interferences. Indicate affected samples in validation comments. For additional aid in assessing potential effects, consult general tables of interelement contributions at critical wavelengths; e.g. as in reference SW-846 6010B (and for atypical metals, other references). ICP-MS interferences in m/e regions may often be evaluated by comparing more differing quantitative ions for the same element. * Qualify only if the deviation indicates an adverse effect on data quality. ** Discuss impact of high concentrations on results.			

Reviewer Comments: All ICS criteria was met per the case narrative. No qualifications were warranted.

10. Matrix Spike (Pre-digestion Spike)	Y	N	NA
Are matrix spike data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the matrix spike analysis?	**X**		
Was a matrix spike prepared for each batch of samples prepared? (**Method 6010C**, Section 9.8 8; **Method 6020A**, Section 9.19; **Method 7471B**, Section 9.5)	**X**		
Is the matrix spike (MS) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.18; **Method 6020A**, Section 9.10; and **Method 7471B**, Section 9.5)	**X**		
Was the matrix spike recovery within ±25% of known value? (**Method 6010C**, Section 9.8 and 9.8.28; **Method 6020A**, Section 9.10)	**X**		
For mercury, was the matrix spike recovery within ±20% of known value? (**Method 7471B**, Section 9.5)	**X**		
Post-Digestion Spike			
If matrix spike recovery was not within ±25% (or ±20% for mercury) was a post-digestion spike analyzed? (**Method 6010C**, Section 9.9.18; **Method 6020A**, Section 9.11.1)	**X**		
Was the recovery of the post-digest spike within ±25% of reference value? (**Method 6010C**, Section 9.9.18; **Method 6020A**, Section 9.11.1))	**X**		
If the post-digest spike fails, it a dilution test run on the sample? (**Method 6010C,** Section 9.9.18; **Method 6020A**, Section 9.11.2)			**X**
Acceptance criteria are 75-125% for metals unless otherwise indicated. Action: Indicate affected samples in validation comments. ** Use technical judgment in determining data impact. Extremely low recoveries with the associated sample result being a non-detect warrant rejection.			

Reviewer Comments: The MS/MSD results were within the acceptance criteria and no qualifications are warranted.

11. Duplicates (MSD or Laboratory)	Y	N	NA
Are laboratory or matrix spike duplicate data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the duplicate analysis?	**X**		
Was the laboratory duplicate (or matrix spike duplicate) prepared for each batch of samples prepared (up to a maximum of 10 samples)? (**Method 6010C**, Section 9.8, **Method 6020A**, Section 9.10, **Method 7471B**, Section 9.5)	**X**		
Is the laboratory duplicate (or MSD) taken through a process identical to that of the associated samples?	**X**		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

11. Duplicates (MSD or Laboratory)	Y	N	NA
(**Method 6010C**, Section 11.18 and **Method 7471B**, Section 9.5)			
Were reported precision estimates within acceptance criteria (for aqueous RPD ≤30%? (**Method 6010C**, Sections 9.8 and 9.8.18, **Method 6020C**, Section 9.10, and **Method 7000B**, Section 9.7)	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All MSD RPD results met the +/- 20% RPD precision criteria for aqueous samples. No qualifications were warranted.

12. Field Duplicate	Y	N	NA
Was field duplicate pair collected for this SDG?	**X**		
Were field duplicate samples collected at a frequency of of one for every 10 primary samples?	**X**		
Were reported precision estimates within project acceptance criteria RPD ≤30%?	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Samples OT001-BLOMW06-091922/OT001-BLOMW06-091922-99 and WP002-BLOMW01-091922/ WP002-BLOMW01-091922-99 were the field duplicates for this SDG. The field duplicate results for iron and manganese in samples were outside of the 30% RPD acceptance criteria. The iron and manganese results have been qualified with a 'QN' validation flag as the sample and duplicate results were >5x the LOQ.

Analyte	OT001-BLOMW06-091922 **Sample**	OT001-BLOMW06-091922-99 **Duplicate**	**RPD**
Fe	11700	7680	**41.5%**
Mn	377	173	**74.2%**
Analyte	WP002-BLOMW01-091922 Sample	WP002-BLOMW01-091922-99 Duplicate	**RPD**
Fe	7690	6910	10.7%
Mn	15600	17900	13.7%

RPD = [|S-D| / (S+D)] × 200%

13. Laboratory Control Sample	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Was a laboratory control sample prepared for each batch of samples prepared? (**Method 6010C**, Section 9.7; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4)	**X**		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

13. Laboratory Control Sample	Y	N	NA
Is the LCS taken through a process identical to that of the associated samples? (**Method 6010C**, Sections 9.7 and 11.1; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4)	**X**		
Were percent recoveries within the 80-120% acceptance criteria? (Note: manufacturer's control limits for solid standards may be used for solid matrices)? (**Method 6010C**, Section 9.7; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4;)	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All LCS recoveries were within the acceptance criteria. No qualifications were warranted.

14. Serial Dilution Analysis	Y	N	NA
Are serial dilution data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the serial dilution analysis?			**X**
Is one serial dilution analysis performed for each matrix in every batch with a minimum of one serial dilution per twenty samples?	**X**		
Is a dilution test run on a sample that fails both pre- and post-digestion spike analysis? (**Method 6010C**, Section 9.9.1; **Method 6020A**, Section 9.11.2; and **Method 7000B**, Section 9.8.1)	**X**		
For samples with concentrations that are minimally a factor of 50x above the method detection limit (MDL) (or detection limit) before a 1:4 dilution, was the serial dilution %D criterion of 10% met (**Method 6010C**, Section 9.9.2 and **Method 6020A**, Section 9.11.2)	**X**		
(**Hg**) For samples with concentrations that are minimally a factor of 10x above the method detection limit (MDL) (or detection limit DL) limit after a 1:5 dilution, was the serial dilution %D criterion of 10% met (**Method 7000B**, Section 9.8.2)			**X**
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The SDS %D results were within the prescribed acceptance criteria. No qualifications warranted.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

15. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	**X**		
Action: Indicate non-correctable contract compliance deviations below If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: The results were either non-detect or were >LOQ.

16. Metals/Inorganics Analytical Data Flags:

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

17. Overall Comments:

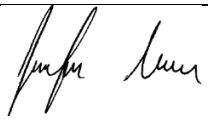
Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
All	Mn	QN	High field duplicate RPD
All	Fe	QN	High field duplicate RPD

See Section 14 for Validation Flag Definitions.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

Data Validator	Data Validation Reviewer
Name: Lyndsi Bourne	Name: Jennifer Norman
Title: Staff Scientist	Title: Data Quality Program Manager
Company: North Wind Portage	Company: North Wind Group
Signature:	Signature: 
Date: 02/13/2023	Date: 02/27/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	20221019154621	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:46
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron QN	7439-89-6	11000		20.5	50.0	100
Manganese QN	7439-96-5	283		0.855	5.00	10.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	20221019155452	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:54
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron QN	7439-89-6	24800		20.5	50.0	100
Manganese QN	7439-96-5	748		0.855	5.00	10.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	20221019155744	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 15:57
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron QN	7439-89-6	3720		20.5	50.0	100
Manganese QN	7439-96-5	62.1		0.855	5.00	10.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	20221019160037	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 16:00
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron QN	7439-89-6	11700		20.5	50.0	100
Manganese QN	7439-96-5	377		0.855	5.00	10.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	20221019160330	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 16:03
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron QN	7439-89-6	7580		20.5	50.0	100
Manganese QN	7439-96-5	173		0.855	5.00	10.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	20221020112540	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP12	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/20/22 11:25
Dilution Factor:	5	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte		CAS	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Manganese	QN	7439-96-5	15600		4.28	25.0	50.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	20221019160631	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 16:06
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron QN	7439-89-6	7690		20.5	50.0	100

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	20221020112829	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP12	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/20/22 11:28
Dilution Factor:	5	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Manganese QN	7439-96-5	17900		4.28	25.0	50.0

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	20221019160932	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/19/22 16:09
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte		CAS	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	QN	7439-89-6	6910		20.5	50.0	100

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Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

This review is based on Project requirements, the requirements of the analytical methods, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS (Final, 31 Aug 2021)*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- USEPA Office of Research and Development., 1993 and Updates, Methods for the Determination of Inorganic Substances in Environmental Samples, EPA 600-R-93-100, August.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	Sample Date	Analysis Method	Analysis Date
OT001-BLOMW07-091922	L1540953-01	Field	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/03/22
OT001-BLOMW05-091922	L1540953-02	Field	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/03/22
OT001-DSAMW02-091922	L1540953-03	Field	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/03/22
OT001-BLOMW06-091922	L1540953-04	Field	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
OT001-BLOMW06-091922-99	L1540953-05	DUP	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
WP002-BLOMW01-091922	L1540953-06	Field	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	Sample Date	Analysis Method	Analysis Date
WP002-BLOMW01-091922-99	L1540953-07	DUP	GW	09/19/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22

(*) Denotes an exceeded holding time
DL: Dilution

2. Reviewer Preliminary Comments

Review Type: [X] Level IV (Level 3 or 4) [] Level III (Level 2b) [] Level II (Level 2a)
Confirm that narrative is present and complete; note overall initial indications.

Seven (7) ground water samples were submitted to Pace Analytical National and were received intact by the lab on 09/29/22 at 5.1°C. They were analyzed for the following:

- Alkalinity by SM 2320B
- TKN by EPA 351.2
- Nitrate/Nitrite by EPA 353.2
- Sulfate by SW-846 9056A

3. Custody of Samples	**Y**	**N**
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	

Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities below and where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected below.

Reviewer's comments: Field and internal custody forms appear to be complete and are traceable.

4. Holding Times and Sample Preservation	**Y**	**N**	**NA**
Anions by Method 9056A			
Are the following analytes analyzed within 28 days of collection? (Method 9056, Section 8.2) Bromide Chloride Fluoride Sulfate	**X**		
Are sample shipped to the lab at ≤6 °C? (Method 9056, Section 8.2)	**X**		
TKN By EPA 351.2 and Nitrate/Nitrite by 353.2			
Are samples maintained at <6°C?	**X**		
Were samples analyzed for TKN and combined Nitrate/Nitrite within 28 days of collection?	**X**		
Were samples for combined Nitrate-Nitrite (NO3/NO2) and TKN preserved to pH <2 with H2SO4?	**X**		

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

4. Holding Times and Sample Preservation	**Y**	**N**	**NA**
Total Alkalinity			
Are samples maintained at <4°C?	**X**		
Were samples analyzed for Total Alkalinity within 14-days of collection?	**X**		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	**X**		
Action: Indicate affected samples below. * Use Professional Judgment in judging impact on samples.			

Reviewer Comments: The holding times were met as outlined in the sample identification table in Section 1 of this report.

5. Preparation Technique

	Y	**N**	**NA**
Are preparation logs for all samples present in the data package?	**X**		

Identify the preparation method(s) used:

	Matrix	**Preparation Method(s)** *(record # or NA)*
	Water	***USEPA 351.2/365.4/353.2/9056A SM 2320 B-2011***
	Soil/Solid	*NA*
	Oil	*NA*
	Air	*NA*

Reviewer Comments: The sample was prepared in accordance with USEPA 351.2/365.4/353.2/9056A, and SM 2320 B-2011.

6. Calibration	**Y**	**N**	**NA**
Are calibration data present in the data submittal?	**X**		
Anions			
Was initial calibration (IC) performed prior to the sample analyses?	**X**		
Were at least 4 standard concentrations used for each analyte of interest in the IC?	**X**		
Were appropriate IC standard concentrations used?	**X**		
Is the IC correlation coefficient (linear regression) for each analyte ≥0.995?	**X**		
Was an initial calibration verification (ICV) standard (second source) run immediately after IC?	**X**		
Are analyte recoveries in the ICV within ±10% of reference values?	**X**		
Was a calibration check standard (CCV) run after every 10th sample and at the end of the sequence?	**X**		
Are analyte recoveries in the CCVs within ±10% of the reference values?	**X**		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?	**X**		
Were retention times (RTs) of individual anions consistent throughout the reported analyses?			**X**
TKN			
Are initial and continuing calibration results included in the data package?	**X**		

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

6. Calibration	Y	N	NA
Were at least 4 standards used to calibrate the instrument?	X		
Were the IC standards run in order of decreasing concentration?	X		
Were appropriate IC standard concentrations used?	X		
Is the IC correlation coefficient (linear regression) ≥0.995?	X		
Was an ICV standard (second source) run immediately after IC?	X		
Was the target analyte recovery in the ICV within ±10% of reference value?	X		
Was a CCV run after every 10 samples, or at least once every two hours?	X		
Were CCV recoveries within ±10% of the reference value?	X		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?			X
Nitrate/Nitrite			
Are initial and continuing calibration results included in the data package?	X		
Were at least 4 standards used to calibrate the instrument?	X		
Were the initial calibration standards run in order of decreasing concentration?	X		
Were appropriate initial calibration standard concentrations used?	X		
Is the initial calibration correlation coefficient (linear regression) ≥0.995?	X		
Was an ICV standard (second source) run immediately after initial calibration?	X		
Was the target analyte recovery in the ICV within ±10% of reference value?	X		
Was a CCV run after every 10 samples, or at least once every two hours?	X		
Were CCV recoveries within ±10% of the reference value?	X		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?			X
Standardization for Total Alkalinity			
Are standardization data present in the package?	X		
Were the 0.02N and 0.1N H2SO4 solutions standardized against a primary sodium bicarbonate standard?	X		
For potentiometric titrations, was the pH meter calibrated prior to titration?	X		
Is the initial pH documented for each sample or QC sample analyzed?	X		
Is the titrant volume used to reach pH 8.3 recorded for each sample or QC sample analyzed?	X		
Is the titrant volume used to reach pH 4.5 recorded for each sample or QC sample analyzed?	X		
Is the titrant volume used to reach pH 4.2 recorded for each sample or QC sample analyzed?	X		
Action: Sample results associated with unacceptable calibration results, especially when the responses suggest high variability or sensitivity problems should be J/UJ qualified. Use professional judgment to determine if sample results warrant rejection or if qualifiers are not necessary – explain.			

Reviewer Comments: All calibration verification data was acceptable.

7. Blanks	Y	N	NA
Are method blank and calibration blank data present in the data submittal?	X		
Was a method blank (or preparation blank) prepared for each batch of samples prepared?	X		
Is the method blank (or preparation blank) taken through a process identical to that of the associated samples?	X		
Was the method blank (or preparation blank) the same matrix as the analytical samples?	X		
Are calibration blanks run for every 10 samples in an analytical sequence?	X		
Were sample results verified as uncorrected for blank concentrations?	X		

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

7. Blanks	Y	N	NA
Were all positive and negative blanks (ICB, CCB, PB or MB) evaluated for contamination?	X		
Were any target analytes detected above the detection limit (DL) or method detection limit (MDL) ICB/CCBs/PB or MB?	X		
Action: Apply rules from table below. Indicate affected samples in validation comments.			
* Qualify only if the deviation indicates an adverse effect on data quality.			
** Use professional judgment, and table below:			

Reviewer Comments: A positive detection was noted in the continuing calibration blank (CCB) for alkalinity, and a negative blank detection was noted in the CCB for TKN and nitrate/nitrite. Qualifications are as follows:

- The alkalinity results have been left unqualified as the sample results were >5x the positive blank concentration.
- TKN in sample WP002-BLOMW01-091922 has been qualified with a 'B' validation flag as the sample results were <2x the negative blank concentration.
- The nitrate/nitrite results have been left unqualified as the sample results were either non-detect or >2x the negative blank concentration.
- All initial calibration blank, the remaining continuing calibration blank, and method blank results were non-detect.

8. Laboratory-Fortified Matrix or Matrix Spike (MS)	Y	N	NA
Are LFM (MS) results included in the data package?	X		
Have field or equipment blanks **not** been used for the MS/MSD analysis?	X		
Have LFMs been prepared and analyzed at a frequency of 1 for every 20 samples?	X		
Is the matrix spike (MS) taken through a process identical to that of the associated samples?	X		
Did the MS/MSD meet the method-specified or laboratory-generated acceptance criteria for the remaining analyses?		X	
Action: Indicate affected samples and resulting data qualification.			
* Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QL' validation flag as the MS%R was <90%.
The remaining MS recoveries were within the method prescribed acceptance limits.

9. Duplicates (MSD or Laboratory)	Y	N	NA
Are laboratory or matrix spike duplicate data present in the data submittal?	X		
Have field or equipment blanks not been used for the duplicate analysis?	X		
Was the laboratory duplicate (or matrix spike duplicate) prepared for each batch of samples prepared (up to a maximum of 20 samples)?	X		
Is the laboratory duplicate (or MSD) taken through a process identical to that of the associated samples?	X		
Were reported precision estimates within acceptance criteria (for aqueous RPD ≤30% and for soils ≤50%)?		X	
Action: Indicate affected samples in validation comments.			
* Qualify only if the deviation indicates an adverse effect on data quality.			

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

Reviewer Comments: The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were <5x the LOQ, but the absolute difference between the sample and duplicate was >LOQ. The remaining duplicate RPDS were acceptable.

10. Field Duplicate	Y	N	NA
Was field duplicate pair collected for this SDG?		**X**	
Were field duplicate samples collected at a frequency of of one for every 10 primary samples?			**X**
Were reported precision estimates within project acceptance criteria RPD ≤35%?			**X**
Action: Indicate affected samples and resulting data qualification. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Samples OT001-BLOMW06-091922/OT001-BLOMW06-091922-99 and WP002-BLOMW01-091922/ WP002-BLOMW01-091922-99 were the field duplicates for this SDG. The field duplicate RPDs were within the 30% acceptance criteria.

Analyte	OT001-BLOMW06-091922 **Sample**	OT001-BLOMW06-091922-99 **Duplicate**	**RPD**
Alkalinity	48500	43300	11.3%
Carbonate	48500	43300	11.3%
Bicarbonate	ND	ND	0.00%
Hydroxide	ND	ND	0.00%
Nitrate/Nitrite	60.5	58.6	3.19%
Sulfate	4600	5380	15.6%
TKN	ND	ND	0.00%
Analyte	WP002-BLOMW01-091922 **Sample**	WP002-BLOMW01-091922-99 **Duplicate**	**RPD**
Alkalinity	961000	962000	0.10%
Carbonate	961000	962000	0.10%
Bicarbonate	ND	ND	0.00%
Hydroxide	ND	ND	0.00%
Nitrate/Nitrite	ND	ND	0.00%
Sulfate	2550	2190	15.2%
TKN	612	639	4.32%

RPD = [|S-D| / (S+D)] × 200%

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

11. Laboratory Fortified Blank (or LCS)	Y	N	NA
Are LCS results included in the data package?	**X**		
Is one LCS analyzed with each batch of samples?	**X**		
Is the LFB taken through the same preparatory and analytical process as the associated samples?	**X**		
For anions was the recovery within laboratory control limits for recovery or within ±10% of reference value? (**Method 300.0**, Sections 9.3.2 and 9.3.3)	**X**		
Did the LCS meet the method-specified or laboratory-generated acceptance criteria for the remaining analyses?		**X**	
Action: Indicate affected samples and resulting data qualifications. *Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The LCS results were acceptable.

12. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f and 5.5.2.2.1.g, and **Method 8000**, Section 7.4)		**X**	
Action: Indicate non-correctable contract compliance deviations below If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:

- Nitrate/Nitrite in samples OT001-BLOMW07-091922, OT001-BLOMW06-091922, and OT001-BLOMW06-091922-99.
- Sulfate in samples OT001-BLOMW07-091922, OT001-BLOMW05-091922, OT001-BLOMW06-091922, WP002-BLOMW01-091922, and WP002-BLOMW01-091922-99.
- TKN in sample OT001-DSAMW02-091922

13. Sample Result Verification
Validation Step
For the following evaluation, some qualification of sample data may be possible. For contractual noncompliance, a validation code is placed if the occurrence is non-correctable.
1. For each analysis, recalculate 2 or more selected results from the raw data. **NA.**
2. Did recalculation confirm reported results? **NA.** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
3. Were results from diluted samples corrected for the dilution factor? **NA.**
Action: Indicate instances of manual calculations not confirming reported results. Where samples have been reanalyzed, and both analyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.

14. Inorganics Analytical Data Flags:

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

15. Overall Comments:

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

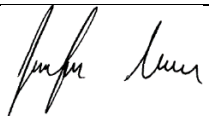
Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
All	TKN	QL	Low MS Recovery
All	TKN	QN	High MSD RPD
WP002-BLOMW01-091922	TKN	B	CCB
OT001-DSAMW02-091922	TKN	J	Results between the MDL and LOQ
OT001-BLOMW07-091922, OT001-BLOMW06-091922, OT001-BLOMW06-091922-99	Nitrate/Nitrite	J	Results between the MDL and LOQ
OT001-BLOMW07-091922, OT001-BLOMW05-091922, OT001-BLOMW06-091922, WP002-BLOMW01-091922, WP002-BLOMW01-091922-99	Sulfate	J	Results between the MDL and LOQ

See Section 14 for Validation Flag Definitions.

Numerous results were reported above the limit of quantitation, have been assessed and remain unqualified.

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540953**

Data Validator	Data Validation Reviewer
Name: Lyndsi Bourne	Name: Jennifer Norman
Title: Staff Scientist	Title: Data Quality Program Manager
Company: North Wind Portage	Company: North Wind Group
Signature:	Signature: 
Date: 02/13/2023	Date: 02/27/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	20221001105634	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:56
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:56
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		48300		8450	10000	20000
Alkalinity,Bicarbonate		48300		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	20221001110007	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:00
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:00
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		67500		8450	10000	20000
Alkalinity,Bicarbonate		67500		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	20221001110335	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:03
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:03
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		123000		8450	10000	20000
Alkalinity,Bicarbonate		123000		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	20221001110703	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:07
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:07
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		48500		8450	10000	20000
Alkalinity,Bicarbonate		48500		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	20221001111045	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:10
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:10
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		43300		8450	10000	20000
Alkalinity,Bicarbonate		43300		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	20221001111445	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:14
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:14
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		961000		8450	10000	20000
Alkalinity,Bicarbonate		961000		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	20221001111830	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 11:18
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 11:18
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		962000		8450	10000	20000
Alkalinity,Bicarbonate		962000		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

LSB 02/17/23

1-IN

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	20221004170218	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 17:02
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 17:02
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite J	7727-37-9	69.0	J	50.0	100	200

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	20221004170335	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 17:03
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 17:03
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	776		50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	20221004170450	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 17:04
Analytical Batch:	WG1934510	**Analysis Date/Time:**	10/04/22 17:04
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	1830		50.0	100	200

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	20221004182453	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:24
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:24
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite J	7727-37-9	60.5	J	50.0	100	200

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	20221004183000	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:30
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:30
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite J	7727-37-9	58.6	J	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	20221004183116	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:31
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:31
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	20221004183231	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:32
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:32
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	18.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/03/22 23:32
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/03/22 23:32
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	3090	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	19.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/03/22 23:45
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/03/22 23:45
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte		CAS	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	J	14808-79-8	3200	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	20.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/03/22 23:58
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/03/22 23:58
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	14808-79-8	8120		594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	21.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 00:11
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 00:11
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	4600	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	24.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 00:49
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 00:49
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	14808-79-8	5380		594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	25.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 01:02
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 01:02
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	2550	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	26.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 01:15
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 01:15
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	2190	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW07-091922

Lab Sample ID:	L1540953-01	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW07-091922	**Collected Date/Time:**	09/19/22 11:30
Lab File ID:	20221004213220	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:32
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW05-091922

Lab Sample ID:	L1540953-02	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW05-091922	**Collected Date/Time:**	09/19/22 12:10
Lab File ID:	20221004213341	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:33
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW02-091922

Lab Sample ID:	L1540953-03	**SDG:**	L1540953
Client Sample ID:	OT001-DSAMW02-091922	**Collected Date/Time:**	09/19/22 13:15
Lab File ID:	20221004213503	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:35
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN J,QL,QN	7727-37-9	172	J	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922

Lab Sample ID:	L1540953-04	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922	**Collected Date/Time:**	09/19/22 14:05
Lab File ID:	20221004213625	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:36
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-BLOMW06-091922-99

Lab Sample ID:	L1540953-05	**SDG:**	L1540953
Client Sample ID:	OT001-BLOMW06-091922-99	**Collected Date/Time:**	09/19/22 14:10
Lab File ID:	20221004213747	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:37
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922

Lab Sample ID:	L1540953-06	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922	**Collected Date/Time:**	09/19/22 15:20
Lab File ID:	20221004213909	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:39
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN B, QL,QN	7727-37-9	612		140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
WP002-BLOMW01-091922-99

Lab Sample ID:	L1540953-07	**SDG:**	L1540953
Client Sample ID:	WP002-BLOMW01-091922-99	**Collected Date/Time:**	09/19/22 15:25
Lab File ID:	20221004214031	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:40
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	639		140	300	600

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ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Sherrie Robinson Lyndsi Bourne	**CS Site Name:**	Port Heiden RRS	**Lab Name:**	Pace Analytical
Title:	Staff Scientist	**ADEC File No.:**	OT001: 2637.38.002.05 NPDL 21-034	**Lab Report No.:**	L1540980
Consulting Firm:	North Wind Site Services	**Hazard ID No.:**	OT001: 185	**Lab Report Date:**	10/31/2022

Note: *Any N/A or No box checked must have an explanation in the comments box.*

1. **Laboratory**

   a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
   Yes ☒ No ☐ N/A ☐
   Comments: Pace analytical (Mount Juliet, TN) performed the analyses of these samples.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
   Yes ☐ No ☐ N/A ☒
   Comments: Samples were not subcontracted.

2. **Chain of Custody (CoC)**

   a. Is the CoC information completed, signed, and dated (including released/received by)?
   Yes ☒ No ☐ N/A ☐
   Comments: Click or tap here to enter text.

   b. Were the correct analyses requested?
   Yes ☒ No ☐ N/A ☐
   Analyses requested: AK 102, SW8260D, USEPA 6010D, 351.2, 353.2, 9056A, SM 2320B
   Comments: Click or tap here to enter text.

3. **Laboratory Sample Receipt Documentation**

   a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?
   Yes ☒ No ☐ N/A ☐

Cooler temperature(s): 4.6°C
Sample temperature(s): Click or tap here to enter text.
Comments: Click or tap here to enter text.

b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?
Yes ☒ No ☐ N/A ☐
Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?
Yes ☐ No ☐ N/A ☒
Comments: No discrepancies were noted.

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

4. Case Narrative

a. Is the case narrative present and understandable?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are there discrepancies, errors, or QC failures identified by the lab?
Yes ☐ No ☒ N/A ☐
Comments: No discrepancies were identified.

c. Were all the corrective actions documented?
Yes ☐ No ☐ N/A ☒
Comments: No corrective actions were noted.

d. What is the effect on data quality/usability according to the case narrative?
Comments: The data quality/usability was not affected.

5. Sample Results

a. Are the correct analyses performed/reported as requested on CoC?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are all applicable holding times met?
Yes ☒ No ☐ N/A ☐
Comments: The AK 102 samples were collected on 09/17/22 and 09/18/22 and were received by the laboratory on 09/29/22 at 4.6°C. The samples were extracted on 09/30/22 within 12-13 days of collection. The extracts were analyzed on 10/02/22 within 2 days of extraction. No qualifications were warranted.

The SW8260D samples were collected on 09/17/22 and 09/18/22 and were received by the laboratory on 09/29/22 at 4.6°C. All samples were analyzed on 10/01/22 and 10/04/22. The sample results analyzed on 10/04/22 were analyzed within 16-17 days of collection, but outside the 14-day collection to analysis holding time. All sample results analyzed on 10/04/22 have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining sample results were analyzed on 10/01/22, within 13-14 days of collection. All preservation criteria and the remaining holding time criteria were met. No further qualifications were warranted.

All preservation and holding time criteria were met for metals and wet chemistry samples.

c. Are all soils reported on a dry weight basis?
Yes ☐ No ☐ N/A ☒
Comments: All samples are aqueous

d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

e. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: All 8260D sample results analyzed on 10/04/22 have been qualified with a 'H' validation flag due to the exceeded holding time.

6. QC Samples

a. Method Blank

i. Was one method blank reported per matrix, analysis, and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all method blank results less than LOQ (or RL)?

Yes ☐ No ☒
Comments: 8260D- Acetone was present in the method blank (lab ID R3845009-3) associated with all samples, except OT001-TRIPBLANK-HCL-01.

Positive blank detections were noted in the continuing calibration blank for iron and manganese.

A positive detection was noted in the continuing calibration blank (CCB) for alkalinity, and a negative blank detection was noted in the CCB for TKN and nitrate/nitrite.

iii. If above LoQ or RL, what samples are affected?
Comments: Acetone in all samples, except OT001-TRIPBLANK-HCL-01, was detected at a concentration <LOQ and has been qualified with a 'B' validation flag due to the method blank detection.

Iron and manganese in samples OT001-RRSMW06-091722, and OT001-DSAMW01-091822 have been qualified with a 'B' validation flag as the sample results were <5x the blank concentration.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

v. Data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: Acetone in all samples, except OT001-TRIPBLANK-HCL-01, has been qualified with a 'B' validation flag due to the method blank detection.
Iron and manganese in samples OT001-RRSMW06-091722, and OT001-DSAMW01-091822 have been qualified with a 'B' validation flag.

The TKN and nitrate/nitrite results have been left unqualified as the sample results were either non-detect or >2x the negative blank concentration.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – Are one LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- 1,2,3-Trichlorobenzene (67.0%) in the LCS (R3843739) associated with the 10/01/22 sample analysis exceeded the 69-129% recovery criteria.

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the RPD reported from LCS/LCSD, and or sample/sample duplicate? (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- The acetone (23.8%), hexachloro-1,3-butadiene (28.2%), naphthalene (23.1%), and 1,2,3-trichlorobenzene (27.3%) RPDs exceeded the <20% acceptance criteria.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a ‘QL’ validation flag due to the low LCSD recovery. No qualifications were warranted due to the high LCSD RPDs as the associated sample results were non-detect.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a ‘QL’ validation flag due to the low LCSD recovery.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: AK102- Sample OT001-RRSMW06-091722 (lab ID L1540980-01) was the parent sample for the MS/MSD analysis.

8260D- Sample OT001-RRSMW06-091722 (lab ID L1540980-01) was the parent sample for the MS/MSD analysis associated with all samples analyzed on 10/01/22. Non-SDG sample L1540401 was the parent sample for the MS/MSD associated with the samples analyzed on 10/04/22.

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?
Yes ☐ No ☒ N/A ☐
Comments: 8260D- In the OT001-RRSMW06-091722 MS/MSD, a majority of the spikes exceeded the upper control limits (See MS/MSD pages attached to report for specifics). In the non-SDG L1540401 MS/MSD, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria.

The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.
Yes ☐ No ☒ N/A ☐
Comments: 8260D- In the non-SDG L1540401 MS/MSD, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria.

The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments: 8260D- No sample results were affected. All OT001-RRSMW06-091722 sample results analyzed on 10/01/22 were non-detect and warrant no qualification due to the high MS/MSD recoveries.
No qualifications were warranted for the non-SDG L1540401 MS/MSD as the parent sample was not from this SDG.

All TKN results were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: All TKN results have been qualified with a 'QL' validation flag as the MS%R was <90%.
All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were <5x the LOQ, but the absolute difference between the sample and duplicate was >LOQ.

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: All TKN results have been qualified with a 'QL' validation flag due to low MS recovery.
All TKN results have been qualified with a 'QN' validation flag due to high laboratory duplicate RPD.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC, and laboratory samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)
Yes ☐ No ☒ N/A ☐
Comments: 8260D- Surrogate 4-bromofluorobenzene (117%) in sample OT001-RRSMW06-091722 analyzed on 10/04/22 exceeded the 85-114% recovery criteria.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

iv. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: Acetone in sample OT001-RRSMW06-091722 was reported above the detection limit and has been qualified with a “QH” validation flag due to the high surrogate recovery.

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all results less than LoQ or RL?
Yes ☒ No ☐ N/A ☐
Comments: All trip blank results were non-detect.

iii. If above LoQ or RL, what samples are affected?
Comments: Not applicable, all trip blank results were non-detect.

iv. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

f. Field Duplicate

i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?
Yes ☒ No ☐ N/A ☐
Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP; however, a field duplicate was not collected for this SDG.

ii. Was the duplicate submitted blind to lab?
Yes ☐ No ☐ N/A ☒
Comments: A field duplicate was not collected for this SDG.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD\ (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| X\ 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes ☐ No ☐ N/A ☒
Comments: A field duplicate was not collected for this SDG.

iv. Is the data quality or usability affected? (Explain)
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?
Yes ☐ No ☒ N/A ☐
Comments: Equipment blanks were not collected for this SDG.

ii. Are all results less than LoQ or RL?
Yes ☐ No ☐ N/A ☒
Comments: Equipment blanks were not collected for this SDG.

iii. If above LoQ or RL, specify what samples are affected.
Comments: Not applicable, equipment blanks were not collected for this SDG.

iv. Are data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?
Yes ☒ No ☐ N/A ☐
Comments: Several sample results have been qualified with a 'J' validation flag as the results were reported between the detection limit (DL) and the limit of quantitation (LOQ) and are estimates. The remaining sample results were either non-detect or reported above the LOQ.

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Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

This review is based on Project requirements, the requirements of Method 8015, Base Method 8000, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE)Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- Method AK101, *Determination of Gasoline Range Organics*, Version 12/21/16.
- Method AK102, *Determination of Diesel Range Organics*, Version 12/21/16.
- Method AK103, *Determination of Residual Range Organics,* Version 12/21/16.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested.

Sample ID	Lab ID	Type	Matrix	Date Collected	Extraction Date	Analysis Date
OT001-RRSMW06-091722	L1540980-01	Field Sample	Ground Water	09/17/22	09/30/22	10/02/22
OT001-RRSMW05-091822	L1540980-02	Field Sample	Ground Water	09/18/22	09/30/22	10/02/22
OT001-DSAMW01-091822	L1540980-03	Field Sample	Ground Water	09/18/22	09/30/22	10/02/22
OT001-DSAMW05-091822	L1540980-04	Field Sample	Ground Water	09/18/22	09/30/22	10/02/22
OT001-GLOMW04-091822	L1540980-05	Field Sample	Ground Water	09/18/22	09/30/22	10/02/22
OT001-DSAMW06-091822	L1540980-06	Field Sample	Ground Water	09/18/22	09/30/22	10/02/22

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [X] Level III (Level 2b) [] Level II (Level 2a)
Confirm that narrative is present and complete; note overall initial indications.

Six (6) groundwater samples were received by received by Pace Analytical on 09/29/22 at 4.6°C. The samples were analyzed for diesel range organics (DRO) by EPA Method AK102. The data was validated to a Level 2b.

3. Custody of Samples	**Y**	**N**
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	

Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.

Reviewer Comments: Field and internal custody forms are complete and accurate.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

4. Holding Times and Preservation	Y	N	NA
Were samples preserved at ≤6° C?	X		
AK 101			
Were aqueous samples analyzed within 14 days of collection?			X
Were soil/solid samples analyzed within 28 days of collection?			X
AK102/AK103			
For AK102, were aqueous samples acidified to pH 2 or less with HCl?	X		
Were aqueous and soil/solid samples extracted within 14-days of collection?	X		
Were extracts analyzed within 40-days of extraction?	X		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	X		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 09/17/22 and 09/18/22 and were received by the laboratory on 09/29/22 at 4.6°C. The samples were extracted on 09/30/22 within 12-13 days of collection. The extracts were analyzed on 10/02/22 within 2 days of extraction. All preservation and holding time criteria were met. No qualifications were warranted.

5. Preparation Technique

	Y	N	NA
Are preparation logs for all samples present in the data package?	X		
Are cleanup data present in the data submittal?			X

Identify the preparation method(s) used:

	Matrix	Preparation Method(s) *(record # or NA)*	Cleanup Method(s) *(record # or NA)*
	Water	*SW3510C*	*NA*
	Soil/Solid	*NA*	*NA*
	Oil	*NA*	*NA*
	Air	*NA*	*NA*

Reviewer Comments: The samples were prepared in accordance with Method SW3510C.

6. Instrumentation QA/QC	Y	N	NA
Were the following instrumentation criteria met?			
Was all retention time criteria met per the analytical method?	X		
Was all initial calibration criteria met (i.e. %RSD <25% or r^2<0.995)?	X		
Was all initial calibration verification (ICV) criteria met (%D<25% **or** method required criteria)?	X		
Was all continuing calibration verification (CCV) criteria met (%D<25% **or** method required criteria)?	X		

Reviewer Comments: All retention time criteria, initial calibration criteria, and continuing calibration criteria were met. No qualifications were warranted.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

7. Method Blank	Y	N	NA
Are method blank results present?	**X**		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix? (**Method 8000B**, Section 8.2.6.1;)	**X**		
Is the method blank subjected to the same cleanup procedures as the associated samples? (**Method 8000B**, Section 8.2.6.4)	**X**		
Is the method blank run after initial calibration or calibration verification? (**Method 8000B**, Sections 7.7.7 and 8.2.6.3)	**X**		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	**X**		
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000**, Section 8.2.6.7)			**X**
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			**X**
Were any target analytes detected in the method, instrument, and/or solvent blanks?		**X**	
Is gross contamination present in the method, instrument, or solvent blank?		**X**	
If gross contamination is present, are associated samples reanalyzed?			**X**
Are blank results **not** subtracted from associated sample results? (**Method 8000**, Section 8.2.6.6)	**X**		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All method blank results were non-detect. No qualifications were warranted.

8. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? **(Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1; **Method 8015**, Section 9.6)	**X**		
Has the laboratory developed control limits for surrogates?	**X**		
Are recoveries within the laboratory-generated limits?	**X**		
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All surrogate recoveries were within the acceptance criteria. No qualifications were warranted.

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)	**X**		
Are RPDs within MSD control criteria (or lab-generated limits)?	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Sample OT001-RRSMW06-091722 (lab ID L1540980-01) was the parent sample for the MS/MSD analysis. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries and precision criteria were met. No qualifications were warranted.

10. Field Duplicate	Y	N	NA
Was a field duplicate pair collected for this SDG?			**X**
Were field duplicate samples collected at a frequency of of one for every 20 primary samples? (**Per Project QAPP)**	**X**		
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**			**X**
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP; however, a field duplicate was not collected for this SDG. No qualifications were warranted.

11. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	**X**		
Is an LCS included with each batch of ≤20 samples on a per-matrix basis? (**Method 8000**, Section 8.5 and **Method 8015**, Section 9.6.2)	**X**		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5; **Method 8015**, Section 9.6.2)	**X**		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4; **Method 8015**, Section 9.6.2)	**X**		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, within the method-specified range of 70-130%)? (**Method 8000B**, Section 8.5.4)	**X**		
If prepared in duplicate, are RPDs within limits?	**X**		
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality ** Evaluate other QC prior to qualifying "R". *** Use professional judgment			

Reviewer Comments: All laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and precision criteria were met. No qualifications were warranted.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

12. Confirming Column	Y	N	NA
Since most samples are not well-characterized, is each sample analysis confirmed on a dissimilar column for all single-peak target compounds (non-DRO and GRO) (i.e. is second-column confirmation performed)? (**Method 8000**, Section 7.9 and **Method 8015**, 11.6.5)			**X**
For DRO and GRO, if analytical interferences are indicated is confirmatory analysis performed? (**Method 8015**, Section 11.6.5)			**X**
Is the RPD between primary and confirming column results <40%? (**Method 8000B**, Section 7.10.4.1 and **Method 8000C**, Section 11.10.4.1)			**X**
If confirmatory analysis is not present, all single-peak target compound results should be qualified "J" or "UJ", since flame-ionization detection (FID) is non-specific and subject to numerous positive interferences.			

Reviewer Comments: No comments.

13. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	**X**		
Action: *Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: All sample results were non-detect.

14. Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

15. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

All sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/10/2023	Date: 03/13/2023

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	1001_041	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 03:21
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

3/10/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	1001_044	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 04:30
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

SW 3/10/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	1001_045	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 04:52
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

SR 3/10/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	1001_046	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 05:15
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	1001_047	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 05:38
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

SAL 3/10/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	1001_048	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	SVGC34	**Preparation Date/Time:**	09/30/22 14:16
Analytical Batch:	WG1934826	**Analysis Date/Time:**	10/02/22 06:01
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	5.90	400	U	170	400	800

3/10/23

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

This review is based on Project requirements, the requirements of the analytical method(s), and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). *Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories*, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted

Sample ID	Lab ID	Type	Matrix	Date Collected	DF	Date Analyzed
OT001-RRSMW06-091722	L1540980-01	Field Sample	Ground Water	09/17/22	1	10/01/22 *10/04/22
OT001-RRSMW05-091822	L1540980-02	Field Sample	Ground Water	09/18/22	1	10/01/22 *10/04/22
OT001-DSAMW01-091822	L1540980-03	Field Sample	Ground Water	09/18/22	1	10/01/22 *10/04/22
OT001-DSAMW05-091822	L1540980-04	Field Sample	Ground Water	09/18/22	1	10/01/22 *10/04/22
OT001-GLOMW04-091822	L1540980-05	Field Sample	Ground Water	09/18/22	1	10/01/22 *10/04/22
OT001-DSAMW06-091822	L1540980-06	Field Sample	Ground Water	09/18/22	1	10/01/22 *10/04/22
OT001-TRIPBLANK-HCL-01	L1540980-07	Trip Blank	Ground Water	09/17/22	1	10/01/22 *10/04/22

DF: Dilution Factor
* Denotes exceeded holding time

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [x] Level III (Level 2B) []Level II (Level 2a)

Seven (7) ground water samples were received by Pace Analytical on 09/29/22 at 4.6°C. The samples were analyzed for volatile organic compounds by EPA Method SW8260D. The data was validated to a Level 2b.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.		

Reviewer Comments: Field and internal custody forms are complete and accurate.

4. Holding Times and Preservation	Y	N	NA
Have aqueous samples been preserved at ≤6°C (**SW846**-Table 2-40A)	**X**		
Have solid samples been preserved at ≤6°C (**SW846**-Table 2-40A)			**X**
Have aqueous samples been preserved with H2SO4, HCl, or solid NaHSO4? (**SW846**-Table 2-40A)	**X**		
Are preserved samples, solids, and wastes analyzed with 14 days of collection? (**SW846**-Table 2-40A)		**X**	
Are unpreserved samples analyzed with 7 days of collection? (**SW846**-Table 2-40A)			**X**
If residual chlorine is present, are samples treated with sodium thiosulfate? (**SW846**-Table 2-40A)			**X**
Inspect narrative, receipt logs, etc. Does the information indicate there were **no** significant problems with sample handling/naming?	**X**		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 09/17/22 and 09/18/22 and were received by the laboratory on 09/29/22 at 4.6°C. All samples were analyzed on 10/01/22 and 10/04/22. The sample results analyzed on 10/04/22 were analyzed within 16-17 days of collection, but outside the 14-day collection to analysis holding time. All sample results analyzed on 10/04/22 have been qualified with a 'H' validation flag due to the exceeded holding time. The remaining sample results were analyzed on 10/01/22, within 13-14 days of collection. All preservation criteria and the remaining holding time criteria were met. No further qualifications were warranted.

5. Preparation Technique				
		Y	N	NA
Are preparation logs for all samples present in the data package?				
Identify the preparation method(s) used:				
	Matrix	**Method(s)** *(record # or NA)*		
	Water	*EPA Method SW8260D*		
	Soil/Solid	*NA*		
	Oil	*NA*		
	Air	*NA*		

Reviewer Comments: The samples were prepared in accordance with EPA Method SW8260D.

6. GC/MS Performance Check	Y	N
Are performance check data present in the data submittal?	**X**	
Is the GC/MS hardware-tuned to meet BFB criteria prior to the initial calibration and for each 12-hr period during which analyses are performed? (**Method 8260B**, Sections 4.9.3, 5.11, 7.3.1, 7.4.1, 7.5.2, 8.2.1, and 11.4.1)	**X**	
Are mass spectral relative abundances acceptable according to the method criteria? (**Method 8260B**, Table 4**)**	**X**	

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

6. GC/MS Performance Check	Y	N
Was there correct assignment of ions?	X	
Raw Data Confirmation		
Raw data show proper averaging of scans according to method recommendations.	X	
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate		

Reviewer Comments: All tune criteria were met. No qualifications were warranted.

7. Initial Calibration	Y	N	NA
Are initial calibration data present in the data submittal?	X		
Does the initial calibration curve consist of a least 5 standards? (**Method 8260B**, Sections 5.7.6.10, 5.7.6.11, 5.12.1 and 7.3.2; and **Method 8000B**, Section 7.4)	X		
Are all target analytes present in the initial calibration? (**Method 8260B**, Section 5.12.3)	X		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the RSD ≤30%? (**Method 8260B**, Section 7.3.6.3 and 8.2.3) **[Note: Method 8260 requires an RSD of ≤15% and Method 8260C/D requires an RSD of 20% for all compounds or another type of curve must be used]**	X		
For the system performance check compounds, are the response factors 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Section 7.3.5.4 and 8.2.3)	X		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	X		
For other compounds, is the response factor ≥0.01 (or method criteria)?	X		
If the RSD does not meet the 20% (15% for **Method 8260**) criterion, is a linear (or quadratic) regression equation used for target compound quantitation? (**Method 8260B**, Sections 7.3.8.2)	X		
If linear and/or quadradic regressions, are used, is r ≥0.99 or r^2≥0.98 (**Method 8000B**, Sections 7.5.2 and 8.3.2)	X		
Is the origin not forced and not included in the calibration curve for linear regression? (**Method 8000**, Section 7.5.2)	X		
QC Check Standard (ICV)			
Are QC Check Standard Results present in the data submittal?	X		
Is the check standard run on an ongoing basis? (**Method 8260B**, Section 8.7-referred to as a standard reference material)	X		
Are check standard results within 30% of reference value?		X	
Raw Data Confirmation			
Raw data have been examined for anomalies	X		
The quantitation ions for 2 compounds have been confirmed as the correct ions for quantitation.	X		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate *** Qualify only peaks outside linear portion			

Reviewer Comments: All initial calibration criteria were met.

The following ICV compounds were outside of the 30%D acceptance criteria; however, the ICVs only bracketed the associated ICAL and no qualifications were warranted:

- 1,2,4-Trichlorobenzene (68.10%) and acrolein (164%) in the ICV analyzed on 08/26/22 at 22:56.

- Acrolein (147%) and bromomethane (212%) in the ICV analyzed on 08/18/22 at 15:17.
- The remaining ICV criteria were met.

8. Continuing Calibration	Y	N	NA
Are continuing calibration data present in the data submittal?	**X**		
Are all target analytes present in the continuing calibration (verification)? (**Method 8260B**, Section 5.12.3)	**X**		
Has continuing calibration verification been performed within 12 hours of the time of associated sample analysis? (**Method 8260B**, Sections 7.4.2 and 8.2.3)	**X**		
For the system performance check compounds, are the response factors in the calibration verification 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Sections 7.3.5.4, 7.4.4.1, 7.4.4.2, and 8.2.3)	**X**		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	**X**		
For other compounds, is the response factor ≥0.01?	**X**		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the %D ≤20%? (**Method 8260B**, Sections 7.3.6.3, 7.4.5.1, 7.4.5.2, and 8.2.3)	**X**		
For other compounds, is %D ≤ 20%? (**Method 8260B**, Section 7.4.5.2)	**X**		
Is a closing CCV performed? (**DOD QSM 5.3** Table B-4)	**X**		
Is the closing CCV %D ≤ 50%? (**DOD QSM 5.3** Table B-4)	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected.			

Reviewer Comments: The following table shows the CCV %Rs that exceeded the opening CCV 80-120% recovery or the closing CCV 50%-150% acceptance criteria and the affected samples.

The closing CCV for the samples analyzed 10/01/22 on instrument VOCMS33 was not included in this data package; however, the CCV was included in the data package for SDG L1540948 and has been utilized in this data package for validation purposes *(See attached closing CCV analyzed 10/01/22 at 20:47)*.

Continuing Calibration Date/Time	Samples Bracketed	Analyte	CCV%R >Opening 80-120%R/ Closing 50-150%R
VOCMS33 Opening CCV 10/01/22, 08:51	All samples analyzed 10/01/22 and associated QA/QC	1,1,2-Trichlorotrifluoroethane	125%
		1,2,4-Trichlorobenzene	78.7%
		1,2-Dibromo-3-chloropropane	79.8%
		4-Methyl-2-pentanone (MIBK)	79.2%
		Chloromethane (SPCC)	72.6%
VOCMS6 Opening CCV 10/03/22, 23:30	Sample OT001-EQBLK01-091922 and associated LCS/LCSD	1,1,2,2-Tetrachloroethane (SPCC)	76.8%
		1,2-Dibromo-3-chloropropane	73.5%
		Acetone	140%
		Bromomethane	12.8%
		Naphthalene	68.0%
		Trichloroethene	124%
VOCMS6 Closing CCV 10/04/22, 09:27		Bromomethane	21.0%

Note: SPCC = System performance check compound

Qualifications are as follows:

- All 1,1,2-trichlorotrifluoroethane and 1,2-dibromo-3-chloropropane results, and acetone in all samples **except** OT001-TRIPBLANK-HCL-01 have been qualified with a 'QN' validation flag as the CCV %R criteria was exceeded.
- The following SPCC compounds were not target compounds. No qualifications were warranted as the SPCC criterion was met:
  - Chloromethane in the CCV analyzed 10/01/22 at 08:51.
  - 1,1,2,2-Tetrachloroethane in the CCV analyzed 10/03/22 at 23:30.
- 1,2,4-Trichlorobenzene, 1,2-dibromo-3-chloropropane, and 4-methyl-2-pentanone (MIBK) were not reported from the CCV analyzed 10/01/22 at 08:51. No qualifications were warranted.
- Bromomethane, naphthalene, and trichloroethene were not reported from the CCVs analyzed 10/03/22 at 23:30 and 10/04/22 at 09:27. No qualifications were warranted.
- The remaining CCV criteria were met. No further qualifications were warranted.

9. Method Blank	**Y**	**N**	**NA**
Are method blank results present?	**X**		
Is the method blank run after initial calibration or calibration verification? (**Method 8260B**, Section 7.4.3 and **Method 8000B**, Sections 7.7.7 and 8.2.6.3)	**X**		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix or on a per batch basis? (**Method 8260B**, Section 8.4 and **Method 8000B**, Section 8.2.6.1)	**X**		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	**X**		
Is the method blank subjected to the same preparation and cleanup procedures as the associated samples? (**Method 8260B**, Section 8.4.1 and **Method 8000B**, Section 8.2.6.4)	**X**		
Are solvent or instrument blanks interspersed through the analytical run or as necessary? (Method 8260B, Section 7.4.3 and **Method 8000B**, Section 8.2.1)			**X**
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			**X**
Were any target analytes detected in the method, instrument, and/or solvent blanks?	**X**		
Is gross contamination present in the method, instrument, or solvent blank?			**X**
If gross contamination is present, are associated samples reanalyzed			**X**
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000B**, Section 8.2.6.7)			**X**
Are blank results **not** subtracted from associated sample results? (**Method 8000B**, Section 8.2.6.6)	**X**		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: Acetone (16.3 ug/l, J) was present in the method blank (lab ID R3845009-3) associated with all samples, **except** OT001-TRIPBLANK-HCL-01. Qualifications are as follows:

- Acetone in all samples, **except** OT001-TRIPBLANK-HCL-01, was detected at a concentration <LOQ and has been qualified with a 'B' validation flag due to the method blank detection.
- All trip blank OT001-TRIPBLANK-HCL-01 results and the remaining method blank results were non-detect. No further qualifications were warranted.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

10. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? (**Method 8260B**, Section 5.9 and **Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1)	**X**		
Are surrogate recoveries within the lab-generated or default (70-130%R) acceptance limits?		**X**	
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Use technical judgment in recoveries, allowing 0 outliers for VOA, possibly 1 for SVOA.			

Reviewer Comments: Surrogate 4-bromofluorobenzene (117%) in sample OT001-RRSMW06-091722 analyzed on 10/04/22 exceeded the 85-114% recovery criteria. Qualifications are as follows:

- Acetone in sample OT001-RRSMW06-091722 was reported above the detection limit and has been qualified with a "QH" validation flag due to the high surrogate recovery.
- The remaining surrogate recoveries were within the acceptance criteria. No further qualifications were warranted.

11. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix or on a per-batch basis? (**Method 8260B**, Sections 8.4 and 8.4.2 and **Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)		**X**	
Are RPDs within MSD control criteria (or lab-generated limits)?		**X**	
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Sample OT001-RRSMW06-091722 (lab ID L1540980-01) was the parent sample for the MS/MSD analysis associated with all samples analyzed on 10/01/22. In the MS/MSD, a majority of the spikes exceeded the upper control limits *(See attached MS/MSD pages for specifics)*. Per the USEPA Functional Guidelines, only the parent sample shall be qualified due to MS/MSD considerations. Data assessment is as follows:

- All OT001-RRSMW06-091722 sample results analyzed on 10/01/22 were non-detect and warrant no qualification due to the high MS/MSD recoveries.
- All precision criteria were met. No qualifications were warranted.

In the non-SDG L1540401 MS/MSD, numerous spikes were recovered outside control limits and outside of the 30% RPD criteria. However, no qualifications were warranted as the MS/MSD parent sample was **not** from this SDG and only the parent sample shall be qualified due to MS/MSD considerations per the USEPA Functional Guidelines.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

12. Field Duplicate	Y	N	NA
Was a field duplicate pair collected for this SDG?		X	
Were field duplicate samples collected at a frequency of of one for every 10 primary samples? (**Per Project QAPP**)	X		
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP**)			X
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP; however, a field duplicate was not collected for this SDG. No qualifications were warranted.

13. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	X		
Has at least one LCS been prepared with each analytical batch up to 20 samples? (**Method 8260B**, Sections 8.4 and 8.4.3)	X		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5)	X		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4)	X		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, the method-specified range of 70-130)? (**Method 8000B**, Section 8.5.4)	X		
If prepared in duplicate, are RPDs within limits?	X		
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality. ** Evaluate other QC prior to qualifying "R".			

Reviewer Comments: The following table shows the LCS/LCSD compounds that exceeded the acceptance criteria, and the affected samples.

LCS/LCSD	Associated samples	Analyte	%Recovery	Acceptance limits	RPD>20%
R3843739-1/2	All sample results (10/01/22 analysis) and associated QA/QC	Acetone			23.8%
		Hexachloro-1,3-butadiene			28.2%
		Naphthalene			23.1%
		1,2,3-Trichlorobenzene	67.0%	69-129%	27.3%

Qualifications are as follows:

- All 1,2,3-trichlorobenzene results were non-detect and have been qualified with a 'QL' validation flag due to the low LCSD recovery.
- No qualifications were warranted due to the high LCSD RPDs as the associated sample results were non-detect.
- Hexachloro-1,3-butadiene and acetone in all samples, **except** OT001-TRIPBLANK-HCL-01, were reported from the 10/04/22 analysis. No qualifications were warranted due to the exceedances in the 10/01/22 LCS analysis.
- The remaining LCS recoveries were within the acceptance criteria. No further qualifications were warranted.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

14. Internal Standards	Y	N	NA
Are internal standard data present in the data submittal?	**X**		
Were method-appropriate internal standards (ISs) used for the reported analyses?	**X**		
Are internal standards added to each calibration standard? (**Method 8260B**, Section 5.12.4 and 7.5.10.2)	**X**		
Do internal standard retention times **not** vary by more than 30 seconds from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.6)	**X**		
Does the EICP area of any internal standard **not** vary by more than a factor of two (-50 to +100%) from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.7)	**X**		
Do area counts appear to be at least minimally adequate?	**X**		
Note: Internal standard assessment is **not** required for a Level 2a data validation. Action: Indicate affected samples in validation comments, primarily if data were rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All internal standard criteria were met. No qualifications were warranted.

15. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f) and 5.5.2.2.1.g)) (**Method 8000**, Section 7.4) (**All data below LOQ qualified with a J**)		**X**	
Action: Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: Several sample results have been qualified with a 'J' validation flag to denote the reported results are estimated due to sample results reported at levels between the detection limit (DL) and the limit of quantitation (LOQ)

The remaining sample results were either non-detect or reported above the LOQ.

16. Tentatively Identified Compounds	Y	N	NA
Are TICs reported in the data submittal?			**X**
If requested, does the TIC report include up to 20 compounds?			**X**
Action: Indicate non-correctable contract compliance deviations below. Indicate missed TICs (if this part of analysis requested)			

Reviewer Comments: TICs were not required.

17. Sample Data Evaluation -Validation with Raw Data Confirmation
1. For one compound in each sample, determine whether CRQLs have been modified to SQLs. **Yes.**
2. Sample-specific evaluation - these evaluations are performed one sample in each batch (excluding QC).
-Evaluate whether the correct quantitation ions were used. **The correct ions were used.**
-Evaluate adequacy of manual integrations of peak areas. (**AMS**, Section 3.5.5.g)) **Manual integrations were**

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

17. Sample Data Evaluation -Validation with Raw Data Confirmation
straightforward
-Evaluate the presence of carryover. **NA**
-Evaluate the validity of dilutions and reanalyses. **NA**
-Evaluate interferences that may preclude accurate quantitation of compounds. **NA**
3. Manually recalculate 2 or more selected results from a sample in the SDG. **NA** 4. Did recalculation confirm reported results? **NA** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
5. Qualify all non-rejected TIC as "NJ" **NA**
6. Evaluate all TICs according to EPA Functional Guidelines VOA verification/validation procedure. **NA**
Action: Indicate in comments instances of manual calculations not confirming reported results. Where samples have been reanalyzed, and both reanalyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.
Description of Sample-specific Evaluation Problems**: NA**

Reviewer Comments: No comments as the samples have undergone a Level 2b review.

18. Method 8260 Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

19. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table

Sample ID	Analyte	Validation Flag	Qualification Reason(s)
OT001-RRSMW06-091722	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Acetone	H, QN, B, QH, J	Exceeded holding time CCV %R >20% Method blank considerations High surrogate recovery Result ≥DL but <LOQ
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery
OT001-RRSMW05-091822	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank considerations Result ≥DL but <LOQ
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery
OT001-DSAMW01-091822	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank considerations Result ≥DL but <LOQ
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery
OT001-DSAMW05-091822	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		

	Trichlorofluoromethane		
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank considerations Result ≥DL but <LOQ
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery
OT001-GLOMW04-091822	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank considerations Result ≥DL but <LOQ
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery
OT001-DSAMW06-091822	Chloromethane	H	Exceeded holding time
	Hexachloro-1,3-butadiene		
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	Trichlorofluoromethane		
	Acetone	H, QN, B, J	Exceeded holding time CCV %R >20% Method blank considerations Result ≥DL but <LOQ
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery
	Tetrachloroethene	J	Result ≥DL but <LOQ
OT001-TRIPBLANK-HCL-01	Chloromethane	H	Exceeded holding time
	4-Methyl-2-pentanone (MIBK)		
	1,2,4-Trichlorobenzene		
	1,2-Dibromo-3-Chloropropane	H, QN	Exceeded holding time CCV %R >20%
	1,1,2-Trichlorotrifluoroethane	QN	CCV %R >20%
	1,2,3-trichlorobenzene	QL	Low LCSD recovery

Note: See Section 18 for Validation Flag Definitions

Trichloroethene in samples OT001-DSAMW01-091822 and OT001-DSAMW05-091822 was reported above the LOQ, has been assessed, and remains unqualified.

The remaining sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1540980**

Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/10/2023	Date: 03/13/2023

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1540948	**Calibration (begin) date/time:**	08/26/22 18:42
Instrument ID:	VOCMS33	**Calibration (end) date/time:**	08/27/22 02:04
Lab File ID:	1001_31-3	**Analysis date/time:**	10/01/22 20:47
Analytical Method:	8260D	**Sample ID:**	ICV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1,2-TETRACHLOROETHANE	0.605857	0.57517280		5.06		0.0050	0.004747	94.90	50 - 150
1,1,1-TRICHLOROETHANE	0.424705	0.46603960		9.73		0.0050	0.005487	110	50 - 150
1,1,2,2-TETRACHLOROETHANE	1.038294	0.92486940		10.90		0.0050	0.004454	89.10	50 - 150
1,1,2-TRICHLOROETHANE	0.603746	0.59021810		2.24		0.0050	0.004888	97.80	50 - 150
1,1,2-TRICHLOROTRIFLUOROETHANE	0.235247	0.27518920		17		0.0050	0.005849	117	50 - 150
1,1-DICHLOROETHANE	0.504936	0.52428760		3.83		0.0050	0.005192	104	50 - 150
1,1-DICHLOROETHENE	0.225217	0.24671810		9.55		0.0050	0.005477	110	50 - 150
1,1-DICHLOROPROPENE	0.347536	0.36435340		4.84		0.0050	0.005242	105	50 - 150
1,2,3-TRICHLOROBENZENE	0.448899	0.28655360		36.20		0.0050	0.003406	68.10	50 - 150
1,2,3-TRICHLOROPROPANE	0.354192	0.33667260		4.95		0.0050	0.004753	95.10	50 - 150
1,2,3-TRIMETHYLBENZENE	2.240528	2.158689		3.65		0.0050	0.004817	96.30	50 - 150
1,2,4-TRICHLOROBENZENE	0.491319	0.32562910		33.70		0.0050	0.003007	60.10	50 - 150
1,2,4-TRIMETHYLBENZENE	2.272939	2.068524		8.99		0.0050	0.004550	91	50 - 150
1,2-DIBROMO-3-CHLOROPROPANE	0.294424	0.22089110		25		0.0050	0.003751	75	50 - 150
1,2-DIBROMOETHANE	0.671035	0.65051980		3.06		0.0050	0.004847	96.90	50 - 150
1,2-DICHLOROBENZENE	1.153333	1.052892		8.71		0.0050	0.004565	91.30	50 - 150
1,2-DICHLOROETHANE	0.435604	0.45459190		4.36		0.0050	0.005218	104	50 - 150
1,2-DICHLOROPROPANE	0.206566	0.19901940		3.65		0.0050	0.004817	96.30	50 - 150
1,3,5-TRIMETHYLBENZENE	2.256067	2.096804		7.06		0.0050	0.004647	92.90	50 - 150
1,3-DICHLOROBENZENE	1.271371	1.109596		12.70		0.0050	0.004364	87.30	50 - 150
1,3-DICHLOROPROPANE	1.019136	0.93100470		8.65		0.0050	0.004568	91.40	50 - 150
1,4-DICHLOROBENZENE	1.311208	1.231466		6.08		0.0050	0.004696	93.90	50 - 150
2,2-DICHLOROPROPANE	0.306146	0.35070130		14.60		0.0050	0.005728	115	50 - 150
2-BUTANONE (MEK)	0.265078	0.23755630		10.40		0.0250	0.02240	89.60	50 - 150
2-CHLOROTOLUENE	2.264295	2.066130		8.75		0.0050	0.004562	91.20	50 - 150
4-CHLOROTOLUENE	2.225717	1.914121		14		0.0050	0.004300	86	50 - 150
4-METHYL-2-PENTANONE (MIBK)	1.306354	1.043869		20.10		0.0250	0.01998	79.90	50 - 150
ACETONE	0.150162	0.16012690		6.64		0.0250	0.02666	107	50 - 150
ACROLEIN	0.045456	0.04088752		10.10		0.0250	0.02249	90	50 - 150
ACRYLONITRILE	0.178990	0.18342430		2.48		0.0250	0.02562	102	50 - 150
BENZENE	1.030760	1.100118		6.73		0.0050	0.005336	107	50 - 150
BROMOBENZENE	1.423135	1.228762		13.70		0.0050	0.004317	86.30	50 - 150
BROMODICHLOROMETHANE	0.384526	0.399743		3.96		0.0050	0.005198	104	50 - 150
BROMOFORM	0.522474	0.45747820		12.40		0.0050	0.004378	87.60	50 - 150
BROMOMETHANE	0.206349	0.23500180		13.90		0.0050	0.005694	114	50 - 150
CARBON TETRACHLORIDE	0.366007	0.41684970		13.90		0.0050	0.005695	114	50 - 150
CHLOROBENZENE	1.7092	1.668747		2.37		0.0050	0.004882	97.60	50 - 150
CHLORODIBROMOMETHANE	0.708476	0.637320		10		0.0050	0.004498	90	50 - 150
CHLOROETHANE	0.1887	0.205725		9.02		0.0050	0.005451	109	50 - 150
CHLOROFORM	0.504617	0.581628		15.30		0.0050	0.005763	115	50 - 150
CHLOROMETHANE	0.412264	0.29029530		29.60		0.0050	0.003521	70.40	50 - 150
CIS-1,2-DICHLOROETHENE	0.282436	0.32378630		14.60		0.0050	0.005732	115	50 - 150
CIS-1,3-DICHLOROPROPENE	0.457796	0.42672290		6.79		0.0050	0.004661	93.20	50 - 150
DI-ISOPROPYL ETHER	1.038852	0.89587450		13.80		0.0050	0.004312	86.20	50 - 150
DIBROMOMETHANE	0.181703	0.19968630		9.90		0.0050	0.005495	110	50 - 150
DICHLORODIFLUOROMETHANE	0.331007	0.30621650		7.49		0.0050	0.004626	92.50	50 - 150

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1540948	**Calibration (begin) date/time:**	08/26/22 18:42
Instrument ID:	VOCMS33	**Calibration (end) date/time:**	08/27/22 02:04
Lab File ID:	1001_31-3	**Analysis date/time:**	10/01/22 20:47
Analytical Method:	8260D	**Sample ID:**	ICV

Analyte	Avg. RRF	RRF	Min. RRF	Diff. %	Max Diff. %	True Value mg/l	Result mg/l	Result % Rec.	Limits %
ETHYLBENZENE	0.902801	0.87014140		3.62		0.0050	0.004819	96.40	50 - 150
HEXACHLORO-1,3-BUTADIENE	0.206669	0.15574470		24.60		0.0050	0.003425	68.50	50 - 150
ISOPROPYLBENZENE	2.569741	2.656623		3.38		0.0050	0.005169	103	50 - 150
M&P-XYLENE	1.114463	1.119914		0.4890		0.01	0.01005	101	50 - 150
METHYL TERT-BUTYL ETHER	0.797049	0.89382760		12.10		0.0050	0.005607	112	50 - 150
METHYLENE CHLORIDE	0.271196	0.31019910		14.40		0.0050	0.005719	114	50 - 150
N-BUTYLBENZENE	1.610173	1.358147		15.70		0.0050	0.004005	80.10	50 - 150
N-PROPYLBENZENE	3.398313	2.982020		12.20		0.0050	0.004387	87.70	50 - 150
NAPHTHALENE	2.081443	1.394250		33		0.0050	0.003480	69.60	50 - 150
O-XYLENE	1.067401	1.073715		0.5920		0.0050	0.005030	101	50 - 150
P-ISOPROPYLTOLUENE	2.094837	1.924195		8.15		0.0050	0.004593	91.90	50 - 150
SEC-BUTYLBENZENE	2.437475	2.263716		7.13		0.0050	0.004644	92.90	50 - 150
STYRENE	1.662337	1.567984		5.68		0.0050	0.004716	94.30	50 - 150
TERT-BUTYLBENZENE	1.834981	1.646497		10.30		0.0050	0.004486	89.70	50 - 150
TETRACHLOROETHENE	0.499857	0.47804010		4.36		0.0050	0.004782	95.60	50 - 150
TOLUENE	2.725093	2.451405		10		0.0050	0.004498	90	50 - 150
TRANS-1,2-DICHLOROETHENE	0.255831	0.26916890		5.21		0.0050	0.005261	105	50 - 150
TRANS-1,3-DICHLOROPROPENE	1.007736	0.81527610		19.10		0.0050	0.004045	80.90	50 - 150
TRICHLOROETHENE	0.280911	0.31232010		11.20		0.0050	0.005559	111	50 - 150
TRICHLOROFLUOROMETHANE	0.364429	0.41998950		15.20		0.0050	0.005762	115	50 - 150
VINYL CHLORIDE	0.304298	0.32272120		6.05		0.0050	0.005303	106	50 - 150
1,2-DICHLOROETHANE-D4	0.354587	0.29594170		16.50		0.0160	0.01586	99.10	50 - 150
4-BROMOFLUOROBENZENE	0.881070	0.80071220		9.12		0.0160	0.01727	108	50 - 150
TOLUENE-D8	2.163474	1.860558		14		0.0160	0.01634	102	50 - 150

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

L1540980-01,02,03,04,05,06,07

SAMPLE NO.:
R3843739-6
R3843739-7

MS Sample / File ID: R3843739-6 / 1001_28
MSD Sample / File ID: R3843739-7 / 1001_29
OS Sample / File ID: L1540980-01 / 1001_18
Instrument ID: VOCMS33
Analytical Method: 8260D

SDG: L1540980
Analytical Batch: WG1935601
Matrix: GW

Analyte	Spike Amount	OS Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	RPD	RPD Limit
	ug/l	*ug/l*	*ug/l*	*ug/l*	*%*	*%*		*%*	*%*	*%*
Acetone	25.0	25.0	34.2	32.9	137	132	1	39.0 - 160	3.87	20
Acrolein	25.0	25.0	37.6	36.3	150	145	1	39.0 - 155	3.52	20
Acrylonitrile	25.0	5.00	32.9	31.5	132	126	1	63.0 - 135	4.35	20
Benzene	5.00	0.500	7.55	7.48	151*	150*	1	79.0 - 120	0.931	20
Bromobenzene	5.00	0.500	5.59	5.86	112	117	1	80.0 - 120	4.72	20
Bromodichloromethane	5.00	0.500	6.96	6.82	139*	136*	1	79.0 - 125	2.03	20
Bromoform	5.00	0.500	5.87	5.86	117	117	1	66.0 - 130	0.171	20
Bromomethane	5.00	2.00	7.98	7.96	160*	159*	1	53.0 - 141	0.251	20
n-Butylbenzene	5.00	0.500	6.09	6.17	122	123	1	75.0 - 128	1.31	20
sec-Butylbenzene	5.00	0.500	6.68	6.91	134*	138*	1	77.0 - 126	3.38	20
tert-Butylbenzene	5.00	0.500	6.39	6.49	128*	130*	1	78.0 - 124	1.55	20
Carbon tetrachloride	5.00	0.500	8.15	7.78	163*	156*	1	72.0 - 136	4.65	20
Chlorobenzene	5.00	0.500	6.57	6.76	131*	135*	1	82.0 - 118	2.85	20
Chlorodibromomethane	5.00	0.500	5.82	5.70	116	114	1	74.0 - 126	2.08	20
Chloroethane	5.00	2.00	8.56	8.24	171*	165*	1	60.0 - 138	3.81	20
Chloroform	5.00	2.00	7.92	7.67	158*	153*	1	79.0 - 124	3.21	20
2-Chlorotoluene	5.00	0.500	6.15	6.27	123*	125*	1	79.0 - 122	1.93	20
4-Chlorotoluene	5.00	0.500	5.79	5.95	116	119	1	78.0 - 122	2.73	20
1,2-Dibromoethane	5.00	0.500	6.23	6.42	125*	128*	1	77.0 - 121	3.00	20
Dibromomethane	5.00	0.500	7.26	7.11	145*	142*	1	79.0 - 123	2.09	20
1,2-Dichlorobenzene	5.00	0.500	6.52	6.72	130*	134*	1	80.0 - 119	3.02	20
1,3-Dichlorobenzene	5.00	0.500	6.20	6.20	124*	124*	1	80.0 - 119	0.000	20
1,4-Dichlorobenzene	5.00	0.500	5.96	6.24	119*	125*	1	79.0 - 118	4.59	20
Dichlorodifluoromethane	5.00	2.00	7.45	7.60	149	152	1	32.0 - 152	1.99	20
1,1-Dichloroethane	5.00	0.500	7.49	7.01	150*	140*	1	77.0 - 125	6.62	20
1,2-Dichloroethane	5.00	0.500	7.13	6.65	143*	133*	1	73.0 - 128	6.97	20
1,1-Dichloroethene	5.00	0.500	8.65	8.12	173*	162*	1	71.0 - 131	6.32	20
cis-1,2-Dichloroethene	5.00	0.500	8.19	7.47	164*	149*	1	78.0 - 123	9.20	20
trans-1,2-Dichloroethene	5.00	0.500	7.97	7.83	159*	157*	1	75.0 - 124	1.77	20
1,2-Dichloropropane	5.00	0.500	6.64	6.55	133*	131*	1	78.0 - 122	1.36	20
1,3-Dichloropropane	5.00	0.500	5.99	5.80	120*	116	1	80.0 - 119	3.22	20
2,2-Dichloropropane	5.00	0.500	8.51	7.94	170*	159*	1	60.0 - 139	6.93	20
1,1-Dichloropropene	5.00	0.500	7.89	7.97	158*	159*	1	79.0 - 125	1.01	20
cis-1,3-Dichloropropene	5.00	0.500	6.13	6.30	123	126*	1	75.0 - 124	2.74	20
trans-1,3-Dichloropropene	5.00	0.500	5.32	5.51	106	110	1	73.0 - 127	3.51	20
Di-isopropyl ether	5.00	0.500	5.73	5.67	115	113	1	67.0 - 128	1.05	20
Ethylbenzene	5.00	0.500	6.80	7.29	136*	146*	1	79.0 - 121	6.96	20
Hexachloro-1,3-butadiene	5.00	0.750	5.34	6.08	107	122	1	66.0 - 134	13.0	20
Isopropylbenzene	5.00	0.500	7.45	7.53	149*	151*	1	72.0 - 131	1.07	20
p-Isopropyltoluene	5.00	0.500	6.58	6.71	132*	134*	1	77.0 - 127	1.96	20
2-Butanone (MEK)	25.0	5.00	28.4	28.2	114	113	1	56.0 - 143	0.707	20
Methylene Chloride	5.00	2.00	7.59	7.27	152*	145*	1	74.0 - 124	4.31	20
Methyl tert-butyl ether	5.00	0.500	7.30	7.23	146*	145*	1	71.0 - 124	0.964	20

*: Value outside the established quality control limits.
D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

3A-OR

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

L1540980-01,02,03,04,05,06,07

SAMPLE NO.:
R3843739-6
R3843739-7

MS Sample / File ID:	R3843739-6 / 1001_28	**SDG:**	L1540980
MSD Sample / File ID:	R3843739-7 / 1001_29	**Analytical Batch:**	WG1935601
OS Sample / File ID:	L1540980-01 / 1001_18	**Matrix:**	GW
Instrument ID:	VOCMS33		
Analytical Method:	8260D		

Analyte	Spike Amount	OS Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	RPD	RPD Limit
	ug/l	*ug/l*	*ug/l*	*ug/l*	*%*	*%*		*%*	*%*	*%*
Naphthalene	5.00	2.00	5.20	5.42	104	108	1	61.0 - 128	4.14	20
n-Propylbenzene	5.00	0.500	6.09	6.22	122	124	1	76.0 - 126	2.11	20
Styrene	5.00	0.500	6.56	6.71	131*	134*	1	78.0 - 123	2.26	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.51	6.73	130*	135*	1	78.0 - 124	3.32	20
1,1,2,2-Tetrachloroethane	5.00	0.500	6.31	6.08	126*	122*	1	71.0 - 121	3.71	20
Tetrachloroethene	5.00	0.600	7.23	7.35	145*	147*	1	74.0 - 129	1.65	20
Toluene	5.00	0.600	6.28	6.36	126*	127*	1	80.0 - 121	1.27	20
1,2,3-Trichlorobenzene	5.00	0.500	4.90	5.45	98.0	109	1	69.0 - 129	10.6	20
1,2,3-Trimethylbenzene	5.00	0.500	6.53	6.64	131*	133*	1	82.0 - 120	1.67	20
1,2,4-Trimethylbenzene	5.00	1.00	6.44	6.50	129*	130*	1	76.0 - 124	0.927	20
1,3,5-Trimethylbenzene	5.00	0.500	6.52	6.54	130*	131*	1	75.0 - 124	0.306	20
1,1,1-Trichloroethane	5.00	0.500	8.34	8.00	167*	160*	1	74.0 - 131	4.16	20
1,1,2-Trichloroethane	5.00	0.500	6.29	6.24	126*	125*	1	80.0 - 119	0.798	20
Trichloroethene	5.00	0.500	7.39	7.27	148*	145*	1	79.0 - 123	1.64	20
Trichlorofluoromethane	5.00	2.00	9.27	9.02	185*	180*	1	65.0 - 141	2.73	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.72	8.80	174*	176*	1	70.0 - 136	0.913	20
1,2,3-Trichloropropane	5.00	1.00	5.70	5.88	114	118	1	73.0 - 122	3.11	20
Vinyl chloride	5.00	0.500	8.71	8.56	174*	171*	1	58.0 - 137	1.74	20
Xylenes, Total	15.0	1.50	20.9	21.1	139*	141*	1	79.0 - 121	0.952	20

*: Value outside the established quality control limits.

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	1001_18	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 16:16
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 16:16
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	J5 U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	J5 U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	J5 U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	J5 U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	J5 U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	J5 U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	J5 U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	J5 U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	J5 U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	J5 U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	J5 U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	J5 U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	J5 U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	J5 U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	J5 U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	J5 U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	J5 U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	J5 U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	J5 U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	J5 U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	J5 U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	J5 U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	J5 U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	J5 U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	J5 U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	J5 U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	J5 U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	J5 U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	J5 U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	J5 U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

SR 3/10/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	1001_18	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 16:16
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 16:16
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	J5 U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	J5 U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	J5 U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	J5 U	0.300	0.600	1.20
Toluene	108-88-3	0	0.600	J5 U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	J5 U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	J5 U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	J5 U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	J5 U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	J5 U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	J5 U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	J5 U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	J5 U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	0	1.50	J5 U	0.174	1.50	3.00

SW 3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	1003_55	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 06:12
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 06:12
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QN B QH J	3.11	13.1	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3	0	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	T8 U	0.160	2.00	5.00

Sample Narrative:
Surrogate failure due to matrix interference

SW 3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	1001_19	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 16:38
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 16:38
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

Sr 3/10/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	1001_19	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 16:38
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 16:38
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	4.61	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	0	1.50	U	0.174	1.50	3.00

Rv 3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	1003_56	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 06:33
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 06:33
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		ug/l	ug/l	ug/l
Acetone	67-64-1	H QN BJ	3.12	13.3	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3		1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1		0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1		0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4		0	2.00	T8 U	0.160	2.00	5.00

3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	1001_20	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 16:59
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 16:59
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	3.05	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

SM 3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	1001_20	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 16:59
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 16:59
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	4.61	10.5		0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	0	1.50	U	0.174	1.50	3.00

SM 3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	1003_57	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 06:55
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 06:55
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN B J	3.12	12.9	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3		1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1		0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1		0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4		0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	1001_21	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 17:20
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 17:20
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		ug/l	ug/l	ug/l
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	1001_21	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 17:20
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 17:20
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	4.61	3.30		0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	6.57	1.50	U	0.174	1.50	3.00

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1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	1003_58	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 07:16
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 07:16
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS		RT	Result	Qualifier	DL	LOD	LOQ
				ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	H QN B J	3.12	11.5	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3		1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8	QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3		0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1		0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1		0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4		0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	1001_22	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 17:41
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 17:41
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	1001_22	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 17:41
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 17:41
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	0	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	1003_59	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 07:38
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 07:38
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QN BJ	3.12	11.5	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3	1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	1001_23	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 18:02
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 18:02
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	1001_23	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 18:02
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 18:02
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4 J	5.73	0.521	J	0.300	0.600	1.20
Toluene	108-88-3	5.47	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	0	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	1003_60	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 08:00
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 08:00
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1 H QN B J	3.12	11.4	B J T8	11.3	25.0	50.0
Chloromethane	74-87-3	1.90	2.00	T8 U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 T8 U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	T8 U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	T8 U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	T8 U	0.481	1.00	2.00
Trichlorofluoromethane	75-69-4	0	2.00	T8 U	0.160	2.00	5.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-TRIPBLANK-HCL-01

Lab Sample ID:	L1540980-07	**SDG:**	L1540980
Client Sample ID:	OT001-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/18/22 17:40
Lab File ID:	1001_07	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 12:27
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 12:27
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Acetone	67-64-1	3.08	25.0	J3 U	11.3	25.0	50.0
Acrolein	107-02-8	0	25.0	U	2.54	25.0	50.0
Acrylonitrile	107-13-1	0	5.00	U	0.671	5.00	10.0
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Bromobenzene	108-86-1	0	0.500	U	0.118	0.500	1.00
Bromodichloromethane	75-27-4	0	0.500	U	0.136	0.500	1.00
Bromoform	75-25-2	0	0.500	U	0.129	0.500	1.00
Bromomethane	74-83-9	0	2.00	U	0.605	2.00	5.00
n-Butylbenzene	104-51-8	0	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	135-98-8	0	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	98-06-6	0	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	56-23-5	0	0.500	U	0.128	0.500	1.00
Chlorobenzene	108-90-7	0	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	124-48-1	0	0.500	U	0.140	0.500	1.00
Chloroethane	75-00-3	0	2.00	U	0.192	2.00	5.00
Chloroform	67-66-3	0	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	95-49-8	0	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	106-43-4	0	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	106-93-4	0	0.500	U	0.126	0.500	1.00
Dibromomethane	74-95-3	0	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	95-50-1	0	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	541-73-1	0	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	106-46-7	0	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	75-71-8	0	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	75-34-3	0	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	107-06-2	0	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	75-35-4	0	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	156-59-2	0	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	156-60-5	0	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	78-87-5	0	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	142-28-9	0	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	594-20-7	0	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	563-58-6	0	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	10061-01-5	0	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	10061-02-6	0	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	108-20-3	0	0.500	U	0.105	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Hexachloro-1,3-butadiene	87-68-3	0	0.750	J3 U	0.337	0.750	1.50
Isopropylbenzene	98-82-8	0	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	99-87-6	0	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	78-93-3	0	5.00	U	1.19	5.00	10.0
Methylene Chloride	75-09-2	0	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	1634-04-4	0	0.500	U	0.101	0.500	1.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-TRIPBLANK-HCL-01

Lab Sample ID:	L1540980-07	**SDG:**	L1540980
Client Sample ID:	OT001-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/18/22 17:40
Lab File ID:	1001_07	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS33	**Preparation Date/Time:**	10/01/22 12:27
Analytical Batch:	WG1935601	**Analysis Date/Time:**	10/01/22 12:27
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Naphthalene	91-20-3	0	2.00	J3 U	1.00	2.00	5.00
n-Propylbenzene	103-65-1	0	0.500	U	0.0993	0.500	1.00
Styrene	100-42-5	0	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	630-20-6	0	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	79-34-5	0	0.500	U	0.133	0.500	1.00
Tetrachloroethene	127-18-4	0	0.600	U	0.300	0.600	1.20
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	87-61-6 QL	0	0.500	J3 J4 U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	526-73-8	0	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	95-63-6	0	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	108-67-8	0	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	71-55-6	0	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	79-00-5	0	0.500	U	0.158	0.500	1.00
Trichloroethene	79-01-6	0	0.500	U	0.190	0.500	1.00
Trichlorofluoromethane	75-69-4	0	2.00	U	0.160	2.00	5.00
1,1,2-Trichlorotrifluoroethane	76-13-1 QN	0	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	96-18-4	0	1.00	U	0.237	1.00	2.50
Vinyl chloride	75-01-4	0	0.500	U	0.234	0.500	1.00
Xylenes, Total	1330-20-7	0	1.50	U	0.174	1.50	3.00

SW 3/10/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-TRIPBLANK-HCL-01

Lab Sample ID:	L1540980-07	**SDG:**	L1540980
Client Sample ID:	OT001-TRIPBLANK-HCL-01	**Collected Date/Time:**	09/18/22 17:40
Lab File ID:	1003_44	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	VOCMS6	**Preparation Date/Time:**	10/04/22 02:14
Analytical Batch:	WG1935909	**Analysis Date/Time:**	10/04/22 02:14
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Chloromethane	74-87-3 H	1.89	2.00	U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	96-12-8 QN	0	2.00	C4 U	0.276	2.00	5.00
4-Methyl-2-pentanone (MIBK)	108-10-1	0	5.00	U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	120-82-1	0	1.00	U	0.481	1.00	2.00

3/10/23

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Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

This review is based on Project requirements, the requirements of the analytical methods, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS (Final, 31 Aug 2021)*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- USEPA Office of Research and Development., 1993 and Updates, Methods for the Determination of Inorganic Substances in Environmental Samples, EPA 600-R-93-100, August.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	DL	Sample Date	Method(s)	Analysis Date(s)
OT001-RRSMW06-091722	L1540980-01	Field	GW	1	09/17/22	6010D	10/20/22
OT001-RRSMW05-091822	L1540980-02	Field	GW	1	09/18/22	6010D	10/20/22
OT001-DSAMW01-091822	L1540980-03	Field	GW	1	09/18/22	6010D	10/11/22
OT001-DSAMW05-091822	L1540980-04	Field	GW	1	09/18/22	6010D	10/11/22
OT001-GLOMW04-091822	L1540980-05	Field	GW	1	09/18/22	6010D	10/11/22
OT001-DSAMW06-091822	L1540980-06	Field	GW	1	09/18/22	6010D	10/11/22

2. Reviewer Preliminary Comments

Data Package Provided: [X] Level IV (Level 4) and/or []Level II (Level 2)

Six (6) ground water samples were submitted to Pace Analytical for metals, mercury, and total solids by EPA Method 6010D. The samples were received intact by the lab on 09/29/22 at 4.6°C. The data has been validated to a Level 2b.

3. Custody of Samples	**Y**	**N**
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	

Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities and where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in validation comments.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Reviewer's Comments: Field and internal custody appear to be complete and are traceable.

4. Holding Times and Sample Preservation	**Y**	**N**	**NA**
Were aqueous samples preserved to a pH <2 for all metals?	**X**		
Were samples identified for mercury analysis maintained at ≤6° C for aqueous or solid matrices, and 4° C for total solids?	**X**		
Were samples for total solids prepared and analyzed within 7 days?	**X**		
Were samples for metals other than mercury prepared and analyzed within 180 days?	**X**		
Were samples for mercury prepared and analyzed within 28 days?	**X**		
Inspect narrative, receipt logs, etc. Does the information indicate that there were **no** significant problems with sample handling/naming? Were soils <50% moisture?	**X**		
Action: Indicate affected samples in validation comments.			

Reviewer's Comments: Receipt logs indicate that samples were received intact, and cooler temperatures were acceptable upon receipt for metals samples and the samples were received intact. Holding times were met for all preparatory and analytical processes. No qualifications were appended to the associated sample results due to holding time and preservation considerations.

5. Preparation Technique

	Y	**N**	**NA**
Are preparation logs for all samples present in the data package?	**X**		

Identify the preparation method(s) used:

	Matrix	**Preparation Method(s)** *(record # or NA)*
	Water	***EPA Method 3015***
	Soil/Solid	*NA*
	Oil	*NA*
	Air	*NA*

Reviewer Comments: The sample was prepared in accordance with Methods 3015. No qualifications were warranted.

6. ICP Calibration	**Y**	**N**	**NA**
Are calibration data for ICP present in the data submittal?	**X**		
If **not** present, has all ICP calibration criteria (i.e. ICV, CCV, LLC, etc.) been met per the case narrative?			**X**
If present, is the ICV recovery within ±10% of reference value? (**Method 6010C**, Section 10.3.2.1)	**X**		
If present, is the lower limit of quantitation check sample recovery (LLC or CRDL standard) within ±30% of reference value? (Method 6010C, Sections 10.1.3.1, 10.3.2.1, and 10.3.4)	**X**		
If present, is a mid-level Continuing Calibration Verification (CCV) standard recovery within ±10% of reference value? (**Method 6010C**, Sections 10.3.4)	**X**		

Reviewer Comments: All initial calibration verification (ICV), continuing calibration verification (CCV), and low-level concentration (LLC) criteria were met per the case narrative.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

8. Blanks	Y	N	NA
Are method blank and calibration blank data present in the data submittal?	**X**		
Was a method blank (or preparation blank) prepared for each batch of samples prepared? (**Method 6010C**, Section 9.6, **Method 6020A**, Section 9.8, **Method 7471B**, Section 9.3)	**X**		
Is the method blank (or preparation blank) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.1; **Method 6020A**, Section 9.8; and **Method 7471B**, Section 9.3)	**X**		
Was the method blank (or preparation blank) the same matrix as the analytical samples?	**X**		
Are calibration blanks run for every 10 samples in an analytical sequence?			
Were sample results verified as uncorrected for blank concentrations?	**X**		
Were all positive and negative blanks (ICB, CCB, PB or MB) evaluated for contamination?	**X**		
Were any target analytes detected above the detection limit (DL) or method detection limit (MDL) ICB/CCBs/PB or MB?			
Action: Apply rules from table below. Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality. ** Use professional judgment, and table below:			

Reviewer Comments: Positive blank detections were noted in the continuing calibration blank for iron and manganese. Qualifications are as follows:

- Iron and manganese in samples OT001-RRSMW06-091722, and OT001-DSAMW01-091822 have been qualified with a 'B' validation flag as the sample results were <5x the blank concentration.
- The remaining sample results have been left unqualified as the sample results were >5x the blank concentration.

9. Interference Check Sample	Y	N	NA
Are interference check standard data present in the data submittal?	**X**		
If not present, was the interference check standard criteria met per the case narrative?			**X**
Were the ICSAB recoveries within acceptance criteria of 80-120%? (**Method 6010C**, Section 4.2.10.2)	**X**		
Action: Use technical judgment to assess any potential interferences. Indicate affected samples in validation comments. For additional aid in assessing potential effects, consult general tables of interelement contributions at critical wavelengths; e.g. as in reference SW-846 6010B (and for atypical metals, other references). ICP-MS interferences in m/e regions may often be evaluated by comparing more differing quantitative ions for the same element. * Qualify only if the deviation indicates an adverse effect on data quality. ** Discuss impact of high concentrations on results.			

Reviewer Comments: All ICS criteria was met per the case narrative. No qualifications were warranted.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

10. Matrix Spike (Pre-digestion Spike)	Y	N	NA
Are matrix spike data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the matrix spike analysis?	**X**		
Was a matrix spike prepared for each batch of samples prepared? (**Method 6010C**, Section 9.8 8; **Method 6020A**, Section 9.19; **Method 7471B**, Section 9.5)	**X**		
Is the matrix spike (MS) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.18; **Method 6020A**, Section 9.10; and **Method 7471B**, Section 9.5)	**X**		
Was the matrix spike recovery within ±25% of known value? (**Method 6010C**, Section 9.8 and 9.8.28; **Method 6020A**, Section 9.10)	**X**		
For mercury, was the matrix spike recovery within ±20% of known value? (**Method 7471B**, Section 9.5)	**X**		
Post-Digestion Spike			
If matrix spike recovery was not within ±25% (or ±20% for mercury) was a post-digestion spike analyzed? (**Method 6010C**, Section 9.9.18; **Method 6020A**, Section 9.11.1)	**X**		
Was the recovery of the post-digest spike within ±25% of reference value? (**Method 6010C**, Section 9.9.18; **Method 6020A**, Section 9.11.1))	**X**		
If the post-digest spike fails, it a dilution test run on the sample? (**Method 6010C,** Section 9.9.18; **Method 6020A**, Section 9.11.2)			**X**
Acceptance criteria are 75-125% for metals unless otherwise indicated. Action: Indicate affected samples in validation comments. ** Use technical judgment in determining data impact. Extremely low recoveries with the associated sample result being a non-detect warrant rejection.			

Reviewer Comments: The MS/MSD results were within the acceptance criteria and no qualifications are warranted.

11. Duplicates (MSD or Laboratory)	Y	N	NA
Are laboratory or matrix spike duplicate data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the duplicate analysis?	**X**		
Was the laboratory duplicate (or matrix spike duplicate) prepared for each batch of samples prepared (up to a maximum of 10 samples)? (**Method 6010C**, Section 9.8, **Method 6020A**, Section 9.10, **Method 7471B**, Section 9.5)	**X**		
Is the laboratory duplicate (or MSD) taken through a process identical to that of the associated samples? (**Method 6010C**, Section 11.18 and **Method 7471B**, Section 9.5)	**X**		
Were reported precision estimates within acceptance criteria (for aqueous RPD ≤30%? (**Method 6010C**, Sections 9.8 and 9.8.18, **Method 6020C**, Section 9.10, and **Method 7000B**, Section 9.7)	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All MSD RPD results met the +/- 20% RPD precision criteria for aqueous samples. No qualifications were warranted.

12. Field Duplicate	Y	N	NA
Was field duplicate pair collected for this SDG?	**X**		

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

12. Field Duplicate	Y	N	NA
Were field duplicate samples collected at a frequency of of one for every 10 primary samples?	X		
Were reported precision estimates within project acceptance criteria RPD ≤30%?	X		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: A field duplicate was not included in this SDG. No qualifications necessary.

13. Laboratory Control Sample	Y	N	NA
Are laboratory control sample data present in the data submittal?	X		
Was a laboratory control sample prepared for each batch of samples prepared? (**Method 6010C**, Section 9.7; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4)	X		
Is the LCS taken through a process identical to that of the associated samples? (**Method 6010C**, Sections 9.7 and 11.1; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4)	X		
Were percent recoveries within the 80-120% acceptance criteria? (Note: manufacturer's control limits for solid standards may be used for solid matrices)? (**Method 6010C**, Section 9.7; **Method 6020A**, Section 9.9; **Method 7471B**, Section 9.4;)	X		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: All LCS recoveries were within the acceptance criteria. No qualifications were warranted.

14. Serial Dilution Analysis	Y	N	NA
Are serial dilution data present in the data submittal?	X		
Have field or equipment blanks <u>not</u> been used for the serial dilution analysis?			X
Is one serial dilution analysis performed for each matrix in every batch with a minimum of one serial dilution per twenty samples?	X		
Is a dilution test run on a sample that fails both pre- and post-digestion spike analysis? (**Method 6010C**, Section 9.9.1; **Method 6020A**, Section 9.11.2; and **Method 7000B**, Section 9.8.1)	X		
For samples with concentrations that are minimally a factor of 50x above the method detection limit (MDL) (or detection limit) before a 1:4 dilution, was the serial dilution %D criterion of 10% met (**Method 6010C**, Section 9.9.2 and **Method 6020A**, Section 9.11.2)	X		
(**Hg**) For samples with concentrations that are minimally a factor of 10x above the method detection limit (MDL) (or detection limit DL) limit after a 1:5 dilution, was the serial dilution %D criterion of 10% met (**Method 7000B**, Section 9.8.2)			X
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Reviewer Comments: The SDS %D results were within the prescribed acceptance criteria. No qualifications warranted.

15. Method Quantitation Limits	**Y**	**N**	**NA**
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	**X**		
Action: Indicate non-correctable contract compliance deviations below If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:

- Manganese in sample OT001-RRSMW06-091722
- Manganese and Iron in sample OT001-DSAMW01-091822
- The results were either non-detect or were >LOQ.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

16. Metals/Inorganics Analytical Data Flags:

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

17. Overall Comments:

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

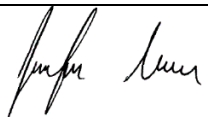
Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
OT001-RRSMW06-091722 OT001-DSAMW01-091822	Iron	B	Positive blank detection
OT001-RRSMW06-091722	Manganese	J	>MDL, but below the LOQ
OT001-DSAMW01-091822	Manganese and Iron	J	>MDL, but below the LOQ
OT001-RRSMW06-091722, OT001-DSAMW01-091822	Manganese	B	Positive blank detection

See Section 14 for Validation Flag Definitions.

Numerous results were reported above the limit of quantitation, have been assessed and remain unqualified.

Level 2b Data Review-Metals

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Data Validator	Data Validation Reviewer
Name: Lyndsi Bourne	Name: Jennifer Norman
Title: Staff Scientist	Title: Data Quality Program Manager
Company: North Wind Portage	Company: North Wind Group
Signature:	Signature: 
Date: 02/13/2023	Date: 02/27/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	20221020111958	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP12	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/20/22 11:19
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron B	7439-89-6	100		20.5	50.0	100
Manganese J,B	7439-96-5	2.56	J	0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	20221020112250	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP12	**Preparation Date/Time:**	10/19/22 09:29
Analytical Batch:	WG1940061	**Analysis Date/Time:**	10/20/22 11:22
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	833		20.5	50.0	100
Manganese	7439-96-5	10.6		0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	20221011154548	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/10/22 15:58
Analytical Batch:	WG1940241	**Analysis Date/Time:**	10/11/22 15:45
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron J,B	7439-89-6	35.6	B J	20.5	50.0	100
Manganese J,B	7439-96-5	1.57	B J	0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	20221011155654	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/10/22 15:58
Analytical Batch:	WG1940241	**Analysis Date/Time:**	10/11/22 15:56
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	573		20.5	50.0	100
Manganese	7439-96-5	64.6		0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	20221011155948	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/10/22 15:58
Analytical Batch:	WG1940241	**Analysis Date/Time:**	10/11/22 15:59
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	556		20.5	50.0	100
Manganese	7439-96-5	27.9		0.855	5.00	10.0

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	20221011160241	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	ICP13	**Preparation Date/Time:**	10/10/22 15:58
Analytical Batch:	WG1940241	**Analysis Date/Time:**	10/11/22 16:02
Dilution Factor:	1	**Prep Method:**	3015
Analytical Method:	6010D	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	45 mL
Total Solids (%):	_____	**Final Wt/Vol:**	50 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Iron	7439-89-6	3050		20.5	50.0	100
Manganese	7439-96-5	211		0.855	5.00	10.0

LSB 02/17/23

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

This review is based on Project requirements, the requirements of the analytical methods, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS (Final, 31 Aug 2021)*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- USEPA Office of Research and Development., 1993 and Updates, Methods for the Determination of Inorganic Substances in Environmental Samples, EPA 600-R-93-100, August.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested

Sample ID	Lab ID	Type	Matrix	Sample Date	Analysis Method	Analysis Date
OT001-RRSMW06-091722	L1540980-01	Field	GW	09/17/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
OT001-RRSMW05-091822	L1540980-02	Field	GW	09/18/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
OT001-DSAMW01-091822	L1540980-03	Field	GW	09/18/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
OT001-DSAMW05-091822	L1540980-04	DUP	GW	09/18/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
OT001-GLOMW04-091822	L1540980-05	Field	GW	09/18/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22
OT001-DSAMW06-091822	L1540980-06	Field	GW	09/18/22	SM 2320B	10/01/22
					EPA 351.2	10/04/22
					EPA 353.2	10/04/22
					SW-846 9056A	10/04/22

(*) Denotes an exceeded holding time
DL: Dilution

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

2. Reviewer Preliminary Comments
Review Type: [] Level IV (Level 3 or 4) [] Level III (Level 2b) [X] Level II (Level 2a)   ***Confirm that narrative is present and complete; note overall initial indications.***
Six (6) ground water samples were submitted to Pace Analytical National and were received intact by the lab on 09/29/22 at 4.6°C. They were analyzed for the following: • Alkalinity by SM 2320B • TKN by EPA 351.2 • Nitrate/Nitrite by EPA 353.2 • Sulfate by SW-846 9056A

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities below and where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected below.		

Reviewer's comments: Field and internal custody forms appear to be complete and are traceable.

4. Holding Times and Sample Preservation	Y	N	NA
Anions by Method 9056A			
Are the following analytes analyzed within 28 days of collection? (Method 9056, Section 8.2) Bromide Chloride Fluoride Sulfate	**X**		
Are sample shipped to the lab at ≤6 °C? (Method 9056, Section 8.2)	**X**		
TKN By EPA 351.2 and Nitrate/Nitrite by 353.2			
Are samples maintained at <6°C?	**X**		
Were samples analyzed for TKN and combined Nitrate/Nitrite within 28 days of collection?	**X**		
Were samples for combined Nitrate-Nitrite (NO3/NO2) and TKN preserved to pH <2 with H2SO4?	**X**		
Total Alkalinity			
Are samples maintained at <4°C?	**X**		
Were samples analyzed for Total Alkalinity within 14-days of collection?	**X**		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	**X**		
Action: Indicate affected samples below. * Use Professional Judgment in judging impact on samples.			

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Reviewer Comments: The holding times were met as outlined in the sample identification table in Section 1 of this report.

5. Preparation Technique				
			Y	**N**	**NA**
Are preparation logs for all samples present in the data package?			**X**		
Identify the preparation method(s) used:					
	Matrix	**Preparation Method(s)** *(record # or NA)*			
	Water	***USEPA 351.2/365.4/353.2/9056A SM 2320 B-2011***			
	Soil/Solid	*NA*			
	Oil	*NA*			
	Air	*NA*			

Reviewer Comments: The sample was prepared in accordance with USEPA 351.2/365.4/353.2/9056A, and SM 2320 B-2011.

6. Calibration	**Y**	**N**	**NA**
Are calibration data present in the data submittal?	**X**		
Anions			
Was initial calibration (IC) performed prior to the sample analyses?	**X**		
Were at least 4 standard concentrations used for each analyte of interest in the IC?	**X**		
Were appropriate IC standard concentrations used?	**X**		
Is the IC correlation coefficient (linear regression) for each analyte ≥0.995?	**X**		
Was an initial calibration verification (ICV) standard (second source) run immediately after IC?	**X**		
Are analyte recoveries in the ICV within ±10% of reference values?	**X**		
Was a calibration check standard (CCV) run after every 10th sample and at the end of the sequence?	**X**		
Are analyte recoveries in the CCVs within ±10% of the reference values?	**X**		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?	**X**		
Were retention times (RTs) of individual anions consistent throughout the reported analyses?			**X**
TKN			
Are initial and continuing calibration results included in the data package?	**X**		
Were at least 4 standards used to calibrate the instrument?	**X**		
Were the IC standards run in order of decreasing concentration?	**X**		
Were appropriate IC standard concentrations used?	**X**		
Is the IC correlation coefficient (linear regression) ≥0.995?	**X**		
Was an ICV standard (second source) run immediately after IC?	**X**		
Was the target analyte recovery in the ICV within ±10% of reference value?	**X**		
Was a CCV run after every 10 samples, or at least once every two hours?	**X**		
Were CCV recoveries within ±10% of the reference value?	**X**		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?			**X**
Nitrate/Nitrite			

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

6. Calibration	**Y**	**N**	**NA**
Are initial and continuing calibration results included in the data package?	**X**		
Were at least 4 standards used to calibrate the instrument?	**X**		
Were the initial calibration standards run in order of decreasing concentration?	**X**		
Were appropriate initial calibration standard concentrations used?	**X**		
Is the initial calibration correlation coefficient (linear regression) ≥0.995?	**X**		
Was an ICV standard (second source) run immediately after initial calibration?	**X**		
Was the target analyte recovery in the ICV within ±10% of reference value?	**X**		
Was a CCV run after every 10 samples, or at least once every two hours?	**X**		
Were CCV recoveries within ±10% of the reference value?	**X**		
Was the system recalibrated and affected samples re-analyzed if the ICV or a CCV was outside acceptance criteria?			**X**
Standardization for Total Alkalinity			
Are standardization data present in the package?	**X**		
Were the 0.02N and 0.1N H2SO4 solutions standardized against a primary sodium bicarbonate standard?	**X**		
For potentiometric titrations, was the pH meter calibrated prior to titration?	**X**		
Is the initial pH documented for each sample or QC sample analyzed?	**X**		
Is the titrant volume used to reach pH 8.3 recorded for each sample or QC sample analyzed?	**X**		
Is the titrant volume used to reach pH 4.5 recorded for each sample or QC sample analyzed?	**X**		
Is the titrant volume used to reach pH 4.2 recorded for each sample or QC sample analyzed?	**X**		
Action: Sample results associated with unacceptable calibration results, especially when the responses suggest high variability or sensitivity problems should be J/UJ qualified. Use professional judgment to determine if sample results warrant rejection or if qualifiers are not necessary – explain.			

Reviewer Comments: All calibration verification data was acceptable.

7. Blanks	**Y**	**N**	**NA**
Are method blank and calibration blank data present in the data submittal?	**X**		
Was a method blank (or preparation blank) prepared for each batch of samples prepared?	**X**		
Is the method blank (or preparation blank) taken through a process identical to that of the associated samples?	**X**		
Was the method blank (or preparation blank) the same matrix as the analytical samples?	**X**		
Are calibration blanks run for every 10 samples in an analytical sequence?	**X**		
Were sample results verified as uncorrected for blank concentrations?	**X**		
Were all positive and negative blanks (ICB, CCB, PB or MB) evaluated for contamination?	**X**		
Were any target analytes detected above the detection limit (DL) or method detection limit (MDL) ICB/CCBs/PB or MB?		**X**	
Action: Apply rules from table below. Indicate affected samples in validation comments.			
* Qualify only if the deviation indicates an adverse effect on data quality.			
** Use professional judgment, and table below:			

Reviewer Comments: A positive detection was noted in the continuing calibration blank (CCB) for alkalinity, and a negative blank detection was noted in the CCB for TKN and nitrate/nitrite. Qualifications are as follows:

- The alkalinity results have been left unqualified as the sample results were either non-detect or >5x the

blank concentration.

- The TKN and nitrate/nitrite results have been left unqualified as the sample results were either non-detect or >2x the negative blank concentration.
- All initial calibration blank, the remaining continuing calibration blank, and method blank results were non-detect.

8. Laboratory-Fortified Matrix or Matrix Spike (MS)	Y	N	NA
Are LFM (MS) results included in the data package?	**X**		
Have field or equipment blanks **not** been used for the MS/MSD analysis?	**X**		
Have LFMs been prepared and analyzed at a frequency of 1 for every 20 samples?	**X**		
Is the matrix spike (MS) taken through a process identical to that of the associated samples?	**X**		
Did the MS/MSD meet the method-specified or laboratory-generated acceptance criteria for the remaining analyses?		**X**	
Action: Indicate affected samples and resulting data qualification. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The MS result for TKN (12.5%) was outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QL' validation flag as the MS%R was <90%.
The remaining MS recoveries were within the method prescribed acceptance limits.

9. Duplicates (MSD or Laboratory)	Y	N	NA
Are laboratory or matrix spike duplicate data present in the data submittal?	**X**		
Have field or equipment blanks not been used for the duplicate analysis?	**X**		
Was the laboratory duplicate (or matrix spike duplicate) prepared for each batch of samples prepared (up to a maximum of 20 samples)?	**X**		
Is the laboratory duplicate (or MSD) taken through a process identical to that of the associated samples?	**X**		
Were reported precision estimates within acceptance criteria (for aqueous RPD ≤30% and for soils ≤50%)?		**X**	
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The duplicate results for TKN (146%, 200%) were outside of the prescribed acceptance criteria. All TKN results have been qualified with a 'QN' validation flag as the sample and duplicate results were <5x the LOQ, but the absolute difference between the sample and duplicate was >LOQ. The remaining duplicate RPDS were acceptable.

10. Field Duplicate	Y	N	NA
Was field duplicate pair collected for this SDG?		**X**	
Were field duplicate samples collected at a frequency of of one for every 10 primary samples?			**X**
Were reported precision estimates within project acceptance criteria RPD ≤35%?			**X**
Action: Indicate affected samples and resulting data qualification. * Qualify only if the deviation indicates an adverse effect on data quality.			

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Reviewer Comments: A field duplicate was not included in this SDG. No qualifications warranted.

11. Laboratory Fortified Blank (or LCS)	Y	N	NA
Are LCS results included in the data package?	**X**		
Is one LCS analyzed with each batch of samples?	**X**		
Is the LFB taken through the same preparatory and analytical process as the associated samples?	**X**		
For anions was the recovery within laboratory control limits for recovery or within ±10% of reference value? (**Method 300.0**, Sections 9.3.2 and 9.3.3)	**X**		
Did the LCS meet the method-specified or laboratory-generated acceptance criteria for the remaining analyses?		**X**	
Action: Indicate affected samples and resulting data qualifications. *Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: The LCS results were acceptable.

12. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f and 5.5.2.2.1.g, and **Method 8000**, Section 7.4)		**X**	
Action: Indicate non-correctable contract compliance deviations below If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: The following results were "J" flagged by the laboratory due to sample results greater than the MDL but below the LOQ. A "J" validation flag has been applied to these results:

- Nitrate/Nitrite in sample OT001-RRSMW05-091822
- Sulfate in samples OT001-RRSMW06-091722, OT001-RRSMW05-091822, OT001-GLOMW04-091822, and OT001-DSAMW06-091822

13. Sample Result Verification
Validation Step
For the following evaluation, some qualification of sample data may be possible. For contractual noncompliance, a validation code is placed if the occurrence is non-correctable.
1. For each analysis, recalculate 2 or more selected results from the raw data. **NA.**
2. Did recalculation confirm reported results? **NA.** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
3. Were results from diluted samples corrected for the dilution factor? **NA.**

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Action: Indicate instances of manual calculations not confirming reported results.
Where samples have been reanalyzed, and both analyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.

14. Inorganics Analytical Data Flags:

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

15. Overall Comments:

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

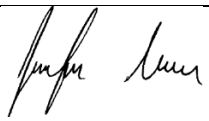
Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
All	TKN	QL	Low MS Recovery
All	TKN	QN	High MSD RPD
OT001-RRSMW05-091822	Nitrate/Nitrite	J	Results between the MDL and LOQ
OT001-RRSMW06-091722, OT001-RRSMW05-091822, OT001-GLOMW04-091822, OT001-DSAMW06-091822	Sulfate	J	Results between the MDL and LOQ

See Section 14 for Validation Flag Definitions.

Numerous results were reported above the limit of quantitation, have been assessed and remain unqualified.

Level 2b Data Review-Wet Chemistry

Project ID:	**South Optimized Remediation Contract**	**Lab Name:**	**Pace Analytical**
SOW No.	**Port Heiden RRS**	**SDG No.**	**L1540980**

Data Validator	Data Validation Reviewer
Name: Lyndsi Bourne	Name: Jennifer Norman
Title: Staff Scientist	Title: Chemist
Company: North Wind Portage	Company: North Wind Group
Signature:	Signature: 
Date: 02/13/2023	Date: 02/27/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	20221001102210	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:22
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:22
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		109000		8450	10000	20000
Alkalinity,Bicarbonate		109000		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	20221001102921	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:29
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:29
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		56200		8450	10000	20000
Alkalinity,Bicarbonate		56200		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	20221001103245	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:32
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:32
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		88800		8450	10000	20000
Alkalinity,Bicarbonate		88800		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	20221001103702	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:37
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:37
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		68300		8450	10000	20000
Alkalinity,Bicarbonate		68300		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	20221001104804	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:48
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:48
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		64200		8450	10000	20000
Alkalinity,Bicarbonate		64200		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	20221001105208	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	TITRANDO3	**Preparation Date/Time:**	10/01/22 10:52
Analytical Batch:	WG1935544	**Analysis Date/Time:**	10/01/22 10:52
Dilution Factor:	1	**Prep Method:**	2320 B-2011
Analytical Method:	2320 B-2011	**Sample Vol Used:**	50 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Alkalinity		58700		8450	10000	20000
Alkalinity,Bicarbonate		58700		8450	10000	20000
Alkalinity,Carbonate		10000	U	8450	10000	20000
Alkalinity,Hydroxide		10000	U	8450	10000	20000

Sample Narrative:
Endpoint pH 4.5 Headspace

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	20221004183347	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:33
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:33
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	1050		50.0	100	200

LSB 02/17/23

SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	20221004183855	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:38
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:38
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte		CAS	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	J	7727-37-9	62.1	J	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	20221004184012	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:40
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:40
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	642		50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	20221004184129	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:41
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:41
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	20221004184636	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:46
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:46
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	425		50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	20221004184752	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT2	**Preparation Date/Time:**	10/04/22 18:47
Analytical Batch:	WG1935271	**Analysis Date/Time:**	10/04/22 18:47
Dilution Factor:	1	**Prep Method:**	353.2
Analytical Method:	353.2	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	27.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 01:28
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 01:28
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	4560	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	30.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 02:06
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 02:06
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	3320	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	31.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 02:19
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 02:19
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	14808-79-8	6390		594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	32.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 02:32
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 02:32
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate	14808-79-8	12700		594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	33.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 02:45
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 02:45
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	3790	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	36.0000.txt	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	IC-22	**Preparation Date/Time:**	10/04/22 03:23
Analytical Batch:	WG1934921	**Analysis Date/Time:**	10/04/22 03:23
Dilution Factor:	1	**Prep Method:**	9056A
Analytical Method:	9056A	**Sample Vol Used:**	10 mL
Matrix:	GW	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Sulfate J	14808-79-8	4400	J	594	2500	5000

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW06-091722

Lab Sample ID:	L1540980-01	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW06-091722	**Collected Date/Time:**	09/17/22 17:48
Lab File ID:	20221004214152	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:41
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte		CAS	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN	QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-RRSMW05-091822

Lab Sample ID:	L1540980-02	**SDG:**	L1540980
Client Sample ID:	OT001-RRSMW05-091822	**Collected Date/Time:**	09/18/22 12:03
Lab File ID:	20221004215002	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:50
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW01-091822

Lab Sample ID:	L1540980-03	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW01-091822	**Collected Date/Time:**	09/18/22 12:55
Lab File ID:	20221004215123	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:51
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW05-091822

Lab Sample ID:	L1540980-04	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW05-091822	**Collected Date/Time:**	09/18/22 15:05
Lab File ID:	20221004215244	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:52
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-GLOMW04-091822

Lab Sample ID:	L1540980-05	**SDG:**	L1540980
Client Sample ID:	OT001-GLOMW04-091822	**Collected Date/Time:**	09/18/22 16:16
Lab File ID:	20221004215405	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:54
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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SAMPLE RESULT SUMMARY
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
OT001-DSAMW06-091822

Lab Sample ID:	L1540980-06	**SDG:**	L1540980
Client Sample ID:	OT001-DSAMW06-091822	**Collected Date/Time:**	09/18/22 17:30
Lab File ID:	20221004215526	**Received Date/Time:**	09/29/22 09:30
Instrument ID:	LACHAT6	**Preparation Date/Time:**	10/04/22 08:19
Analytical Batch:	WG1935863	**Analysis Date/Time:**	10/04/22 21:55
Dilution Factor:	1	**Prep Method:**	351.2/365.4
Analytical Method:	351.2	**Sample Vol Used:**	_____
Matrix:	GW	**Initial Wt/Vol:**	20 mL
Total Solids (%):	_____	**Final Wt/Vol:**	20 mL

Analyte	CAS	Result	Qualifier	DL	LOD	LOQ
		ug/l		*ug/l*	*ug/l*	*ug/l*
Kjeldahl Nitrogen, TKN QL,QN	7727-37-9	300	U	140	300	600

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ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Sherrie Robinson	**CS Site Name:**	Port Heiden RRS	**Lab Name:**	Pace Analytical
Title:	Staff Scientist	**ADEC File No.:**	SS006: 2637.38.002.02 NPDL 21-034	**Lab Report No.:**	L1566427
Consulting Firm:	North Wind Site Services	**Hazard ID No.:**	SS006: 179	**Lab Report Date:**	12/22/2022

Note: *Any N/A or No box checked must have an explanation in the comments box.*

1. **Laboratory**

   a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
   Yes ☒ No ☐ N/A ☐
   Comments: Pace analytical (Mount Juliet, TN) performed the analyses of these samples.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
   Yes ☐ No ☐ N/A ☒
   Comments: Samples were not subcontracted.

2. **Chain of Custody (CoC)**

   a. Is the CoC information completed, signed, and dated (including released/received by)?
   Yes ☒ No ☐ N/A ☐
   Comments: Click or tap here to enter text.

   b. Were the correct analyses requested?
   Yes ☒ No ☐ N/A ☐
   Analyses requested: AK 102, SW8260D
   Comments: Click or tap here to enter text.

3. **Laboratory Sample Receipt Documentation**

   a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?
   Yes ☒ No ☐ N/A ☐
   Cooler temperature(s): 4.5°C

Sample temperature(s): Click or tap here to enter text.
Comments: Click or tap here to enter text.

b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?
Yes ☒ No ☐ N/A ☐
Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?
Yes ☐ No ☐ N/A ☒
Comments: No discrepancies were noted.

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

4. Case Narrative

a. Is the case narrative present and understandable?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are there discrepancies, errors, or QC failures identified by the lab?
Yes ☐ No ☒ N/A ☐
Comments: No discrepancies were identified.

c. Were all the corrective actions documented?
Yes ☐ No ☐ N/A ☒
Comments: No corrective actions were noted.

d. What is the effect on data quality/usability according to the case narrative?
Comments: The data quality/usability was not affected.

5. Sample Results

a. Are the correct analyses performed/reported as requested on CoC?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

b. Are all applicable holding times met?
Yes ☐ No ☒ N/A ☐
Comments: AK 102- The samples were collected on 12/06/22 and were received by the laboratory on 12/10/22 at 4.5°C. The samples were extracted on 12/14/23 within 8 days of collection. The extracts were analyzed on 12/15/23 within 1 day of extraction. All preservation criteria and the remaining holding time criteria were met. No qualifications were warranted.

8260D- The samples were collected on 12/06/22 and were received by the laboratory on 12/10/22 at 4.5°C. The samples were analyzed on 12/15/22 and 12/16/22, within 9-10 days of collection. All preservation and holding time criteria were met. No qualifications were warranted.

c. Are all soils reported on a dry weight basis?
Yes ☐ No ☐ N/A ☒
Comments: All samples were aqueous

d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

6. QC Samples

a. Method Blank

i. Was one method blank reported per matrix, analysis, and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all method blank results less than LOQ (or RL)?
Yes ☒ No ☐
Comments: All method blank results were non-detect.

iii. If above LoQ or RL, what samples are affected?
Comments: All method blank results were non-detect. No samples were affected.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☐ No ☐ N/A ☒

Comments: All method blank results were non-detect.

v. Data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – Are one LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes ☐ No ☐ N/A ☒
Comments: Not applicable, metals/inorganics were not included in this report.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ☒ No ☐ N/A ☐
Comments: All LCS/LCSD recoveries were within the acceptance criteria.

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the RPD reported from LCS/LCSD, and or sample/sample duplicate? (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
Yes ☒ No ☐ N/A ☐
Comments: All LCSD precision criteria was met.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: All LCS/LCSD recovery criteria was met.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☐ No ☐ N/A ☒
Comments: Not applicable, all LCS/LCSD recoveries were within the acceptance criteria.

vii. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐

Comments: Data quality and usability was not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☒ No ☐ N/A ☐
Comments: Sample SS006-066MW07-120622 (lab ID L1566427-08) was the parent sample for the MS/MSD analysis.

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☐ No ☐ N/A ☒
Comments: Not applicable, metals/inorganics were not included in this report.

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?
Yes ☐ No ☒ N/A ☐
Comments: 8260D- In the MSD, benzene (75%) was outside of the 79-120% recovery criteria.

iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.
Yes ☒ No ☐ N/A ☐
Comments: All precision criteria were met.

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: 8260D- Benzene was non-detect in sample SS006-066MW07-120622 and has been qualified with a ‘QL’ validation flag due to low MSD recovery. met.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

vii. Is the data quality or usability affected?
Yes ☒ No ☐ N/A ☐
Comments: 8260D- Benzene in sample SS006-066MW07-120622 has been qualified with a ‘QL’ validation flag due to low MSD recovery.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC, and laboratory samples?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)
Yes ☐ No ☒ N/A ☐
Comments: AK 102- Surrogate o-terphenyl in sample SS006-066MW05-120622 (13.6%) exceeded the 50-150% recovery criteria.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments:

iv. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: AK102- DRO C10-C25 in sample SS007-WP04-100722 was reported above the detection limit and has been qualified with a “QL” validation flag due to the low surrogate recovery.

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

ii. Are all results less than LoQ or RL?
Yes ☒ No ☐ N/A ☐
Comments: All trip blank results were non-detect.

iii. If above LoQ or RL, what samples are affected?
Comments: Not applicable, all trip blank results were non-detect.

iv. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

f. Field Duplicate

i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?
Yes ☒ No ☐ N/A ☐
Comments: The field duplicate pair for this SDG was SS006-066MW09-120622 and SS006 066MW99 120622.

ii. Was the duplicate submitted blind to lab?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water or air, 50% soil)

$$RPD\ (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| X\ 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes ☒ No ☐ N/A ☐
Comments: All field duplicate criteria were met.

iv. Is the data quality or usability affected? (Explain)
Yes ☐ No ☒ N/A ☐
Comments: Data quality and usability was not affected.

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?
Yes ☐ No ☒ N/A ☐
Comments: Equipment blanks were not collected for this SDG.

ii. Are all results less than LoQ or RL?
Yes ☐ No ☐ N/A ☒
Comments: Equipment blanks were not collected for this SDG.

iii. If above LoQ or RL, specify what samples are affected.
Comments: Not applicable, equipment blanks were not collected for this SDG.

iv. Are data quality or usability affected?
Yes ☐ No ☒ N/A ☐

Comments: Data quality and usability was not affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Are they defined and appropriate?

Yes ☐ No ☐ N/A ☒

Comments: All sample results were non-detect or reported above the LOQ.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical National**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

This review is based on Project requirements, the requirements of Method 8015, Base Method 8000, and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.
- Method AK101, *Determination of Gasoline Range Organics*, Version 12/21/16.
- Method AK102, *Determination of Diesel Range Organics*, Version 12/21/16.
- Method AK103, *Determination of Residual Range Organics,* Version 12/21/16.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted and Analyses Requested.

Sample ID	Lab ID	Type	Matrix	Date Collected	Prep/Extraction Date	Analysis Date
SS006-066MW06-120622	L1566427-02	Field Sample	Groundwater	12/06/22	12/14/22	12/15/22
SS006-066MW09-120622	L1566427-03	Field Sample	Groundwater	12/06/22	12/14/22	12/15/22
SS006-066MW99-120622	L1566427-04	Field Duplicate of SS006-066MW09-120622	Groundwater	12/06/22	12/14/22	12/15/22
SS006-066MW08-120622	L1566427-05	Field Sample	Groundwater	12/06/22	12/14/22	12/15/22
SS006-066MW05-120622	L1566427-06	Field Sample	Groundwater	12/06/22	12/14/22	12/15/22
SS006-066MW04-120622	L1566427-07	Field Sample	Groundwater	12/06/22	12/14/22	12/15/22
SS006-066MW07-120622	L1566427-08	Field Sample	Groundwater	12/06/22	12/14/22	12/15/22

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [X] Level III (Level 2b) [] Level II (Level 2a)
Confirm that narrative is present and complete; note overall initial indications.

Seven (7) groundwater samples were received by received by Pace Analytical on 12/10/22 at 4.5°C. The samples were analyzed for diesel range organics (DRO) by EPA Method AK102. The data was validated to a Level 2B.

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	X	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.		

Reviewer Comments: Field and internal custody forms are complete and accurate.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical National**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

4. Holding Times and Preservation	Y	N	NA
Were samples preserved at ≤6° C?	X		
AK 101			
Were aqueous samples analyzed within 14 days of collection?			X
Were soil/solid samples analyzed within 28 days of collection?			X
AK102/AK103			
For AK102, were aqueous samples acidified to pH 2 or less with HCl?	X		
Were aqueous and soil/solid samples extracted within 14-days of collection?	X		
Were extracts analyzed within 40-days of extraction?	X		
Inspect narrative, receipt logs, etc. Does the information indicate no significant problems with sample handling/naming?	X		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 12/06/22 and were received by the laboratory on 12/10/22 at 4.5°C. The samples were extracted on 12/14/23 within 8 days of collection. The extracts were analyzed on 12/15/23 within 1 day of extraction. All preservation criteria and the remaining holding time criteria were met. No qualifications were warranted.

5. Preparation Technique

	Y	N	NA
Are preparation logs for all samples present in the data package?	X		
Are cleanup data present in the data submittal?			X

Identify the preparation method(s) used:

	Matrix	Preparation Method(s) *(record # or NA)*	Cleanup Method(s) *(record # or NA)*
	Water	*SW3510C*	*NA*
	Soil/Solid	*NA*	*NA*
	Oil	*NA*	*NA*
	Air	*NA*	*NA*

Reviewer Comments: The samples were prepared in accordance with Method SW3510C.

6. Instrumentation QA/QC	Y	N	NA
Were the following instrumentation criteria met?			
Was all retention time criteria met per the analytical method?	X		
Was all initial calibration criteria met (i.e. %RSD <25% or r^2<0.995)?	X		
Was all initial calibration verification (ICV) criteria met (%D<25% **or** method required criteria)?	X		
Was all continuing calibration verification (CCV) criteria met (%D<25% **or** method required criteria)?	X		

Reviewer Comments: All retention time criteria, initial calibration criteria, and continuing calibration criteria were met. No qualifications were warranted.

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical National**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

7. Method Blank	Y	N	NA
Are method blank results present?	**X**		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix? (**Method 8000B**, Section 8.2.6.1;)	**X**		
Is the method blank subjected to the same cleanup procedures as the associated samples? (**Method 8000B**, Section 8.2.6.4)	**X**		
Is the method blank run after initial calibration or calibration verification? (**Method 8000B**, Sections 7.7.7 and 8.2.6.3)	**X**		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	**X**		
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000**, Section 8.2.6.7)			**X**
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			**X**
Were any target analytes detected in the method, instrument, and/or solvent blanks?		**X**	
Is gross contamination present in the method, instrument, or solvent blank?		**X**	
If gross contamination is present, are associated samples reanalyzed?			**X**
Are blank results **not** subtracted from associated sample results? (**Method 8000**, Section 8.2.6.6)	**X**		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All method blank results were non-detect. No qualifications were warranted.

8. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? **(Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1; **Method 8015**, Section 9.6)	**X**		
Has the laboratory developed control limits for surrogates?	**X**		
Are recoveries within the laboratory-generated limits?		**X**	
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Surrogate o-terphenyl in sample SS006-066MW05-120622 (13.6%) exceeded the 50-150% recovery criteria. The Form 1s for the sample noted, *"Sample produced emulsion during extraction process, low surrogate/spike recoveries due to matrix."* Qualifications are as follows:

- AK102 DRO C10-C25 in sample SS007-WP04-100722 was reported above the detection limit and has been qualified with a "QL" validation flag due to the low surrogate recovery.
- The remaining surrogate recoveries were within the acceptance criteria. No further qualifications were warranted.

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical National**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

9. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix? (**Method 8000B**, Section 8.5)	X		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	X		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	X		
Are all target compounds spiked into the MS/MSD fractions?	X		
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)	X		
Are RPDs within MSD control criteria (or lab-generated limits)?	X		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Sample SS006-066MW07-120622 (lab ID L1566427-08) was the parent sample for the MS/MSD analysis. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries and precision criteria were met. No qualifications were warranted.

10. Field Duplicate	Y	N	NA
Was a field duplicate pair collected for this SDG?	X		
Were field duplicate samples collected at a frequency of of one for every 20 primary samples? (**Per Project QAPP)**	X		
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**	X		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP. The field duplicate pair for this SDG was SS006-066MW09-120622 and SS006-066MW99-120622. All SS006-066MW09-120622 and SS006-066MW99-120622 sample results were non-detect which meets the field duplicate criteria. No qualifications were warranted.

11. Laboratory Control Sample (LCS)	Y	N	NA
Are laboratory control sample data present in the data submittal?	X		
Is an LCS included with each batch of ≤20 samples on a per-matrix basis? (**Method 8000**, Section 8.5 and **Method 8015**, Section 9.6.2)	X		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5; **Method 8015**, Section 9.6.2)	X		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4; **Method 8015**, Section 9.6.2)	X		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, within the method-specified range of 70-130%)? (**Method 8000B**, Section 8.5.4)	X		
If prepared in duplicate, are RPDs within limits?	X		

Level 2b Data Review- AK 102

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical National**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

11. Laboratory Control Sample (LCS)	Y	N	NA
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality ** Evaluate other QC prior to qualifying "R". *** Use professional judgment			

Reviewer Comments: All laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and precision criteria were met. No qualifications were warranted.

12. Confirming Column	Y	N	NA
Since most samples are not well-characterized, is each sample analysis confirmed on a dissimilar column for all single-peak target compounds (non-DRO and GRO) (i.e. is second-column confirmation performed)? (**Method 8000**, Section 7.9 and **Method 8015**, 11.6.5)			**X**
For DRO and GRO, if analytical interferences are indicated is confirmatory analysis performed? (**Method 8015**, Section 11.6.5)			**X**
Is the RPD between primary and confirming column results <40%? (**Method 8000B**, Section 7.10.4.1 and **Method 8000C**, Section 11.10.4.1)			**X**
If confirmatory analysis is not present, all single-peak target compound results should be qualified "J" or "UJ", since flame-ionization detection (FID) is non-specific and subject to numerous positive interferences.			

Reviewer Comments: No comments.

13. Method Quantitation Limits	Y	N	NA
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**Method 8000**, Section 7.4)	**X**		
Action: *Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: AK102 DRO C10-C25 in sample SS006-066MW05-120622 was reported above the LOQ.

The remaining results were non-detect.

14. Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition
J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

15. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
SS006-066MW05-120622	AK102 DRO C10-C25	QL	Low surrogate recovery

Note: See Section 14 for Validation Flag Definitions

The remaining sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/13/2023	Date: 03/13/2023

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW06-120622

Lab Sample ID:	L1566427-02	**SDG:**	L1566427
Client Sample ID:	SS006-066MW06-120622	**Collected Date/Time:**	12/06/22 16:50
Lab File ID:	1215_009	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 10:55
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	105 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	0	400	U	170	400	800

SW 3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW09-120622

Lab Sample ID:	L1566427-03	**SDG:**	L1566427
Client Sample ID:	SS006-066MW09-120622	**Collected Date/Time:**	12/06/22 11:34
Lab File ID:	1215_010	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 11:19
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	105 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	6.09	400	U	170	400	800

JM 3/13/23

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW99-120622

Lab Sample ID:	L1566427-04	**SDG:**	L1566427
Client Sample ID:	SS006-066MW99-120622	**Collected Date/Time:**	12/06/22 11:35
Lab File ID:	1215_011	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 11:42
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	100 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	6.09	400	U	170	400	800

SW 3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW08-120622

Lab Sample ID:	L1566427-05	**SDG:**	L1566427
Client Sample ID:	SS006-066MW08-120622	**Collected Date/Time:**	12/06/22 12:42
Lab File ID:	1215_012	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 12:05
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	105 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	6.09	400	U	170	400	800

3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW05-120622

Lab Sample ID:	L1566427-06	**SDG:**	L1566427
Client Sample ID:	SS006-066MW05-120622	**Collected Date/Time:**	12/06/22 14:22
Lab File ID:	1215_013	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 12:28
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	110 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25 QL	6.09	2410		170	400	800

Sample Narrative:
Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix.

SV 3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW04-120622

Lab Sample ID:	L1566427-07	**SDG:**	L1566427
Client Sample ID:	SS006-066MW04-120622	**Collected Date/Time:**	12/06/22 15:14
Lab File ID:	1215_014	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 12:51
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	105 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	0	400	U	170	400	800

gw 3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW07-120622

Lab Sample ID:	L1566427-08	**SDG:**	L1566427
Client Sample ID:	SS006-066MW07-120622	**Collected Date/Time:**	12/06/22 15:55
Lab File ID:	1215_015	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	SVGC21	**Preparation Date/Time:**	12/14/22 17:23
Analytical Batch:	WG1974005	**Analysis Date/Time:**	12/15/22 13:14
Dilution Factor:	1	**Prep Method:**	3510C
Analytical Method:	AK102	**Sample Vol Used:**	
Matrix:	GW	**Initial Wt/Vol:**	110 mL
Total Solids (%):		**Final Wt/Vol:**	30 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
AK102 DRO C10-C25	C10-C25	6.09	400	U	170	400	800

SW 3/13/23

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Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

This review is based on Project requirements, the requirements of the analytical method(s), and validator technical judgment in accordance with the following documents:

- South Optimized Remediation Contract. *Port Heiden RRS. Final, 31 Aug 2021.*
- Department of Defense (DoD). *Department of Defense (DOD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories*, Version 5.4. 2021.
- U.S. Environmental Protection Agency (USEPA). 1986. *Solid Waste SW-846 Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, Third Edition and Updates.

Validation qualifiers are written in red on copies of the Laboratory Form 1s (result forms). The following includes analytes reviewed, and checklists of verification and validation items addressed. The headers Y, N, and NA stand for "yes," "no,", and "not applicable" based on the criteria evaluated. The validator provides a comment after individual subject checklists. At the end of all the checklists is an overall comments section, in which the review may be summarized. The overall validation results are not limited to the criteria in the checklists and may be augmented by any other items noted by experienced validators. Additional items included are to be noted.

Data Review

1. Samples Submitted

Sample ID	Lab ID	Type	Matrix	Date Collected	DF	Date Analyzed
SS006-TRIPBLANK-HCL-01	L1566427-01	Trip Blank	Ground Water	12/06/22	1	12/15/22
SS006-066MW06-120622	L1566427-02	Field Sample	Ground Water	12/06/22	1	12/16/22
SS006-066MW09-120622	L1566427-03	Field Sample	Ground Water	12/06/22	1	12/16/22
SS006-066MW99-120622	L1566427-04	Field Duplicate of SS006-066MW09-120622	Ground Water	12/06/22	1	12/16/22
SS006-066MW08-120622	L1566427-05	Field Sample	Ground Water	12/06/22	1	12/16/22
SS006-066MW05-120622	L1566427-06	Field Sample	Ground Water	12/06/22	1	12/16/22
SS006-066MW04-120622	L1566427-07	Field Sample	Ground Water	12/06/22	1	12/16/22
SS006-066MW07-120622	L1566427-08	Field Sample	Ground Water	12/06/22	1	12/16/22

DF: Dilution Factor

* Denotes exceeded holding time

2. Reviewer Preliminary Comments

Review Type: [] Level IV (Level 3 or 4) [x] Level III (Level 2B) []Level II (Level 2a)

Eight (8) ground water samples were received by received Pace Analytical on 12/10/22 at 4.5°C. The samples were analyzed for benzene, ethylbenzene, toluene, and total xylenes (BTEX) by EPA Method SW8260D. The data was validated to a Level 2b.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

3. Custody of Samples	Y	N
Are samples traceable through inspection of signature records on field and laboratory chains of custody?	**X**	
Action: For any samples not traceable upon inspection of verification report and chains of custody, indicate the identities where the break in traceability occurred. Qualify samples not traceable "R." Indicate which samples were affected in narrative.		

Reviewer Comments: Field and internal custody forms are complete and accurate.

4. Holding Times and Preservation	Y	N	NA
Have aqueous samples been preserved at ≤6°C (**SW846**-Table 2-40A)	**X**		
Have solid samples been preserved at ≤6°C (**SW846**-Table 2-40A)			**X**
Have aqueous samples been preserved with H2SO4, HCl, or solid NaHSO4? (**SW846**-Table 2-40A)	**X**		
Are preserved samples, solids, and wastes analyzed with 14 days of collection? (**SW846**-Table 2-40A)	**X**		
Are unpreserved samples analyzed with 7 days of collection? (**SW846**-Table 2-40A)			**X**
If residual chlorine is present, are samples treated with sodium thiosulfate? (**SW846**-Table 2-40A)			**X**
Inspect narrative, receipt logs, etc. Does the information indicate there were **no** significant problems with sample handling/naming?	**X**		
Action: Indicate affected samples in validation comments where holding time exceeded or improper preservative, qualify based on judgment of impact.			

Reviewer Comments: The samples were collected on 12/06/22 and were received by the laboratory on 12/10/22 at 4.5°C. The samples were analyzed on 12/15/22 and 12/16/22, within 9-10 days of collection. All preservation and holding time criteria were met. No qualifications were warranted.

5. Preparation Technique			
	Y	**N**	**NA**
Are preparation logs for all samples present in the data package?			
Identify the preparation method(s) used:			

	Matrix	**Method(s)** *(record # or NA)*
	Water	*EPA Method SW8260D*
	Soil/Solid	*NA*
	Oil	*NA*
	Air	*NA*

Reviewer Comments: The samples were prepared in accordance with EPA Method SW8260D.

6. GC/MS Performance Check	Y	N
Are performance check data present in the data submittal?	**X**	
Is the GC/MS hardware-tuned to meet BFB criteria prior to the initial calibration and for each 12-hr period during which analyses are performed? (**Method 8260B**, Sections 4.9.3, 5.11, 7.3.1, 7.4.1, 7.5.2, 8.2.1, and 11.4.1)	**X**	
Are mass spectral relative abundances acceptable according to the method criteria? (**Method 8260B**, Table 4**)**	**X**	
Was there correct assignment of ions?	**X**	
Raw Data Confirmation		
Raw data show proper averaging of scans according to method recommendations.	**X**	

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

6. GC/MS Performance Check	**Y**	**N**
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate		

Reviewer Comments: All tune criteria were met. No qualifications were warranted.

7. Initial Calibration	**Y**	**N**	**NA**
Are initial calibration data present in the data submittal?	**X**		
Does the initial calibration curve consist of a least 5 standards? (**Method 8260B**, Sections 5.7.6.10, 5.7.6.11, 5.12.1 and 7.3.2; and **Method 8000B**, Section 7.4)	**X**		
Are all target analytes present in the initial calibration? (**Method 8260B**, Section 5.12.3)	**X**		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the RSD ≤30%? (**Method 8260B**, Section 7.3.6.3 and 8.2.3) **[Note: Method 8260 requires an RSD of ≤15% and Method 8260C/D requires an RSD of 20% for all compounds or another type of curve must be used]**	**X**		
For the system performance check compounds, are the response factors 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Section 7.3.5.4 and 8.2.3)	**X**		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	**X**		
For other compounds, is the response factor ≥0.01 (or method criteria)?	**X**		
If the RSD does not meet the 20% (15% for **Method 8260**) criterion, is a linear (or quadratic) regression equation used for target compound quantitation? (**Method 8260B**, Sections 7.3.8.2)	**X**		
If linear and/or quadradic regressions, are used, is r ≥0.99 or r^2≥0.98 (**Method 8000B**, Sections 7.5.2 and 8.3.2)	**X**		
Is the origin not forced and not included in the calibration curve for linear regression? (**Method 8000**, Section 7.5.2)	**X**		
QC Check Standard (ICV)			
Are QC Check Standard Results present in the data submittal?	**X**		
Is the check standard run on an ongoing basis? (**Method 8260B**, Section 8.7-referred to as a standard reference material)	**X**		
Are check standard results within 30% of reference value?	**X**		
Raw Data Confirmation			
Raw data have been examined for anomalies	**X**		
The quantitation ions for 2 compounds have been confirmed as the correct ions for quantitation.	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate *** Qualify only peaks outside linear portion			

Reviewer Comments: All initial calibration criteria and initial calibration verification criteria were met. No qualifications were warranted.

8. Continuing Calibration	**Y**	**N**	**NA**
Are continuing calibration data present in the data submittal?	**X**		
Are all target analytes present in the continuing calibration (verification)? (**Method 8260B**, Section 5.12.3)	**X**		

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

8. Continuing Calibration	Y	N	NA
Has continuing calibration verification been performed within 12 hours of the time of associated sample analysis? (**Method 8260B**, Sections 7.4.2 and 8.2.3)	X		
For the system performance check compounds, are the response factors in the calibration verification 0.10 for Chloromethane, 1,1-Dichloroethane, and Bromoform and 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane? (**Method 8260B**, Sections 7.3.5.4, 7.4.4.1, 7.4.4.2, and 8.2.3)	X		
Do target compounds meet the minimum response factors summarized in Table 4? (**Method 8260D,** Table 4**)**	X		
For other compounds, is the response factor ≥0.01?	X		
For the continuing check compounds (1,1-Dichloroethene, Chloroform, 1,2-Dichloropropane, Toluene, Ethylbenzene, and vinyl chloride), is the %D ≤20%? (**Method 8260B**, Sections 7.3.6.3, 7.4.5.1, 7.4.5.2, and 8.2.3)	X		
For other compounds, is %D ≤ 20%? (**Method 8260B**, Section 7.4.5.2)	X		
Is a closing CCV performed? (**DOD QSM 5.3** Table B-4)	X		
Is the closing CCV %D ≤ 50%? (**DOD QSM 5.3** Table B-4)	X		
Action: Indicate affected samples in validation comments, primarily if data are rejected.			

Reviewer Comments: All continuing calibration criteria were met. No qualifications were warranted.

9. Method Blank	Y	N	NA
Are method blank results present?	X		
Is the method blank run after initial calibration or calibration verification? (**Method 8260B**, Section 7.4.3 and **Method 8000B**, Sections 7.7.7 and 8.2.6.3)	X		
Are method blanks prepared at a frequency of 5% or one (1) per twenty (20) samples per matrix or on a per batch basis? (**Method 8260B**, Section 8.4 and **Method 8000B**, Section 8.2.6.1)	X		
Is the method blank analyzed on at least one of the instruments used in the analysis of associated samples? (**Method 8000B**, Section 8.2.6.2)	X		
Is the method blank subjected to the same preparation and cleanup procedures as the associated samples? (**Method 8260B**, Section 8.4.1 and **Method 8000B**, Section 8.2.6.4)	X		
Are solvent or instrument blanks interspersed through the analytical run or as necessary? (Method 8260B, Section 7.4.3 and **Method 8000B**, Section 8.2.1)			X
Is a solvent blank analyzed on each instrument used for associated sample analyses? (**Method 8000B**, Section 8.2.6.2)			X
Were any target analytes detected in the method, instrument, and/or solvent blanks?		X	
Is gross contamination present in the method, instrument, or solvent blank?			X
If gross contamination is present, are associated samples reanalyzed			X
Have instrument or solvent blanks been analyzed after samples with elevated concentrations of target analytes? (**Method 8000B**, Section 8.2.6.7)			X
Are blank results **not** subtracted from associated sample results? (**Method 8000B**, Section 8.2.6.6)	X		
Action: Indicate affected samples only if data are rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All method blank (MB) and trip blank SS006-TRIPBLANK-HCL-01 results were non-detect. No qualifications were warranted.

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

10. Surrogate Standards	Y	N	NA
Are surrogate data present in the data submittal?	**X**		
Were method-appropriate surrogate standards used for the reported analyses?	**X**		
Were the surrogates added to all standards, QC samples, and project samples? (**Method 8260B**, Section 5.9 and **Method 8000B**, Sections 7.6.8, 7.7.4, and 8.7.1)	**X**		
Are surrogate recoveries within the lab-generated or default (70-130%R) acceptance limits?	**X**		
Action: Indicate affected samples in validation comments, primarily if data were rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Use technical judgment in recoveries, allowing 0 outliers for VOA, possibly 1 for SVOA.			

Reviewer Comments: All surrogate recoveries were within the acceptance criteria. No qualifications were warranted.

11. Matrix Spike/Matrix Spike Duplicate	Y	N	NA
Have MS/MSD data been reported?	**X**		
Have field, equipment, rinse, or trip blanks not been used for the MS/MSD analysis?	**X**		
Have MS/MSD pairs been prepared at a frequency of one (1) per twenty (20) per matrix or on a per-batch basis? (**Method 8260B**, Sections 8.4 and 8.4.2 and **Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs prepared in the same batch as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are the MS/MSD pairs analyzed in the same sequence as the associated samples? (**Method 8000B**, Section 8.5)	**X**		
Are all target compounds spiked into the MS/MSD fractions?	**X**		
Are recoveries within the lab-generated limits (or control criteria of 70-130%)? (**Method 8000B**, Section 8.5.4)		**X**	
Are RPDs within MSD control criteria (or lab-generated limits)?	**X**		
Action: Indicate affected samples in validation comments, primarily if data are rejected. * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify only after evaluating other QC data in the SDG.			

Reviewer Comments: Sample SS006-066MW07-120622 (lab ID L1566427-08) was the parent sample for the MS/MSD analysis. In the MSD, benzene (75%) was outside of the 79-120% recovery criteria. Per the DOD QSM, only the parent sample shall be qualified due to MS/MSD considerations. Data assessment is as follows:

- Benzene was non-detect in sample SS006-066MW07-120622 and has been qualified with a 'QL' validation flag due to low MSD recovery.
- The remaining MS/MSD recoveries and all precision criteria were met. No qualifications were warranted.

12. Field Duplicate	Y	N	NA
Was a field duplicate pair collected for this SDG?	**X**		
Were field duplicate samples collected at a frequency of of one for every 10 primary samples? (**Per Project QAPP)**	**X**		
Were reported precision estimates within project acceptance criteria RPD ≤30%? (**Per Project QAPP)**	**X**		
Action: Indicate affected samples in validation comments. * Qualify only if the deviation indicates an adverse effect on data quality.			

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

Reviewer Comments: Field duplicates were collected at a frequency of one for every 20 primary samples for this project per the QAPP. The field duplicate pair for this SDG was SS006-066MW09-120622 and SS006-066MW99-120622. All SS006-066MW09-120622 and SS006-066MW99-120622 sample results were non-detect which meets the field duplicate criteria. No qualifications were warranted.

13. Laboratory Control Sample (LCS)	**Y**	**N**	**NA**
Are laboratory control sample data present in the data submittal?	**X**		
Has at least one LCS been prepared with each analytical batch up to 20 samples? (**Method 8260B**, Sections 8.4 and 8.4.3)	**X**		
Is the LCS the same matrix as the samples in the reporting batch? (**Method 8000B**, Section 8.5)	**X**		
Have laboratory-generated control limits been established for each target compound for each matrix analyzed? (**Method 8000B**, Section 8.5.4)	**X**		
Are the recoveries of target compounds within the laboratory-generated control limits (or in the absence of laboratory control limits, the method-specified range of 70-130)? (**Method 8000B**, Section 8.5.4)	**X**		
If prepared in duplicate, are RPDs within limits?	**X**		
Action: Report rejected analytes at minimum. * Qualify only if the deviation indicates an adverse effect on data quality. ** Evaluate other QC prior to qualifying "R".			

Reviewer Comments: All laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and precision criteria were met. No qualifications were warranted.

14. Internal Standards	**Y**	**N**	**NA**
Are internal standard data present in the data submittal?	**X**		
Were method-appropriate internal standards (ISs) used for the reported analyses?	**X**		
Are internal standards added to each calibration standard? (**Method 8260B**, Section 5.12.4 and 7.5.10.2)	**X**		
Do internal standard retention times **not** vary by more than 30 seconds from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.6)	**X**		
Does the EICP area of any internal standard **not** vary by more than a factor of two (-50 to +100%) from that in the mid-point standard level of the initial calibration? (**Method 8260B**, Section 7.4.7)	**X**		
Do area counts appear to be at least minimally adequate?	**X**		
Note: Internal standard assessment is **not** required for a Level 2a data validation. Action: Indicate affected samples in validation comments, primarily if data were rejected * Qualify only if the deviation indicates an adverse effect on data quality. ** Qualify as appropriate			

Reviewer Comments: All internal standard criteria were met. No qualifications were warranted.

15. Method Quantitation Limits	**Y**	**N**	**NA**
Does the method quantitation limit (established by the lowest concentration calibration standard) meet project requirements? (**Method 8000**, Sections 7.4.1.2 and 7.4.1.4)	**X**		
Are only those results that fall between the lowest and highest calibration standards reported (i.e., no "J" values or values between the MDL and low standard or above the high standard)? (**QSAS**, Sections 5.5.2.2.1.f) and 5.5.2.2.1.g)) (**Method 8000**, Section 7.4) (**All data below LOQ qualified with a J**)	**X**		

Data Review Method 8260 -Volatile Organic Compounds by GC/MS

Project ID:	**Port Heiden RRS NPDL 21-034**	**Lab Name:**	**Pace Analytical**
SOW No.	**South Optimized Remediation Contract**	**SDG No.**	**L1566427**

15. Method Quantitation Limits	Y	N	NA
Action: Indicate non-correctable contract compliance deviations below. If MQL>RDL, reanalysis may be warranted.			

Reviewer Comments: All sample results were non-detect.

16. Tentatively Identified Compounds	Y	N	NA
Are TICs reported in the data submittal?			**X**
If requested, does the TIC report include up to 20 compounds?			**X**
Action: Indicate non-correctable contract compliance deviations below. Indicate missed TICs (if this part of analysis requested)			

Reviewer Comments: TICs were not required.

17. Sample Data Evaluation -Validation with Raw Data Confirmation
1. For one compound in each sample, determine whether CRQLs have been modified to SQLs. **Yes.**
2. Sample-specific evaluation - these evaluations are performed one sample in each batch (excluding QC).
-Evaluate whether the correct quantitation ions were used. **The correct ions were used.**
-Evaluate adequacy of manual integrations of peak areas. (**AMS**, Section 3.5.5.g)) **Manual integrations were straightforward**
-Evaluate the presence of carryover. **NA**
-Evaluate the validity of dilutions and reanalyses. **NA**
-Evaluate interferences that may preclude accurate quantitation of compounds. **NA**
3. Manually recalculate 2 or more selected results from a sample in the SDG. **NA** 4. Did recalculation confirm reported results? **NA** If not, increase the frequency of recalculations until adequate confidence is gained in the reported results.
5. Qualify all non-rejected TIC as "NJ" **NA**
6. Evaluate all TICs according to EPA Functional Guidelines VOA verification/validation procedure. **NA**
Action: Indicate in comments instances of manual calculations not confirming reported results. Where samples have been reanalyzed, and both reanalyses are included in the data package, indicate on the laboratory reporting forms which results are the most reliable.
Description of Sample-specific Evaluation Problems**: NA**

Reviewer Comments: No comments as the samples have undergone a Level 2b review.

18. Method 8260 Analytical Data Qualifiers

The following table provides data qualifiers used in **validation**.

Qualifier	Definition

J	The analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL.
B	Analyte result is considered a high estimated value due to contamination present in the blank.
H	Analyte result is considered a low estimate due to holding time exceedance.
QH, QL, QN	QH, QL, QN Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects or a quality control failure.
R	Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with a "R" flag).

19. Overall Comments

Overall, the data meet the requirements and intent of the methods, indicate the preparatory process and analytical system were in control at the time of sample analysis, and the reported laboratory results are of sufficient quality for their intended purpose.

Sample Qualifications Summary Table			
Sample ID	Analyte	Validation Flag	Qualification Reason(s)
SS006-066MW07-120622	Benzene	QL	Low MSD recovery

The remaining sample results were not detected and were reported at their respective detection limits (LOD) and were flagged "U" by the laboratory.

Data Validator	Data Validation Reviewer
Name: Sherrie Robinson	Name: Amber Brinly
Title: Staff Scientist	Title: Staff Scientist
Company: North Wind Site Services	Company: North Wind Portage
Signature: Sherrie Robinson	Signature: Amber Brinly
Date: 03/13/2023	Date: 03/13/2023

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-TRIPBLANK-HCL-01

Lab Sample ID:	L1566427-01	**SDG:**	L1566427
Client Sample ID:	SS006-TRIPBLANK-HCL-01	**Collected Date/Time:**	12/06/22 09:00
Lab File ID:	1215a_18	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/15/22 23:58
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/15/22 23:58
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

SM 3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW06-120622

Lab Sample ID:	L1566427-02	**SDG:**	L1566427
Client Sample ID:	SS006-066MW06-120622	**Collected Date/Time:**	12/06/22 16:50
Lab File ID:	1215a_22	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 01:20
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 01:20
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW09-120622

Lab Sample ID:	L1566427-03	**SDG:**	L1566427
Client Sample ID:	SS006-066MW09-120622	**Collected Date/Time:**	12/06/22 11:34
Lab File ID:	1215a_23	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 01:41
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 01:41
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

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1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW99-120622

Lab Sample ID:	L1566427-04	**SDG:**	L1566427
Client Sample ID:	SS006-066MW99-120622	**Collected Date/Time:**	12/06/22 11:35
Lab File ID:	1215a_24	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 02:01
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 02:01
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW08-120622

Lab Sample ID:	L1566427-05	**SDG:**	L1566427
Client Sample ID:	SS006-066MW08-120622	**Collected Date/Time:**	12/06/22 12:42
Lab File ID:	1215a_25	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 02:21
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 02:21
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW05-120622

Lab Sample ID:	L1566427-06	**SDG:**	L1566427
Client Sample ID:	SS006-066MW05-120622	**Collected Date/Time:**	12/06/22 14:22
Lab File ID:	1215a_26	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 02:42
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 02:42
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

SW 3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW04-120622

Lab Sample ID:	L1566427-07	**SDG:**	L1566427
Client Sample ID:	SS006-066MW04-120622	**Collected Date/Time:**	12/06/22 15:14
Lab File ID:	1215a_27	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 03:02
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 03:02
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2	0	0.500	U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

3/13/23

1A-OR

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
SS006-066MW07-120622

Lab Sample ID:	L1566427-08	**SDG:**	L1566427
Client Sample ID:	SS006-066MW07-120622	**Collected Date/Time:**	12/06/22 15:55
Lab File ID:	1215a_28	**Received Date/Time:**	12/10/22 10:00
Instrument ID:	VOCMS36	**Preparation Date/Time:**	12/16/22 03:23
Analytical Batch:	WG1975380	**Analysis Date/Time:**	12/16/22 03:23
Dilution Factor:	1	**Prep Method:**	8260D
Analytical Method:	8260D	**Sample Vol Used:**	5 mL
Matrix:	GW	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	5 mL

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/l		*ug/l*	*ug/l*	*ug/l*
Benzene	71-43-2 QL	0	0.500	J6 U	0.0941	0.500	1.00
Ethylbenzene	100-41-4	0	0.500	U	0.137	0.500	1.00
Toluene	108-88-3	0	0.600	U	0.278	0.600	1.20
Total Xylenes	1330-20-7	0	1.50	U	0.174	1.50	3.00

3/13/23

APPENDIX E

Laboratory Analytical Reports

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ANALYTICAL REPORT

February 14, 2023

Revised Report

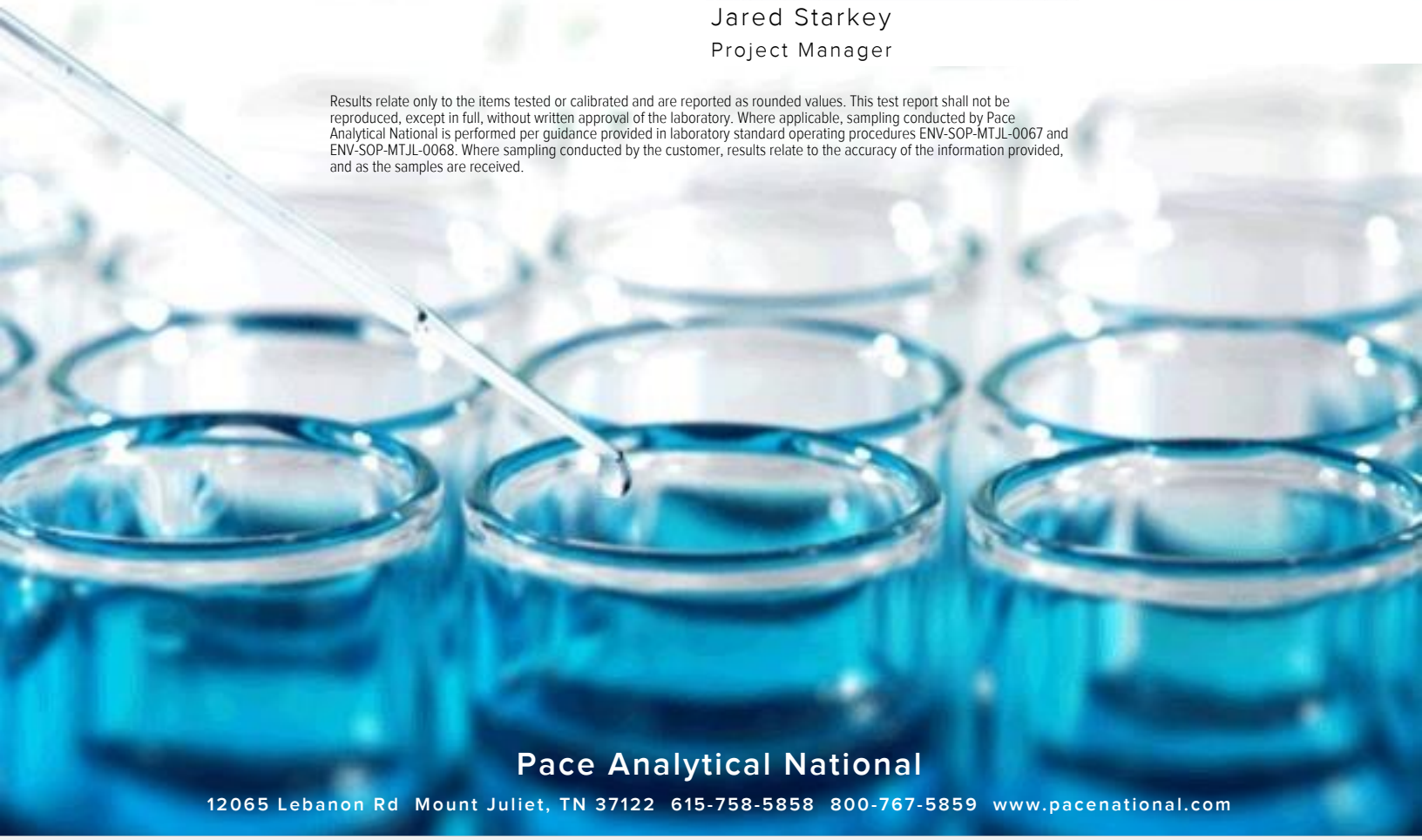
North Wind Site Services, LLC- AK

Sample Delivery Group:	L1540948
Samples Received:	09/29/2022
Project Number:	060068.001
Description:	Port Heiden RRS NPDL 21-034
Site:	EQBLK01
Report To:	Jill Jones 7910 King Street Anchorage, AK 99518

Entire Report Reviewed By:

Jared Starkey
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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OT001-EQBLK01-091922 L1540948-01 GW

Collected by: Sydney S | Collected date/time: 09/19/22 14:30 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:45	10/01/22 11:45	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 22:03	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 16:49	10/04/22 16:49	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934792	1	09/30/22 01:50	09/30/22 01:50	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:37	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 12:48	10/01/22 12:48	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 04:02	10/04/22 04:02	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 21:20	DMG	Mt. Juliet, TN

OT001-DSAMW07-092022 L1540948-02 GW

Collected by: Sydney S | Collected date/time: 09/20/22 09:15 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:48	10/01/22 11:48	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:21	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 16:50	10/04/22 16:50	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934792	1	09/30/22 03:09	09/30/22 03:09	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:40	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937343	1	10/05/22 00:31	10/05/22 00:31	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 21:43	DMG	Mt. Juliet, TN

SS006-215MW12-092022 L1540948-03 GW

Collected by: Sydney S | Collected date/time: 09/20/22 10:20 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:30	10/01/22 11:30	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:22	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 16:55	10/04/22 16:55	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1935036	1	10/03/22 23:40	10/03/22 23:40	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:26	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937331	1	10/04/22 23:14	10/04/22 23:14	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 19:02	DMG	Mt. Juliet, TN

SS006-215MW12-092022-99 L1540948-04 GW

Collected by: Sydney S | Collected date/time: 09/20/22 10:25 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:38	10/01/22 11:38	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:31	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 17:01	10/04/22 17:01	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/03/22 23:07	10/03/22 23:07	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:43	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937331	1	10/04/22 23:35	10/04/22 23:35	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 22:06	DMG	Mt. Juliet, TN

SS006-TRIPBLANK-HCL-01 L1540948-05 GW

Collected by: Sydney S | Collected date/time: 09/19/22 09:00 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937343	1	10/05/22 00:01	10/05/22 00:01	ACG	Mt. Juliet, TN

Unless qualified or notated within the narrative below, all sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jared Starkey
Project Manager

Report Revision History

Level II Report - Version 1: 10/27/22 14:42
Level IV Report - Version 2: 10/27/22 14:48

Project Comments

EDD

Sample Delivery Group (SDG) Narrative

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

Batch	Method	Lab Sample ID
WG1935909	8260D	L1540948-01

Wet Chemistry by Method 351.2

RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Batch	Lab Sample ID	Analytes
WG1935863	(DUP) R3844701-3, L1540948-03	Kjeldahl Nitrogen, TKN

The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Batch	Lab Sample ID	Analytes
WG1935863	(MSD) R3844701-5, L1540948-03	Kjeldahl Nitrogen, TKN

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935863	(MSD) R3844701-5, L1540948-03	Kjeldahl Nitrogen, TKN

Volatile Organic Compounds (GC/MS) by Method 8260D

The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.

Batch	Lab Sample ID	Analytes
WG1935909	L1540948-01	1,2-Dibromo-3-Chloropropane
WG1937343	L1540948-02	1,2,3-Trichlorobenzene, Bromomethane, Chloroethane and Naphthalene
WG1937343	L1540948-05	1,2,3-Trichlorobenzene, Bromomethane, Chloroethane and Naphthalene

Surrogate recovery limits have been exceeded; values are outside upper control limits.

Batch	Analyte	Lab Sample ID
WG1937343	Toluene-d8	L1540948-02, 05

The same analyte is found in the associated blank.

Batch	Analyte	Lab Sample ID
WG1935909	Acetone	L1540948-01

The associated batch QC was above the established quality control range for accuracy.

Batch	Lab Sample ID	Analytes
WG1937343	(LCS) R3845564-1, (LCSD) R3845564-3, L1540948-02, 05	1,1,2,2-Tetrachloroethane, 1,2,3-Trichloropropane, 4-Methyl-2-pentanone (MIBK), Acrolein and Di-isopropyl ether

The associated batch QC was below the established quality control range for accuracy.

Batch	Lab Sample ID	Analytes
WG1935601	(LCSD) R3843739-2, L1540948-01	1,2,3-Trichlorobenzene
WG1937343	(LCS) R3845564-1, (LCSD) R3845564-3, L1540948-02, 05	Bromomethane and Naphthalene

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935601	(LCSD) R3843739-2, L1540948-01	1,2,3-Trichlorobenzene and Naphthalene
WG1937343	(LCSD) R3845564-3, L1540948-02, 05	Bromomethane

The sample matrix interfered with the ability to make any accurate determination; spike value is high.

Batch	Lab Sample ID	Analytes
WG1935601	(MS) R3843739-6, (MS) R3843739-4, (MSD) R3843739-5, (MSD) R3843739-7	44 analytes
WG1937331	(MS) R3845570-3, (MSD) R3845570-4, L1540948-03	Benzene, Ethylbenzene, Toluene, Total Xylenes and Xylenes, Total
WG1937343	(MS) R3845564-5, (MS) R3845564-7, (MSD) R3845564-6, (MSD) R3845564-8	27 analytes

The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Batch	Lab Sample ID	Analytes
WG1937343	(MS) R3845564-5, (MS) R3845564-7, (MSD) R3845564-6, (MSD) R3845564-8	Bromomethane and Naphthalene

The sample concentration is too high to evaluate accurate spike recoveries.

Batch	Lab Sample ID	Analytes
WG1935601	(MS) R3843739-4, (MSD) R3843739-5	Naphthalene

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935601	(MSD) R3843739-5	Naphthalene
WG1937343	(MSD) R3845564-6	Bromomethane and Naphthalene

DETECTION SUMMARY

Wet Chemistry by Method 2320 B-2011

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-DSAMW07-092022	L1540948-02	Alkalinity		83600		8450	10000	20000	1	10/01/2022 11:48	WG1935544
OT001-DSAMW07-092022	L1540948-02	Alkalinity,Bicarbonate		83600		8450	10000	20000	1	10/01/2022 11:48	WG1935544
SS006-215MW12-092022	L1540948-03	Alkalinity		57700		8450	10000	20000	1	10/01/2022 11:30	WG1935544
SS006-215MW12-092022	L1540948-03	Alkalinity,Bicarbonate		57700		8450	10000	20000	1	10/01/2022 11:30	WG1935544
SS006-215MW12-092022-99	L1540948-04	Alkalinity		59100		8450	10000	20000	1	10/01/2022 11:38	WG1935544
SS006-215MW12-092022-99	L1540948-04	Alkalinity,Bicarbonate		59100		8450	10000	20000	1	10/01/2022 11:38	WG1935544

Wet Chemistry by Method 351.2

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
SS006-215MW12-092022	L1540948-03	Kjeldahl Nitrogen, TKN	7727-37-9	217	J J3 J6 P1	140	300	600	1	10/04/2022 21:22	WG1935863

Wet Chemistry by Method 353.2

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-DSAMW07-092022	L1540948-02	Nitrate-Nitrite	7727-37-9	82.4	J	50.0	100	200	1	10/04/2022 16:50	WG1934510
SS006-215MW12-092022	L1540948-03	Nitrate-Nitrite	7727-37-9	402		50.0	100	200	1	10/04/2022 16:55	WG1934510
SS006-215MW12-092022-99	L1540948-04	Nitrate-Nitrite	7727-37-9	402		50.0	100	200	1	10/04/2022 17:01	WG1934510

Wet Chemistry by Method 9056A

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-DSAMW07-092022	L1540948-02	Sulfate	14808-79-8	3380	J	594	2500	5000	1	09/30/2022 03:09	WG1934792
SS006-215MW12-092022	L1540948-03	Sulfate	14808-79-8	3720	J	594	2500	5000	1	10/03/2022 23:40	WG1935036
SS006-215MW12-092022-99	L1540948-04	Sulfate	14808-79-8	4220	J	594	2500	5000	1	10/03/2022 23:07	WG1934921

Metals (ICP) by Method 6010D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-DSAMW07-092022	L1540948-02	Iron	7439-89-6	2430		20.5	50.0	100	1	10/19/2022 15:40	WG1940061
OT001-DSAMW07-092022	L1540948-02	Manganese	7439-96-5	59.9		0.855	5.00	10.0	1	10/19/2022 15:40	WG1940061
SS006-215MW12-092022	L1540948-03	Iron	7439-89-6	4520		20.5	50.0	100	1	10/19/2022 15:26	WG1940061
SS006-215MW12-092022	L1540948-03	Manganese	7439-96-5	121		0.855	5.00	10.0	1	10/19/2022 15:26	WG1940061
SS006-215MW12-092022-99	L1540948-04	Iron	7439-89-6	4810		20.5	50.0	100	1	10/19/2022 15:43	WG1940061
SS006-215MW12-092022-99	L1540948-04	Manganese	7439-96-5	104		0.855	5.00	10.0	1	10/19/2022 15:43	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-EQBLK01-091922	L1540948-01	Acetone	67-64-1	15.9	B J T8	11.3	25.0	50.0	1	10/04/2022 04:02	WG1935909
OT001-EQBLK01-091922	L1540948-01	Benzene	71-43-2	3.46		0.0941	0.500	1.00	1	10/01/2022 12:48	WG1935601
OT001-EQBLK01-091922	L1540948-01	Chloroform	67-66-3	0.740	J	0.111	2.00	5.00	1	10/01/2022 12:48	WG1935601
OT001-EQBLK01-091922	L1540948-01	Ethylbenzene	100-41-4	2.82		0.137	0.500	1.00	1	10/01/2022 12:48	WG1935601
OT001-EQBLK01-091922	L1540948-01	n-Propylbenzene	103-65-1	0.162	J	0.0993	0.500	1.00	1	10/01/2022 12:48	WG1935601
OT001-EQBLK01-091922	L1540948-01	Toluene	108-88-3	22.9		0.278	0.600	1.20	1	10/01/2022 12:48	WG1935601
OT001-EQBLK01-091922	L1540948-01	1,2,4-Trimethylbenzene	95-63-6	0.365	J	0.322	1.00	2.00	1	10/01/2022 12:48	WG1935601
OT001-EQBLK01-091922	L1540948-01	Xylenes, Total	1330-20-7	9.44		0.174	1.50	3.00	1	10/01/2022 12:48	WG1935601
OT001-DSAMW07-092022	L1540948-02	Toluene	108-88-3	0.285	J	0.278	0.600	1.20	1	10/05/2022 00:31	WG1937343

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.7	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		10000	U	8450	10000	20000	1	10/01/2022 11:45	WG1935544
Alkalinity,Bicarbonate		10000	U	8450	10000	20000	1	10/01/2022 11:45	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:45	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:45	WG1935544

Sample Narrative:

L1540948-01 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 22:03	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200	1	10/04/2022 16:49	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	2500	U	594	2500	5000	1	09/30/2022 01:50	WG1934792

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	50.0	U	20.5	50.0	100	1	10/19/2022 15:37	WG1940061
Manganese	7439-96-5	5.00	U	0.855	5.00	10.0	1	10/19/2022 15:37	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	15.9	B J T8	11.3	25.0	50.0	1	10/04/2022 04:02	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 12:48	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 12:48	WG1935601
Benzene	71-43-2	3.46		0.0941	0.500	1.00	1	10/01/2022 12:48	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:48	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 12:48	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 12:48	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 12:48	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 12:48	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 12:48	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 12:48	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 12:48	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 12:48	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 12:48	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 12:48	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	0.740	J	0.111	2.00	5.00	1	10/01/2022 12:48	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 04:02	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 12:48	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 04:02	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 12:48	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 12:48	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 12:48	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 12:48	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 12:48	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 12:48	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 12:48	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:48	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 12:48	WG1935601
Ethylbenzene	100-41-4	2.82		0.137	0.500	1.00	1	10/01/2022 12:48	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 04:02	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 12:48	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 12:48	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 12:48	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 12:48	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 04:02	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 12:48	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 12:48	WG1935601
n-Propylbenzene	103-65-1	0.162	J	0.0993	0.500	1.00	1	10/01/2022 12:48	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 12:48	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 12:48	WG1935601
Toluene	108-88-3	22.9		0.278	0.600	1.20	1	10/01/2022 12:48	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 04:02	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2,4-Trimethylbenzene	95-63-6	0.365	J	0.322	1.00	2.00	1	10/01/2022 12:48	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 12:48	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 12:48	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 04:02	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 12:48	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 12:48	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 12:48	WG1935601
Xylenes, Total	1330-20-7	9.44		0.174	1.50	3.00	1	10/01/2022 12:48	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/01/2022 12:48*	WG1935601
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*10/04/2022 04:02*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/01/2022 12:48*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*106*				*85.0-114*		*10/04/2022 04:02*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*98.7*				*81.0-118*		*10/01/2022 12:48*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*117*				*81.0-118*		*10/04/2022 04:02*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 21:20	WG1934826
(S) o-Terphenyl	*84-15-1*	*93.9*				*50.0-150*		*10/01/2022 21:20*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.7	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		83600		8450	10000	20000	1	10/01/2022 11:48	WG1935544
Alkalinity,Bicarbonate		83600		8450	10000	20000	1	10/01/2022 11:48	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:48	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:48	WG1935544

Sample Narrative:

L1540948-02 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:21	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	82.4	J	50.0	100	200	1	10/04/2022 16:50	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	3380	J	594	2500	5000	1	09/30/2022 03:09	WG1934792

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	2430		20.5	50.0	100	1	10/19/2022 15:40	WG1940061
Manganese	7439-96-5	59.9		0.855	5.00	10.0	1	10/19/2022 15:40	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	10/05/2022 00:31	WG1937343
Acrolein	107-02-8	25.0	J4 U	2.54	25.0	50.0	1	10/05/2022 00:31	WG1937343
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/05/2022 00:31	WG1937343
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/05/2022 00:31	WG1937343
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/05/2022 00:31	WG1937343
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/05/2022 00:31	WG1937343
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/05/2022 00:31	WG1937343
Bromomethane	74-83-9	2.00	C4 J3 J4 U	0.605	2.00	5.00	1	10/05/2022 00:31	WG1937343
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/05/2022 00:31	WG1937343
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/05/2022 00:31	WG1937343
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/05/2022 00:31	WG1937343
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/05/2022 00:31	WG1937343
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/05/2022 00:31	WG1937343
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/05/2022 00:31	WG1937343
Chloroethane	75-00-3	2.00	C4 U	0.192	2.00	5.00	1	10/05/2022 00:31	WG1937343

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/05/2022 00:31	WG1937343
Chloromethane	74-87-3	2.00	U	0.960	2.00	4.00	1	10/05/2022 00:31	WG1937343
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/05/2022 00:31	WG1937343
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	10/05/2022 00:31	WG1937343
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/05/2022 00:31	WG1937343
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/05/2022 00:31	WG1937343
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/05/2022 00:31	WG1937343
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/05/2022 00:31	WG1937343
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/05/2022 00:31	WG1937343
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/05/2022 00:31	WG1937343
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/05/2022 00:31	WG1937343
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/05/2022 00:31	WG1937343
Di-isopropyl ether	108-20-3	0.500	J4 U	0.105	0.500	1.00	1	10/05/2022 00:31	WG1937343
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/05/2022 00:31	WG1937343
Hexachloro-1,3-butadiene	87-68-3	0.750	U	0.337	0.750	1.50	1	10/05/2022 00:31	WG1937343
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/05/2022 00:31	WG1937343
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/05/2022 00:31	WG1937343
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/05/2022 00:31	WG1937343
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/05/2022 00:31	WG1937343
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	J4 U	0.478	5.00	10.0	1	10/05/2022 00:31	WG1937343
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/05/2022 00:31	WG1937343
Naphthalene	91-20-3	2.00	C4 J4 U	1.00	2.00	5.00	1	10/05/2022 00:31	WG1937343
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/05/2022 00:31	WG1937343
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,1,2,2-Tetrachloroethane	79-34-5	0.500	J4 U	0.133	0.500	1.00	1	10/05/2022 00:31	WG1937343
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/05/2022 00:31	WG1937343
Toluene	108-88-3	0.285	J	0.278	0.600	1.20	1	10/05/2022 00:31	WG1937343
1,2,3-Trichlorobenzene	87-61-6	0.500	C4 U	0.230	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2,4-Trichlorobenzene	120-82-1	1.00	U	0.481	1.00	2.00	1	10/05/2022 00:31	WG1937343
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/05/2022 00:31	WG1937343
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/05/2022 00:31	WG1937343
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/05/2022 00:31	WG1937343
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	10/05/2022 00:31	WG1937343
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/05/2022 00:31	WG1937343
1,2,3-Trichloropropane	96-18-4	1.00	J4 U	0.237	1.00	2.50	1	10/05/2022 00:31	WG1937343
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/05/2022 00:31	WG1937343
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/05/2022 00:31	WG1937343
(S) Toluene-d8	*2037-26-5*	*114*	J1			*89.0-112*		*10/05/2022 00:31*	WG1937343
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*10/05/2022 00:31*	WG1937343
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*111*				*81.0-118*		*10/05/2022 00:31*	WG1937343

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 21:43	WG1934826
(S) o-Terphenyl	*84-15-1*	*102*				*50.0-150*		*10/01/2022 21:43*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.7	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		57700		8450	10000	20000	1	10/01/2022 11:30	WG1935544
Alkalinity,Bicarbonate		57700		8450	10000	20000	1	10/01/2022 11:30	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:30	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:30	WG1935544

Sample Narrative:

L1540948-03 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	217	J J3 J6 P1	140	300	600	1	10/04/2022 21:22	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	402		50.0	100	200	1	10/04/2022 16:55	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	3720	J	594	2500	5000	1	10/03/2022 23:40	WG1935036

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	4520		20.5	50.0	100	1	10/19/2022 15:26	WG1940061
Manganese	7439-96-5	121		0.855	5.00	10.0	1	10/19/2022 15:26	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	J5 U	0.0941	0.500	1.00	1	10/04/2022 23:14	WG1937331
Ethylbenzene	100-41-4	0.500	J5 U	0.137	0.500	1.00	1	10/04/2022 23:14	WG1937331
Toluene	108-88-3	0.600	J5 U	0.278	0.600	1.20	1	10/04/2022 23:14	WG1937331
Total Xylenes	1330-20-7	1.50	J5 U	0.174	1.50	3.00	1	10/04/2022 23:14	WG1937331
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/04/2022 23:14*	WG1937331
(S) 4-Bromofluorobenzene	*460-00-4*	*109*				*85.0-114*		*10/04/2022 23:14*	WG1937331
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*85.0*				*81.0-118*		*10/04/2022 23:14*	WG1937331

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 19:02	WG1934826
(S) o-Terphenyl	*84-15-1*	*93.4*				*50.0-150*		*10/01/2022 19:02*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.7	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		59100		8450	10000	20000	1	10/01/2022 11:38	WG1935544
Alkalinity,Bicarbonate		59100		8450	10000	20000	1	10/01/2022 11:38	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:38	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:38	WG1935544

Sample Narrative:
L1540948-04 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:31	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	402		50.0	100	200	1	10/04/2022 17:01	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	4220	J	594	2500	5000	1	10/03/2022 23:07	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	4810		20.5	50.0	100	1	10/19/2022 15:43	WG1940061
Manganese	7439-96-5	104		0.855	5.00	10.0	1	10/19/2022 15:43	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/04/2022 23:35	WG1937331
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/04/2022 23:35	WG1937331
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/04/2022 23:35	WG1937331
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/04/2022 23:35	WG1937331
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/04/2022 23:35*	WG1937331
(S) 4-Bromofluorobenzene	*460-00-4*	*107*				*85.0-114*		*10/04/2022 23:35*	WG1937331
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*90.1*				*81.0-118*		*10/04/2022 23:35*	WG1937331

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 22:06	WG1934826
(S) o-Terphenyl	*84-15-1*	*98.3*				*50.0-150*		*10/01/2022 22:06*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.7	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	25.0	U	11.3	25.0	50.0	1	10/05/2022 00:01	WG1937343
Acrolein	107-02-8	25.0	J4 U	2.54	25.0	50.0	1	10/05/2022 00:01	WG1937343
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/05/2022 00:01	WG1937343
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/05/2022 00:01	WG1937343
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/05/2022 00:01	WG1937343
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/05/2022 00:01	WG1937343
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/05/2022 00:01	WG1937343
Bromomethane	74-83-9	2.00	C4 J3 J4 U	0.605	2.00	5.00	1	10/05/2022 00:01	WG1937343
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/05/2022 00:01	WG1937343
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/05/2022 00:01	WG1937343
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/05/2022 00:01	WG1937343
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/05/2022 00:01	WG1937343
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/05/2022 00:01	WG1937343
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/05/2022 00:01	WG1937343
Chloroethane	75-00-3	2.00	C4 U	0.192	2.00	5.00	1	10/05/2022 00:01	WG1937343
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/05/2022 00:01	WG1937343
Chloromethane	74-87-3	2.00	U	0.960	2.00	4.00	1	10/05/2022 00:01	WG1937343
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/05/2022 00:01	WG1937343
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	U	0.276	2.00	5.00	1	10/05/2022 00:01	WG1937343
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/05/2022 00:01	WG1937343
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/05/2022 00:01	WG1937343
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/05/2022 00:01	WG1937343
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/05/2022 00:01	WG1937343
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/05/2022 00:01	WG1937343
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/05/2022 00:01	WG1937343
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/05/2022 00:01	WG1937343
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/05/2022 00:01	WG1937343
Di-isopropyl ether	108-20-3	0.500	J4 U	0.105	0.500	1.00	1	10/05/2022 00:01	WG1937343
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/05/2022 00:01	WG1937343
Hexachloro-1,3-butadiene	87-68-3	0.750	U	0.337	0.750	1.50	1	10/05/2022 00:01	WG1937343
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/05/2022 00:01	WG1937343
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/05/2022 00:01	WG1937343
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/05/2022 00:01	WG1937343
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/05/2022 00:01	WG1937343
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	J4 U	0.478	5.00	10.0	1	10/05/2022 00:01	WG1937343
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/05/2022 00:01	WG1937343
Naphthalene	91-20-3	2.00	C4 J4 U	1.00	2.00	5.00	1	10/05/2022 00:01	WG1937343
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/05/2022 00:01	WG1937343
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/05/2022 00:01	WG1937343

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,1,2,2-Tetrachloroethane	79-34-5	0.500	J4 U	0.133	0.500	1.00	1	10/05/2022 00:01	WG1937343
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/05/2022 00:01	WG1937343
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/05/2022 00:01	WG1937343
1,2,3-Trichlorobenzene	87-61-6	0.500	C4 U	0.230	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2,4-Trichlorobenzene	120-82-1	1.00	U	0.481	1.00	2.00	1	10/05/2022 00:01	WG1937343
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/05/2022 00:01	WG1937343
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/05/2022 00:01	WG1937343
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/05/2022 00:01	WG1937343
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	10/05/2022 00:01	WG1937343
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/05/2022 00:01	WG1937343
1,2,3-Trichloropropane	96-18-4	1.00	J4 U	0.237	1.00	2.50	1	10/05/2022 00:01	WG1937343
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/05/2022 00:01	WG1937343
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/05/2022 00:01	WG1937343
(S) Toluene-d8	*2037-26-5*	*114*	J1			*89.0-112*		*10/05/2022 00:01*	WG1937343
(S) 4-Bromofluorobenzene	*460-00-4*	*96.9*				*85.0-114*		*10/05/2022 00:01*	WG1937343
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*107*				*81.0-118*		*10/05/2022 00:01*	WG1937343

Method Blank (MB)

(MB) R3843643-2 10/01/22 10:04

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Alkalinity	10000	U	8450	10000	20000
Alkalinity,Bicarbonate	10000	U	8450	10000	20000
Alkalinity,Carbonate	10000	U	8450	10000	20000
Alkalinity,Hydroxide	10000	U	8450	10000	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1540085-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1540085-06 10/01/22 10:15 • (DUP) R3843643-3 10/01/22 10:18

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	667000	665000	1	0.262		20
Alkalinity,Bicarbonate	667000	665000	1	0.262		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/01/22 10:22 • (DUP) R3843643-4 10/01/22 10:25

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	109000	110000	1	0.841		20
Alkalinity,Bicarbonate	109000	110000	1	0.841		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/01/22 11:30 • (DUP) R3843643-5 10/01/22 11:34

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	57700	57100	1	0.978		20
Alkalinity,Bicarbonate	57700	57100	1	0.978		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3843643-1 10/01/22 10:00

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	102000	102	85.0-115	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3844701-1 10/04/22 21:13

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Kjeldahl Nitrogen, TKN	300	U	140	300	600

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/04/22 21:22 • (DUP) R3844701-3 10/04/22 21:24

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	217	300	1	200	P1 U	20

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/04/22 21:41 • (DUP) R3844701-6 10/04/22 21:45

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	300	300	1	0.000	U	20

Laboratory Control Sample (LCS)

(LCS) R3844701-2 10/04/22 21:14

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Kjeldahl Nitrogen, TKN	12700	13100	103	74.0-124	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/04/22 21:22 • (MS) R3844701-4 10/04/22 21:25 • (MSD) R3844701-5 10/04/22 21:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	5000	217	5380	843	103	12.5	1	90.0-110		J3 J6	146	20

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 21:41 • (MS) R3844701-7 10/04/22 21:47 • (MSD) R3844701-8 10/04/22 21:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	5000	300	5170	5110	103	102	1	90.0-110			1.17	20

Method Blank (MB)

(MB) R3844674-1 10/04/22 16:24

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Nitrate-Nitrite	100	U	50.0	100	200

L1540788-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540788-01 10/04/22 16:32 • (DUP) R3844674-3 10/04/22 16:34

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	1740	1740	1	0.000		20

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/04/22 16:55 • (DUP) R3844674-5 10/04/22 16:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	402	409	1	1.73		20

Laboratory Control Sample (LCS)

(LCS) R3844674-2 10/04/22 16:25

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate-Nitrite	2500	2640	106	90.0-110	

L1540788-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1540788-01 10/04/22 16:32 • (MS) R3844674-4 10/04/22 16:39

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Nitrate-Nitrite	2500	1740	4340	104	1	90.0-110	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/04/22 16:55 • (MS) R3844674-6 10/04/22 16:58 • (MSD) R3844674-7 10/04/22 16:59

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	2500	402	2940	2990	102	104	1	90.0-110			1.69	20

Method Blank (MB)

(MB) R3843182-1 09/29/22 13:58

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Sulfate	2500	U	594	2500	5000

L1540948-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-01 09/30/22 01:50 • (DUP) R3843182-3 09/30/22 02:03

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	2500	2500	1	0.000	U	15

L1541035-31 Original Sample (OS) • Duplicate (DUP)

(OS) L1541035-31 09/30/22 05:57 • (DUP) R3843182-6 09/30/22 06:10

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	37500	38100	1	1.75		15

Laboratory Control Sample (LCS)

(LCS) R3843182-2 09/29/22 14:11

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	39700	99.2	87.0-112	

L1540948-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-01 09/30/22 01:50 • (MS) R3843182-4 09/30/22 02:17 • (MSD) R3843182-5 09/30/22 02:56

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	2500	49500	50000	99.1	100	1	87.0-112			0.930	15

L1541035-31 Original Sample (OS) • Matrix Spike (MS)

(OS) L1541035-31 09/30/22 05:57 • (MS) R3843182-7 09/30/22 06:23

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	37500	88800	103	1	87.0-112	

Method Blank (MB)

(MB) R3844341-1 10/03/22 19:45

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Sulfate	2500	U	594	2500	5000

L1540948-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-04 10/03/22 23:07 • (DUP) R3844341-3 10/03/22 23:19

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	4220	4200	1	0.613	J	15

L1541084-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1541084-04 10/04/22 04:28 • (DUP) R3844341-6 10/04/22 04:41

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	66200	65600	1	0.796		15

Laboratory Control Sample (LCS)

(LCS) R3844341-2 10/03/22 19:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	40300	101	87.0-112	

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 01:28 • (MS) R3844341-4 10/04/22 01:41 • (MSD) R3844341-5 10/04/22 01:54

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	4560	52700	54100	96.2	99.0	1	87.0-112			2.60	15

L1541084-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1541084-04 10/04/22 04:28 • (MS) R3844341-7 10/04/22 04:53

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	66200	113000	93.3	1	87.0-112	

Method Blank (MB)

(MB) R3844361-1 10/03/22 20:02

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Sulfate	2500	U	594	2500	5000

L1541043-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1541043-01 10/04/22 00:27 • (DUP) R3844361-5 10/04/22 00:43

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	113000	113000	1	0.0451		15

L1541726-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1541726-01 10/04/22 06:33 • (DUP) R3844361-6 10/04/22 06:49

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	7890	7800	1	1.22		15

Laboratory Control Sample (LCS)

(LCS) R3844361-2 10/03/22 20:18

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	41600	104	87.0-112	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/03/22 23:40 • (MS) R3844361-3 10/03/22 23:56 • (MSD) R3844361-4 10/04/22 00:11

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	3720	54000	53800	101	100	1	87.0-112			0.462	15

L1541726-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1541726-01 10/04/22 06:33 • (MS) R3844361-7 10/04/22 07:05

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	7890	58800	102	1	87.0-112	

Method Blank (MB)

(MB) R3850672-1 10/19/22 15:20

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Iron	50.0	U	20.5	50.0	100
Manganese	5.00	U	0.855	5.00	10.0

Laboratory Control Sample (LCS)

(LCS) R3850672-2 10/19/22 15:23

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Iron	10000	9600	96.0	87.0-115	
Manganese	1000	912	91.2	90.0-114	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/19/22 15:26 • (MS) R3850672-4 10/19/22 15:32 • (MSD) R3850672-5 10/19/22 15:34

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Iron	10000	4520	14100	15900	96.0	114	1	87.0-115			11.9	20
Manganese	1000	121	1040	1050	91.7	93.0	1	90.0-114			1.26	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Ds
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

Method Blank (MB)

(MB) R3843739-3 10/01/22 09:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acrolein	25.0	U	2.54	25.0	50.0
Acrylonitrile	5.00	U	0.671	5.00	10.0
Benzene	0.500	U	0.0941	0.500	1.00
Bromobenzene	0.500	U	0.118	0.500	1.00
Bromodichloromethane	0.500	U	0.136	0.500	1.00
Bromoform	0.500	U	0.129	0.500	1.00
Bromomethane	2.00	U	0.605	2.00	5.00
n-Butylbenzene	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	0.500	U	0.128	0.500	1.00
Chlorobenzene	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	0.500	U	0.140	0.500	1.00
Chloroethane	2.00	U	0.192	2.00	5.00
Chloroform	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	0.500	U	0.126	0.500	1.00
Dibromomethane	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	0.500	U	0.105	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
Isopropylbenzene	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	5.00	U	1.19	5.00	10.0
Methylene Chloride	2.00	U	0.430	2.00	5.00

Method Blank (MB)

(MB) R3843739-3 10/01/22 09:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Methyl tert-butyl ether	0.500	U	0.101	0.500	1.00
Naphthalene	2.00	U	1.00	2.00	5.00
n-Propylbenzene	0.500	U	0.0993	0.500	1.00
Styrene	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	0.500	U	0.133	0.500	1.00
Tetrachloroethene	0.600	U	0.300	0.600	1.20
Toluene	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	0.500	U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	0.500	U	0.158	0.500	1.00
Trichloroethene	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	1.00	U	0.237	1.00	2.50
Vinyl chloride	0.500	U	0.234	0.500	1.00
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*103*				*89.0-112*
(S) 4-Bromofluorobenzene	*107*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*94.5*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acrolein	25.0	20.4	18.4	81.6	73.6	39.0-155			10.3	20
Acrylonitrile	25.0	25.0	23.3	100	93.2	63.0-135			7.04	20
Benzene	5.00	5.48	5.44	110	109	79.0-120			0.733	20
Bromobenzene	5.00	4.28	4.68	85.6	93.6	80.0-120			8.93	20
Bromodichloromethane	5.00	5.24	4.99	105	99.8	79.0-125			4.89	20
Bromoform	5.00	4.63	4.15	92.6	83.0	66.0-130			10.9	20
Bromomethane	5.00	5.77	5.65	115	113	53.0-141			2.10	20
n-Butylbenzene	5.00	4.41	3.95	88.2	79.0	75.0-128			11.0	20
sec-Butylbenzene	5.00	4.84	4.88	96.8	97.6	77.0-126			0.823	20
tert-Butylbenzene	5.00	4.58	4.87	91.6	97.4	78.0-124			6.14	20
Carbon tetrachloride	5.00	5.33	5.67	107	113	72.0-136			6.18	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chlorobenzene	5.00	4.92	4.98	98.4	99.6	82.0-118			1.21	20
Chlorodibromomethane	5.00	4.45	4.45	89.0	89.0	74.0-126			0.000	20
Chloroethane	5.00	5.58	5.89	112	118	60.0-138			5.41	20
Chloroform	5.00	5.79	5.86	116	117	79.0-124			1.20	20
2-Chlorotoluene	5.00	4.66	4.73	93.2	94.6	79.0-122			1.49	20
4-Chlorotoluene	5.00	4.30	4.56	86.0	91.2	78.0-122			5.87	20
1,2-Dibromoethane	5.00	4.84	4.84	96.8	96.8	77.0-121			0.000	20
Dibromomethane	5.00	5.65	5.61	113	112	79.0-123			0.710	20
1,2-Dichlorobenzene	5.00	4.87	4.51	97.4	90.2	80.0-119			7.68	20
1,3-Dichlorobenzene	5.00	4.68	4.69	93.6	93.8	80.0-119			0.213	20
1,4-Dichlorobenzene	5.00	4.59	4.71	91.8	94.2	79.0-118			2.58	20
Dichlorodifluoromethane	5.00	5.02	5.12	100	102	32.0-152			1.97	20
1,1-Dichloroethane	5.00	5.27	5.42	105	108	77.0-125			2.81	20
1,2-Dichloroethane	5.00	5.23	5.14	105	103	73.0-128			1.74	20
1,1-Dichloroethene	5.00	5.63	6.11	113	122	71.0-131			8.18	20
cis-1,2-Dichloroethene	5.00	5.79	5.88	116	118	78.0-123			1.54	20
trans-1,2-Dichloroethene	5.00	5.60	5.67	112	113	75.0-124			1.24	20
1,2-Dichloropropane	5.00	4.87	4.70	97.4	94.0	78.0-122			3.55	20
1,3-Dichloropropane	5.00	4.47	4.66	89.4	93.2	80.0-119			4.16	20
2,2-Dichloropropane	5.00	5.52	5.38	110	108	60.0-139			2.57	20
1,1-Dichloropropene	5.00	5.16	5.32	103	106	79.0-125			3.05	20
cis-1,3-Dichloropropene	5.00	4.54	4.49	90.8	89.8	75.0-124			1.11	20
trans-1,3-Dichloropropene	5.00	4.01	3.95	80.2	79.0	73.0-127			1.51	20
Di-isopropyl ether	5.00	4.29	4.22	85.8	84.4	67.0-128			1.65	20
Ethylbenzene	5.00	5.27	5.04	105	101	79.0-121			4.46	20
Isopropylbenzene	5.00	5.25	4.99	105	99.8	72.0-131			5.08	20
p-Isopropyltoluene	5.00	4.60	4.56	92.0	91.2	77.0-127			0.873	20
2-Butanone (MEK)	25.0	22.1	20.5	88.4	82.0	56.0-143			7.51	20
Methylene Chloride	5.00	5.69	5.90	114	118	74.0-124			3.62	20
Methyl tert-butyl ether	5.00	5.45	5.51	109	110	71.0-124			1.09	20
Naphthalene	5.00	4.11	3.26	82.2	65.2	61.0-128		J3	23.1	20
n-Propylbenzene	5.00	4.35	4.68	87.0	93.6	76.0-126			7.31	20
Styrene	5.00	4.84	4.69	96.8	93.8	78.0-123			3.15	20
1,1,1,2-Tetrachloroethane	5.00	4.81	4.70	96.2	94.0	78.0-124			2.31	20
1,1,2,2-Tetrachloroethane	5.00	4.49	4.85	89.8	97.0	71.0-121			7.71	20
Tetrachloroethene	5.00	5.00	5.09	100	102	74.0-129			1.78	20
Toluene	5.00	4.69	4.84	93.8	96.8	80.0-121			3.15	20
1,2,3-Trichlorobenzene	5.00	4.41	3.35	88.2	67.0	69.0-129		J3 J4	27.3	20
1,2,3-Trimethylbenzene	5.00	4.82	4.66	96.4	93.2	82.0-120			3.38	20
1,2,4-Trimethylbenzene	5.00	4.55	4.49	91.0	89.8	76.0-124			1.33	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Ds
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,3,5-Trimethylbenzene	5.00	4.58	4.82	91.6	96.4	75.0-124			5.11	20
1,1,1-Trichloroethane	5.00	5.62	5.64	112	113	74.0-131			0.355	20
1,1,2-Trichloroethane	5.00	4.82	5.03	96.4	101	80.0-119			4.26	20
Trichloroethene	5.00	5.51	5.51	110	110	79.0-123			0.000	20
1,1,2-Trichlorotrifluoroethane	5.00	6.24	6.30	125	126	70.0-136			0.957	20
1,2,3-Trichloropropane	5.00	4.69	5.36	93.8	107	73.0-122			13.3	20
Vinyl chloride	5.00	5.47	5.43	109	109	58.0-137			0.734	20
Xylenes, Total	15.0	15.5	15.2	103	101	79.0-121			1.95	20
(S) Toluene-d8				*99.6*	*103*	*89.0-112*				
(S) 4-Bromofluorobenzene				*108*	*102*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*97.6*	*97.4*	*81.0-118*				

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acrolein	25.0	25.0	26.5	28.3	106	113	1	39.0-155			6.57	20
Acrylonitrile	25.0	5.00	28.6	29.6	114	118	1	63.0-135			3.44	20
Benzene	5.00	0.614	7.71	7.92	142	146	1	79.0-120	J5	J5	2.69	20
Bromobenzene	5.00	0.500	5.41	5.67	108	113	1	80.0-120			4.69	20
Bromodichloromethane	5.00	0.500	6.70	6.89	134	138	1	79.0-125	J5	J5	2.80	20
Bromoform	5.00	0.500	5.45	5.63	109	113	1	66.0-130			3.25	20
Bromomethane	5.00	2.00	7.23	8.28	145	166	1	53.0-141	J5	J5	13.5	20
n-Butylbenzene	5.00	1.62	6.41	6.43	95.8	96.2	1	75.0-128			0.312	20
sec-Butylbenzene	5.00	1.49	7.05	7.45	111	119	1	77.0-126			5.52	20
tert-Butylbenzene	5.00	0.171	5.52	6.11	107	119	1	78.0-124			10.1	20
Carbon tetrachloride	5.00	0.500	7.80	8.12	156	162	1	72.0-136	J5	J5	4.02	20
Chlorobenzene	5.00	0.500	6.22	6.41	124	128	1	82.0-118	J5	J5	3.01	20
Chlorodibromomethane	5.00	0.500	5.41	5.87	108	117	1	74.0-126			8.16	20
Chloroethane	5.00	2.00	8.44	8.64	169	173	1	60.0-138	J5	J5	2.34	20
Chloroform	5.00	2.00	7.49	7.92	150	158	1	79.0-124	J5	J5	5.58	20
2-Chlorotoluene	5.00	0.500	5.44	5.96	109	119	1	79.0-122			9.12	20
4-Chlorotoluene	5.00	0.500	5.29	5.78	106	116	1	78.0-122			8.85	20
1,2-Dibromoethane	5.00	0.500	5.79	6.21	116	124	1	77.0-121		J5	7.00	20
Dibromomethane	5.00	0.500	6.98	7.00	140	140	1	79.0-123	J5	J5	0.286	20
1,2-Dichlorobenzene	5.00	0.550	6.73	6.65	124	122	1	80.0-119	J5	J5	1.20	20
1,3-Dichlorobenzene	5.00	0.500	5.65	6.02	113	120	1	80.0-119		J5	6.34	20
1,4-Dichlorobenzene	5.00	0.500	5.79	6.02	116	120	1	79.0-118		J5	3.90	20

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Dichlorodifluoromethane	5.00	2.00	7.07	7.55	141	151	1	32.0-152			6.57	20
1,1-Dichloroethane	5.00	0.500	6.91	7.37	138	147	1	77.0-125	J5	J5	6.44	20
1,2-Dichloroethane	5.00	0.500	6.61	6.69	132	134	1	73.0-128	J5	J5	1.20	20
1,1-Dichloroethene	5.00	0.500	7.65	8.47	153	169	1	71.0-131	J5	J5	10.2	20
cis-1,2-Dichloroethene	5.00	0.500	7.47	7.62	149	152	1	78.0-123	J5	J5	1.99	20
trans-1,2-Dichloroethene	5.00	0.500	7.64	7.76	153	155	1	75.0-124	J5	J5	1.56	20
1,2-Dichloropropane	5.00	0.500	6.23	6.63	125	133	1	78.0-122	J5	J5	6.22	20
1,3-Dichloropropane	5.00	0.500	5.53	5.93	111	119	1	80.0-119			6.98	20
2,2-Dichloropropane	5.00	0.500	7.94	8.47	159	169	1	60.0-139	J5	J5	6.46	20
1,1-Dichloropropene	5.00	0.500	7.35	7.57	147	151	1	79.0-125	J5	J5	2.95	20
cis-1,3-Dichloropropene	5.00	0.500	5.83	6.04	117	121	1	75.0-124			3.54	20
trans-1,3-Dichloropropene	5.00	0.500	5.09	5.34	102	107	1	73.0-127			4.79	20
Di-isopropyl ether	5.00	0.500	5.37	5.78	107	116	1	67.0-128			7.35	20
Ethylbenzene	5.00	2.03	8.88	8.97	137	139	1	79.0-121	J5	J5	1.01	20
Isopropylbenzene	5.00	2.52	9.16	9.72	133	144	1	72.0-131	J5	J5	5.93	20
p-Isopropyltoluene	5.00	2.45	7.97	8.28	110	117	1	77.0-127			3.82	20
2-Butanone (MEK)	25.0	5.00	24.8	25.4	99.2	102	1	56.0-143			2.39	20
Methylene Chloride	5.00	2.00	7.32	7.70	146	154	1	74.0-124	J5	J5	5.06	20
Methyl tert-butyl ether	5.00	0.500	6.87	7.22	137	144	1	71.0-124	J5	J5	4.97	20
Naphthalene	5.00	25.1	27.0	21.6	38.0	0.000	1	61.0-128	V	J3 V	22.2	20
n-Propylbenzene	5.00	2.63	8.01	8.73	108	122	1	76.0-126			8.60	20
Styrene	5.00	0.500	6.17	6.43	123	129	1	78.0-123		J5	4.13	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.09	6.35	122	127	1	78.0-124		J5	4.18	20
1,1,2,2-Tetrachloroethane	5.00	0.500	5.63	6.03	113	121	1	71.0-121			6.86	20
Tetrachloroethene	5.00	0.600	6.88	7.17	138	143	1	74.0-129	J5	J5	4.13	20
Toluene	5.00	0.600	5.93	6.32	119	126	1	80.0-121		J5	6.37	20
1,2,3-Trichlorobenzene	5.00	0.500	5.67	5.03	113	101	1	69.0-129			12.0	20
1,2,3-Trimethylbenzene	5.00	5.68	11.6	11.7	118	120	1	82.0-120			0.858	20
1,2,4-Trimethylbenzene	5.00	30.0	35.4	35.6	108	112	1	76.0-124			0.563	20
1,3,5-Trimethylbenzene	5.00	0.500	5.59	6.14	112	123	1	75.0-124			9.38	20
1,1,1-Trichloroethane	5.00	0.500	7.83	8.12	157	162	1	74.0-131	J5	J5	3.64	20
1,1,2-Trichloroethane	5.00	0.500	5.78	6.23	116	125	1	80.0-119		J5	7.49	20
Trichloroethene	5.00	0.500	6.91	7.35	138	147	1	79.0-123	J5	J5	6.17	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.21	9.14	164	183	1	70.0-136	J5	J5	10.7	20
1,2,3-Trichloropropane	5.00	1.00	5.12	5.84	102	117	1	73.0-122			13.1	20
Vinyl chloride	5.00	0.500	8.40	8.75	168	175	1	58.0-137	J5	J5	4.08	20
Xylenes, Total	15.0	0.379	19.8	21.1	129	138	1	79.0-121	J5	J5	6.36	20
(S) Toluene-d8					*95.3*	*98.0*		*89.0-112*				
(S) 4-Bromofluorobenzene					*108*	*108*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*101*	*101*		*81.0-118*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acrolein	25.0	25.0	37.6	36.3	150	145	1	39.0-155			3.52	20
Acrylonitrile	25.0	5.00	32.9	31.5	132	126	1	63.0-135			4.35	20
Benzene	5.00	0.500	7.55	7.48	151	150	1	79.0-120	J5	J5	0.931	20
Bromobenzene	5.00	0.500	5.59	5.86	112	117	1	80.0-120			4.72	20
Bromodichloromethane	5.00	0.500	6.96	6.82	139	136	1	79.0-125	J5	J5	2.03	20
Bromoform	5.00	0.500	5.87	5.86	117	117	1	66.0-130			0.171	20
Bromomethane	5.00	2.00	7.98	7.96	160	159	1	53.0-141	J5	J5	0.251	20
n-Butylbenzene	5.00	0.500	6.09	6.17	122	123	1	75.0-128			1.31	20
sec-Butylbenzene	5.00	0.500	6.68	6.91	134	138	1	77.0-126	J5	J5	3.38	20
tert-Butylbenzene	5.00	0.500	6.39	6.49	128	130	1	78.0-124	J5	J5	1.55	20
Carbon tetrachloride	5.00	0.500	8.15	7.78	163	156	1	72.0-136	J5	J5	4.65	20
Chlorobenzene	5.00	0.500	6.57	6.76	131	135	1	82.0-118	J5	J5	2.85	20
Chlorodibromomethane	5.00	0.500	5.82	5.70	116	114	1	74.0-126			2.08	20
Chloroethane	5.00	2.00	8.56	8.24	171	165	1	60.0-138	J5	J5	3.81	20
Chloroform	5.00	2.00	7.92	7.67	158	153	1	79.0-124	J5	J5	3.21	20
2-Chlorotoluene	5.00	0.500	6.15	6.27	123	125	1	79.0-122	J5	J5	1.93	20
4-Chlorotoluene	5.00	0.500	5.79	5.95	116	119	1	78.0-122			2.73	20
1,2-Dibromoethane	5.00	0.500	6.23	6.42	125	128	1	77.0-121	J5	J5	3.00	20
Dibromomethane	5.00	0.500	7.26	7.11	145	142	1	79.0-123	J5	J5	2.09	20
1,2-Dichlorobenzene	5.00	0.500	6.52	6.72	130	134	1	80.0-119	J5	J5	3.02	20
1,3-Dichlorobenzene	5.00	0.500	6.20	6.20	124	124	1	80.0-119	J5	J5	0.000	20
1,4-Dichlorobenzene	5.00	0.500	5.96	6.24	119	125	1	79.0-118	J5	J5	4.59	20
Dichlorodifluoromethane	5.00	2.00	7.45	7.60	149	152	1	32.0-152			1.99	20
1,1-Dichloroethane	5.00	0.500	7.49	7.01	150	140	1	77.0-125	J5	J5	6.62	20
1,2-Dichloroethane	5.00	0.500	7.13	6.65	143	133	1	73.0-128	J5	J5	6.97	20
1,1-Dichloroethene	5.00	0.500	8.65	8.12	173	162	1	71.0-131	J5	J5	6.32	20
cis-1,2-Dichloroethene	5.00	0.500	8.19	7.47	164	149	1	78.0-123	J5	J5	9.20	20
trans-1,2-Dichloroethene	5.00	0.500	7.97	7.83	159	157	1	75.0-124	J5	J5	1.77	20
1,2-Dichloropropane	5.00	0.500	6.64	6.55	133	131	1	78.0-122	J5	J5	1.36	20
1,3-Dichloropropane	5.00	0.500	5.99	5.80	120	116	1	80.0-119	J5		3.22	20
2,2-Dichloropropane	5.00	0.500	8.51	7.94	170	159	1	60.0-139	J5	J5	6.93	20
1,1-Dichloropropene	5.00	0.500	7.89	7.97	158	159	1	79.0-125	J5	J5	1.01	20
cis-1,3-Dichloropropene	5.00	0.500	6.13	6.30	123	126	1	75.0-124		J5	2.74	20
trans-1,3-Dichloropropene	5.00	0.500	5.32	5.51	106	110	1	73.0-127			3.51	20
Di-isopropyl ether	5.00	0.500	5.73	5.67	115	113	1	67.0-128			1.05	20
Ethylbenzene	5.00	0.500	6.80	7.29	136	146	1	79.0-121	J5	J5	6.96	20
Isopropylbenzene	5.00	0.500	7.45	7.53	149	151	1	72.0-131	J5	J5	1.07	20
p-Isopropyltoluene	5.00	0.500	6.58	6.71	132	134	1	77.0-127	J5	J5	1.96	20
2-Butanone (MEK)	25.0	5.00	28.4	28.2	114	113	1	56.0-143			0.707	20
Methylene Chloride	5.00	2.00	7.59	7.27	152	145	1	74.0-124	J5	J5	4.31	20

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Methyl tert-butyl ether	5.00	0.500	7.30	7.23	146	145	1	71.0-124	J5	J5	0.964	20
Naphthalene	5.00	2.00	5.20	5.42	104	108	1	61.0-128			4.14	20
n-Propylbenzene	5.00	0.500	6.09	6.22	122	124	1	76.0-126			2.11	20
Styrene	5.00	0.500	6.56	6.71	131	134	1	78.0-123	J5	J5	2.26	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.51	6.73	130	135	1	78.0-124	J5	J5	3.32	20
1,1,2,2-Tetrachloroethane	5.00	0.500	6.31	6.08	126	122	1	71.0-121	J5	J5	3.71	20
Tetrachloroethene	5.00	0.600	7.23	7.35	145	147	1	74.0-129	J5	J5	1.65	20
Toluene	5.00	0.600	6.28	6.36	126	127	1	80.0-121	J5	J5	1.27	20
1,2,3-Trichlorobenzene	5.00	0.500	4.90	5.45	98.0	109	1	69.0-129			10.6	20
1,2,3-Trimethylbenzene	5.00	0.500	6.53	6.64	131	133	1	82.0-120	J5	J5	1.67	20
1,2,4-Trimethylbenzene	5.00	1.00	6.44	6.50	129	130	1	76.0-124	J5	J5	0.927	20
1,3,5-Trimethylbenzene	5.00	0.500	6.52	6.54	130	131	1	75.0-124	J5	J5	0.306	20
1,1,1-Trichloroethane	5.00	0.500	8.34	8.00	167	160	1	74.0-131	J5	J5	4.16	20
1,1,2-Trichloroethane	5.00	0.500	6.29	6.24	126	125	1	80.0-119	J5	J5	0.798	20
Trichloroethene	5.00	0.500	7.39	7.27	148	145	1	79.0-123	J5	J5	1.64	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.72	8.80	174	176	1	70.0-136	J5	J5	0.913	20
1,2,3-Trichloropropane	5.00	1.00	5.70	5.88	114	118	1	73.0-122			3.11	20
Vinyl chloride	5.00	0.500	8.71	8.56	174	171	1	58.0-137	J5	J5	1.74	20
Xylenes, Total	15.0	1.50	20.9	21.1	139	141	1	79.0-121	J5	J5	0.952	20
(S) Toluene-d8					*99.3*	*99.9*		*89.0-112*				
(S) 4-Bromofluorobenzene					*107*	*107*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*99.6*	*96.4*		*81.0-118*				

Method Blank (MB)

(MB) R3845009-3 10/04/22 01:31

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	16.3	J	11.3	25.0	50.0
Chloromethane	2.00	U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	2.00	U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	0.750	U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	5.00	U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	1.00	U	0.481	1.00	2.00
Trichlorofluoromethane	2.00	U	0.160	2.00	5.00
(S) Toluene-d8	*107*				*89.0-112*
(S) 4-Bromofluorobenzene	*110*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*114*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845009-1 10/03/22 23:52 • (LCSD) R3845009-2 10/04/22 00:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	37.2	38.2	149	153	39.0-160			2.65	20
Chloromethane	5.00	4.27	4.07	85.4	81.4	50.0-139			4.80	20
1,2-Dibromo-3-Chloropropane	5.00	4.72	4.19	94.4	83.8	62.0-128			11.9	20
Hexachloro-1,3-butadiene	5.00	4.84	5.09	96.8	102	66.0-134			5.04	20
4-Methyl-2-pentanone (MIBK)	25.0	22.4	21.9	89.6	87.6	67.0-130			2.26	20
1,2,4-Trichlorobenzene	5.00	5.11	4.76	102	95.2	69.0-130			7.09	20
Trichlorofluoromethane	5.00	6.01	5.38	120	108	65.0-141			11.1	20
(S) Toluene-d8				*105*	*104*	*89.0-112*				
(S) 4-Bromofluorobenzene				*109*	*105*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*113*	*111*	*81.0-118*				

Method Blank (MB)

(MB) R3845570-2 10/04/22 21:35

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Benzene	0.500	U	0.0941	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
Toluene	0.600	U	0.278	0.600	1.20
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*102*				*89.0-112*
(S) 4-Bromofluorobenzene	*105*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*85.1*				*81.0-118*

Laboratory Control Sample (LCS)

(LCS) R3845570-1 10/04/22 20:54

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	5.00	5.77	115	79.0-120	
Ethylbenzene	5.00	5.48	110	79.0-121	
Toluene	5.00	4.93	98.6	80.0-121	
Xylenes, Total	15.0	16.4	109	79.0-121	
(S) Toluene-d8			*102*	*89.0-112*	
(S) 4-Bromofluorobenzene			*104*	*85.0-114*	
(S) 1,2-Dichloroethane-d4			*88.5*	*81.0-118*	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/04/22 23:14 • (MS) R3845570-3 10/05/22 07:18 • (MSD) R3845570-4 10/05/22 07:39

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	5.00	0.500	7.86	7.29	157	146	1	79.0-120	J5	J5	7.52	20
Ethylbenzene	5.00	0.500	7.08	6.63	142	133	1	79.0-121	J5	J5	6.56	20
Toluene	5.00	0.600	6.46	5.87	129	117	1	80.0-121	J5		9.57	20
Xylenes, Total	15.0	1.50	20.5	20.2	137	135	1	79.0-121	J5	J5	1.47	20
(S) Toluene-d8					*100*	*99.1*		*89.0-112*				
(S) 4-Bromofluorobenzene					*102*	*105*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*87.6*	*87.9*		*81.0-118*				

Method Blank (MB)

(MB) R3845564-4 10/04/22 23:33

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	25.0	U	11.3	25.0	50.0
Acrolein	25.0	U	2.54	25.0	50.0
Acrylonitrile	5.00	U	0.671	5.00	10.0
Benzene	0.500	U	0.0941	0.500	1.00
Bromobenzene	0.500	U	0.118	0.500	1.00
Bromodichloromethane	0.500	U	0.136	0.500	1.00
Bromoform	0.500	U	0.129	0.500	1.00
Bromomethane	2.00	U	0.605	2.00	5.00
n-Butylbenzene	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	0.500	U	0.128	0.500	1.00
Chlorobenzene	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	0.500	U	0.140	0.500	1.00
Chloroethane	2.00	U	0.192	2.00	5.00
Chloroform	2.00	U	0.111	2.00	5.00
Chloromethane	2.00	U	0.960	2.00	4.00
2-Chlorotoluene	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	0.500	U	0.126	0.500	1.00
1,2-Dibromo-3-Chloropropane	2.00	U	0.276	2.00	5.00
Dibromomethane	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	0.500	U	0.105	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
Hexachloro-1,3-butadiene	0.469	J	0.337	0.750	1.50

Method Blank (MB)

(MB) R3845564-4 10/04/22 23:33

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Isopropylbenzene	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	5.00	U	1.19	5.00	10.0
Methylene Chloride	2.00	U	0.430	2.00	5.00
4-Methyl-2-pentanone (MIBK)	5.00	U	0.478	5.00	10.0
Methyl tert-butyl ether	0.500	U	0.101	0.500	1.00
Naphthalene	2.00	U	1.00	2.00	5.00
n-Propylbenzene	0.500	U	0.0993	0.500	1.00
Styrene	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	0.500	U	0.133	0.500	1.00
Tetrachloroethene	0.600	U	0.300	0.600	1.20
Toluene	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	0.759	J	0.230	0.500	1.00
1,2,4-Trichlorobenzene	1.00	U	0.481	1.00	2.00
1,2,3-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	0.500	U	0.158	0.500	1.00
Trichloroethene	0.500	U	0.190	0.500	1.00
Trichlorofluoromethane	2.00	U	0.160	2.00	5.00
1,1,2-Trichlorotrifluoroethane	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	1.00	U	0.237	1.00	2.50
Vinyl chloride	0.500	U	0.234	0.500	1.00
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*112*				*89.0-112*
(S) 4-Bromofluorobenzene	*95.8*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*110*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845564-1 10/04/22 21:50 • (LCSD) R3845564-3 10/04/22 23:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	34.8	34.7	139	139	39.0-160			0.288	20
Acrolein	25.0	39.7	38.6	159	154	39.0-155	J4		2.81	20
Acrylonitrile	25.0	33.0	33.2	132	133	63.0-135			0.604	20
Benzene	5.00	5.17	5.03	103	101	79.0-120			2.75	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845564-1 10/04/22 21:50 • (LCSD) R3845564-3 10/04/22 23:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromobenzene	5.00	5.58	6.01	112	120	80.0-120			7.42	20
Bromodichloromethane	5.00	4.78	4.92	95.6	98.4	79.0-125			2.89	20
Bromoform	5.00	4.58	4.83	91.6	96.6	66.0-130			5.31	20
Bromomethane	5.00	0.466	0.804	9.32	16.1	53.0-141	J4	J3 J4	53.2	20
n-Butylbenzene	5.00	4.40	4.57	88.0	91.4	75.0-128			3.79	20
sec-Butylbenzene	5.00	5.27	5.16	105	103	77.0-126			2.11	20
tert-Butylbenzene	5.00	4.79	4.91	95.8	98.2	78.0-124			2.47	20
Carbon tetrachloride	5.00	4.91	4.78	98.2	95.6	72.0-136			2.68	20
Chlorobenzene	5.00	4.90	5.21	98.0	104	82.0-118			6.13	20
Chlorodibromomethane	5.00	4.63	5.11	92.6	102	74.0-126			9.86	20
Chloroethane	5.00	3.96	3.98	79.2	79.6	60.0-138			0.504	20
Chloroform	5.00	4.92	5.04	98.4	101	79.0-124			2.41	20
Chloromethane	5.00	5.03	4.97	101	99.4	50.0-139			1.20	20
2-Chlorotoluene	5.00	5.25	5.38	105	108	79.0-122			2.45	20
4-Chlorotoluene	5.00	5.16	5.23	103	105	78.0-122			1.35	20
1,2-Dibromoethane	5.00	4.90	5.54	98.0	111	77.0-121			12.3	20
1,2-Dibromo-3-Chloropropane	5.00	4.37	3.77	87.4	75.4	62.0-128			14.7	20
Dibromomethane	5.00	4.74	4.87	94.8	97.4	79.0-123			2.71	20
1,2-Dichlorobenzene	5.00	5.31	5.53	106	111	80.0-119			4.06	20
1,3-Dichlorobenzene	5.00	5.04	5.43	101	109	80.0-119			7.45	20
1,4-Dichlorobenzene	5.00	5.27	5.62	105	112	79.0-118			6.43	20
Dichlorodifluoromethane	5.00	4.53	4.49	90.6	89.8	32.0-152			0.887	20
1,1-Dichloroethane	5.00	5.28	5.29	106	106	77.0-125			0.189	20
1,2-Dichloroethane	5.00	4.74	4.86	94.8	97.2	73.0-128			2.50	20
1,1-Dichloroethene	5.00	4.76	5.33	95.2	107	71.0-131			11.3	20
cis-1,2-Dichloroethene	5.00	4.61	4.96	92.2	99.2	78.0-123			7.31	20
trans-1,2-Dichloroethene	5.00	4.82	4.83	96.4	96.6	75.0-124			0.207	20
1,2-Dichloropropane	5.00	5.21	5.30	104	106	78.0-122			1.71	20
1,3-Dichloropropane	5.00	5.23	5.91	105	118	80.0-119			12.2	20
2,2-Dichloropropane	5.00	4.68	4.95	93.6	99.0	60.0-139			5.61	20
1,1-Dichloropropene	5.00	4.93	5.03	98.6	101	79.0-125			2.01	20
cis-1,3-Dichloropropene	5.00	4.63	4.75	92.6	95.0	75.0-124			2.56	20
trans-1,3-Dichloropropene	5.00	4.82	5.30	96.4	106	73.0-127			9.49	20
Di-isopropyl ether	5.00	6.81	6.83	136	137	67.0-128	J4	J4	0.293	20
Ethylbenzene	5.00	4.65	4.90	93.0	98.0	79.0-121			5.24	20
Hexachloro-1,3-butadiene	5.00	5.87	5.26	117	105	66.0-134			11.0	20
Isopropylbenzene	5.00	4.42	4.72	88.4	94.4	72.0-131			6.56	20
p-Isopropyltoluene	5.00	4.84	5.05	96.8	101	77.0-127			4.25	20
2-Butanone (MEK)	25.0	34.4	33.7	138	135	56.0-143			2.06	20
Methylene Chloride	5.00	5.16	5.12	103	102	74.0-124			0.778	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845564-1 10/04/22 21:50 • (LCSD) R3845564-3 10/04/22 23:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
4-Methyl-2-pentanone (MIBK)	25.0	34.0	35.3	136	141	67.0-130	J4	J4	3.75	20
Methyl tert-butyl ether	5.00	5.02	5.18	100	104	71.0-124			3.14	20
Naphthalene	5.00	2.00	2.42	40.0	48.4	61.0-128	J4	J4	19.0	20
n-Propylbenzene	5.00	5.16	5.21	103	104	76.0-126			0.964	20
Styrene	5.00	4.21	4.63	84.2	92.6	78.0-123			9.50	20
1,1,1,2-Tetrachloroethane	5.00	4.76	5.16	95.2	103	78.0-124			8.06	20
1,1,2,2-Tetrachloroethane	5.00	6.06	6.15	121	123	71.0-121		J4	1.47	20
Tetrachloroethene	5.00	4.97	5.26	99.4	105	74.0-129			5.67	20
Toluene	5.00	5.01	5.14	100	103	80.0-121			2.56	20
1,2,3-Trichlorobenzene	5.00	3.80	4.27	76.0	85.4	69.0-129			11.6	20
1,2,4-Trichlorobenzene	5.00	4.05	4.23	81.0	84.6	69.0-130			4.35	20
1,2,3-Trimethylbenzene	5.00	5.15	5.12	103	102	82.0-120			0.584	20
1,2,4-Trimethylbenzene	5.00	4.87	5.06	97.4	101	76.0-124			3.83	20
1,3,5-Trimethylbenzene	5.00	5.04	5.15	101	103	75.0-124			2.16	20
1,1,1-Trichloroethane	5.00	4.79	4.94	95.8	98.8	74.0-131			3.08	20
1,1,2-Trichloroethane	5.00	5.18	5.51	104	110	80.0-119			6.17	20
Trichloroethene	5.00	4.72	4.78	94.4	95.6	79.0-123			1.26	20
Trichlorofluoromethane	5.00	4.93	4.95	98.6	99.0	65.0-141			0.405	20
1,1,2-Trichlorotrifluoroethane	5.00	5.57	5.60	111	112	70.0-136			0.537	20
1,2,3-Trichloropropane	5.00	6.17	6.28	123	126	73.0-122	J4	J4	1.77	20
Vinyl chloride	5.00	4.70	4.92	94.0	98.4	58.0-137			4.57	20
Xylenes, Total	15.0	13.8	14.4	92.0	96.0	79.0-121			4.26	20
(S) Toluene-d8				*109*	*111*	*89.0-112*				
(S) 4-Bromofluorobenzene				*102*	*102*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*109*	*109*	*81.0-118*				

L1540865-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540865-04 10/05/22 05:41 • (MS) R3845564-5 10/05/22 09:09 • (MSD) R3845564-6 10/05/22 09:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	25.0	33.8	32.9	135	132	1	39.0-160			2.70	20
Acrolein	25.0	25.0	36.2	35.0	145	140	1	39.0-155			3.37	20
Acrylonitrile	25.0	5.00	35.3	33.8	141	135	1	63.0-135	J5		4.34	20
Benzene	5.00	0.500	5.55	5.64	111	113	1	79.0-120			1.61	20
Bromobenzene	5.00	0.500	6.30	6.53	126	131	1	80.0-120	J5	J5	3.59	20
Bromodichloromethane	5.00	0.500	5.32	5.29	106	106	1	79.0-125			0.566	20
Bromoform	5.00	0.500	5.26	5.50	105	110	1	66.0-130			4.46	20
Bromomethane	5.00	2.00	0.616	0.771	12.3	15.4	1	53.0-141	J6	J3 J6	22.4	20

L1540865-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540865-04 10/05/22 05:41 • (MS) R3845564-5 10/05/22 09:09 • (MSD) R3845564-6 10/05/22 09:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
n-Butylbenzene	5.00	0.500	5.39	5.36	108	107	1	75.0-128			0.558	20
sec-Butylbenzene	5.00	0.500	5.95	6.11	119	122	1	77.0-126			2.65	20
tert-Butylbenzene	5.00	0.500	5.61	5.58	112	112	1	78.0-124			0.536	20
Carbon tetrachloride	5.00	0.500	5.56	5.78	111	116	1	72.0-136			3.88	20
Chlorobenzene	5.00	0.500	5.56	5.67	111	113	1	82.0-118			1.96	20
Chlorodibromomethane	5.00	0.500	5.33	5.66	107	113	1	74.0-126			6.01	20
Chloroethane	5.00	2.00	4.39	4.42	87.8	88.4	1	60.0-138			0.681	20
Chloroform	5.00	2.00	5.58	5.48	112	110	1	79.0-124			1.81	20
Chloromethane	5.00	2.00	5.15	5.24	103	105	1	50.0-139			1.73	20
2-Chlorotoluene	5.00	0.500	5.92	6.03	118	121	1	79.0-122			1.84	20
4-Chlorotoluene	5.00	0.500	5.69	5.81	114	116	1	78.0-122			2.09	20
1,2-Dibromoethane	5.00	0.500	5.65	5.75	113	115	1	77.0-121			1.75	20
1,2-Dibromo-3-Chloropropane	5.00	2.00	5.17	4.95	103	99.0	1	62.0-128			4.35	20
Dibromomethane	5.00	0.500	5.36	5.40	107	108	1	79.0-123			0.744	20
1,2-Dichlorobenzene	5.00	0.500	6.27	6.10	125	122	1	80.0-119	J5	J5	2.75	20
1,3-Dichlorobenzene	5.00	0.500	5.91	6.05	118	121	1	80.0-119		J5	2.34	20
1,4-Dichlorobenzene	5.00	0.500	6.23	6.24	125	125	1	79.0-118	J5	J5	0.160	20
Dichlorodifluoromethane	5.00	2.00	5.17	4.88	103	97.6	1	32.0-152			5.77	20
1,1-Dichloroethane	5.00	0.500	5.94	5.94	119	119	1	77.0-125			0.000	20
1,2-Dichloroethane	5.00	0.500	5.22	5.33	104	107	1	73.0-128			2.09	20
1,1-Dichloroethene	5.00	0.500	5.60	5.60	112	112	1	71.0-131			0.000	20
cis-1,2-Dichloroethene	5.00	0.500	5.58	5.51	112	110	1	78.0-123			1.26	20
trans-1,2-Dichloroethene	5.00	0.500	5.29	5.07	106	101	1	75.0-124			4.25	20
1,2-Dichloropropane	5.00	0.500	5.92	5.61	118	112	1	78.0-122			5.38	20
1,3-Dichloropropane	5.00	0.500	6.19	6.16	124	123	1	80.0-119	J5	J5	0.486	20
2,2-Dichloropropane	5.00	0.500	5.56	5.65	111	113	1	60.0-139			1.61	20
1,1-Dichloropropene	5.00	0.500	5.61	5.52	112	110	1	79.0-125			1.62	20
cis-1,3-Dichloropropene	5.00	0.500	5.03	4.85	101	97.0	1	75.0-124			3.64	20
trans-1,3-Dichloropropene	5.00	0.500	5.64	5.42	113	108	1	73.0-127			3.98	20
Di-isopropyl ether	5.00	0.500	7.36	7.22	147	144	1	67.0-128	J5	J5	1.92	20
Ethylbenzene	5.00	0.500	5.47	5.44	109	109	1	79.0-121			0.550	20
Hexachloro-1,3-butadiene	5.00	0.750	6.43	6.81	129	136	1	66.0-134		J5	5.74	20
Isopropylbenzene	5.00	0.500	5.28	5.33	106	107	1	72.0-131			0.943	20
p-Isopropyltoluene	5.00	0.500	5.65	5.74	113	115	1	77.0-127			1.58	20
2-Butanone (MEK)	25.0	5.00	36.2	34.4	145	138	1	56.0-143	J5		5.10	20
Methylene Chloride	5.00	2.00	5.41	5.54	108	111	1	74.0-124			2.37	20
4-Methyl-2-pentanone (MIBK)	25.0	5.00	38.9	37.4	156	150	1	67.0-130	J5	J5	3.93	20
Methyl tert-butyl ether	5.00	0.500	5.63	5.50	113	110	1	71.0-124			2.34	20
Naphthalene	5.00	2.00	2.64	3.75	52.8	75.0	1	61.0-128	J6	J3	34.7	20
n-Propylbenzene	5.00	0.500	5.82	5.96	116	119	1	76.0-126			2.38	20

L1540865-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540865-04 10/05/22 05:41 • (MS) R3845564-5 10/05/22 09:09 • (MSD) R3845564-6 10/05/22 09:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Styrene	5.00	0.500	4.85	5.05	97.0	101	1	78.0-123			4.04	20
1,1,1,2-Tetrachloroethane	5.00	0.500	5.40	5.68	108	114	1	78.0-124			5.05	20
1,1,2,2-Tetrachloroethane	5.00	0.500	7.07	7.10	141	142	1	71.0-121	J5	J5	0.423	20
Tetrachloroethene	5.00	0.600	5.52	5.64	110	113	1	74.0-129			2.15	20
Toluene	5.00	0.600	5.65	5.62	113	112	1	80.0-121			0.532	20
1,2,3-Trichlorobenzene	5.00	0.500	4.37	5.34	87.4	107	1	69.0-129			20.0	20
1,2,4-Trichlorobenzene	5.00	1.00	4.12	4.51	82.4	90.2	1	69.0-130			9.04	20
1,2,3-Trimethylbenzene	5.00	0.500	5.72	5.93	114	119	1	82.0-120			3.61	20
1,2,4-Trimethylbenzene	5.00	1.00	5.68	5.69	114	114	1	76.0-124			0.176	20
1,3,5-Trimethylbenzene	5.00	0.500	5.67	5.73	113	115	1	75.0-124			1.05	20
1,1,1-Trichloroethane	5.00	0.500	5.75	5.79	115	116	1	74.0-131			0.693	20
1,1,2-Trichloroethane	5.00	0.500	6.03	5.81	121	116	1	80.0-119	J5		3.72	20
Trichloroethene	5.00	0.500	5.07	5.10	101	102	1	79.0-123			0.590	20
Trichlorofluoromethane	5.00	2.00	5.68	5.73	114	115	1	65.0-141			0.876	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	6.32	6.08	126	122	1	70.0-136			3.87	20
1,2,3-Trichloropropane	5.00	1.00	6.43	6.67	129	133	1	73.0-122	J5	J5	3.66	20
Vinyl chloride	5.00	0.500	5.32	5.26	106	105	1	58.0-137			1.13	20
Xylenes, Total	15.0	1.50	15.6	15.6	104	104	1	79.0-121			0.000	20
(S) Toluene-d8					*106*	*108*		*89.0-112*				
(S) 4-Bromofluorobenzene					*101*	*101*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*109*	*110*		*81.0-118*				

L1540970-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540970-01 10/05/22 08:06 • (MS) R3845564-7 10/05/22 09:50 • (MSD) R3845564-8 10/05/22 10:11

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	25.0	42.0	41.4	168	166	1	39.0-160	J5	J5	1.44	20
Acrolein	25.0	25.0	39.8	37.7	159	151	1	39.0-155	J5		5.42	20
Acrylonitrile	25.0	5.00	36.2	36.2	145	145	1	63.0-135	J5	J5	0.000	20
Benzene	5.00	0.280	6.35	6.03	121	115	1	79.0-120	J5		5.17	20
Bromobenzene	5.00	0.500	6.58	6.75	132	135	1	80.0-120	J5	J5	2.55	20
Bromodichloromethane	5.00	0.500	5.70	5.38	114	108	1	79.0-125			5.78	20
Bromoform	5.00	0.500	5.88	5.61	118	112	1	66.0-130			4.70	20
Bromomethane	5.00	2.00	0.997	0.908	19.9	18.2	1	53.0-141	J6	J6	9.34	20
n-Butylbenzene	5.00	0.500	5.52	5.23	110	105	1	75.0-128			5.40	20
sec-Butylbenzene	5.00	0.500	6.44	6.10	129	122	1	77.0-126	J5		5.42	20
tert-Butylbenzene	5.00	0.500	5.85	5.96	117	119	1	78.0-124			1.86	20
Carbon tetrachloride	5.00	0.500	6.16	5.87	123	117	1	72.0-136			4.82	20

L1540970-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540970-01 10/05/22 08:06 • (MS) R3845564-7 10/05/22 09:50 • (MSD) R3845564-8 10/05/22 10:11

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chlorobenzene	5.00	0.500	6.35	6.15	127	123	1	82.0-118	J5	J5	3.20	20
Chlorodibromomethane	5.00	0.500	5.78	5.46	116	109	1	74.0-126			5.69	20
Chloroethane	5.00	2.00	4.50	4.71	90.0	94.2	1	60.0-138			4.56	20
Chloroform	5.00	2.00	6.05	5.68	121	114	1	79.0-124			6.31	20
Chloromethane	5.00	2.00	5.55	5.39	111	108	1	50.0-139			2.93	20
2-Chlorotoluene	5.00	0.500	6.26	6.43	125	129	1	79.0-122	J5	J5	2.68	20
4-Chlorotoluene	5.00	0.500	5.97	6.20	119	124	1	78.0-122		J5	3.78	20
1,2-Dibromoethane	5.00	0.500	6.29	5.85	126	117	1	77.0-121	J5		7.25	20
1,2-Dibromo-3-Chloropropane	5.00	2.00	4.94	5.51	98.8	110	1	62.0-128			10.9	20
Dibromomethane	5.00	0.500	5.46	5.37	109	107	1	79.0-123			1.66	20
1,2-Dichlorobenzene	5.00	0.500	6.61	6.88	132	138	1	80.0-119	J5	J5	4.00	20
1,3-Dichlorobenzene	5.00	0.500	6.36	6.20	127	124	1	80.0-119	J5	J5	2.55	20
1,4-Dichlorobenzene	5.00	0.500	6.85	6.65	137	133	1	79.0-118	J5	J5	2.96	20
Dichlorodifluoromethane	5.00	2.00	5.66	5.14	113	103	1	32.0-152			9.63	20
1,1-Dichloroethane	5.00	0.737	6.90	6.67	123	119	1	77.0-125			3.39	20
1,2-Dichloroethane	5.00	0.500	5.52	5.38	110	108	1	73.0-128			2.57	20
1,1-Dichloroethene	5.00	0.500	5.90	5.72	118	114	1	71.0-131			3.10	20
cis-1,2-Dichloroethene	5.00	3.93	10.3	9.48	127	111	1	78.0-123	J5		8.29	20
trans-1,2-Dichloroethene	5.00	0.500	5.61	5.48	112	110	1	75.0-124			2.34	20
1,2-Dichloropropane	5.00	0.500	6.11	6.26	122	125	1	78.0-122		J5	2.43	20
1,3-Dichloropropane	5.00	0.500	6.56	6.23	131	125	1	80.0-119	J5	J5	5.16	20
2,2-Dichloropropane	5.00	0.500	5.42	5.17	108	103	1	60.0-139			4.72	20
1,1-Dichloropropene	5.00	0.500	6.31	5.70	126	114	1	79.0-125	J5		10.2	20
cis-1,3-Dichloropropene	5.00	0.500	5.23	4.95	105	99.0	1	75.0-124			5.50	20
trans-1,3-Dichloropropene	5.00	0.500	5.96	5.56	119	111	1	73.0-127			6.94	20
Di-isopropyl ether	5.00	0.500	7.91	7.77	158	155	1	67.0-128	J5	J5	1.79	20
Ethylbenzene	5.00	0.500	5.80	5.54	116	111	1	79.0-121			4.59	20
Hexachloro-1,3-butadiene	5.00	0.750	7.34	7.63	147	153	1	66.0-134	J5	J5	3.87	20
Isopropylbenzene	5.00	0.500	5.81	5.46	116	109	1	72.0-131			6.21	20
p-Isopropyltoluene	5.00	0.500	6.24	5.98	125	120	1	77.0-127			4.26	20
2-Butanone (MEK)	25.0	5.00	36.1	37.0	144	148	1	56.0-143	J5	J5	2.46	20
Methylene Chloride	5.00	2.73	8.79	8.41	121	114	1	74.0-124			4.42	20
4-Methyl-2-pentanone (MIBK)	25.0	5.00	40.1	39.6	160	158	1	67.0-130	J5	J5	1.25	20
Methyl tert-butyl ether	5.00	1.17	7.28	7.00	122	117	1	71.0-124			3.92	20
Naphthalene	5.00	2.00	4.31	4.85	86.2	97.0	1	61.0-128			11.8	20
n-Propylbenzene	5.00	0.500	6.17	6.17	123	123	1	76.0-126			0.000	20
Styrene	5.00	0.500	5.43	5.23	109	105	1	78.0-123			3.75	20
1,1,1,2-Tetrachloroethane	5.00	0.500	5.91	5.73	118	115	1	78.0-124			3.09	20
1,1,2,2-Tetrachloroethane	5.00	0.500	7.53	7.48	151	150	1	71.0-121	J5	J5	0.666	20
Tetrachloroethene	5.00	0.652	6.87	6.48	124	117	1	74.0-129			5.84	20

L1540970-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540970-01 10/05/22 08:06 • (MS) R3845564-7 10/05/22 09:50 • (MSD) R3845564-8 10/05/22 10:11

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Toluene	5.00	0.600	6.10	5.72	122	114	1	80.0-121	J5		6.43	20
1,2,3-Trichlorobenzene	5.00	0.500	4.94	5.78	98.8	116	1	69.0-129			15.7	20
1,2,4-Trichlorobenzene	5.00	1.00	5.07	4.40	101	88.0	1	69.0-130			14.1	20
1,2,3-Trimethylbenzene	5.00	0.500	6.02	6.03	120	121	1	82.0-120		J5	0.166	20
1,2,4-Trimethylbenzene	5.00	1.00	6.03	5.91	121	118	1	76.0-124			2.01	20
1,3,5-Trimethylbenzene	5.00	0.500	6.08	5.91	122	118	1	75.0-124			2.84	20
1,1,1-Trichloroethane	5.00	0.500	6.11	5.89	122	118	1	74.0-131			3.67	20
1,1,2-Trichloroethane	5.00	0.500	6.68	6.02	134	120	1	80.0-119	J5	J5	10.4	20
Trichloroethene	5.00	0.196	5.46	5.47	105	105	1	79.0-123			0.183	20
Trichlorofluoromethane	5.00	2.00	6.02	5.74	120	115	1	65.0-141			4.76	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	6.91	6.28	138	126	1	70.0-136	J5		9.55	20
1,2,3-Trichloropropane	5.00	1.00	7.10	6.73	142	135	1	73.0-122	J5	J5	5.35	20
Vinyl chloride	5.00	0.500	5.67	5.34	113	107	1	58.0-137			5.99	20
Xylenes, Total	15.0	1.50	16.8	16.6	112	111	1	79.0-121			1.20	20
(S) Toluene-d8					*108*	*109*		*89.0-112*				
(S) 4-Bromofluorobenzene					*101*	*100*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*109*	*109*		*81.0-118*				

Method Blank (MB)

(MB) R3843855-1 10/01/22 17:54

Analyte	MB Result	MB Qualifier	MB DL	MB LOD	MB LOQ
	ug/l		ug/l	ug/l	ug/l
AK102 DRO C10-C25	400	U	170	400	800
(S) o-Terphenyl	*100*				*60.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843855-2 10/01/22 18:17 • (LCSD) R3843855-3 10/01/22 18:39

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
AK102 DRO C10-C25	6000	6410	6270	107	104	75.0-125			2.21	20
(S) o-Terphenyl				*83.5*	*84.3*	*60.0-120*				

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/01/22 19:02 • (MS) R3843855-4 10/01/22 19:25 • (MSD) R3843855-5 10/01/22 19:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
AK102 DRO C10-C25	5460	400	5540	6470	101	108	1	75.0-125			15.5	20
(S) o-Terphenyl					*79.8*	*85.1*		*50.0-150*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/02/22 03:21 • (MS) R3843855-6 10/02/22 03:44 • (MSD) R3843855-7 10/02/22 04:07

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
AK102 DRO C10-C25	6000	400	6560	6350	109	106	1	75.0-125			3.25	20
(S) o-Terphenyl					*83.1*	*85.4*		*50.0-150*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
C4	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
U	Below Detectable Limits: Indicates that the analyte was not detected.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
North Wind Site Services, LLC- AK
2525 C Street, Ste 130
~~7910 King Street~~
Anchorage, AK ~~99518~~ 99503

Billing Information:
Accounts Payable
1425 Higham St
Idaho Falls, ID 83402

Report to: Jill Jones

Email To: ~~jhansmeyer@northwindgrp.com~~;jill.jones@nort

Project Description: Port Heiden RRS

City/State Collected: PORT HEIDEN, AK

Please Circle: PT MT CT ET

Phone: 907-277-5488

Client Project # 060068.001

Lab Project # NORWINDAAK-ORC

Collected by (print): SYDNEY SOUZA

Site/Facility ID # PORT HEIDEN (PTH)

P.O. # 6-00000738

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DODAK102 100ml Amb HCl	DODALK 250mlHDPE-NoPres +SULFATE	DODFEICP,DODMNICP 250mlHDPE-HNO3	DODNO2NO3 250mlHDPE-H2SO4 +TKN	DODSULFATE 250mlHDPE-NoPres	DODTKN 250mlHDPE-H2SO4	DODV8260BTEX 40mlAmb-HCl (BTEX)	DODV8260C 40mlAmb-HCl (VOCs)			Remarks	Sample # (lab only)
OT001-EQBK-01-091922	G	GW		09-19-22	14:30	8	X	X	X	X				X			EQUIP BLANK	101
OT001-DSAMW07-092022	G	GW		09-20-22	09:15	8	X	X	X	X				X				02
SS006-215MW12-092022	G	GW		09-20-22	10:20	8	X	X	X	X			X					03
SS006-215MW12-092022-MS	G	GW		09-20-22	10:20	8	X	X	X	X			X				MS	08
SS006-215MW12-092022-MSD	G	GW		09-20-22	10:20	8	X	X	X	X			X				MSD	07
SS006-215MW12-092022-99	G	GW		09-20-22	10:25	8	X	X	X	X			X					09
~~SS006-TRIPBLNK-01~~		GW																
SS006-TRIPBLNK-HCL-01		GW		09-19-22	09:00	1								X			TRIP BLANK	06
		GW																
		GW																

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1540949
G070

Account: NORWINDAAK
Template: T215484
Prelogin: P948323
PM: 546 - Jared Starkey
PB:

Shipped Via: FedEX 2nd Day

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
NPDL: 21-034
COOLER NAME: CRUELLA

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx X Courier _____

Tracking # 5885 7555 4720

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	09-20-22	12:30	Renee Lafata
Renee Lafata	09/28/22	12:30	Sydney Souza
Sydney Souza	9/28/22	12:40	M. Scott

Trip Blank Received: (Yes) / No
HCL / MeoH
TBR
1

Temp: GIBC 4.7 +0-4.7 Bottles Received: 46

Date: 9/29/22 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

ANALYTICAL REPORT

October 25, 2022

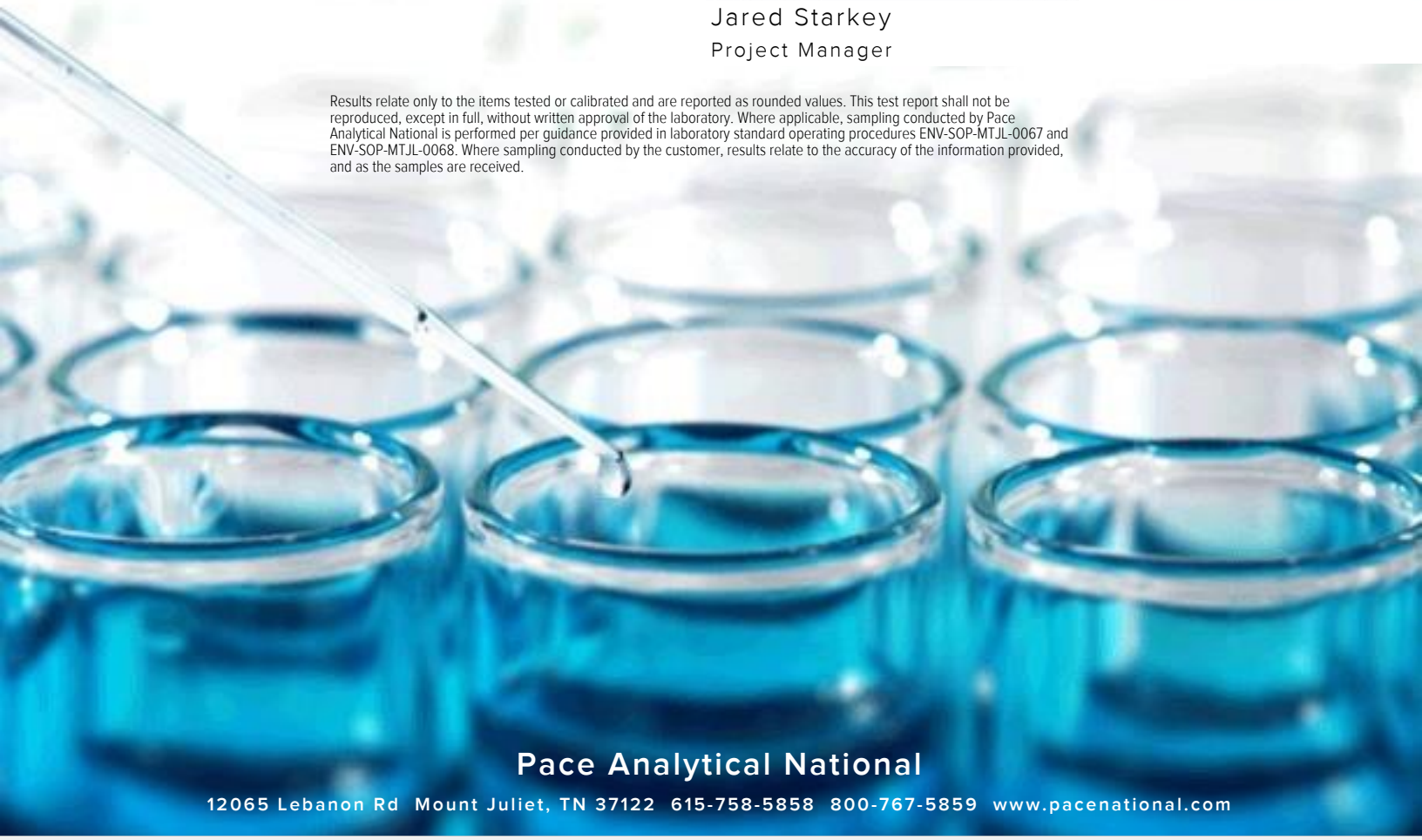
North Wind Site Services, LLC- AK

Sample Delivery Group:	L1540953
Samples Received:	09/29/2022
Project Number:	060068.001
Description:	Port Heiden RRS NPDL 21-034
Site:	BLOMW07
Report To:	Jill Jones 7910 King Street Anchorage, AK 99518

Entire Report Reviewed By:

Jared Starkey
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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OT001-BLOMW07-091922 L1540953-01 GW

Collected by: Sydney S | Collected date/time: 09/19/22 11:30 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:56	10/01/22 10:56	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:32	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 17:02	10/04/22 17:02	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/03/22 23:32	10/03/22 23:32	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:46	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 14:31	10/01/22 14:31	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 04:23	10/04/22 04:23	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 22:29	DMG	Mt. Juliet, TN

OT001-BLOMW05-091922 L1540953-02 GW

Collected by: Sydney S | Collected date/time: 09/19/22 12:10 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:00	10/01/22 11:00	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:33	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 17:03	10/04/22 17:03	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/03/22 23:45	10/03/22 23:45	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:54	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 14:53	10/01/22 14:53	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 04:45	10/04/22 04:45	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 22:52	DMG	Mt. Juliet, TN

OT001-DSAMW02-091922 L1540953-03 GW

Collected by: Sydney S | Collected date/time: 09/19/22 13:15 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:03	10/01/22 11:03	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:35	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1934510	1	10/04/22 17:04	10/04/22 17:04	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/03/22 23:58	10/03/22 23:58	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 15:57	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 15:13	10/01/22 15:13	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 05:06	10/04/22 05:06	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937829	10	10/06/22 01:10	10/06/22 01:10	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/01/22 23:15	DMG	Mt. Juliet, TN

OT001-BLOMW06-091922 L1540953-04 GW

Collected by: Sydney S | Collected date/time: 09/19/22 14:05 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:07	10/01/22 11:07	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:36	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:24	10/04/22 18:24	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 00:11	10/04/22 00:11	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 16:00	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 15:34	10/01/22 15:34	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 05:28	10/04/22 05:28	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937829	1	10/06/22 00:33	10/06/22 00:33	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 01:50	DMG	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Ds
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

OT001-BLOMW06-091922-99 L1540953-05 GW

Collected by: Sydney S | Collected date/time: 09/19/22 14:10 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:10	10/01/22 11:10	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:37	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:30	10/04/22 18:30	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 00:49	10/04/22 00:49	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 16:03	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 15:55	10/01/22 15:55	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 05:50	10/04/22 05:50	JHH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1937829	1	10/06/22 00:51	10/06/22 00:51	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 02:13	DMG	Mt. Juliet, TN

WP002-BLOMW01-091922 L1540953-06 GW

Collected by: Sydney S | Collected date/time: 09/19/22 15:20 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:14	10/01/22 11:14	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:39	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:31	10/04/22 18:31	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 01:02	10/04/22 01:02	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 16:06	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	5	10/19/22 09:29	10/20/22 11:25	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	50	10/01/22 18:22	10/01/22 18:22	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	50	10/04/22 08:22	10/04/22 08:22	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 02:36	DMG	Mt. Juliet, TN

WP002-BLOMW01-091922-99 L1540953-07 GW

Collected by: Sydney S | Collected date/time: 09/19/22 15:25 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 11:18	10/01/22 11:18	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:40	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:32	10/04/22 18:32	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 01:15	10/04/22 01:15	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/19/22 16:09	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	5	10/19/22 09:29	10/20/22 11:28	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	25	10/01/22 18:43	10/01/22 18:43	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	25	10/04/22 08:43	10/04/22 08:43	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 02:58	DMG	Mt. Juliet, TN

WP002-TRIPBLANK-HCL-01 L1540953-08 GW

Collected by: Sydney S | Collected date/time: 09/19/22 09:00 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 12:06	10/01/22 12:06	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 01:52	10/04/22 01:52	JHH	Mt. Juliet, TN

Unless qualified or notated within the narrative below, all sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jared Starkey
Project Manager

Project Comments

EDD

Sample Delivery Group (SDG) Narrative

pH outside of method requirement.

Batch	Method	Lab Sample ID
WG1935601	8260D	L1540953-06, 07
WG1935909	8260D	L1540953-06, 07

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

Batch	Method	Lab Sample ID
WG1935909	8260D	L1540953-01, 02, 03, 04, 05, 06, 07
WG1937829	8260D	L1540953-03, 04, 05

Analyzed from headspace vial.

Batch	Method	Lab Sample ID
WG1935909	8260D	L1540953-08
WG1937829	8260D	L1540953-04

Wet Chemistry by Method 351.2

RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Batch	Lab Sample ID	Analytes
WG1935863	(DUP) R3844701-3	Kjeldahl Nitrogen, TKN

The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Batch	Lab Sample ID	Analytes
WG1935863	(MSD) R3844701-5	Kjeldahl Nitrogen, TKN

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935863	(MSD) R3844701-5	Kjeldahl Nitrogen, TKN

Volatile Organic Compounds (GC/MS) by Method 8260D

The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.

Batch	Lab Sample ID	Analytes
WG1935909	L1540953-01	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-02	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-03	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-04	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-05	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-06	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-07	1,2-Dibromo-3-Chloropropane
WG1935909	L1540953-08	1,2-Dibromo-3-Chloropropane

The same analyte is found in the associated blank.

Batch	Analyte	Lab Sample ID
WG1935909	Acetone	L1540953-01, 02, 03, 04, 05, 08

The associated batch QC was below the established quality control range for accuracy.

Batch	Lab Sample ID	Analytes
WG1935601	(LCSD) R3843739-2, L1540953-01, 02, 03, 04, 05, 06, 07, 08	1,2,3-Trichlorobenzene

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935601	(LCSD) R3843739-2, L1540953-01, 02, 03, 04, 05, 06, 07, 08	1,2,3-Trichlorobenzene and Naphthalene

The sample matrix interfered with the ability to make any accurate determination; spike value is high.

Batch	Lab Sample ID	Analytes
WG1935601	(MS) R3843739-6, (MS) R3843739-4, (MSD) R3843739-5, (MSD) R3843739-7	44 analytes

The sample concentration is too high to evaluate accurate spike recoveries.

Batch	Lab Sample ID	Analytes
WG1935601	(MS) R3843739-4, (MSD) R3843739-5	Naphthalene

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935601	(MSD) R3843739-5	Naphthalene

Wet Chemistry by Method 2320 B-2011

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-BLOMW07-091922	L1540953-01	Alkalinity		48300		8450	10000	20000	1	10/01/2022 10:56	WG1935544
OT001-BLOMW07-091922	L1540953-01	Alkalinity,Bicarbonate		48300		8450	10000	20000	1	10/01/2022 10:56	WG1935544
OT001-BLOMW05-091922	L1540953-02	Alkalinity		67500		8450	10000	20000	1	10/01/2022 11:00	WG1935544
OT001-BLOMW05-091922	L1540953-02	Alkalinity,Bicarbonate		67500		8450	10000	20000	1	10/01/2022 11:00	WG1935544
OT001-DSAMW02-091922	L1540953-03	Alkalinity		123000		8450	10000	20000	1	10/01/2022 11:03	WG1935544
OT001-DSAMW02-091922	L1540953-03	Alkalinity,Bicarbonate		123000		8450	10000	20000	1	10/01/2022 11:03	WG1935544
OT001-BLOMW06-091922	L1540953-04	Alkalinity		48500		8450	10000	20000	1	10/01/2022 11:07	WG1935544
OT001-BLOMW06-091922	L1540953-04	Alkalinity,Bicarbonate		48500		8450	10000	20000	1	10/01/2022 11:07	WG1935544
OT001-BLOMW06-091922-99	L1540953-05	Alkalinity		43300		8450	10000	20000	1	10/01/2022 11:10	WG1935544
OT001-BLOMW06-091922-99	L1540953-05	Alkalinity,Bicarbonate		43300		8450	10000	20000	1	10/01/2022 11:10	WG1935544
WP002-BLOMW01-091922	L1540953-06	Alkalinity		961000		8450	10000	20000	1	10/01/2022 11:14	WG1935544
WP002-BLOMW01-091922	L1540953-06	Alkalinity,Bicarbonate		961000		8450	10000	20000	1	10/01/2022 11:14	WG1935544
WP002-BLOMW01-091922-99	L1540953-07	Alkalinity		962000		8450	10000	20000	1	10/01/2022 11:18	WG1935544
WP002-BLOMW01-091922-99	L1540953-07	Alkalinity,Bicarbonate		962000		8450	10000	20000	1	10/01/2022 11:18	WG1935544

Wet Chemistry by Method 351.2

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-DSAMW02-091922	L1540953-03	Kjeldahl Nitrogen, TKN	7727-37-9	172	J	140	300	600	1	10/04/2022 21:35	WG1935863
WP002-BLOMW01-091922	L1540953-06	Kjeldahl Nitrogen, TKN	7727-37-9	612		140	300	600	1	10/04/2022 21:39	WG1935863
WP002-BLOMW01-091922-99	L1540953-07	Kjeldahl Nitrogen, TKN	7727-37-9	639		140	300	600	1	10/04/2022 21:40	WG1935863

Wet Chemistry by Method 353.2

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-BLOMW07-091922	L1540953-01	Nitrate-Nitrite	7727-37-9	69.0	J	50.0	100	200	1	10/04/2022 17:02	WG1934510
OT001-BLOMW05-091922	L1540953-02	Nitrate-Nitrite	7727-37-9	776		50.0	100	200	1	10/04/2022 17:03	WG1934510
OT001-DSAMW02-091922	L1540953-03	Nitrate-Nitrite	7727-37-9	1830		50.0	100	200	1	10/04/2022 17:04	WG1934510
OT001-BLOMW06-091922	L1540953-04	Nitrate-Nitrite	7727-37-9	60.5	J	50.0	100	200	1	10/04/2022 18:24	WG1935271
OT001-BLOMW06-091922-99	L1540953-05	Nitrate-Nitrite	7727-37-9	58.6	J	50.0	100	200	1	10/04/2022 18:30	WG1935271

Wet Chemistry by Method 9056A

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-BLOMW07-091922	L1540953-01	Sulfate	14808-79-8	3090	J	594	2500	5000	1	10/03/2022 23:32	WG1934921

DETECTION SUMMARY

Wet Chemistry by Method 9056A

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-BLOMW05-091922	L1540953-02	Sulfate	14808-79-8	3200	J	594	2500	5000	1	10/03/2022 23:45	WG1934921
OT001-DSAMW02-091922	L1540953-03	Sulfate	14808-79-8	8120		594	2500	5000	1	10/03/2022 23:58	WG1934921
OT001-BLOMW06-091922	L1540953-04	Sulfate	14808-79-8	4600	J	594	2500	5000	1	10/04/2022 00:11	WG1934921
OT001-BLOMW06-091922-99	L1540953-05	Sulfate	14808-79-8	5380		594	2500	5000	1	10/04/2022 00:49	WG1934921
WP002-BLOMW01-091922	L1540953-06	Sulfate	14808-79-8	2550	J	594	2500	5000	1	10/04/2022 01:02	WG1934921
WP002-BLOMW01-091922-99	L1540953-07	Sulfate	14808-79-8	2190	J	594	2500	5000	1	10/04/2022 01:15	WG1934921

Metals (ICP) by Method 6010D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-BLOMW07-091922	L1540953-01	Iron	7439-89-6	11000		20.5	50.0	100	1	10/19/2022 15:46	WG1940061
OT001-BLOMW07-091922	L1540953-01	Manganese	7439-96-5	283		0.855	5.00	10.0	1	10/19/2022 15:46	WG1940061
OT001-BLOMW05-091922	L1540953-02	Iron	7439-89-6	24800		20.5	50.0	100	1	10/19/2022 15:54	WG1940061
OT001-BLOMW05-091922	L1540953-02	Manganese	7439-96-5	748		0.855	5.00	10.0	1	10/19/2022 15:54	WG1940061
OT001-DSAMW02-091922	L1540953-03	Iron	7439-89-6	3720		20.5	50.0	100	1	10/19/2022 15:57	WG1940061
OT001-DSAMW02-091922	L1540953-03	Manganese	7439-96-5	62.1		0.855	5.00	10.0	1	10/19/2022 15:57	WG1940061
OT001-BLOMW06-091922	L1540953-04	Iron	7439-89-6	11700		20.5	50.0	100	1	10/19/2022 16:00	WG1940061
OT001-BLOMW06-091922	L1540953-04	Manganese	7439-96-5	377		0.855	5.00	10.0	1	10/19/2022 16:00	WG1940061
OT001-BLOMW06-091922-99	L1540953-05	Iron	7439-89-6	7580		20.5	50.0	100	1	10/19/2022 16:03	WG1940061
OT001-BLOMW06-091922-99	L1540953-05	Manganese	7439-96-5	173		0.855	5.00	10.0	1	10/19/2022 16:03	WG1940061
WP002-BLOMW01-091922	L1540953-06	Iron	7439-89-6	7690		20.5	50.0	100	1	10/19/2022 16:06	WG1940061
WP002-BLOMW01-091922	L1540953-06	Manganese	7439-96-5	15600		4.28	25.0	50.0	5	10/20/2022 11:25	WG1940061
WP002-BLOMW01-091922-99	L1540953-07	Iron	7439-89-6	6910		20.5	50.0	100	1	10/19/2022 16:09	WG1940061
WP002-BLOMW01-091922-99	L1540953-07	Manganese	7439-96-5	17900		4.28	25.0	50.0	5	10/20/2022 11:28	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-BLOMW07-091922	L1540953-01	Acetone	67-64-1	14.8	B J T8	11.3	25.0	50.0	1	10/04/2022 04:23	WG1935909
OT001-BLOMW05-091922	L1540953-02	Acetone	67-64-1	14.5	B J T8	11.3	25.0	50.0	1	10/04/2022 04:45	WG1935909

DETECTION SUMMARY

Volatile Organic Compounds (GC/MS) by Method 8260D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-DSAMW02-091922	L1540953-03	Acetone	67-64-1	12.7	B J T8	11.3	25.0	50.0	1	10/04/2022 05:06	WG1935909
OT001-DSAMW02-091922	L1540953-03	Chloroform	67-66-3	0.185	J	0.111	2.00	5.00	1	10/01/2022 15:13	WG1935601
OT001-DSAMW02-091922	L1540953-03	1,1,1-Trichloroethane	71-55-6	1.19		0.149	0.500	1.00	1	10/01/2022 15:13	WG1935601
OT001-DSAMW02-091922	L1540953-03	Trichloroethene	79-01-6	410	T8	1.90	5.00	10.0	10	10/06/2022 01:10	WG1937829
OT001-DSAMW02-091922	L1540953-03	Trichlorofluoromethane	75-69-4	0.924	J T8	0.160	2.00	5.00	1	10/04/2022 05:06	WG1935909
OT001-BLOMW06-091922	L1540953-04	Acetone	67-64-1	13.2	B J T8	11.3	25.0	50.0	1	10/04/2022 05:28	WG1935909
OT001-BLOMW06-091922	L1540953-04	Xylenes, Total	1330-20-7	0.190	J	0.174	1.50	3.00	1	10/01/2022 15:34	WG1935601
OT001-BLOMW06-091922-99	L1540953-05	Acetone	67-64-1	15.3	B J T8	11.3	25.0	50.0	1	10/04/2022 05:50	WG1935909
OT001-BLOMW06-091922-99	L1540953-05	Trichloroethene	79-01-6	0.572	J T8	0.190	0.500	1.00	1	10/06/2022 00:51	WG1937829
WP002-BLOMW01-091922	L1540953-06	cis-1,2-Dichloroethene	156-59-2	12.2	J	6.30	25.0	50.0	50	10/01/2022 18:22	WG1935601
WP002-BLOMW01-091922-99	L1540953-07	cis-1,2-Dichloroethene	156-59-2	12.3	J	3.15	12.5	25.0	25	10/01/2022 18:43	WG1935601
WP002-BLOMW01-091922-99	L1540953-07	Isopropylbenzene	98-82-8	5.02	J	2.63	12.5	25.0	25	10/01/2022 18:43	WG1935601
WP002-TRIPBLANK-HCL-01	L1540953-08	Acetone	67-64-1	15.3	B J	11.3	25.0	50.0	1	10/04/2022 01:52	WG1935909
WP002-TRIPBLANK-HCL-01	L1540953-08	Benzene	71-43-2	0.269	J	0.0941	0.500	1.00	1	10/01/2022 12:06	WG1935601
WP002-TRIPBLANK-HCL-01	L1540953-08	Xylenes, Total	1330-20-7	0.188	J	0.174	1.50	3.00	1	10/01/2022 12:06	WG1935601

Semi-Volatile Organic Compounds (GC) by Method AK102

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
WP002-BLOMW01-091922	L1540953-06	AK102 DRO C10-C25	C10-C25	13700		170	400	800	1	10/02/2022 02:36	WG1934826
WP002-BLOMW01-091922-99	L1540953-07	AK102 DRO C10-C25	C10-C25	13600		170	400	800	1	10/02/2022 02:58	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		48300		8450	10000	20000	1	10/01/2022 10:56	WG1935544
Alkalinity,Bicarbonate		48300		8450	10000	20000	1	10/01/2022 10:56	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:56	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:56	WG1935544

Sample Narrative:
L1540953-01 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:32	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	69.0	J	50.0	100	200	1	10/04/2022 17:02	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	3090	J	594	2500	5000	1	10/03/2022 23:32	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	11000		20.5	50.0	100	1	10/19/2022 15:46	WG1940061
Manganese	7439-96-5	283		0.855	5.00	10.0	1	10/19/2022 15:46	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	14.8	B J T8	11.3	25.0	50.0	1	10/04/2022 04:23	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 14:31	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 14:31	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 14:31	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 14:31	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 14:31	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 14:31	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 14:31	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 14:31	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 14:31	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 14:31	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 14:31	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 14:31	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 14:31	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 14:31	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 14:31	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 04:23	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 14:31	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 04:23	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 14:31	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 14:31	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 14:31	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 14:31	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 14:31	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 14:31	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 14:31	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 14:31	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 14:31	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 14:31	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 04:23	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 14:31	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 14:31	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 14:31	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 14:31	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 04:23	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 14:31	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 14:31	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 14:31	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 14:31	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 14:31	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 14:31	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 04:23	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 14:31	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 14:31	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 14:31	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 04:23	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 14:31	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 14:31	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 14:31	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 14:31	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/01/2022 14:31*	WG1935601
(S) Toluene-d8	*2037-26-5*	*108*				*89.0-112*		*10/04/2022 04:23*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/01/2022 14:31*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/04/2022 04:23*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*98.1*				*81.0-118*		*10/01/2022 14:31*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*116*				*81.0-118*		*10/04/2022 04:23*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 22:29	WG1934826
(S) o-Terphenyl	*84-15-1*	*100*				*50.0-150*		*10/01/2022 22:29*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		67500		8450	10000	20000	1	10/01/2022 11:00	WG1935544
Alkalinity,Bicarbonate		67500		8450	10000	20000	1	10/01/2022 11:00	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:00	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:00	WG1935544

Sample Narrative:

L1540953-02 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:33	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	776		50.0	100	200	1	10/04/2022 17:03	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	3200	J	594	2500	5000	1	10/03/2022 23:45	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	24800		20.5	50.0	100	1	10/19/2022 15:54	WG1940061
Manganese	7439-96-5	748		0.855	5.00	10.0	1	10/19/2022 15:54	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	14.5	B J T8	11.3	25.0	50.0	1	10/04/2022 04:45	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 14:53	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 14:53	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 14:53	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 14:53	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 14:53	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 14:53	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 14:53	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 14:53	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 14:53	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 14:53	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 14:53	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 14:53	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 14:53	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 14:53	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 14:53	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 04:45	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 14:53	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 04:45	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 14:53	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 14:53	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 14:53	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 14:53	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 14:53	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 14:53	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 14:53	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 14:53	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 14:53	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 14:53	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 04:45	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 14:53	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 14:53	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 14:53	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 14:53	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 04:45	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 14:53	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 14:53	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 14:53	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 14:53	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 14:53	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 14:53	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 04:45	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 14:53	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 14:53	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 14:53	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 04:45	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 14:53	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 14:53	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 14:53	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 14:53	WG1935601
(S) Toluene-d8	*2037-26-5*	*102*				*89.0-112*		*10/01/2022 14:53*	WG1935601
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*10/04/2022 04:45*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*109*				*85.0-114*		*10/01/2022 14:53*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*107*				*85.0-114*		*10/04/2022 04:45*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*99.9*				*81.0-118*		*10/01/2022 14:53*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*113*				*81.0-118*		*10/04/2022 04:45*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 22:52	WG1934826
(S) o-Terphenyl	*84-15-1*	*100*				*50.0-150*		*10/01/2022 22:52*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		123000		8450	10000	20000	1	10/01/2022 11:03	WG1935544
Alkalinity,Bicarbonate		123000		8450	10000	20000	1	10/01/2022 11:03	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:03	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:03	WG1935544

Sample Narrative:

L1540953-03 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	172	J	140	300	600	1	10/04/2022 21:35	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	1830		50.0	100	200	1	10/04/2022 17:04	WG1934510

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	8120		594	2500	5000	1	10/03/2022 23:58	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	3720		20.5	50.0	100	1	10/19/2022 15:57	WG1940061
Manganese	7439-96-5	62.1		0.855	5.00	10.0	1	10/19/2022 15:57	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	12.7	B J T8	11.3	25.0	50.0	1	10/04/2022 05:06	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 15:13	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 15:13	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 15:13	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:13	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 15:13	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 15:13	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 15:13	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 15:13	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 15:13	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 15:13	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 15:13	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 15:13	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 15:13	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 15:13	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	0.185	J	0.111	2.00	5.00	1	10/01/2022 15:13	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 05:06	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 15:13	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 05:06	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 15:13	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 15:13	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 15:13	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 15:13	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 15:13	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 15:13	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 15:13	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:13	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 15:13	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 15:13	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 05:06	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 15:13	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 15:13	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 15:13	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 15:13	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 05:06	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 15:13	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 15:13	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 15:13	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 15:13	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 15:13	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 15:13	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 05:06	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 15:13	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,1,1-Trichloroethane	71-55-6	1.19		0.149	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 15:13	WG1935601
Trichloroethene	79-01-6	410	T8	1.90	5.00	10.0	10	10/06/2022 01:10	WG1937829
Trichlorofluoromethane	75-69-4	0.924	J T8	0.160	2.00	5.00	1	10/04/2022 05:06	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 15:13	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 15:13	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 15:13	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 15:13	WG1935601
(S) Toluene-d8	*2037-26-5*	*102*				*89.0-112*		*10/01/2022 15:13*	WG1935601
(S) Toluene-d8	*2037-26-5*	*99.1*				*89.0-112*		*10/04/2022 05:06*	WG1935909
(S) Toluene-d8	*2037-26-5*	*101*				*89.0-112*		*10/06/2022 01:10*	WG1937829
(S) 4-Bromofluorobenzene	*460-00-4*	*108*				*85.0-114*		*10/01/2022 15:13*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*103*				*85.0-114*		*10/04/2022 05:06*	WG1935909

1 Cp
2 Tc
3 Ss
4 Cn
5 Ds
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 4-Bromofluorobenzene	*460-00-4*	*88.4*				*85.0-114*		*10/06/2022 01:10*	WG1937829
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*99.9*				*81.0-118*		*10/01/2022 15:13*	WG1935601
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*111*				*81.0-118*		*10/04/2022 05:06*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*114*				*81.0-118*		*10/06/2022 01:10*	WG1937829

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/01/2022 23:15	WG1934826
(S) o-Terphenyl	*84-15-1*	*93.8*				*50.0-150*		*10/01/2022 23:15*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		48500		8450	10000	20000	1	10/01/2022 11:07	WG1935544
Alkalinity,Bicarbonate		48500		8450	10000	20000	1	10/01/2022 11:07	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:07	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:07	WG1935544

Sample Narrative:

L1540953-04 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:36	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	60.5	J	50.0	100	200	1	10/04/2022 18:24	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	4600	J	594	2500	5000	1	10/04/2022 00:11	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	11700		20.5	50.0	100	1	10/19/2022 16:00	WG1940061
Manganese	7439-96-5	377		0.855	5.00	10.0	1	10/19/2022 16:00	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	13.2	B J T8	11.3	25.0	50.0	1	10/04/2022 05:28	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 15:34	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 15:34	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 15:34	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:34	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 15:34	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 15:34	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 15:34	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 15:34	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 15:34	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 15:34	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 15:34	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 15:34	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 15:34	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 15:34	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 15:34	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 05:28	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 15:34	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 05:28	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 15:34	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 15:34	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 15:34	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 15:34	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 15:34	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 15:34	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 15:34	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:34	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 15:34	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 15:34	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 05:28	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 15:34	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 15:34	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 15:34	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 15:34	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 05:28	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 15:34	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 15:34	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 15:34	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 15:34	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 15:34	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 15:34	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 05:28	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 15:34	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 15:34	WG1935601
Trichloroethene	79-01-6	0.500	T8 U	0.190	0.500	1.00	1	10/06/2022 00:33	WG1937829
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 05:28	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 15:34	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 15:34	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 15:34	WG1935601
Xylenes, Total	1330-20-7	0.190	J	0.174	1.50	3.00	1	10/01/2022 15:34	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/01/2022 15:34*	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/04/2022 05:28*	WG1935909
(S) Toluene-d8	*2037-26-5*	*100*				*89.0-112*		*10/06/2022 00:33*	WG1937829
(S) 4-Bromofluorobenzene	*460-00-4*	*107*				*85.0-114*		*10/01/2022 15:34*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/04/2022 05:28*	WG1935909

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 4-Bromofluorobenzene	*460-00-4*	*98.7*				*85.0-114*		*10/06/2022 00:33*	WG1937829
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*95.8*				*81.0-118*		*10/01/2022 15:34*	WG1935601
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*114*				*81.0-118*		*10/04/2022 05:28*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*117*				*81.0-118*		*10/06/2022 00:33*	WG1937829

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 01:50	WG1934826
(S) o-Terphenyl	*84-15-1*	*97.6*				*50.0-150*		*10/02/2022 01:50*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		43300		8450	10000	20000	1	10/01/2022 11:10	WG1935544
Alkalinity,Bicarbonate		43300		8450	10000	20000	1	10/01/2022 11:10	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:10	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:10	WG1935544

Sample Narrative:

L1540953-05 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:37	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	58.6	J	50.0	100	200	1	10/04/2022 18:30	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	5380		594	2500	5000	1	10/04/2022 00:49	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	7580		20.5	50.0	100	1	10/19/2022 16:03	WG1940061
Manganese	7439-96-5	173		0.855	5.00	10.0	1	10/19/2022 16:03	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	15.3	B J T8	11.3	25.0	50.0	1	10/04/2022 05:50	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 15:55	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 15:55	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 15:55	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:55	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 15:55	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 15:55	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 15:55	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 15:55	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 15:55	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 15:55	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 15:55	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 15:55	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 15:55	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 15:55	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 15:55	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 05:50	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 15:55	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 05:50	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 15:55	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 15:55	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 15:55	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 15:55	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 15:55	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 15:55	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 15:55	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:55	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 15:55	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 15:55	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 05:50	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 15:55	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 15:55	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 15:55	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 15:55	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 05:50	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 15:55	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 15:55	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 15:55	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 15:55	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 15:55	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 15:55	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 05:50	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 15:55	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 15:55	WG1935601
Trichloroethene	79-01-6	0.572	J T8	0.190	0.500	1.00	1	10/06/2022 00:51	WG1937829
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 05:50	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 15:55	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 15:55	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 15:55	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 15:55	WG1935601
(S) Toluene-d8	*2037-26-5*	*101*				*89.0-112*		*10/01/2022 15:55*	WG1935601
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*10/04/2022 05:50*	WG1935909
(S) Toluene-d8	*2037-26-5*	*99.3*				*89.0-112*		*10/06/2022 00:51*	WG1937829
(S) 4-Bromofluorobenzene	*460-00-4*	*106*				*85.0-114*		*10/01/2022 15:55*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*113*				*85.0-114*		*10/04/2022 05:50*	WG1935909

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 4-Bromofluorobenzene	*460-00-4*	*90.0*				*85.0-114*		*10/06/2022 00:51*	WG1937829
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*98.0*				*81.0-118*		*10/01/2022 15:55*	WG1935601
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*117*				*81.0-118*		*10/04/2022 05:50*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*112*				*81.0-118*		*10/06/2022 00:51*	WG1937829

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 02:13	WG1934826
(S) o-Terphenyl	*84-15-1*	*95.5*				*50.0-150*		*10/02/2022 02:13*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		961000		8450	10000	20000	1	10/01/2022 11:14	WG1935544
Alkalinity,Bicarbonate		961000		8450	10000	20000	1	10/01/2022 11:14	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:14	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:14	WG1935544

Sample Narrative:

L1540953-06 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	612		140	300	600	1	10/04/2022 21:39	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200	1	10/04/2022 18:31	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	2550	J	594	2500	5000	1	10/04/2022 01:02	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	7690		20.5	50.0	100	1	10/19/2022 16:06	WG1940061
Manganese	7439-96-5	15600		4.28	25.0	50.0	5	10/20/2022 11:25	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	1250	T8 U	565	1250	2500	50	10/04/2022 08:22	WG1935909
Acrolein	107-02-8	1250	U	127	1250	2500	50	10/01/2022 18:22	WG1935601
Acrylonitrile	107-13-1	250	U	33.6	250	500	50	10/01/2022 18:22	WG1935601
Benzene	71-43-2	25.0	U	4.71	25.0	50.0	50	10/01/2022 18:22	WG1935601
Bromobenzene	108-86-1	25.0	U	5.90	25.0	50.0	50	10/01/2022 18:22	WG1935601
Bromodichloromethane	75-27-4	25.0	U	6.80	25.0	50.0	50	10/01/2022 18:22	WG1935601
Bromoform	75-25-2	25.0	U	6.45	25.0	50.0	50	10/01/2022 18:22	WG1935601
Bromomethane	74-83-9	100	U	30.3	100	250	50	10/01/2022 18:22	WG1935601
n-Butylbenzene	104-51-8	25.0	U	7.85	25.0	50.0	50	10/01/2022 18:22	WG1935601
sec-Butylbenzene	135-98-8	25.0	U	6.25	25.0	50.0	50	10/01/2022 18:22	WG1935601
tert-Butylbenzene	98-06-6	25.0	U	6.35	25.0	50.0	50	10/01/2022 18:22	WG1935601
Carbon tetrachloride	56-23-5	25.0	U	6.40	25.0	50.0	50	10/01/2022 18:22	WG1935601
Chlorobenzene	108-90-7	25.0	U	5.80	25.0	50.0	50	10/01/2022 18:22	WG1935601
Chlorodibromomethane	124-48-1	25.0	U	7.00	25.0	50.0	50	10/01/2022 18:22	WG1935601
Chloroethane	75-00-3	100	U	9.60	100	250	50	10/01/2022 18:22	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chloroform	67-66-3	100	U	5.55	100	250	50	10/01/2022 18:22	WG1935601
Chloromethane	74-87-3	100	T8 U	48.0	100	200	50	10/04/2022 08:22	WG1935909
2-Chlorotoluene	95-49-8	25.0	U	5.30	25.0	50.0	50	10/01/2022 18:22	WG1935601
4-Chlorotoluene	106-43-4	25.0	U	5.70	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2-Dibromoethane	106-93-4	25.0	U	6.30	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	100	C4 T8 U	13.8	100	250	50	10/04/2022 08:22	WG1935909
Dibromomethane	74-95-3	25.0	U	6.10	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2-Dichlorobenzene	95-50-1	25.0	U	5.35	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,3-Dichlorobenzene	541-73-1	25.0	U	5.50	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,4-Dichlorobenzene	106-46-7	25.0	U	6.00	25.0	50.0	50	10/01/2022 18:22	WG1935601
Dichlorodifluoromethane	75-71-8	100	U	18.7	100	250	50	10/01/2022 18:22	WG1935601
1,1-Dichloroethane	75-34-3	25.0	U	5.00	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2-Dichloroethane	107-06-2	25.0	U	4.09	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,1-Dichloroethene	75-35-4	25.0	U	9.40	25.0	50.0	50	10/01/2022 18:22	WG1935601
cis-1,2-Dichloroethene	156-59-2	12.2	J	6.30	25.0	50.0	50	10/01/2022 18:22	WG1935601
trans-1,2-Dichloroethene	156-60-5	25.0	U	7.45	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2-Dichloropropane	78-87-5	25.0	U	7.45	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,3-Dichloropropane	142-28-9	25.0	U	5.50	25.0	50.0	50	10/01/2022 18:22	WG1935601
2,2-Dichloropropane	594-20-7	25.0	U	8.05	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,1-Dichloropropene	563-58-6	25.0	U	7.10	25.0	50.0	50	10/01/2022 18:22	WG1935601
cis-1,3-Dichloropropene	10061-01-5	25.0	U	5.55	25.0	50.0	50	10/01/2022 18:22	WG1935601
trans-1,3-Dichloropropene	10061-02-6	25.0	U	5.90	25.0	50.0	50	10/01/2022 18:22	WG1935601
Di-isopropyl ether	108-20-3	25.0	U	5.25	25.0	50.0	50	10/01/2022 18:22	WG1935601
Ethylbenzene	100-41-4	25.0	U	6.85	25.0	50.0	50	10/01/2022 18:22	WG1935601
Hexachloro-1,3-butadiene	87-68-3	37.5	T8 U	16.9	37.5	75.0	50	10/04/2022 08:22	WG1935909
Isopropylbenzene	98-82-8	25.0	U	5.25	25.0	50.0	50	10/01/2022 18:22	WG1935601
p-Isopropyltoluene	99-87-6	25.0	U	6.00	25.0	50.0	50	10/01/2022 18:22	WG1935601
2-Butanone (MEK)	78-93-3	250	U	59.5	250	500	50	10/01/2022 18:22	WG1935601
Methylene Chloride	75-09-2	100	U	21.5	100	250	50	10/01/2022 18:22	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	250	T8 U	23.9	250	500	50	10/04/2022 08:22	WG1935909
Methyl tert-butyl ether	1634-04-4	25.0	U	5.05	25.0	50.0	50	10/01/2022 18:22	WG1935601
Naphthalene	91-20-3	100	J3 U	50.0	100	250	50	10/01/2022 18:22	WG1935601
n-Propylbenzene	103-65-1	25.0	U	4.97	25.0	50.0	50	10/01/2022 18:22	WG1935601
Styrene	100-42-5	25.0	U	5.90	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	25.0	U	7.35	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	25.0	U	6.65	25.0	50.0	50	10/01/2022 18:22	WG1935601
Tetrachloroethene	127-18-4	30.0	U	15.0	30.0	60.0	50	10/01/2022 18:22	WG1935601
Toluene	108-88-3	30.0	U	13.9	30.0	60.0	50	10/01/2022 18:22	WG1935601
1,2,3-Trichlorobenzene	87-61-6	25.0	J3 J4 U	11.5	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2,4-Trichlorobenzene	120-82-1	50.0	T8 U	24.1	50.0	100	50	10/04/2022 08:22	WG1935909
1,2,3-Trimethylbenzene	526-73-8	25.0	U	5.20	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2,4-Trimethylbenzene	95-63-6	50.0	U	16.1	50.0	100	50	10/01/2022 18:22	WG1935601
1,3,5-Trimethylbenzene	108-67-8	25.0	U	5.20	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,1,1-Trichloroethane	71-55-6	25.0	U	7.45	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,1,2-Trichloroethane	79-00-5	25.0	U	7.90	25.0	50.0	50	10/01/2022 18:22	WG1935601
Trichloroethene	79-01-6	25.0	U	9.50	25.0	50.0	50	10/01/2022 18:22	WG1935601
Trichlorofluoromethane	75-69-4	100	T8 U	8.00	100	250	50	10/04/2022 08:22	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	25.0	U	9.00	25.0	50.0	50	10/01/2022 18:22	WG1935601
1,2,3-Trichloropropane	96-18-4	50.0	U	11.9	50.0	125	50	10/01/2022 18:22	WG1935601
Vinyl chloride	75-01-4	25.0	U	11.7	25.0	50.0	50	10/01/2022 18:22	WG1935601
Xylenes, Total	1330-20-7	75.0	U	8.70	75.0	150	50	10/01/2022 18:22	WG1935601
(S) Toluene-d8	*2037-26-5*	*101*				*89.0-112*		*10/01/2022 18:22*	WG1935601
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*10/04/2022 08:22*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*109*				*85.0-114*		*10/01/2022 18:22*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*112*				*85.0-114*		*10/04/2022 08:22*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*97.7*				*81.0-118*		*10/01/2022 18:22*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis date / time	Batch
		ug/l		ug/l	ug/l	ug/l			
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*111*				*81.0-118*		*10/04/2022 08:22*	WG1935909

Sample Narrative:

L1540953-06 WG1935909: Lowest possible dilution due to sample foaming.

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis date / time	Batch
		ug/l		ug/l	ug/l	ug/l			
AK102 DRO C10-C25	C10-C25	13700		170	400	800	1	10/02/2022 02:36	WG1934826
(S) o-Terphenyl	*84-15-1*	*106*				*50.0-150*		*10/02/2022 02:36*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		962000		8450	10000	20000	1	10/01/2022 11:18	WG1935544
Alkalinity,Bicarbonate		962000		8450	10000	20000	1	10/01/2022 11:18	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 11:18	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 11:18	WG1935544

Sample Narrative:

L1540953-07 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	639		140	300	600	1	10/04/2022 21:40	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200	1	10/04/2022 18:32	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	2190	J	594	2500	5000	1	10/04/2022 01:15	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	6910		20.5	50.0	100	1	10/19/2022 16:09	WG1940061
Manganese	7439-96-5	17900		4.28	25.0	50.0	5	10/20/2022 11:28	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	625	T8 U	282	625	1250	25	10/04/2022 08:43	WG1935909
Acrolein	107-02-8	625	U	63.5	625	1250	25	10/01/2022 18:43	WG1935601
Acrylonitrile	107-13-1	125	U	16.8	125	250	25	10/01/2022 18:43	WG1935601
Benzene	71-43-2	12.5	U	2.35	12.5	25.0	25	10/01/2022 18:43	WG1935601
Bromobenzene	108-86-1	12.5	U	2.95	12.5	25.0	25	10/01/2022 18:43	WG1935601
Bromodichloromethane	75-27-4	12.5	U	3.40	12.5	25.0	25	10/01/2022 18:43	WG1935601
Bromoform	75-25-2	12.5	U	3.22	12.5	25.0	25	10/01/2022 18:43	WG1935601
Bromomethane	74-83-9	50.0	U	15.1	50.0	125	25	10/01/2022 18:43	WG1935601
n-Butylbenzene	104-51-8	12.5	U	3.93	12.5	25.0	25	10/01/2022 18:43	WG1935601
sec-Butylbenzene	135-98-8	12.5	U	3.13	12.5	25.0	25	10/01/2022 18:43	WG1935601
tert-Butylbenzene	98-06-6	12.5	U	3.18	12.5	25.0	25	10/01/2022 18:43	WG1935601
Carbon tetrachloride	56-23-5	12.5	U	3.20	12.5	25.0	25	10/01/2022 18:43	WG1935601
Chlorobenzene	108-90-7	12.5	U	2.90	12.5	25.0	25	10/01/2022 18:43	WG1935601
Chlorodibromomethane	124-48-1	12.5	U	3.50	12.5	25.0	25	10/01/2022 18:43	WG1935601
Chloroethane	75-00-3	50.0	U	4.80	50.0	125	25	10/01/2022 18:43	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	50.0	U	2.78	50.0	125	25	10/01/2022 18:43	WG1935601
Chloromethane	74-87-3	50.0	T8 U	24.0	50.0	100	25	10/04/2022 08:43	WG1935909
2-Chlorotoluene	95-49-8	12.5	U	2.65	12.5	25.0	25	10/01/2022 18:43	WG1935601
4-Chlorotoluene	106-43-4	12.5	U	2.85	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2-Dibromoethane	106-93-4	12.5	U	3.15	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	50.0	C4 T8 U	6.90	50.0	125	25	10/04/2022 08:43	WG1935909
Dibromomethane	74-95-3	12.5	U	3.05	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2-Dichlorobenzene	95-50-1	12.5	U	2.68	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,3-Dichlorobenzene	541-73-1	12.5	U	2.75	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,4-Dichlorobenzene	106-46-7	12.5	U	3.00	12.5	25.0	25	10/01/2022 18:43	WG1935601
Dichlorodifluoromethane	75-71-8	50.0	U	9.35	50.0	125	25	10/01/2022 18:43	WG1935601
1,1-Dichloroethane	75-34-3	12.5	U	2.50	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2-Dichloroethane	107-06-2	12.5	U	2.05	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,1-Dichloroethene	75-35-4	12.5	U	4.70	12.5	25.0	25	10/01/2022 18:43	WG1935601
cis-1,2-Dichloroethene	156-59-2	12.3	J	3.15	12.5	25.0	25	10/01/2022 18:43	WG1935601
trans-1,2-Dichloroethene	156-60-5	12.5	U	3.73	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2-Dichloropropane	78-87-5	12.5	U	3.73	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,3-Dichloropropane	142-28-9	12.5	U	2.75	12.5	25.0	25	10/01/2022 18:43	WG1935601
2,2-Dichloropropane	594-20-7	12.5	U	4.03	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,1-Dichloropropene	563-58-6	12.5	U	3.55	12.5	25.0	25	10/01/2022 18:43	WG1935601
cis-1,3-Dichloropropene	10061-01-5	12.5	U	2.78	12.5	25.0	25	10/01/2022 18:43	WG1935601
trans-1,3-Dichloropropene	10061-02-6	12.5	U	2.95	12.5	25.0	25	10/01/2022 18:43	WG1935601
Di-isopropyl ether	108-20-3	12.5	U	2.63	12.5	25.0	25	10/01/2022 18:43	WG1935601
Ethylbenzene	100-41-4	12.5	U	3.43	12.5	25.0	25	10/01/2022 18:43	WG1935601
Hexachloro-1,3-butadiene	87-68-3	18.8	T8 U	8.43	18.8	37.5	25	10/04/2022 08:43	WG1935909
Isopropylbenzene	98-82-8	5.02	J	2.63	12.5	25.0	25	10/01/2022 18:43	WG1935601
p-Isopropyltoluene	99-87-6	12.5	U	3.00	12.5	25.0	25	10/01/2022 18:43	WG1935601
2-Butanone (MEK)	78-93-3	125	U	29.8	125	250	25	10/01/2022 18:43	WG1935601
Methylene Chloride	75-09-2	50.0	U	10.7	50.0	125	25	10/01/2022 18:43	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	125	T8 U	12.0	125	250	25	10/04/2022 08:43	WG1935909
Methyl tert-butyl ether	1634-04-4	12.5	U	2.53	12.5	25.0	25	10/01/2022 18:43	WG1935601
Naphthalene	91-20-3	50.0	J3 U	25.0	50.0	125	25	10/01/2022 18:43	WG1935601
n-Propylbenzene	103-65-1	12.5	U	2.48	12.5	25.0	25	10/01/2022 18:43	WG1935601
Styrene	100-42-5	12.5	U	2.95	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	12.5	U	3.68	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	12.5	U	3.33	12.5	25.0	25	10/01/2022 18:43	WG1935601
Tetrachloroethene	127-18-4	15.0	U	7.50	15.0	30.0	25	10/01/2022 18:43	WG1935601
Toluene	108-88-3	15.0	U	6.95	15.0	30.0	25	10/01/2022 18:43	WG1935601
1,2,3-Trichlorobenzene	87-61-6	12.5	J3 J4 U	5.75	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2,4-Trichlorobenzene	120-82-1	25.0	T8 U	12.0	25.0	50.0	25	10/04/2022 08:43	WG1935909
1,2,3-Trimethylbenzene	526-73-8	12.5	U	2.60	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2,4-Trimethylbenzene	95-63-6	25.0	U	8.05	25.0	50.0	25	10/01/2022 18:43	WG1935601
1,3,5-Trimethylbenzene	108-67-8	12.5	U	2.60	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,1,1-Trichloroethane	71-55-6	12.5	U	3.73	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,1,2-Trichloroethane	79-00-5	12.5	U	3.95	12.5	25.0	25	10/01/2022 18:43	WG1935601
Trichloroethene	79-01-6	12.5	U	4.75	12.5	25.0	25	10/01/2022 18:43	WG1935601
Trichlorofluoromethane	75-69-4	50.0	T8 U	4.00	50.0	125	25	10/04/2022 08:43	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	12.5	U	4.50	12.5	25.0	25	10/01/2022 18:43	WG1935601
1,2,3-Trichloropropane	96-18-4	25.0	U	5.93	25.0	62.5	25	10/01/2022 18:43	WG1935601
Vinyl chloride	75-01-4	12.5	U	5.85	12.5	25.0	25	10/01/2022 18:43	WG1935601
Xylenes, Total	1330-20-7	37.5	U	4.35	37.5	75.0	25	10/01/2022 18:43	WG1935601
(S) Toluene-d8	*2037-26-5*	*102*				*89.0-112*		*10/01/2022 18:43*	WG1935601
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*10/04/2022 08:43*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*108*				*85.0-114*		*10/01/2022 18:43*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*111*				*85.0-114*		*10/04/2022 08:43*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*96.9*				*81.0-118*		*10/01/2022 18:43*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis date / time	Batch
		ug/l		ug/l	ug/l	ug/l			
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*112*				*81.0-118*		*10/04/2022 08:43*	WG1935909

Sample Narrative:

L1540953-07 WG1935909: Lowest possible dilution due to sample foaming.

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis date / time	Batch
		ug/l		ug/l	ug/l	ug/l			
AK102 DRO C10-C25	C10-C25	13600		170	400	800	1	10/02/2022 02:58	WG1934826
(S) o-Terphenyl	*84-15-1*	*111*				*50.0-150*		*10/02/2022 02:58*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	5.1	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	15.3	B J	11.3	25.0	50.0	1	10/04/2022 01:52	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 12:06	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 12:06	WG1935601
Benzene	71-43-2	0.269	J	0.0941	0.500	1.00	1	10/01/2022 12:06	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:06	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 12:06	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 12:06	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 12:06	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 12:06	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 12:06	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 12:06	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 12:06	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 12:06	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 12:06	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 12:06	WG1935601
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 12:06	WG1935601
Chloromethane	74-87-3	2.00	U	0.960	2.00	4.00	1	10/04/2022 01:52	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 12:06	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 U	0.276	2.00	5.00	1	10/04/2022 01:52	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 12:06	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 12:06	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 12:06	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 12:06	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 12:06	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 12:06	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 12:06	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:06	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 12:06	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 12:06	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	U	0.337	0.750	1.50	1	10/04/2022 01:52	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 12:06	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 12:06	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 12:06	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 12:06	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	10/04/2022 01:52	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 12:06	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 12:06	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 12:06	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:06	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 12:06	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 12:06	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 12:06	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	U	0.481	1.00	2.00	1	10/04/2022 01:52	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 12:06	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 12:06	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 12:06	WG1935601
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	10/04/2022 01:52	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 12:06	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 12:06	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 12:06	WG1935601
Xylenes, Total	1330-20-7	0.188	J	0.174	1.50	3.00	1	10/01/2022 12:06	WG1935601
(S) Toluene-d8	*2037-26-5*	*102*				*89.0-112*		*10/01/2022 12:06*	WG1935601
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*10/04/2022 01:52*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*109*				*85.0-114*		*10/01/2022 12:06*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*108*				*85.0-114*		*10/04/2022 01:52*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*99.4*				*81.0-118*		*10/01/2022 12:06*	WG1935601
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*115*				*81.0-118*		*10/04/2022 01:52*	WG1935909

Method Blank (MB)

(MB) R3843643-2 10/01/22 10:04

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Alkalinity	10000	U	8450	10000	20000
Alkalinity,Bicarbonate	10000	U	8450	10000	20000
Alkalinity,Carbonate	10000	U	8450	10000	20000
Alkalinity,Hydroxide	10000	U	8450	10000	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1540085-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1540085-06 10/01/22 10:15 • (DUP) R3843643-3 10/01/22 10:18

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	667000	665000	1	0.262		20
Alkalinity,Bicarbonate	667000	665000	1	0.262		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/01/22 10:22 • (DUP) R3843643-4 10/01/22 10:25

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	109000	110000	1	0.841		20
Alkalinity,Bicarbonate	109000	110000	1	0.841		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/01/22 11:30 • (DUP) R3843643-5 10/01/22 11:34

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	57700	57100	1	0.978		20
Alkalinity,Bicarbonate	57700	57100	1	0.978		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3843643-1 10/01/22 10:00

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	102000	102	85.0-115	

Sample Narrative:

LCS: Endpoint pH 4.5

1 Cp
2 Tc
3 Ss
4 Cn
5 Ds
6 Sr
7 Qc
8 Gl
9 Al
10 Sc

Method Blank (MB)

(MB) R3844701-1 10/04/22 21:13

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Kjeldahl Nitrogen, TKN	300	U	140	300	600

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/04/22 21:22 • (DUP) R3844701-3 10/04/22 21:24

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	217	300	1	200	P1 U	20

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/04/22 21:41 • (DUP) R3844701-6 10/04/22 21:45

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	300	300	1	0.000	U	20

Laboratory Control Sample (LCS)

(LCS) R3844701-2 10/04/22 21:14

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Kjeldahl Nitrogen, TKN	12700	13100	103	74.0-124	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/04/22 21:22 • (MS) R3844701-4 10/04/22 21:25 • (MSD) R3844701-5 10/04/22 21:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	5000	217	5380	843	103	12.5	1	90.0-110		J3 J6	146	20

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 21:41 • (MS) R3844701-7 10/04/22 21:47 • (MSD) R3844701-8 10/04/22 21:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	5000	300	5170	5110	103	102	1	90.0-110			1.17	20

Method Blank (MB)

(MB) R3844674-1 10/04/22 16:24

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Nitrate-Nitrite	100	U	50.0	100	200

L1540788-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540788-01 10/04/22 16:32 • (DUP) R3844674-3 10/04/22 16:34

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	1740	1740	1	0.000		20

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/04/22 16:55 • (DUP) R3844674-5 10/04/22 16:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	402	409	1	1.73		20

Laboratory Control Sample (LCS)

(LCS) R3844674-2 10/04/22 16:25

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate-Nitrite	2500	2640	106	90.0-110	

L1540788-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1540788-01 10/04/22 16:32 • (MS) R3844674-4 10/04/22 16:39

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Nitrate-Nitrite	2500	1740	4340	104	1	90.0-110	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/04/22 16:55 • (MS) R3844674-6 10/04/22 16:58 • (MSD) R3844674-7 10/04/22 16:59

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	2500	402	2940	2990	102	104	1	90.0-110			1.69	20

Method Blank (MB)

(MB) R3844682-1 10/04/22 18:14

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Nitrate-Nitrite	100	U	50.0	100	200

L1540935-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540935-03 10/04/22 18:19 • (DUP) R3844682-3 10/04/22 18:21

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	100	100	1	0.000	U	20

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/04/22 18:33 • (DUP) R3844682-5 10/04/22 18:35

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	1050	1060	1	0.948		20

Laboratory Control Sample (LCS)

(LCS) R3844682-2 10/04/22 18:15

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate-Nitrite	2500	2630	105	90.0-110	

L1540935-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1540935-03 10/04/22 18:19 • (MS) R3844682-4 10/04/22 18:22

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Nitrate-Nitrite	2500	100	2660	106	1	90.0-110	

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 18:33 • (MS) R3844682-6 10/04/22 18:36 • (MSD) R3844682-7 10/04/22 18:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	2500	1050	3650	3640	104	104	1	90.0-110			0.274	20

Method Blank (MB)

(MB) R3844341-1 10/03/22 19:45

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Sulfate	2500	U	594	2500	5000

L1540948-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-04 10/03/22 23:07 • (DUP) R3844341-3 10/03/22 23:19

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	4220	4200	1	0.613	J	15

L1541084-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1541084-04 10/04/22 04:28 • (DUP) R3844341-6 10/04/22 04:41

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	66200	65600	1	0.796		15

Laboratory Control Sample (LCS)

(LCS) R3844341-2 10/03/22 19:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	40300	101	87.0-112	

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 01:28 • (MS) R3844341-4 10/04/22 01:41 • (MSD) R3844341-5 10/04/22 01:54

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	4560	52700	54100	96.2	99.0	1	87.0-112			2.60	15

L1541084-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1541084-04 10/04/22 04:28 • (MS) R3844341-7 10/04/22 04:53

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	66200	113000	93.3	1	87.0-112	

QUALITY CONTROL SUMMARY

L1540953-01,02,03,04,05,06,07

Method Blank (MB)

(MB) R3850672-1 10/19/22 15:20

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Iron	50.0	U	20.5	50.0	100
Manganese	5.00	U	0.855	5.00	10.0

Laboratory Control Sample (LCS)

(LCS) R3850672-2 10/19/22 15:23

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Iron	10000	9600	96.0	87.0-115	
Manganese	1000	912	91.2	90.0-114	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/19/22 15:26 • (MS) R3850672-4 10/19/22 15:32 • (MSD) R3850672-5 10/19/22 15:34

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Iron	10000	4520	14100	15900	96.0	114	1	87.0-115			11.9	20
Manganese	1000	121	1040	1050	91.7	93.0	1	90.0-114			1.26	20

Method Blank (MB)

(MB) R3843739-3 10/01/22 09:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acrolein	25.0	U	2.54	25.0	50.0
Acrylonitrile	5.00	U	0.671	5.00	10.0
Benzene	0.500	U	0.0941	0.500	1.00
Bromobenzene	0.500	U	0.118	0.500	1.00
Bromodichloromethane	0.500	U	0.136	0.500	1.00
Bromoform	0.500	U	0.129	0.500	1.00
Bromomethane	2.00	U	0.605	2.00	5.00
n-Butylbenzene	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	0.500	U	0.128	0.500	1.00
Chlorobenzene	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	0.500	U	0.140	0.500	1.00
Chloroethane	2.00	U	0.192	2.00	5.00
Chloroform	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	0.500	U	0.126	0.500	1.00
Dibromomethane	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	0.500	U	0.105	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
Isopropylbenzene	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	0.500	U	0.120	0.500	1.00
2-Butanone (MEK)	5.00	U	1.19	5.00	10.0
Methylene Chloride	2.00	U	0.430	2.00	5.00

Method Blank (MB)

(MB) R3843739-3 10/01/22 09:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Methyl tert-butyl ether	0.500	U	0.101	0.500	1.00
Naphthalene	2.00	U	1.00	2.00	5.00
n-Propylbenzene	0.500	U	0.0993	0.500	1.00
Styrene	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	0.500	U	0.133	0.500	1.00
Tetrachloroethene	0.600	U	0.300	0.600	1.20
Toluene	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	0.500	U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	0.500	U	0.158	0.500	1.00
Trichloroethene	0.500	U	0.190	0.500	1.00
1,1,2-Trichlorotrifluoroethane	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	1.00	U	0.237	1.00	2.50
Vinyl chloride	0.500	U	0.234	0.500	1.00
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*103*				*89.0-112*
(S) 4-Bromofluorobenzene	*107*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*94.5*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acrolein	25.0	20.4	18.4	81.6	73.6	39.0-155			10.3	20
Acrylonitrile	25.0	25.0	23.3	100	93.2	63.0-135			7.04	20
Benzene	5.00	5.48	5.44	110	109	79.0-120			0.733	20
Bromobenzene	5.00	4.28	4.68	85.6	93.6	80.0-120			8.93	20
Bromodichloromethane	5.00	5.24	4.99	105	99.8	79.0-125			4.89	20
Bromoform	5.00	4.63	4.15	92.6	83.0	66.0-130			10.9	20
Bromomethane	5.00	5.77	5.65	115	113	53.0-141			2.10	20
n-Butylbenzene	5.00	4.41	3.95	88.2	79.0	75.0-128			11.0	20
sec-Butylbenzene	5.00	4.84	4.88	96.8	97.6	77.0-126			0.823	20
tert-Butylbenzene	5.00	4.58	4.87	91.6	97.4	78.0-124			6.14	20
Carbon tetrachloride	5.00	5.33	5.67	107	113	72.0-136			6.18	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chlorobenzene	5.00	4.92	4.98	98.4	99.6	82.0-118			1.21	20
Chlorodibromomethane	5.00	4.45	4.45	89.0	89.0	74.0-126			0.000	20
Chloroethane	5.00	5.58	5.89	112	118	60.0-138			5.41	20
Chloroform	5.00	5.79	5.86	116	117	79.0-124			1.20	20
2-Chlorotoluene	5.00	4.66	4.73	93.2	94.6	79.0-122			1.49	20
4-Chlorotoluene	5.00	4.30	4.56	86.0	91.2	78.0-122			5.87	20
1,2-Dibromoethane	5.00	4.84	4.84	96.8	96.8	77.0-121			0.000	20
Dibromomethane	5.00	5.65	5.61	113	112	79.0-123			0.710	20
1,2-Dichlorobenzene	5.00	4.87	4.51	97.4	90.2	80.0-119			7.68	20
1,3-Dichlorobenzene	5.00	4.68	4.69	93.6	93.8	80.0-119			0.213	20
1,4-Dichlorobenzene	5.00	4.59	4.71	91.8	94.2	79.0-118			2.58	20
Dichlorodifluoromethane	5.00	5.02	5.12	100	102	32.0-152			1.97	20
1,1-Dichloroethane	5.00	5.27	5.42	105	108	77.0-125			2.81	20
1,2-Dichloroethane	5.00	5.23	5.14	105	103	73.0-128			1.74	20
1,1-Dichloroethene	5.00	5.63	6.11	113	122	71.0-131			8.18	20
cis-1,2-Dichloroethene	5.00	5.79	5.88	116	118	78.0-123			1.54	20
trans-1,2-Dichloroethene	5.00	5.60	5.67	112	113	75.0-124			1.24	20
1,2-Dichloropropane	5.00	4.87	4.70	97.4	94.0	78.0-122			3.55	20
1,3-Dichloropropane	5.00	4.47	4.66	89.4	93.2	80.0-119			4.16	20
2,2-Dichloropropane	5.00	5.52	5.38	110	108	60.0-139			2.57	20
1,1-Dichloropropene	5.00	5.16	5.32	103	106	79.0-125			3.05	20
cis-1,3-Dichloropropene	5.00	4.54	4.49	90.8	89.8	75.0-124			1.11	20
trans-1,3-Dichloropropene	5.00	4.01	3.95	80.2	79.0	73.0-127			1.51	20
Di-isopropyl ether	5.00	4.29	4.22	85.8	84.4	67.0-128			1.65	20
Ethylbenzene	5.00	5.27	5.04	105	101	79.0-121			4.46	20
Isopropylbenzene	5.00	5.25	4.99	105	99.8	72.0-131			5.08	20
p-Isopropyltoluene	5.00	4.60	4.56	92.0	91.2	77.0-127			0.873	20
2-Butanone (MEK)	25.0	22.1	20.5	88.4	82.0	56.0-143			7.51	20
Methylene Chloride	5.00	5.69	5.90	114	118	74.0-124			3.62	20
Methyl tert-butyl ether	5.00	5.45	5.51	109	110	71.0-124			1.09	20
Naphthalene	5.00	4.11	3.26	82.2	65.2	61.0-128		J3	23.1	20
n-Propylbenzene	5.00	4.35	4.68	87.0	93.6	76.0-126			7.31	20
Styrene	5.00	4.84	4.69	96.8	93.8	78.0-123			3.15	20
1,1,1,2-Tetrachloroethane	5.00	4.81	4.70	96.2	94.0	78.0-124			2.31	20
1,1,2,2-Tetrachloroethane	5.00	4.49	4.85	89.8	97.0	71.0-121			7.71	20
Tetrachloroethene	5.00	5.00	5.09	100	102	74.0-129			1.78	20
Toluene	5.00	4.69	4.84	93.8	96.8	80.0-121			3.15	20
1,2,3-Trichlorobenzene	5.00	4.41	3.35	88.2	67.0	69.0-129		J3 J4	27.3	20
1,2,3-Trimethylbenzene	5.00	4.82	4.66	96.4	93.2	82.0-120			3.38	20
1,2,4-Trimethylbenzene	5.00	4.55	4.49	91.0	89.8	76.0-124			1.33	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,3,5-Trimethylbenzene	5.00	4.58	4.82	91.6	96.4	75.0-124			5.11	20
1,1,1-Trichloroethane	5.00	5.62	5.64	112	113	74.0-131			0.355	20
1,1,2-Trichloroethane	5.00	4.82	5.03	96.4	101	80.0-119			4.26	20
Trichloroethene	5.00	5.51	5.51	110	110	79.0-123			0.000	20
1,1,2-Trichlorotrifluoroethane	5.00	6.24	6.30	125	126	70.0-136			0.957	20
1,2,3-Trichloropropane	5.00	4.69	5.36	93.8	107	73.0-122			13.3	20
Vinyl chloride	5.00	5.47	5.43	109	109	58.0-137			0.734	20
Xylenes, Total	15.0	15.5	15.2	103	101	79.0-121			1.95	20
(S) Toluene-d8				*99.6*	*103*	*89.0-112*				
(S) 4-Bromofluorobenzene				*108*	*102*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*97.6*	*97.4*	*81.0-118*				

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acrolein	25.0	25.0	26.5	28.3	106	113	1	39.0-155			6.57	20
Acrylonitrile	25.0	5.00	28.6	29.6	114	118	1	63.0-135			3.44	20
Benzene	5.00	0.614	7.71	7.92	142	146	1	79.0-120	J5	J5	2.69	20
Bromobenzene	5.00	0.500	5.41	5.67	108	113	1	80.0-120			4.69	20
Bromodichloromethane	5.00	0.500	6.70	6.89	134	138	1	79.0-125	J5	J5	2.80	20
Bromoform	5.00	0.500	5.45	5.63	109	113	1	66.0-130			3.25	20
Bromomethane	5.00	2.00	7.23	8.28	145	166	1	53.0-141	J5	J5	13.5	20
n-Butylbenzene	5.00	1.62	6.41	6.43	95.8	96.2	1	75.0-128			0.312	20
sec-Butylbenzene	5.00	1.49	7.05	7.45	111	119	1	77.0-126			5.52	20
tert-Butylbenzene	5.00	0.171	5.52	6.11	107	119	1	78.0-124			10.1	20
Carbon tetrachloride	5.00	0.500	7.80	8.12	156	162	1	72.0-136	J5	J5	4.02	20
Chlorobenzene	5.00	0.500	6.22	6.41	124	128	1	82.0-118	J5	J5	3.01	20
Chlorodibromomethane	5.00	0.500	5.41	5.87	108	117	1	74.0-126			8.16	20
Chloroethane	5.00	2.00	8.44	8.64	169	173	1	60.0-138	J5	J5	2.34	20
Chloroform	5.00	2.00	7.49	7.92	150	158	1	79.0-124	J5	J5	5.58	20
2-Chlorotoluene	5.00	0.500	5.44	5.96	109	119	1	79.0-122			9.12	20
4-Chlorotoluene	5.00	0.500	5.29	5.78	106	116	1	78.0-122			8.85	20
1,2-Dibromoethane	5.00	0.500	5.79	6.21	116	124	1	77.0-121		J5	7.00	20
Dibromomethane	5.00	0.500	6.98	7.00	140	140	1	79.0-123	J5	J5	0.286	20
1,2-Dichlorobenzene	5.00	0.550	6.73	6.65	124	122	1	80.0-119	J5	J5	1.20	20
1,3-Dichlorobenzene	5.00	0.500	5.65	6.02	113	120	1	80.0-119		J5	6.34	20
1,4-Dichlorobenzene	5.00	0.500	5.79	6.02	116	120	1	79.0-118		J5	3.90	20

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Dichlorodifluoromethane	5.00	2.00	7.07	7.55	141	151	1	32.0-152			6.57	20
1,1-Dichloroethane	5.00	0.500	6.91	7.37	138	147	1	77.0-125	J5	J5	6.44	20
1,2-Dichloroethane	5.00	0.500	6.61	6.69	132	134	1	73.0-128	J5	J5	1.20	20
1,1-Dichloroethene	5.00	0.500	7.65	8.47	153	169	1	71.0-131	J5	J5	10.2	20
cis-1,2-Dichloroethene	5.00	0.500	7.47	7.62	149	152	1	78.0-123	J5	J5	1.99	20
trans-1,2-Dichloroethene	5.00	0.500	7.64	7.76	153	155	1	75.0-124	J5	J5	1.56	20
1,2-Dichloropropane	5.00	0.500	6.23	6.63	125	133	1	78.0-122	J5	J5	6.22	20
1,3-Dichloropropane	5.00	0.500	5.53	5.93	111	119	1	80.0-119			6.98	20
2,2-Dichloropropane	5.00	0.500	7.94	8.47	159	169	1	60.0-139	J5	J5	6.46	20
1,1-Dichloropropene	5.00	0.500	7.35	7.57	147	151	1	79.0-125	J5	J5	2.95	20
cis-1,3-Dichloropropene	5.00	0.500	5.83	6.04	117	121	1	75.0-124			3.54	20
trans-1,3-Dichloropropene	5.00	0.500	5.09	5.34	102	107	1	73.0-127			4.79	20
Di-isopropyl ether	5.00	0.500	5.37	5.78	107	116	1	67.0-128			7.35	20
Ethylbenzene	5.00	2.03	8.88	8.97	137	139	1	79.0-121	J5	J5	1.01	20
Isopropylbenzene	5.00	2.52	9.16	9.72	133	144	1	72.0-131	J5	J5	5.93	20
p-Isopropyltoluene	5.00	2.45	7.97	8.28	110	117	1	77.0-127			3.82	20
2-Butanone (MEK)	25.0	5.00	24.8	25.4	99.2	102	1	56.0-143			2.39	20
Methylene Chloride	5.00	2.00	7.32	7.70	146	154	1	74.0-124	J5	J5	5.06	20
Methyl tert-butyl ether	5.00	0.500	6.87	7.22	137	144	1	71.0-124	J5	J5	4.97	20
Naphthalene	5.00	25.1	27.0	21.6	38.0	0.000	1	61.0-128	V	J3 V	22.2	20
n-Propylbenzene	5.00	2.63	8.01	8.73	108	122	1	76.0-126			8.60	20
Styrene	5.00	0.500	6.17	6.43	123	129	1	78.0-123		J5	4.13	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.09	6.35	122	127	1	78.0-124		J5	4.18	20
1,1,2,2-Tetrachloroethane	5.00	0.500	5.63	6.03	113	121	1	71.0-121			6.86	20
Tetrachloroethene	5.00	0.600	6.88	7.17	138	143	1	74.0-129	J5	J5	4.13	20
Toluene	5.00	0.600	5.93	6.32	119	126	1	80.0-121		J5	6.37	20
1,2,3-Trichlorobenzene	5.00	0.500	5.67	5.03	113	101	1	69.0-129			12.0	20
1,2,3-Trimethylbenzene	5.00	5.68	11.6	11.7	118	120	1	82.0-120			0.858	20
1,2,4-Trimethylbenzene	5.00	30.0	35.4	35.6	108	112	1	76.0-124			0.563	20
1,3,5-Trimethylbenzene	5.00	0.500	5.59	6.14	112	123	1	75.0-124			9.38	20
1,1,1-Trichloroethane	5.00	0.500	7.83	8.12	157	162	1	74.0-131	J5	J5	3.64	20
1,1,2-Trichloroethane	5.00	0.500	5.78	6.23	116	125	1	80.0-119		J5	7.49	20
Trichloroethene	5.00	0.500	6.91	7.35	138	147	1	79.0-123	J5	J5	6.17	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.21	9.14	164	183	1	70.0-136	J5	J5	10.7	20
1,2,3-Trichloropropane	5.00	1.00	5.12	5.84	102	117	1	73.0-122			13.1	20
Vinyl chloride	5.00	0.500	8.40	8.75	168	175	1	58.0-137	J5	J5	4.08	20
Xylenes, Total	15.0	0.379	19.8	21.1	129	138	1	79.0-121	J5	J5	6.36	20
(S) Toluene-d8					*95.3*	*98.0*		*89.0-112*				
(S) 4-Bromofluorobenzene					*108*	*108*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*101*	*101*		*81.0-118*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acrolein	25.0	25.0	37.6	36.3	150	145	1	39.0-155			3.52	20
Acrylonitrile	25.0	5.00	32.9	31.5	132	126	1	63.0-135			4.35	20
Benzene	5.00	0.500	7.55	7.48	151	150	1	79.0-120	J5	J5	0.931	20
Bromobenzene	5.00	0.500	5.59	5.86	112	117	1	80.0-120			4.72	20
Bromodichloromethane	5.00	0.500	6.96	6.82	139	136	1	79.0-125	J5	J5	2.03	20
Bromoform	5.00	0.500	5.87	5.86	117	117	1	66.0-130			0.171	20
Bromomethane	5.00	2.00	7.98	7.96	160	159	1	53.0-141	J5	J5	0.251	20
n-Butylbenzene	5.00	0.500	6.09	6.17	122	123	1	75.0-128			1.31	20
sec-Butylbenzene	5.00	0.500	6.68	6.91	134	138	1	77.0-126	J5	J5	3.38	20
tert-Butylbenzene	5.00	0.500	6.39	6.49	128	130	1	78.0-124	J5	J5	1.55	20
Carbon tetrachloride	5.00	0.500	8.15	7.78	163	156	1	72.0-136	J5	J5	4.65	20
Chlorobenzene	5.00	0.500	6.57	6.76	131	135	1	82.0-118	J5	J5	2.85	20
Chlorodibromomethane	5.00	0.500	5.82	5.70	116	114	1	74.0-126			2.08	20
Chloroethane	5.00	2.00	8.56	8.24	171	165	1	60.0-138	J5	J5	3.81	20
Chloroform	5.00	2.00	7.92	7.67	158	153	1	79.0-124	J5	J5	3.21	20
2-Chlorotoluene	5.00	0.500	6.15	6.27	123	125	1	79.0-122	J5	J5	1.93	20
4-Chlorotoluene	5.00	0.500	5.79	5.95	116	119	1	78.0-122			2.73	20
1,2-Dibromoethane	5.00	0.500	6.23	6.42	125	128	1	77.0-121	J5	J5	3.00	20
Dibromomethane	5.00	0.500	7.26	7.11	145	142	1	79.0-123	J5	J5	2.09	20
1,2-Dichlorobenzene	5.00	0.500	6.52	6.72	130	134	1	80.0-119	J5	J5	3.02	20
1,3-Dichlorobenzene	5.00	0.500	6.20	6.20	124	124	1	80.0-119	J5	J5	0.000	20
1,4-Dichlorobenzene	5.00	0.500	5.96	6.24	119	125	1	79.0-118	J5	J5	4.59	20
Dichlorodifluoromethane	5.00	2.00	7.45	7.60	149	152	1	32.0-152			1.99	20
1,1-Dichloroethane	5.00	0.500	7.49	7.01	150	140	1	77.0-125	J5	J5	6.62	20
1,2-Dichloroethane	5.00	0.500	7.13	6.65	143	133	1	73.0-128	J5	J5	6.97	20
1,1-Dichloroethene	5.00	0.500	8.65	8.12	173	162	1	71.0-131	J5	J5	6.32	20
cis-1,2-Dichloroethene	5.00	0.500	8.19	7.47	164	149	1	78.0-123	J5	J5	9.20	20
trans-1,2-Dichloroethene	5.00	0.500	7.97	7.83	159	157	1	75.0-124	J5	J5	1.77	20
1,2-Dichloropropane	5.00	0.500	6.64	6.55	133	131	1	78.0-122	J5	J5	1.36	20
1,3-Dichloropropane	5.00	0.500	5.99	5.80	120	116	1	80.0-119	J5		3.22	20
2,2-Dichloropropane	5.00	0.500	8.51	7.94	170	159	1	60.0-139	J5	J5	6.93	20
1,1-Dichloropropene	5.00	0.500	7.89	7.97	158	159	1	79.0-125	J5	J5	1.01	20
cis-1,3-Dichloropropene	5.00	0.500	6.13	6.30	123	126	1	75.0-124		J5	2.74	20
trans-1,3-Dichloropropene	5.00	0.500	5.32	5.51	106	110	1	73.0-127			3.51	20
Di-isopropyl ether	5.00	0.500	5.73	5.67	115	113	1	67.0-128			1.05	20
Ethylbenzene	5.00	0.500	6.80	7.29	136	146	1	79.0-121	J5	J5	6.96	20
Isopropylbenzene	5.00	0.500	7.45	7.53	149	151	1	72.0-131	J5	J5	1.07	20
p-Isopropyltoluene	5.00	0.500	6.58	6.71	132	134	1	77.0-127	J5	J5	1.96	20
2-Butanone (MEK)	25.0	5.00	28.4	28.2	114	113	1	56.0-143			0.707	20
Methylene Chloride	5.00	2.00	7.59	7.27	152	145	1	74.0-124	J5	J5	4.31	20

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Methyl tert-butyl ether	5.00	0.500	7.30	7.23	146	145	1	71.0-124	J5	J5	0.964	20
Naphthalene	5.00	2.00	5.20	5.42	104	108	1	61.0-128			4.14	20
n-Propylbenzene	5.00	0.500	6.09	6.22	122	124	1	76.0-126			2.11	20
Styrene	5.00	0.500	6.56	6.71	131	134	1	78.0-123	J5	J5	2.26	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.51	6.73	130	135	1	78.0-124	J5	J5	3.32	20
1,1,2,2-Tetrachloroethane	5.00	0.500	6.31	6.08	126	122	1	71.0-121	J5	J5	3.71	20
Tetrachloroethene	5.00	0.600	7.23	7.35	145	147	1	74.0-129	J5	J5	1.65	20
Toluene	5.00	0.600	6.28	6.36	126	127	1	80.0-121	J5	J5	1.27	20
1,2,3-Trichlorobenzene	5.00	0.500	4.90	5.45	98.0	109	1	69.0-129			10.6	20
1,2,3-Trimethylbenzene	5.00	0.500	6.53	6.64	131	133	1	82.0-120	J5	J5	1.67	20
1,2,4-Trimethylbenzene	5.00	1.00	6.44	6.50	129	130	1	76.0-124	J5	J5	0.927	20
1,3,5-Trimethylbenzene	5.00	0.500	6.52	6.54	130	131	1	75.0-124	J5	J5	0.306	20
1,1,1-Trichloroethane	5.00	0.500	8.34	8.00	167	160	1	74.0-131	J5	J5	4.16	20
1,1,2-Trichloroethane	5.00	0.500	6.29	6.24	126	125	1	80.0-119	J5	J5	0.798	20
Trichloroethene	5.00	0.500	7.39	7.27	148	145	1	79.0-123	J5	J5	1.64	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.72	8.80	174	176	1	70.0-136	J5	J5	0.913	20
1,2,3-Trichloropropane	5.00	1.00	5.70	5.88	114	118	1	73.0-122			3.11	20
Vinyl chloride	5.00	0.500	8.71	8.56	174	171	1	58.0-137	J5	J5	1.74	20
Xylenes, Total	15.0	1.50	20.9	21.1	139	141	1	79.0-121	J5	J5	0.952	20
(S) Toluene-d8					*99.3*	*99.9*		*89.0-112*				
(S) 4-Bromofluorobenzene					*107*	*107*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*99.6*	*96.4*		*81.0-118*				

Method Blank (MB)

(MB) R3845009-3 10/04/22 01:31

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	16.3	J	11.3	25.0	50.0
Chloromethane	2.00	U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	2.00	U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	0.750	U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	5.00	U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	1.00	U	0.481	1.00	2.00
Trichlorofluoromethane	2.00	U	0.160	2.00	5.00
(S) Toluene-d8	*107*				*89.0-112*
(S) 4-Bromofluorobenzene	*110*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*114*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845009-1 10/03/22 23:52 • (LCSD) R3845009-2 10/04/22 00:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	37.2	38.2	149	153	39.0-160			2.65	20
Chloromethane	5.00	4.27	4.07	85.4	81.4	50.0-139			4.80	20
1,2-Dibromo-3-Chloropropane	5.00	4.72	4.19	94.4	83.8	62.0-128			11.9	20
Hexachloro-1,3-butadiene	5.00	4.84	5.09	96.8	102	66.0-134			5.04	20
4-Methyl-2-pentanone (MIBK)	25.0	22.4	21.9	89.6	87.6	67.0-130			2.26	20
1,2,4-Trichlorobenzene	5.00	5.11	4.76	102	95.2	69.0-130			7.09	20
Trichlorofluoromethane	5.00	6.01	5.38	120	108	65.0-141			11.1	20
(S) Toluene-d8				*105*	*104*	*89.0-112*				
(S) 4-Bromofluorobenzene				*109*	*105*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*113*	*111*	*81.0-118*				

Method Blank (MB)

(MB) R3845890-3 10/05/22 22:08

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Trichloroethene	0.500	U	0.190	0.500	1.00
(S) Toluene-d8	*101*				*89.0-112*
(S) 4-Bromofluorobenzene	*90.8*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*115*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845890-1 10/05/22 19:58 • (LCSD) R3845890-2 10/05/22 20:36

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Trichloroethene	5.00	5.89	5.81	118	116	79.0-123			1.37	20
(S) Toluene-d8				*101*	*102*	*89.0-112*				
(S) 4-Bromofluorobenzene				*92.4*	*95.6*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*114*	*113*	*81.0-118*				

Method Blank (MB)

(MB) R3843855-1 10/01/22 17:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
AK102 DRO C10-C25	400	U	170	400	800
(S) o-Terphenyl	*100*				*60.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843855-2 10/01/22 18:17 • (LCSD) R3843855-3 10/01/22 18:39

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6000	6410	6270	107	104	75.0-125			2.21	20
(S) o-Terphenyl				*83.5*	*84.3*	*60.0-120*				

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/01/22 19:02 • (MS) R3843855-4 10/01/22 19:25 • (MSD) R3843855-5 10/01/22 19:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	5460	400	5540	6470	101	108	1	75.0-125			15.5	20
(S) o-Terphenyl					*79.8*	*85.1*		*50.0-150*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/02/22 03:21 • (MS) R3843855-6 10/02/22 03:44 • (MSD) R3843855-7 10/02/22 04:07

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6000	400	6560	6350	109	106	1	75.0-125			3.25	20
(S) o-Terphenyl					*83.1*	*85.4*		*50.0-150*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
C4	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
U	Below Detectable Limits: Indicates that the analyte was not detected.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
North Wind Site Services, LLC- AK

2525 C St., Ste 130
Anchorage, AK 99503

Billing Information:
Accounts Payable
1425 Higham St
Idaho Falls, ID 83402

Report to:
Jill Jones

Email To: jill.jones@northwindgrp.com, rlafata@northwindgrp.com

Project Description:
Port Heiden RRS

City/State Collected: PORT HEIDEN, AK

Please Circle: PT MT CT ET

Phone: **(907) 891-7338**

Client Project #
060068.061

Lab Project #
NORWINDAAK-ORC

Collected by (print):
SYDNEY SOUZA

Site/Facility ID #
PORT HEIDEN

P.O. #
6-00000738

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DODAK102 100ml Amb HCl	DODALK 250mlHDPE-NoPres + SULFATE	DODFEICP,DODMNICP 250mlHDPE-HNO3	DODNO2NO3 250mlHDPE-H2SO4 + TKN	DODSULFATE 250mlHDPE-NoPres	DODTKN 250mlHDPE-H2SO4	DODV8260BTEX 40mlAmb-HCl	DODV8260C 40mlAmb-HCl (VOCs)			Remarks	Sample # (lab only)
OT001-BLOMW07-091922	G	GW		09-19-22	11:30	8	X	X	X	X				XX				01
OT001-BLOMW05-091922	G	GW		09-19-22	12:10	8	X	X	X	X				XX				02
~~OT001-BLOT~~		GW																
OT001-DSAMW02-091922	G	GW		09-19-22	13:15	8	X	X	X	X				X				03
OT001-BLOMW06-091922		GW		09-19-22	14:05	8	X	X	X	X				XX				04
OT001-BLOMW06-091922-99		GW		09-19-22	14:10	8	X	X	X	X				XX				05
WP002-BLOMW01-091922		GW		09-19-22	15:20	8	X	X	X	X				X				06
WP002-BLOMW01-091922-99		GW		09-19-22	15:25	8	X	X	X	X				X				07
~~WP002-TRIPBLK-01~~		GW																
WP002-TRIPBLNK-HCL-01		GW		09-19-22	09:00	1								X			TRIP BLANK	08

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
NTDL: 21-034
COOLER NAME: MALEFICIENT

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 5882 7555 4731

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	09-20-22	12:30	Renee Lafata
Renee Lafata	09/28/22	1230	Sydney Souza
Sydney Souza	9/28/22	12:40	

Trip Blank Received: Yes / No
HCL / MeoH
TBR
1

Temp: 0.8 °C
5.1+0=5.1

Bottles Received: 56

Date: 9/29/22 Time: 0930

Received for lab by: (Signature)

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1540953
G069

Acctnum: **NORWINDAAK**
Template: **T215484**
Prelogin: **P948323**
PM: **546 - Jared Starkey**
PB:
Shipped Via: **FedEX 2nd Day**

ANALYTICAL REPORT

October 20, 2022

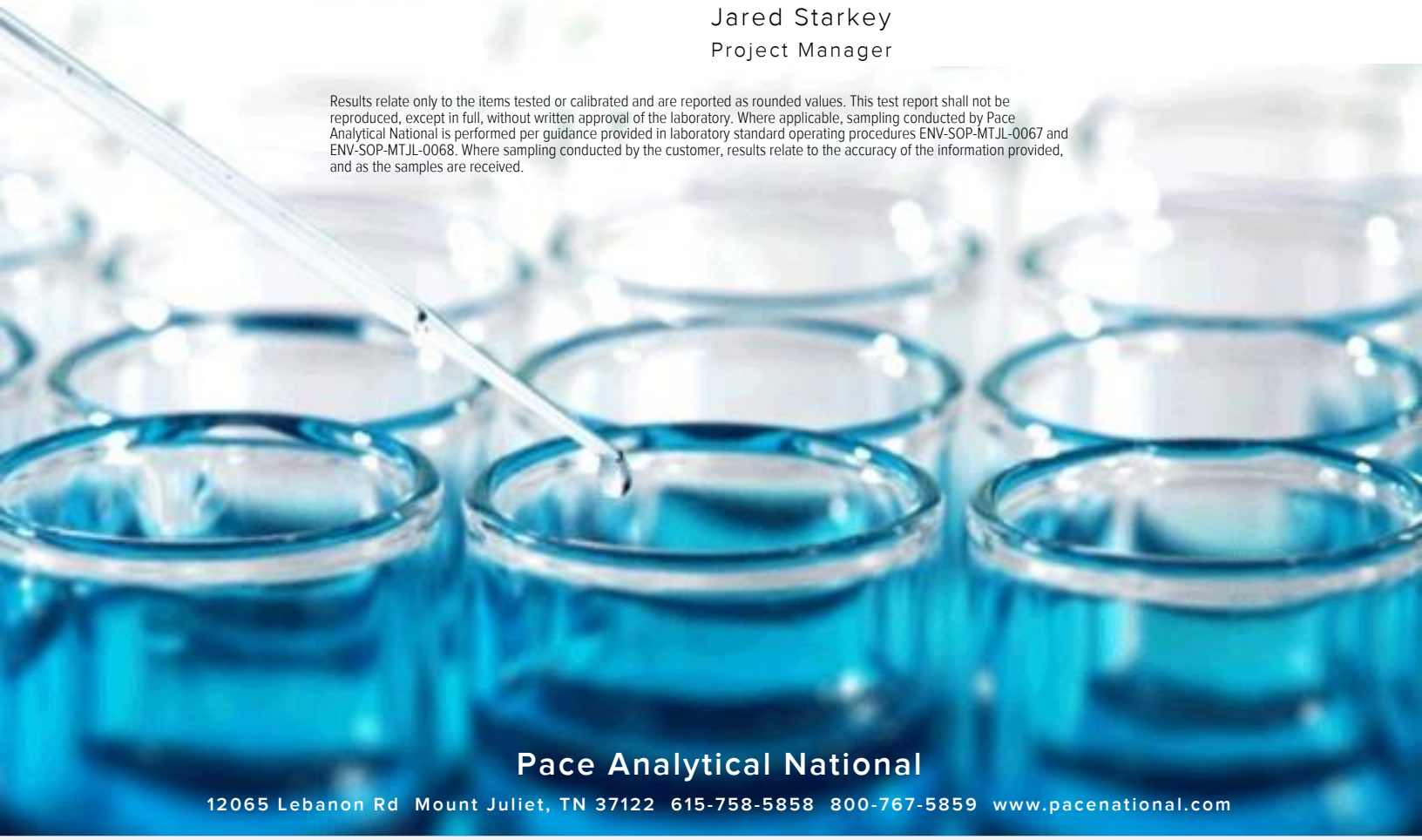
North Wind Site Services, LLC- AK

Sample Delivery Group:	L1540980
Samples Received:	09/29/2022
Project Number:	060068.001
Description:	Port Heiden RRS NPDL 21-034
Site:	RRSMW06
Report To:	Jill Jones 7910 King Street Anchorage, AK 99518

Entire Report Reviewed By:

Jared Starkey
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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OT001-RRSMW06-091722 L1540980-01 GW

Collected by: Sydney S | Collected date/time: 09/17/22 17:48 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:22	10/01/22 10:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:41	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:33	10/04/22 18:33	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 01:28	10/04/22 01:28	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/20/22 11:19	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 16:16	10/01/22 16:16	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 06:12	10/04/22 06:12	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 03:21	DMG	Mt. Juliet, TN

OT001-RRSMW05-091822 L1540980-02 GW

Collected by: Sydney S | Collected date/time: 09/18/22 12:03 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:29	10/01/22 10:29	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:50	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:38	10/04/22 18:38	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 02:06	10/04/22 02:06	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940061	1	10/19/22 09:29	10/20/22 11:22	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 16:38	10/01/22 16:38	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 06:33	10/04/22 06:33	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 04:30	DMG	Mt. Juliet, TN

OT001-DSAMW01-091822 L1540980-03 GW

Collected by: Sydney S | Collected date/time: 09/18/22 12:55 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:32	10/01/22 10:32	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:51	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:40	10/04/22 18:40	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 02:19	10/04/22 02:19	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940241	1	10/10/22 15:58	10/11/22 15:45	JDG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 16:59	10/01/22 16:59	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 06:55	10/04/22 06:55	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 04:52	DMG	Mt. Juliet, TN

OT001-DSAMW05-091822 L1540980-04 GW

Collected by: Sydney S | Collected date/time: 09/18/22 15:05 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:37	10/01/22 10:37	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:52	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:41	10/04/22 18:41	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 02:32	10/04/22 02:32	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940241	1	10/10/22 15:58	10/11/22 15:56	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 17:20	10/01/22 17:20	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 07:16	10/04/22 07:16	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 05:15	DMG	Mt. Juliet, TN

OT001-GLOMW04-091822 L1540980-05 GW

Collected by: Sydney S | Collected date/time: 09/18/22 16:16 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:48	10/01/22 10:48	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:54	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:46	10/04/22 18:46	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 02:45	10/04/22 02:45	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940241	1	10/10/22 15:58	10/11/22 15:59	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 17:41	10/01/22 17:41	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 07:38	10/04/22 07:38	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 05:38	DMG	Mt. Juliet, TN

OT001-DSAMW06-091822 L1540980-06 GW

Collected by: Sydney S | Collected date/time: 09/18/22 17:30 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 2320 B-2011	WG1935544	1	10/01/22 10:52	10/01/22 10:52	ARD	Mt. Juliet, TN
Wet Chemistry by Method 351.2	WG1935863	1	10/04/22 08:19	10/04/22 21:55	LDT	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1935271	1	10/04/22 18:47	10/04/22 18:47	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1934921	1	10/04/22 03:23	10/04/22 03:23	GEB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1940241	1	10/10/22 15:58	10/11/22 16:02	ZSA	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 18:02	10/01/22 18:02	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 08:00	10/04/22 08:00	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1934826	1	09/30/22 14:16	10/02/22 06:01	DMG	Mt. Juliet, TN

OT001-TRIPBLANK-HCL-01 L1540980-07 GW

Collected by: Sydney S | Collected date/time: 09/18/22 17:40 | Received date/time: 09/29/22 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935601	1	10/01/22 12:27	10/01/22 12:27	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1935909	1	10/04/22 02:14	10/04/22 02:14	JHH	Mt. Juliet, TN

Unless qualified or notated within the narrative below, all sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jared Starkey
Project Manager

Sample Delivery Group (SDG) Narrative

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

Batch	Method	Lab Sample ID
WG1935909	8260D	L1540980-01, 02, 03, 04, 05, 06

Analyzed from headspace vial.

Batch	Method	Lab Sample ID
WG1935909	8260D	L1540980-07

Wet Chemistry by Method 351.2

RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Batch	Lab Sample ID	Analytes
WG1935863	(DUP) R3844701-3	Kjeldahl Nitrogen, TKN

The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Batch	Lab Sample ID	Analytes
WG1935863	(MSD) R3844701-5	Kjeldahl Nitrogen, TKN

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935863	(MSD) R3844701-5	Kjeldahl Nitrogen, TKN

Metals (ICP) by Method 6010D

The same analyte is found in the associated blank.

Batch	Analyte	Lab Sample ID
WG1940241	Iron	L1540980-03
WG1940241	Manganese	L1540980-03

Volatile Organic Compounds (GC/MS) by Method 8260D

The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.

Batch	Lab Sample ID	Analytes
WG1935909	L1540980-01	1,2-Dibromo-3-Chloropropane
WG1935909	L1540980-02	1,2-Dibromo-3-Chloropropane
WG1935909	L1540980-03	1,2-Dibromo-3-Chloropropane
WG1935909	L1540980-04	1,2-Dibromo-3-Chloropropane
WG1935909	L1540980-05	1,2-Dibromo-3-Chloropropane
WG1935909	L1540980-06	1,2-Dibromo-3-Chloropropane
WG1935909	L1540980-07	1,2-Dibromo-3-Chloropropane

Surrogate recovery limits have been exceeded; values are outside upper control limits.

Batch	Analyte	Lab Sample ID
WG1935909	4-Bromofluorobenzene	L1540980-01

The same analyte is found in the associated blank.

Batch	Analyte	Lab Sample ID
WG1935909	Acetone	L1540980-01, 02, 03, 04, 05, 06

The associated batch QC was below the established quality control range for accuracy.

Batch	Lab Sample ID	Analytes
WG1935601	(LCSD) R3843739-2, L1540980-01, 02, 03, 04, 05, 06, 07	1,2,3-Trichlorobenzene

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935601	(LCSD) R3843739-2, L1540980-02, 03, 04, 05, 06, 07	1,2,3-Trichlorobenzene, Acetone, Hexachloro-1,3-butadiene and Naphthalene

The sample matrix interfered with the ability to make any accurate determination; spike value is high.

Batch	Lab Sample ID	Analytes
WG1935601	(MS) R3843739-6, (MS) R3843739-4, (MSD) R3843739-5, (MSD) R3843739-7, L1540980-01	45 analytes

The sample concentration is too high to evaluate accurate spike recoveries.

Batch	Lab Sample ID	Analytes
WG1935601	(MS) R3843739-4, (MSD) R3843739-5	Naphthalene

The associated batch QC was outside the established quality control range for precision.

Batch	Lab Sample ID	Analytes
WG1935601	(MSD) R3843739-5	Naphthalene

Wet Chemistry by Method 2320 B-2011

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-RRSMW06-091722	L1540980-01	Alkalinity		109000		8450	10000	20000	1	10/01/2022 10:22	WG1935544
OT001-RRSMW06-091722	L1540980-01	Alkalinity,Bicarbonate		109000		8450	10000	20000	1	10/01/2022 10:22	WG1935544
OT001-RRSMW05-091822	L1540980-02	Alkalinity		56200		8450	10000	20000	1	10/01/2022 10:29	WG1935544
OT001-RRSMW05-091822	L1540980-02	Alkalinity,Bicarbonate		56200		8450	10000	20000	1	10/01/2022 10:29	WG1935544
OT001-DSAMW01-091822	L1540980-03	Alkalinity		88800		8450	10000	20000	1	10/01/2022 10:32	WG1935544
OT001-DSAMW01-091822	L1540980-03	Alkalinity,Bicarbonate		88800		8450	10000	20000	1	10/01/2022 10:32	WG1935544
OT001-DSAMW05-091822	L1540980-04	Alkalinity		68300		8450	10000	20000	1	10/01/2022 10:37	WG1935544
OT001-DSAMW05-091822	L1540980-04	Alkalinity,Bicarbonate		68300		8450	10000	20000	1	10/01/2022 10:37	WG1935544
OT001-GLOMW04-091822	L1540980-05	Alkalinity		64200		8450	10000	20000	1	10/01/2022 10:48	WG1935544
OT001-GLOMW04-091822	L1540980-05	Alkalinity,Bicarbonate		64200		8450	10000	20000	1	10/01/2022 10:48	WG1935544
OT001-DSAMW06-091822	L1540980-06	Alkalinity		58700		8450	10000	20000	1	10/01/2022 10:52	WG1935544
OT001-DSAMW06-091822	L1540980-06	Alkalinity,Bicarbonate		58700		8450	10000	20000	1	10/01/2022 10:52	WG1935544

Wet Chemistry by Method 353.2

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-RRSMW06-091722	L1540980-01	Nitrate-Nitrite	7727-37-9	1050		50.0	100	200	1	10/04/2022 18:33	WG1935271
OT001-RRSMW05-091822	L1540980-02	Nitrate-Nitrite	7727-37-9	62.1	J	50.0	100	200	1	10/04/2022 18:38	WG1935271
OT001-DSAMW01-091822	L1540980-03	Nitrate-Nitrite	7727-37-9	642		50.0	100	200	1	10/04/2022 18:40	WG1935271
OT001-GLOMW04-091822	L1540980-05	Nitrate-Nitrite	7727-37-9	425		50.0	100	200	1	10/04/2022 18:46	WG1935271

Wet Chemistry by Method 9056A

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-RRSMW06-091722	L1540980-01	Sulfate	14808-79-8	4560	J	594	2500	5000	1	10/04/2022 01:28	WG1934921
OT001-RRSMW05-091822	L1540980-02	Sulfate	14808-79-8	3320	J	594	2500	5000	1	10/04/2022 02:06	WG1934921
OT001-DSAMW01-091822	L1540980-03	Sulfate	14808-79-8	6390		594	2500	5000	1	10/04/2022 02:19	WG1934921
OT001-DSAMW05-091822	L1540980-04	Sulfate	14808-79-8	12700		594	2500	5000	1	10/04/2022 02:32	WG1934921
OT001-GLOMW04-091822	L1540980-05	Sulfate	14808-79-8	3790	J	594	2500	5000	1	10/04/2022 02:45	WG1934921
OT001-DSAMW06-091822	L1540980-06	Sulfate	14808-79-8	4400	J	594	2500	5000	1	10/04/2022 03:23	WG1934921

DETECTION SUMMARY

Metals (ICP) by Method 6010D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-RRSMW06-091722	L1540980-01	Iron	7439-89-6	100		20.5	50.0	100	1	10/20/2022 11:19	WG1940061
OT001-RRSMW06-091722	L1540980-01	Manganese	7439-96-5	2.56	J	0.855	5.00	10.0	1	10/20/2022 11:19	WG1940061
OT001-RRSMW05-091822	L1540980-02	Iron	7439-89-6	833		20.5	50.0	100	1	10/20/2022 11:22	WG1940061
OT001-RRSMW05-091822	L1540980-02	Manganese	7439-96-5	10.6		0.855	5.00	10.0	1	10/20/2022 11:22	WG1940061
OT001-DSAMW01-091822	L1540980-03	Iron	7439-89-6	35.6	B J	20.5	50.0	100	1	10/11/2022 15:45	WG1940241
OT001-DSAMW01-091822	L1540980-03	Manganese	7439-96-5	1.57	B J	0.855	5.00	10.0	1	10/11/2022 15:45	WG1940241
OT001-DSAMW05-091822	L1540980-04	Iron	7439-89-6	573		20.5	50.0	100	1	10/11/2022 15:56	WG1940241
OT001-DSAMW05-091822	L1540980-04	Manganese	7439-96-5	64.6		0.855	5.00	10.0	1	10/11/2022 15:56	WG1940241
OT001-GLOMW04-091822	L1540980-05	Iron	7439-89-6	556		20.5	50.0	100	1	10/11/2022 15:59	WG1940241
OT001-GLOMW04-091822	L1540980-05	Manganese	7439-96-5	27.9		0.855	5.00	10.0	1	10/11/2022 15:59	WG1940241
OT001-DSAMW06-091822	L1540980-06	Iron	7439-89-6	3050		20.5	50.0	100	1	10/11/2022 16:02	WG1940241
OT001-DSAMW06-091822	L1540980-06	Manganese	7439-96-5	211		0.855	5.00	10.0	1	10/11/2022 16:02	WG1940241

Volatile Organic Compounds (GC/MS) by Method 8260D

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
OT001-RRSMW06-091722	L1540980-01	Acetone	67-64-1	13.1	B J T8	11.3	25.0	50.0	1	10/04/2022 06:12	WG1935909
OT001-RRSMW05-091822	L1540980-02	Acetone	67-64-1	13.3	B J T8	11.3	25.0	50.0	1	10/04/2022 06:33	WG1935909
OT001-DSAMW01-091822	L1540980-03	Acetone	67-64-1	12.9	B J T8	11.3	25.0	50.0	1	10/04/2022 06:55	WG1935909
OT001-DSAMW01-091822	L1540980-03	Trichloroethene	79-01-6	10.5		0.190	0.500	1.00	1	10/01/2022 16:59	WG1935601
OT001-DSAMW05-091822	L1540980-04	Acetone	67-64-1	11.5	B J T8	11.3	25.0	50.0	1	10/04/2022 07:16	WG1935909
OT001-DSAMW05-091822	L1540980-04	Trichloroethene	79-01-6	3.30		0.190	0.500	1.00	1	10/01/2022 17:20	WG1935601
OT001-GLOMW04-091822	L1540980-05	Acetone	67-64-1	11.5	B J T8	11.3	25.0	50.0	1	10/04/2022 07:38	WG1935909
OT001-DSAMW06-091822	L1540980-06	Acetone	67-64-1	11.4	B J T8	11.3	25.0	50.0	1	10/04/2022 08:00	WG1935909
OT001-DSAMW06-091822	L1540980-06	Tetrachloroethene	127-18-4	0.521	J	0.300	0.600	1.20	1	10/01/2022 18:02	WG1935601

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Alkalinity		109000		8450	10000	20000	1	10/01/2022 10:22	WG1935544
Alkalinity,Bicarbonate		109000		8450	10000	20000	1	10/01/2022 10:22	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:22	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:22	WG1935544

Sample Narrative:
L1540980-01 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:41	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Nitrate-Nitrite	7727-37-9	1050		50.0	100	200	1	10/04/2022 18:33	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Sulfate	14808-79-8	4560	J	594	2500	5000	1	10/04/2022 01:28	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Iron	7439-89-6	100		20.5	50.0	100	1	10/20/2022 11:19	WG1940061
Manganese	7439-96-5	2.56	J	0.855	5.00	10.0	1	10/20/2022 11:19	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	13.1	B J T8	11.3	25.0	50.0	1	10/04/2022 06:12	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 16:16	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 16:16	WG1935601
Benzene	71-43-2	0.500	J5 U	0.0941	0.500	1.00	1	10/01/2022 16:16	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:16	WG1935601
Bromodichloromethane	75-27-4	0.500	J5 U	0.136	0.500	1.00	1	10/01/2022 16:16	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 16:16	WG1935601
Bromomethane	74-83-9	2.00	J5 U	0.605	2.00	5.00	1	10/01/2022 16:16	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 16:16	WG1935601
sec-Butylbenzene	135-98-8	0.500	J5 U	0.125	0.500	1.00	1	10/01/2022 16:16	WG1935601
tert-Butylbenzene	98-06-6	0.500	J5 U	0.127	0.500	1.00	1	10/01/2022 16:16	WG1935601
Carbon tetrachloride	56-23-5	0.500	J5 U	0.128	0.500	1.00	1	10/01/2022 16:16	WG1935601
Chlorobenzene	108-90-7	0.500	J5 U	0.116	0.500	1.00	1	10/01/2022 16:16	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 16:16	WG1935601
Chloroethane	75-00-3	2.00	J5 U	0.192	2.00	5.00	1	10/01/2022 16:16	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chloroform	67-66-3	2.00	J5 U	0.111	2.00	5.00	1	10/01/2022 16:16	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 06:12	WG1935909
2-Chlorotoluene	95-49-8	0.500	J5 U	0.106	0.500	1.00	1	10/01/2022 16:16	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2-Dibromoethane	106-93-4	0.500	J5 U	0.126	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 06:12	WG1935909
Dibromomethane	74-95-3	0.500	J5 U	0.122	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	J5 U	0.107	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	J5 U	0.110	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	J5 U	0.120	0.500	1.00	1	10/01/2022 16:16	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 16:16	WG1935601
1,1-Dichloroethane	75-34-3	0.500	J5 U	0.100	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2-Dichloroethane	107-06-2	0.500	J5 U	0.0819	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,1-Dichloroethene	75-35-4	0.500	J5 U	0.188	0.500	1.00	1	10/01/2022 16:16	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	J5 U	0.126	0.500	1.00	1	10/01/2022 16:16	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	J5 U	0.149	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2-Dichloropropane	78-87-5	0.500	J5 U	0.149	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,3-Dichloropropane	142-28-9	0.500	J5 U	0.110	0.500	1.00	1	10/01/2022 16:16	WG1935601
2,2-Dichloropropane	594-20-7	0.500	J5 U	0.161	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,1-Dichloropropene	563-58-6	0.500	J5 U	0.142	0.500	1.00	1	10/01/2022 16:16	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	J5 U	0.111	0.500	1.00	1	10/01/2022 16:16	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:16	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 16:16	WG1935601
Ethylbenzene	100-41-4	0.500	J5 U	0.137	0.500	1.00	1	10/01/2022 16:16	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 06:12	WG1935909
Isopropylbenzene	98-82-8	0.500	J5 U	0.105	0.500	1.00	1	10/01/2022 16:16	WG1935601
p-Isopropyltoluene	99-87-6	0.500	J5 U	0.120	0.500	1.00	1	10/01/2022 16:16	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 16:16	WG1935601
Methylene Chloride	75-09-2	2.00	J5 U	0.430	2.00	5.00	1	10/01/2022 16:16	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 06:12	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	J5 U	0.101	0.500	1.00	1	10/01/2022 16:16	WG1935601
Naphthalene	91-20-3	2.00	U	1.00	2.00	5.00	1	10/01/2022 16:16	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 16:16	WG1935601
Styrene	100-42-5	0.500	J5 U	0.118	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	J5 U	0.147	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	J5 U	0.133	0.500	1.00	1	10/01/2022 16:16	WG1935601
Tetrachloroethene	127-18-4	0.600	J5 U	0.300	0.600	1.20	1	10/01/2022 16:16	WG1935601
Toluene	108-88-3	0.600	J5 U	0.278	0.600	1.20	1	10/01/2022 16:16	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J4 U	0.230	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 06:12	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	J5 U	0.104	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	J5 U	0.322	1.00	2.00	1	10/01/2022 16:16	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	J5 U	0.104	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	J5 U	0.149	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	J5 U	0.158	0.500	1.00	1	10/01/2022 16:16	WG1935601
Trichloroethene	79-01-6	0.500	J5 U	0.190	0.500	1.00	1	10/01/2022 16:16	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 06:12	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	J5 U	0.180	0.500	1.00	1	10/01/2022 16:16	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 16:16	WG1935601
Vinyl chloride	75-01-4	0.500	J5 U	0.234	0.500	1.00	1	10/01/2022 16:16	WG1935601
Xylenes, Total	1330-20-7	1.50	J5 U	0.174	1.50	3.00	1	10/01/2022 16:16	WG1935601
(S) Toluene-d8	*2037-26-5*	*102*				*89.0-112*		*10/01/2022 16:16*	WG1935601
(S) Toluene-d8	*2037-26-5*	*109*				*89.0-112*		*10/04/2022 06:12*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/01/2022 16:16*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*117*	J1			*85.0-114*		*10/04/2022 06:12*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*95.8*				*81.0-118*		*10/01/2022 16:16*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*115*				*81.0-118*		*10/04/2022 06:12*	WG1935909

Sample Narrative:

L1540980-01 WG1935909: Surrogate failure due to matrix interference

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 03:21	WG1934826
(S) o-Terphenyl	*84-15-1*	*99.1*				*50.0-150*		*10/02/2022 03:21*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		56200		8450	10000	20000	1	10/01/2022 10:29	WG1935544
Alkalinity,Bicarbonate		56200		8450	10000	20000	1	10/01/2022 10:29	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:29	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:29	WG1935544

Sample Narrative:
L1540980-02 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:50	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	62.1	J	50.0	100	200	1	10/04/2022 18:38	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	3320	J	594	2500	5000	1	10/04/2022 02:06	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	833		20.5	50.0	100	1	10/20/2022 11:22	WG1940061
Manganese	7439-96-5	10.6		0.855	5.00	10.0	1	10/20/2022 11:22	WG1940061

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	13.3	B J T8	11.3	25.0	50.0	1	10/04/2022 06:33	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 16:38	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 16:38	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 16:38	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:38	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 16:38	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 16:38	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 16:38	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 16:38	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 16:38	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 16:38	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 16:38	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 16:38	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 16:38	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 16:38	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 16:38	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 06:33	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 16:38	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 06:33	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 16:38	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 16:38	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 16:38	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 16:38	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 16:38	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 16:38	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 16:38	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:38	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 16:38	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 16:38	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 06:33	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 16:38	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 16:38	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 16:38	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 16:38	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 06:33	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 16:38	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 16:38	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 16:38	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 16:38	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 16:38	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 16:38	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 06:33	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 16:38	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 16:38	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 16:38	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 06:33	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 16:38	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 16:38	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 16:38	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 16:38	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/01/2022 16:38*	WG1935601
(S) Toluene-d8	*2037-26-5*	*107*				*89.0-112*		*10/04/2022 06:33*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*108*				*85.0-114*		*10/01/2022 16:38*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*113*				*85.0-114*		*10/04/2022 06:33*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*95.3*				*81.0-118*		*10/01/2022 16:38*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*113*				*81.0-118*		*10/04/2022 06:33*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 04:30	WG1934826
(S) o-Terphenyl	*84-15-1*	*95.0*				*50.0-150*		*10/02/2022 04:30*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		88800		8450	10000	20000	1	10/01/2022 10:32	WG1935544
Alkalinity,Bicarbonate		88800		8450	10000	20000	1	10/01/2022 10:32	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:32	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:32	WG1935544

Sample Narrative:
L1540980-03 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:51	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	642		50.0	100	200	1	10/04/2022 18:40	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	6390		594	2500	5000	1	10/04/2022 02:19	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	35.6	B J	20.5	50.0	100	1	10/11/2022 15:45	WG1940241
Manganese	7439-96-5	1.57	B J	0.855	5.00	10.0	1	10/11/2022 15:45	WG1940241

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	12.9	B J T8	11.3	25.0	50.0	1	10/04/2022 06:55	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 16:59	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 16:59	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 16:59	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:59	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 16:59	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 16:59	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 16:59	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 16:59	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 16:59	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 16:59	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 16:59	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 16:59	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 16:59	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 16:59	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 16:59	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 06:55	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 16:59	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 06:55	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 16:59	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 16:59	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 16:59	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 16:59	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 16:59	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 16:59	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 16:59	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:59	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 16:59	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 16:59	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 06:55	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 16:59	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 16:59	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 16:59	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 16:59	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 06:55	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 16:59	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 16:59	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 16:59	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 16:59	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 16:59	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 16:59	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 06:55	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 16:59	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 16:59	WG1935601
Trichloroethene	79-01-6	10.5		0.190	0.500	1.00	1	10/01/2022 16:59	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 06:55	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 16:59	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 16:59	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 16:59	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 16:59	WG1935601
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*10/01/2022 16:59*	WG1935601
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*10/04/2022 06:55*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*108*				*85.0-114*		*10/01/2022 16:59*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*107*				*85.0-114*		*10/04/2022 06:55*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*98.5*				*81.0-118*		*10/01/2022 16:59*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*114*				*81.0-118*		*10/04/2022 06:55*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 04:52	WG1934826
(S) o-Terphenyl	*84-15-1*	*98.0*				*50.0-150*		*10/02/2022 04:52*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		68300		8450	10000	20000	1	10/01/2022 10:37	WG1935544
Alkalinity,Bicarbonate		68300		8450	10000	20000	1	10/01/2022 10:37	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:37	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:37	WG1935544

Sample Narrative:

L1540980-04 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:52	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200	1	10/04/2022 18:41	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	12700		594	2500	5000	1	10/04/2022 02:32	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	573		20.5	50.0	100	1	10/11/2022 15:56	WG1940241
Manganese	7439-96-5	64.6		0.855	5.00	10.0	1	10/11/2022 15:56	WG1940241

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	11.5	B J T8	11.3	25.0	50.0	1	10/04/2022 07:16	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 17:20	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 17:20	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 17:20	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 17:20	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 17:20	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 17:20	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 17:20	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 17:20	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 17:20	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 17:20	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 17:20	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 17:20	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 17:20	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 17:20	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 17:20	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 07:16	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 17:20	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 07:16	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 17:20	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 17:20	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 17:20	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 17:20	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 17:20	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 17:20	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 17:20	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 17:20	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 17:20	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 17:20	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 07:16	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 17:20	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 17:20	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 17:20	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 17:20	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 07:16	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 17:20	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 17:20	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 17:20	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 17:20	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 17:20	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 17:20	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 07:16	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 17:20	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 17:20	WG1935601
Trichloroethene	79-01-6	3.30		0.190	0.500	1.00	1	10/01/2022 17:20	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 07:16	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 17:20	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 17:20	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 17:20	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 17:20	WG1935601
(S) Toluene-d8	*2037-26-5*	*100*				*89.0-112*		*10/01/2022 17:20*	WG1935601
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*10/04/2022 07:16*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*108*				*85.0-114*		*10/01/2022 17:20*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*111*				*85.0-114*		*10/04/2022 07:16*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*100*				*81.0-118*		*10/01/2022 17:20*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*117*				*81.0-118*		*10/04/2022 07:16*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 05:15	WG1934826
(S) o-Terphenyl	*84-15-1*	*101*				*50.0-150*		*10/02/2022 05:15*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Alkalinity		64200		8450	10000	20000	1	10/01/2022 10:48	WG1935544
Alkalinity,Bicarbonate		64200		8450	10000	20000	1	10/01/2022 10:48	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:48	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:48	WG1935544

Sample Narrative:
L1540980-05 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:54	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Nitrate-Nitrite	7727-37-9	425		50.0	100	200	1	10/04/2022 18:46	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Sulfate	14808-79-8	3790	J	594	2500	5000	1	10/04/2022 02:45	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Iron	7439-89-6	556		20.5	50.0	100	1	10/11/2022 15:59	WG1940241
Manganese	7439-96-5	27.9		0.855	5.00	10.0	1	10/11/2022 15:59	WG1940241

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	11.5	B J T8	11.3	25.0	50.0	1	10/04/2022 07:38	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 17:41	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 17:41	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 17:41	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 17:41	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 17:41	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 17:41	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 17:41	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 17:41	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 17:41	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 17:41	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 17:41	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 17:41	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 17:41	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 17:41	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 17:41	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 07:38	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 17:41	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 07:38	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 17:41	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 17:41	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 17:41	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 17:41	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 17:41	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 17:41	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 17:41	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 17:41	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 17:41	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 17:41	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 07:38	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 17:41	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 17:41	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 17:41	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 17:41	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 07:38	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 17:41	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 17:41	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 17:41	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 17:41	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 17:41	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 17:41	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 07:38	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 17:41	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 17:41	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 17:41	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 07:38	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 17:41	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 17:41	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 17:41	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 17:41	WG1935601
(S) Toluene-d8	*2037-26-5*	*101*				*89.0-112*		*10/01/2022 17:41*	WG1935601
(S) Toluene-d8	*2037-26-5*	*101*				*89.0-112*		*10/04/2022 07:38*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*106*				*85.0-114*		*10/01/2022 17:41*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*107*				*85.0-114*		*10/04/2022 07:38*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*95.6*				*81.0-118*		*10/01/2022 17:41*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*116*				*81.0-118*		*10/04/2022 07:38*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 05:38	WG1934826
(S) o-Terphenyl	*84-15-1*	*94.0*				*50.0-150*		*10/02/2022 05:38*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Wet Chemistry by Method 2320 B-2011

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Alkalinity		58700		8450	10000	20000	1	10/01/2022 10:52	WG1935544
Alkalinity,Bicarbonate		58700		8450	10000	20000	1	10/01/2022 10:52	WG1935544
Alkalinity,Carbonate		10000	U	8450	10000	20000	1	10/01/2022 10:52	WG1935544
Alkalinity,Hydroxide		10000	U	8450	10000	20000	1	10/01/2022 10:52	WG1935544

Sample Narrative:
L1540980-06 WG1935544: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 351.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Kjeldahl Nitrogen, TKN	7727-37-9	300	U	140	300	600	1	10/04/2022 21:55	WG1935863

Wet Chemistry by Method 353.2

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Nitrate-Nitrite	7727-37-9	100	U	50.0	100	200	1	10/04/2022 18:47	WG1935271

Wet Chemistry by Method 9056A

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Sulfate	14808-79-8	4400	J	594	2500	5000	1	10/04/2022 03:23	WG1934921

Metals (ICP) by Method 6010D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Iron	7439-89-6	3050		20.5	50.0	100	1	10/11/2022 16:02	WG1940241
Manganese	7439-96-5	211		0.855	5.00	10.0	1	10/11/2022 16:02	WG1940241

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Acetone	67-64-1	11.4	B J T8	11.3	25.0	50.0	1	10/04/2022 08:00	WG1935909
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 18:02	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 18:02	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 18:02	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 18:02	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 18:02	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 18:02	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 18:02	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 18:02	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 18:02	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 18:02	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 18:02	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 18:02	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 18:02	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 18:02	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 18:02	WG1935601
Chloromethane	74-87-3	2.00	T8 U	0.960	2.00	4.00	1	10/04/2022 08:00	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 18:02	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 T8 U	0.276	2.00	5.00	1	10/04/2022 08:00	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 18:02	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 18:02	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 18:02	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 18:02	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 18:02	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 18:02	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 18:02	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 18:02	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 18:02	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 18:02	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	T8 U	0.337	0.750	1.50	1	10/04/2022 08:00	WG1935909
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 18:02	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 18:02	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 18:02	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 18:02	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	T8 U	0.478	5.00	10.0	1	10/04/2022 08:00	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 18:02	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 18:02	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 18:02	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 18:02	WG1935601
Tetrachloroethene	127-18-4	0.521	J	0.300	0.600	1.20	1	10/01/2022 18:02	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 18:02	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	T8 U	0.481	1.00	2.00	1	10/04/2022 08:00	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 18:02	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 18:02	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 18:02	WG1935601
Trichlorofluoromethane	75-69-4	2.00	T8 U	0.160	2.00	5.00	1	10/04/2022 08:00	WG1935909
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 18:02	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 18:02	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 18:02	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 18:02	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/01/2022 18:02*	WG1935601
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*10/04/2022 08:00*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*106*				*85.0-114*		*10/01/2022 18:02*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/04/2022 08:00*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*97.7*				*81.0-118*		*10/01/2022 18:02*	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*112*				*81.0-118*		*10/04/2022 08:00*	WG1935909

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	10/02/2022 06:01	WG1934826
(S) o-Terphenyl	*84-15-1*	*101*				*50.0-150*		*10/02/2022 06:01*	WG1934826

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.6	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result ug/l	Qualifier	DL ug/l	LOD ug/l	LOQ ug/l	Dilution	Analysis date / time	Batch
Acetone	67-64-1	25.0	J3 U	11.3	25.0	50.0	1	10/01/2022 12:27	WG1935601
Acrolein	107-02-8	25.0	U	2.54	25.0	50.0	1	10/01/2022 12:27	WG1935601
Acrylonitrile	107-13-1	5.00	U	0.671	5.00	10.0	1	10/01/2022 12:27	WG1935601
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	10/01/2022 12:27	WG1935601
Bromobenzene	108-86-1	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:27	WG1935601
Bromodichloromethane	75-27-4	0.500	U	0.136	0.500	1.00	1	10/01/2022 12:27	WG1935601
Bromoform	75-25-2	0.500	U	0.129	0.500	1.00	1	10/01/2022 12:27	WG1935601
Bromomethane	74-83-9	2.00	U	0.605	2.00	5.00	1	10/01/2022 12:27	WG1935601
n-Butylbenzene	104-51-8	0.500	U	0.157	0.500	1.00	1	10/01/2022 12:27	WG1935601
sec-Butylbenzene	135-98-8	0.500	U	0.125	0.500	1.00	1	10/01/2022 12:27	WG1935601
tert-Butylbenzene	98-06-6	0.500	U	0.127	0.500	1.00	1	10/01/2022 12:27	WG1935601
Carbon tetrachloride	56-23-5	0.500	U	0.128	0.500	1.00	1	10/01/2022 12:27	WG1935601
Chlorobenzene	108-90-7	0.500	U	0.116	0.500	1.00	1	10/01/2022 12:27	WG1935601
Chlorodibromomethane	124-48-1	0.500	U	0.140	0.500	1.00	1	10/01/2022 12:27	WG1935601
Chloroethane	75-00-3	2.00	U	0.192	2.00	5.00	1	10/01/2022 12:27	WG1935601
Chloroform	67-66-3	2.00	U	0.111	2.00	5.00	1	10/01/2022 12:27	WG1935601
Chloromethane	74-87-3	2.00	U	0.960	2.00	4.00	1	10/04/2022 02:14	WG1935909
2-Chlorotoluene	95-49-8	0.500	U	0.106	0.500	1.00	1	10/01/2022 12:27	WG1935601
4-Chlorotoluene	106-43-4	0.500	U	0.114	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2-Dibromoethane	106-93-4	0.500	U	0.126	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2-Dibromo-3-Chloropropane	96-12-8	2.00	C4 U	0.276	2.00	5.00	1	10/04/2022 02:14	WG1935909
Dibromomethane	74-95-3	0.500	U	0.122	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2-Dichlorobenzene	95-50-1	0.500	U	0.107	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,3-Dichlorobenzene	541-73-1	0.500	U	0.110	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,4-Dichlorobenzene	106-46-7	0.500	U	0.120	0.500	1.00	1	10/01/2022 12:27	WG1935601
Dichlorodifluoromethane	75-71-8	2.00	U	0.374	2.00	5.00	1	10/01/2022 12:27	WG1935601
1,1-Dichloroethane	75-34-3	0.500	U	0.100	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2-Dichloroethane	107-06-2	0.500	U	0.0819	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,1-Dichloroethene	75-35-4	0.500	U	0.188	0.500	1.00	1	10/01/2022 12:27	WG1935601
cis-1,2-Dichloroethene	156-59-2	0.500	U	0.126	0.500	1.00	1	10/01/2022 12:27	WG1935601
trans-1,2-Dichloroethene	156-60-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2-Dichloropropane	78-87-5	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,3-Dichloropropane	142-28-9	0.500	U	0.110	0.500	1.00	1	10/01/2022 12:27	WG1935601
2,2-Dichloropropane	594-20-7	0.500	U	0.161	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,1-Dichloropropene	563-58-6	0.500	U	0.142	0.500	1.00	1	10/01/2022 12:27	WG1935601
cis-1,3-Dichloropropene	10061-01-5	0.500	U	0.111	0.500	1.00	1	10/01/2022 12:27	WG1935601
trans-1,3-Dichloropropene	10061-02-6	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:27	WG1935601
Di-isopropyl ether	108-20-3	0.500	U	0.105	0.500	1.00	1	10/01/2022 12:27	WG1935601
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	10/01/2022 12:27	WG1935601
Hexachloro-1,3-butadiene	87-68-3	0.750	J3 U	0.337	0.750	1.50	1	10/01/2022 12:27	WG1935601
Isopropylbenzene	98-82-8	0.500	U	0.105	0.500	1.00	1	10/01/2022 12:27	WG1935601
p-Isopropyltoluene	99-87-6	0.500	U	0.120	0.500	1.00	1	10/01/2022 12:27	WG1935601
2-Butanone (MEK)	78-93-3	5.00	U	1.19	5.00	10.0	1	10/01/2022 12:27	WG1935601
Methylene Chloride	75-09-2	2.00	U	0.430	2.00	5.00	1	10/01/2022 12:27	WG1935601
4-Methyl-2-pentanone (MIBK)	108-10-1	5.00	U	0.478	5.00	10.0	1	10/04/2022 02:14	WG1935909
Methyl tert-butyl ether	1634-04-4	0.500	U	0.101	0.500	1.00	1	10/01/2022 12:27	WG1935601
Naphthalene	91-20-3	2.00	J3 U	1.00	2.00	5.00	1	10/01/2022 12:27	WG1935601
n-Propylbenzene	103-65-1	0.500	U	0.0993	0.500	1.00	1	10/01/2022 12:27	WG1935601
Styrene	100-42-5	0.500	U	0.118	0.500	1.00	1	10/01/2022 12:27	WG1935601

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	0.147	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,1,2,2-Tetrachloroethane	79-34-5	0.500	U	0.133	0.500	1.00	1	10/01/2022 12:27	WG1935601
Tetrachloroethene	127-18-4	0.600	U	0.300	0.600	1.20	1	10/01/2022 12:27	WG1935601
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	10/01/2022 12:27	WG1935601
1,2,3-Trichlorobenzene	87-61-6	0.500	J3 J4 U	0.230	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2,4-Trichlorobenzene	120-82-1	1.00	U	0.481	1.00	2.00	1	10/04/2022 02:14	WG1935909
1,2,3-Trimethylbenzene	526-73-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2,4-Trimethylbenzene	95-63-6	1.00	U	0.322	1.00	2.00	1	10/01/2022 12:27	WG1935601
1,3,5-Trimethylbenzene	108-67-8	0.500	U	0.104	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,1,1-Trichloroethane	71-55-6	0.500	U	0.149	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,1,2-Trichloroethane	79-00-5	0.500	U	0.158	0.500	1.00	1	10/01/2022 12:27	WG1935601
Trichloroethene	79-01-6	0.500	U	0.190	0.500	1.00	1	10/01/2022 12:27	WG1935601
Trichlorofluoromethane	75-69-4	2.00	U	0.160	2.00	5.00	1	10/01/2022 12:27	WG1935601
1,1,2-Trichlorotrifluoroethane	76-13-1	0.500	U	0.180	0.500	1.00	1	10/01/2022 12:27	WG1935601
1,2,3-Trichloropropane	96-18-4	1.00	U	0.237	1.00	2.50	1	10/01/2022 12:27	WG1935601
Vinyl chloride	75-01-4	0.500	U	0.234	0.500	1.00	1	10/01/2022 12:27	WG1935601
Xylenes, Total	1330-20-7	1.50	U	0.174	1.50	3.00	1	10/01/2022 12:27	WG1935601
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*10/01/2022 12:27*	WG1935601
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*10/04/2022 02:14*	WG1935909
(S) 4-Bromofluorobenzene	*460-00-4*	*110*				*85.0-114*		*10/01/2022 12:27*	WG1935601
(S) 4-Bromofluorobenzene	*460-00-4*	*105*				*85.0-114*		*10/04/2022 02:14*	WG1935909
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*96.3*				*81.0-118*		*10/01/2022 12:27*	WG1935601
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*112*				*81.0-118*		*10/04/2022 02:14*	WG1935909

Method Blank (MB)

(MB) R3843643-2 10/01/22 10:04

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Alkalinity	10000	U	8450	10000	20000
Alkalinity,Bicarbonate	10000	U	8450	10000	20000
Alkalinity,Carbonate	10000	U	8450	10000	20000
Alkalinity,Hydroxide	10000	U	8450	10000	20000

Sample Narrative:

BLANK: Endpoint pH 4.5

L1540085-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1540085-06 10/01/22 10:15 • (DUP) R3843643-3 10/01/22 10:18

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	667000	665000	1	0.262		20
Alkalinity,Bicarbonate	667000	665000	1	0.262		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/01/22 10:22 • (DUP) R3843643-4 10/01/22 10:25

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	109000	110000	1	0.841		20
Alkalinity,Bicarbonate	109000	110000	1	0.841		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/01/22 11:30 • (DUP) R3843643-5 10/01/22 11:34

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	57700	57100	1	0.978		20
Alkalinity,Bicarbonate	57700	57100	1	0.978		20
Alkalinity,Carbonate	10000	10000	1	0.000	U	20
Alkalinity,Hydroxide	10000	10000	1	0.000	U	20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3843643-1 10/01/22 10:00

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100000	102000	102	85.0-115	

Sample Narrative:

LCS: Endpoint pH 4.5

Method Blank (MB)

(MB) R3844701-1 10/04/22 21:13

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Kjeldahl Nitrogen, TKN	300	U	140	300	600

L1540948-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-03 10/04/22 21:22 • (DUP) R3844701-3 10/04/22 21:24

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	217	300	1	200	P1 U	20

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/04/22 21:41 • (DUP) R3844701-6 10/04/22 21:45

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	300	300	1	0.000	U	20

Laboratory Control Sample (LCS)

(LCS) R3844701-2 10/04/22 21:14

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Kjeldahl Nitrogen, TKN	12700	13100	103	74.0-124	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/04/22 21:22 • (MS) R3844701-4 10/04/22 21:25 • (MSD) R3844701-5 10/04/22 21:29

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	5000	217	5380	843	103	12.5	1	90.0-110		J3 J6	146	20

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 21:41 • (MS) R3844701-7 10/04/22 21:47 • (MSD) R3844701-8 10/04/22 21:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	5000	300	5170	5110	103	102	1	90.0-110			1.17	20

Method Blank (MB)

(MB) R3844682-1 10/04/22 18:14

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Nitrate-Nitrite	100	U	50.0	100	200

L1540935-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1540935-03 10/04/22 18:19 • (DUP) R3844682-3 10/04/22 18:21

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	100	100	1	0.000	U	20

L1540980-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1540980-01 10/04/22 18:33 • (DUP) R3844682-5 10/04/22 18:35

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate-Nitrite	1050	1060	1	0.948		20

Laboratory Control Sample (LCS)

(LCS) R3844682-2 10/04/22 18:15

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate-Nitrite	2500	2630	105	90.0-110	

L1540935-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1540935-03 10/04/22 18:19 • (MS) R3844682-4 10/04/22 18:22

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Nitrate-Nitrite	2500	100	2660	106	1	90.0-110	

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 18:33 • (MS) R3844682-6 10/04/22 18:36 • (MSD) R3844682-7 10/04/22 18:37

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate-Nitrite	2500	1050	3650	3640	104	104	1	90.0-110			0.274	20

Method Blank (MB)

(MB) R3844341-1 10/03/22 19:45

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Sulfate	2500	U	594	2500	5000

L1540948-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1540948-04 10/03/22 23:07 • (DUP) R3844341-3 10/03/22 23:19

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	4220	4200	1	0.613	J	15

L1541084-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1541084-04 10/04/22 04:28 • (DUP) R3844341-6 10/04/22 04:41

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	66200	65600	1	0.796		15

Laboratory Control Sample (LCS)

(LCS) R3844341-2 10/03/22 19:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40000	40300	101	87.0-112	

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/04/22 01:28 • (MS) R3844341-4 10/04/22 01:41 • (MSD) R3844341-5 10/04/22 01:54

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50000	4560	52700	54100	96.2	99.0	1	87.0-112			2.60	15

L1541084-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1541084-04 10/04/22 04:28 • (MS) R3844341-7 10/04/22 04:53

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50000	66200	113000	93.3	1	87.0-112	

Method Blank (MB)

(MB) R3850672-1 10/19/22 15:20

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Iron	50.0	U	20.5	50.0	100
Manganese	5.00	U	0.855	5.00	10.0

Laboratory Control Sample (LCS)

(LCS) R3850672-2 10/19/22 15:23

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Iron	10000	9600	96.0	87.0-115	
Manganese	1000	912	91.2	90.0-114	

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/19/22 15:26 • (MS) R3850672-4 10/19/22 15:32 • (MSD) R3850672-5 10/19/22 15:34

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Iron	10000	4520	14100	15900	96.0	114	1	87.0-115			11.9	20
Manganese	1000	121	1040	1050	91.7	93.0	1	90.0-114			1.26	20

Method Blank (MB)

(MB) R3847318-1 10/11/22 15:40

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Iron	45.4	J	20.5	50.0	100
Manganese	1.10	J	0.855	5.00	10.0

Laboratory Control Sample (LCS)

(LCS) R3847318-2 10/11/22 15:42

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Iron	10000	9460	94.6	87.0-115	
Manganese	1000	901	90.1	90.0-114	

L1540980-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-03 10/11/22 15:45 • (MS) R3847318-4 10/11/22 15:51 • (MSD) R3847318-5 10/11/22 15:54

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Iron	10000	35.6	9520	9630	94.9	95.9	1	87.0-115			1.06	20
Manganese	1000	1.57	907	916	90.6	91.5	1	90.0-114			0.970	20

Method Blank (MB)

(MB) R3843739-3 10/01/22 09:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	25.0	U	11.3	25.0	50.0
Acrolein	25.0	U	2.54	25.0	50.0
Acrylonitrile	5.00	U	0.671	5.00	10.0
Benzene	0.500	U	0.0941	0.500	1.00
Bromobenzene	0.500	U	0.118	0.500	1.00
Bromodichloromethane	0.500	U	0.136	0.500	1.00
Bromoform	0.500	U	0.129	0.500	1.00
Bromomethane	2.00	U	0.605	2.00	5.00
n-Butylbenzene	0.500	U	0.157	0.500	1.00
sec-Butylbenzene	0.500	U	0.125	0.500	1.00
tert-Butylbenzene	0.500	U	0.127	0.500	1.00
Carbon tetrachloride	0.500	U	0.128	0.500	1.00
Chlorobenzene	0.500	U	0.116	0.500	1.00
Chlorodibromomethane	0.500	U	0.140	0.500	1.00
Chloroethane	2.00	U	0.192	2.00	5.00
Chloroform	2.00	U	0.111	2.00	5.00
2-Chlorotoluene	0.500	U	0.106	0.500	1.00
4-Chlorotoluene	0.500	U	0.114	0.500	1.00
1,2-Dibromoethane	0.500	U	0.126	0.500	1.00
Dibromomethane	0.500	U	0.122	0.500	1.00
1,2-Dichlorobenzene	0.500	U	0.107	0.500	1.00
1,3-Dichlorobenzene	0.500	U	0.110	0.500	1.00
1,4-Dichlorobenzene	0.500	U	0.120	0.500	1.00
Dichlorodifluoromethane	2.00	U	0.374	2.00	5.00
1,1-Dichloroethane	0.500	U	0.100	0.500	1.00
1,2-Dichloroethane	0.500	U	0.0819	0.500	1.00
1,1-Dichloroethene	0.500	U	0.188	0.500	1.00
cis-1,2-Dichloroethene	0.500	U	0.126	0.500	1.00
trans-1,2-Dichloroethene	0.500	U	0.149	0.500	1.00
1,2-Dichloropropane	0.500	U	0.149	0.500	1.00
1,3-Dichloropropane	0.500	U	0.110	0.500	1.00
2,2-Dichloropropane	0.500	U	0.161	0.500	1.00
1,1-Dichloropropene	0.500	U	0.142	0.500	1.00
cis-1,3-Dichloropropene	0.500	U	0.111	0.500	1.00
trans-1,3-Dichloropropene	0.500	U	0.118	0.500	1.00
Di-isopropyl ether	0.500	U	0.105	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
Hexachloro-1,3-butadiene	0.750	U	0.337	0.750	1.50
Isopropylbenzene	0.500	U	0.105	0.500	1.00
p-Isopropyltoluene	0.500	U	0.120	0.500	1.00

Method Blank (MB)

(MB) R3843739-3 10/01/22 09:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
2-Butanone (MEK)	5.00	U	1.19	5.00	10.0
Methylene Chloride	2.00	U	0.430	2.00	5.00
Methyl tert-butyl ether	0.500	U	0.101	0.500	1.00
Naphthalene	2.00	U	1.00	2.00	5.00
n-Propylbenzene	0.500	U	0.0993	0.500	1.00
Styrene	0.500	U	0.118	0.500	1.00
1,1,1,2-Tetrachloroethane	0.500	U	0.147	0.500	1.00
1,1,2,2-Tetrachloroethane	0.500	U	0.133	0.500	1.00
Tetrachloroethene	0.600	U	0.300	0.600	1.20
Toluene	0.600	U	0.278	0.600	1.20
1,2,3-Trichlorobenzene	0.500	U	0.230	0.500	1.00
1,2,3-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,2,4-Trimethylbenzene	1.00	U	0.322	1.00	2.00
1,3,5-Trimethylbenzene	0.500	U	0.104	0.500	1.00
1,1,1-Trichloroethane	0.500	U	0.149	0.500	1.00
1,1,2-Trichloroethane	0.500	U	0.158	0.500	1.00
Trichloroethene	0.500	U	0.190	0.500	1.00
Trichlorofluoromethane	2.00	U	0.160	2.00	5.00
1,1,2-Trichlorotrifluoroethane	0.500	U	0.180	0.500	1.00
1,2,3-Trichloropropane	1.00	U	0.237	1.00	2.50
Vinyl chloride	0.500	U	0.234	0.500	1.00
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*103*				*89.0-112*
(S) 4-Bromofluorobenzene	*107*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*94.5*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	28.2	22.2	113	88.8	39.0-160		J3	23.8	20
Acrolein	25.0	20.4	18.4	81.6	73.6	39.0-155			10.3	20
Acrylonitrile	25.0	25.0	23.3	100	93.2	63.0-135			7.04	20
Benzene	5.00	5.48	5.44	110	109	79.0-120			0.733	20
Bromobenzene	5.00	4.28	4.68	85.6	93.6	80.0-120			8.93	20
Bromodichloromethane	5.00	5.24	4.99	105	99.8	79.0-125			4.89	20
Bromoform	5.00	4.63	4.15	92.6	83.0	66.0-130			10.9	20
Bromomethane	5.00	5.77	5.65	115	113	53.0-141			2.10	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
n-Butylbenzene	5.00	4.41	3.95	88.2	79.0	75.0-128			11.0	20
sec-Butylbenzene	5.00	4.84	4.88	96.8	97.6	77.0-126			0.823	20
tert-Butylbenzene	5.00	4.58	4.87	91.6	97.4	78.0-124			6.14	20
Carbon tetrachloride	5.00	5.33	5.67	107	113	72.0-136			6.18	20
Chlorobenzene	5.00	4.92	4.98	98.4	99.6	82.0-118			1.21	20
Chlorodibromomethane	5.00	4.45	4.45	89.0	89.0	74.0-126			0.000	20
Chloroethane	5.00	5.58	5.89	112	118	60.0-138			5.41	20
Chloroform	5.00	5.79	5.86	116	117	79.0-124			1.20	20
2-Chlorotoluene	5.00	4.66	4.73	93.2	94.6	79.0-122			1.49	20
4-Chlorotoluene	5.00	4.30	4.56	86.0	91.2	78.0-122			5.87	20
1,2-Dibromoethane	5.00	4.84	4.84	96.8	96.8	77.0-121			0.000	20
Dibromomethane	5.00	5.65	5.61	113	112	79.0-123			0.710	20
1,2-Dichlorobenzene	5.00	4.87	4.51	97.4	90.2	80.0-119			7.68	20
1,3-Dichlorobenzene	5.00	4.68	4.69	93.6	93.8	80.0-119			0.213	20
1,4-Dichlorobenzene	5.00	4.59	4.71	91.8	94.2	79.0-118			2.58	20
Dichlorodifluoromethane	5.00	5.02	5.12	100	102	32.0-152			1.97	20
1,1-Dichloroethane	5.00	5.27	5.42	105	108	77.0-125			2.81	20
1,2-Dichloroethane	5.00	5.23	5.14	105	103	73.0-128			1.74	20
1,1-Dichloroethene	5.00	5.63	6.11	113	122	71.0-131			8.18	20
cis-1,2-Dichloroethene	5.00	5.79	5.88	116	118	78.0-123			1.54	20
trans-1,2-Dichloroethene	5.00	5.60	5.67	112	113	75.0-124			1.24	20
1,2-Dichloropropane	5.00	4.87	4.70	97.4	94.0	78.0-122			3.55	20
1,3-Dichloropropane	5.00	4.47	4.66	89.4	93.2	80.0-119			4.16	20
2,2-Dichloropropane	5.00	5.52	5.38	110	108	60.0-139			2.57	20
1,1-Dichloropropene	5.00	5.16	5.32	103	106	79.0-125			3.05	20
cis-1,3-Dichloropropene	5.00	4.54	4.49	90.8	89.8	75.0-124			1.11	20
trans-1,3-Dichloropropene	5.00	4.01	3.95	80.2	79.0	73.0-127			1.51	20
Di-isopropyl ether	5.00	4.29	4.22	85.8	84.4	67.0-128			1.65	20
Ethylbenzene	5.00	5.27	5.04	105	101	79.0-121			4.46	20
Hexachloro-1,3-butadiene	5.00	4.61	3.47	92.2	69.4	66.0-134		J3	28.2	20
Isopropylbenzene	5.00	5.25	4.99	105	99.8	72.0-131			5.08	20
p-Isopropyltoluene	5.00	4.60	4.56	92.0	91.2	77.0-127			0.873	20
2-Butanone (MEK)	25.0	22.1	20.5	88.4	82.0	56.0-143			7.51	20
Methylene Chloride	5.00	5.69	5.90	114	118	74.0-124			3.62	20
Methyl tert-butyl ether	5.00	5.45	5.51	109	110	71.0-124			1.09	20
Naphthalene	5.00	4.11	3.26	82.2	65.2	61.0-128		J3	23.1	20
n-Propylbenzene	5.00	4.35	4.68	87.0	93.6	76.0-126			7.31	20
Styrene	5.00	4.84	4.69	96.8	93.8	78.0-123			3.15	20
1,1,1,2-Tetrachloroethane	5.00	4.81	4.70	96.2	94.0	78.0-124			2.31	20
1,1,2,2-Tetrachloroethane	5.00	4.49	4.85	89.8	97.0	71.0-121			7.71	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843739-1 10/01/22 08:51 • (LCSD) R3843739-2 10/01/22 09:12

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	5.00	5.00	5.09	100	102	74.0-129			1.78	20
Toluene	5.00	4.69	4.84	93.8	96.8	80.0-121			3.15	20
1,2,3-Trichlorobenzene	5.00	4.41	3.35	88.2	67.0	69.0-129		J3 J4	27.3	20
1,2,3-Trimethylbenzene	5.00	4.82	4.66	96.4	93.2	82.0-120			3.38	20
1,2,4-Trimethylbenzene	5.00	4.55	4.49	91.0	89.8	76.0-124			1.33	20
1,3,5-Trimethylbenzene	5.00	4.58	4.82	91.6	96.4	75.0-124			5.11	20
1,1,1-Trichloroethane	5.00	5.62	5.64	112	113	74.0-131			0.355	20
1,1,2-Trichloroethane	5.00	4.82	5.03	96.4	101	80.0-119			4.26	20
Trichloroethene	5.00	5.51	5.51	110	110	79.0-123			0.000	20
Trichlorofluoromethane	5.00	5.64	5.75	113	115	65.0-141			1.93	20
1,1,2-Trichlorotrifluoroethane	5.00	6.24	6.30	125	126	70.0-136			0.957	20
1,2,3-Trichloropropane	5.00	4.69	5.36	93.8	107	73.0-122			13.3	20
Vinyl chloride	5.00	5.47	5.43	109	109	58.0-137			0.734	20
Xylenes, Total	15.0	15.5	15.2	103	101	79.0-121			1.95	20
(S) Toluene-d8				*99.6*	*103*	*89.0-112*				
(S) 4-Bromofluorobenzene				*108*	*102*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*97.6*	*97.4*	*81.0-118*				

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	25.0	30.3	27.9	121	112	1	39.0-160			8.25	20
Acrolein	25.0	25.0	26.5	28.3	106	113	1	39.0-155			6.57	20
Acrylonitrile	25.0	5.00	28.6	29.6	114	118	1	63.0-135			3.44	20
Benzene	5.00	0.614	7.71	7.92	142	146	1	79.0-120	J5	J5	2.69	20
Bromobenzene	5.00	0.500	5.41	5.67	108	113	1	80.0-120			4.69	20
Bromodichloromethane	5.00	0.500	6.70	6.89	134	138	1	79.0-125	J5	J5	2.80	20
Bromoform	5.00	0.500	5.45	5.63	109	113	1	66.0-130			3.25	20
Bromomethane	5.00	2.00	7.23	8.28	145	166	1	53.0-141	J5	J5	13.5	20
n-Butylbenzene	5.00	1.62	6.41	6.43	95.8	96.2	1	75.0-128			0.312	20
sec-Butylbenzene	5.00	1.49	7.05	7.45	111	119	1	77.0-126			5.52	20
tert-Butylbenzene	5.00	0.171	5.52	6.11	107	119	1	78.0-124			10.1	20
Carbon tetrachloride	5.00	0.500	7.80	8.12	156	162	1	72.0-136	J5	J5	4.02	20
Chlorobenzene	5.00	0.500	6.22	6.41	124	128	1	82.0-118	J5	J5	3.01	20
Chlorodibromomethane	5.00	0.500	5.41	5.87	108	117	1	74.0-126			8.16	20
Chloroethane	5.00	2.00	8.44	8.64	169	173	1	60.0-138	J5	J5	2.34	20
Chloroform	5.00	2.00	7.49	7.92	150	158	1	79.0-124	J5	J5	5.58	20

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2-Chlorotoluene	5.00	0.500	5.44	5.96	109	119	1	79.0-122			9.12	20
4-Chlorotoluene	5.00	0.500	5.29	5.78	106	116	1	78.0-122			8.85	20
1,2-Dibromoethane	5.00	0.500	5.79	6.21	116	124	1	77.0-121		J5	7.00	20
Dibromomethane	5.00	0.500	6.98	7.00	140	140	1	79.0-123	J5	J5	0.286	20
1,2-Dichlorobenzene	5.00	0.550	6.73	6.65	124	122	1	80.0-119	J5	J5	1.20	20
1,3-Dichlorobenzene	5.00	0.500	5.65	6.02	113	120	1	80.0-119		J5	6.34	20
1,4-Dichlorobenzene	5.00	0.500	5.79	6.02	116	120	1	79.0-118		J5	3.90	20
Dichlorodifluoromethane	5.00	2.00	7.07	7.55	141	151	1	32.0-152			6.57	20
1,1-Dichloroethane	5.00	0.500	6.91	7.37	138	147	1	77.0-125	J5	J5	6.44	20
1,2-Dichloroethane	5.00	0.500	6.61	6.69	132	134	1	73.0-128	J5	J5	1.20	20
1,1-Dichloroethene	5.00	0.500	7.65	8.47	153	169	1	71.0-131	J5	J5	10.2	20
cis-1,2-Dichloroethene	5.00	0.500	7.47	7.62	149	152	1	78.0-123	J5	J5	1.99	20
trans-1,2-Dichloroethene	5.00	0.500	7.64	7.76	153	155	1	75.0-124	J5	J5	1.56	20
1,2-Dichloropropane	5.00	0.500	6.23	6.63	125	133	1	78.0-122	J5	J5	6.22	20
1,3-Dichloropropane	5.00	0.500	5.53	5.93	111	119	1	80.0-119			6.98	20
2,2-Dichloropropane	5.00	0.500	7.94	8.47	159	169	1	60.0-139	J5	J5	6.46	20
1,1-Dichloropropene	5.00	0.500	7.35	7.57	147	151	1	79.0-125	J5	J5	2.95	20
cis-1,3-Dichloropropene	5.00	0.500	5.83	6.04	117	121	1	75.0-124			3.54	20
trans-1,3-Dichloropropene	5.00	0.500	5.09	5.34	102	107	1	73.0-127			4.79	20
Di-isopropyl ether	5.00	0.500	5.37	5.78	107	116	1	67.0-128			7.35	20
Ethylbenzene	5.00	2.03	8.88	8.97	137	139	1	79.0-121	J5	J5	1.01	20
Hexachloro-1,3-butadiene	5.00	0.750	4.66	4.15	93.2	83.0	1	66.0-134			11.6	20
Isopropylbenzene	5.00	2.52	9.16	9.72	133	144	1	72.0-131	J5	J5	5.93	20
p-Isopropyltoluene	5.00	2.45	7.97	8.28	110	117	1	77.0-127			3.82	20
2-Butanone (MEK)	25.0	5.00	24.8	25.4	99.2	102	1	56.0-143			2.39	20
Methylene Chloride	5.00	2.00	7.32	7.70	146	154	1	74.0-124	J5	J5	5.06	20
Methyl tert-butyl ether	5.00	0.500	6.87	7.22	137	144	1	71.0-124	J5	J5	4.97	20
Naphthalene	5.00	25.1	27.0	21.6	38.0	0.000	1	61.0-128	V	J3 V	22.2	20
n-Propylbenzene	5.00	2.63	8.01	8.73	108	122	1	76.0-126			8.60	20
Styrene	5.00	0.500	6.17	6.43	123	129	1	78.0-123		J5	4.13	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.09	6.35	122	127	1	78.0-124		J5	4.18	20
1,1,2,2-Tetrachloroethane	5.00	0.500	5.63	6.03	113	121	1	71.0-121			6.86	20
Tetrachloroethene	5.00	0.600	6.88	7.17	138	143	1	74.0-129	J5	J5	4.13	20
Toluene	5.00	0.600	5.93	6.32	119	126	1	80.0-121		J5	6.37	20
1,2,3-Trichlorobenzene	5.00	0.500	5.67	5.03	113	101	1	69.0-129			12.0	20
1,2,3-Trimethylbenzene	5.00	5.68	11.6	11.7	118	120	1	82.0-120			0.858	20
1,2,4-Trimethylbenzene	5.00	30.0	35.4	35.6	108	112	1	76.0-124			0.563	20
1,3,5-Trimethylbenzene	5.00	0.500	5.59	6.14	112	123	1	75.0-124			9.38	20
1,1,1-Trichloroethane	5.00	0.500	7.83	8.12	157	162	1	74.0-131	J5	J5	3.64	20
1,1,2-Trichloroethane	5.00	0.500	5.78	6.23	116	125	1	80.0-119		J5	7.49	20

L1540401-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540401-01 10/01/22 13:08 • (MS) R3843739-4 10/01/22 19:03 • (MSD) R3843739-5 10/01/22 19:24

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Trichloroethene	5.00	0.500	6.91	7.35	138	147	1	79.0-123	J5	J5	6.17	20
Trichlorofluoromethane	5.00	2.00	8.35	8.92	167	178	1	65.0-141	J5	J5	6.60	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.21	9.14	164	183	1	70.0-136	J5	J5	10.7	20
1,2,3-Trichloropropane	5.00	1.00	5.12	5.84	102	117	1	73.0-122			13.1	20
Vinyl chloride	5.00	0.500	8.40	8.75	168	175	1	58.0-137	J5	J5	4.08	20
Xylenes, Total	15.0	0.379	19.8	21.1	129	138	1	79.0-121	J5	J5	6.36	20
(S) Toluene-d8					*95.3*	*98.0*		*89.0-112*				
(S) 4-Bromofluorobenzene					*108*	*108*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*101*	*101*		*81.0-118*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	25.0	34.2	32.9	137	132	1	39.0-160			3.87	20
Acrolein	25.0	25.0	37.6	36.3	150	145	1	39.0-155			3.52	20
Acrylonitrile	25.0	5.00	32.9	31.5	132	126	1	63.0-135			4.35	20
Benzene	5.00	0.500	7.55	7.48	151	150	1	79.0-120	J5	J5	0.931	20
Bromobenzene	5.00	0.500	5.59	5.86	112	117	1	80.0-120			4.72	20
Bromodichloromethane	5.00	0.500	6.96	6.82	139	136	1	79.0-125	J5	J5	2.03	20
Bromoform	5.00	0.500	5.87	5.86	117	117	1	66.0-130			0.171	20
Bromomethane	5.00	2.00	7.98	7.96	160	159	1	53.0-141	J5	J5	0.251	20
n-Butylbenzene	5.00	0.500	6.09	6.17	122	123	1	75.0-128			1.31	20
sec-Butylbenzene	5.00	0.500	6.68	6.91	134	138	1	77.0-126	J5	J5	3.38	20
tert-Butylbenzene	5.00	0.500	6.39	6.49	128	130	1	78.0-124	J5	J5	1.55	20
Carbon tetrachloride	5.00	0.500	8.15	7.78	163	156	1	72.0-136	J5	J5	4.65	20
Chlorobenzene	5.00	0.500	6.57	6.76	131	135	1	82.0-118	J5	J5	2.85	20
Chlorodibromomethane	5.00	0.500	5.82	5.70	116	114	1	74.0-126			2.08	20
Chloroethane	5.00	2.00	8.56	8.24	171	165	1	60.0-138	J5	J5	3.81	20
Chloroform	5.00	2.00	7.92	7.67	158	153	1	79.0-124	J5	J5	3.21	20
2-Chlorotoluene	5.00	0.500	6.15	6.27	123	125	1	79.0-122	J5	J5	1.93	20
4-Chlorotoluene	5.00	0.500	5.79	5.95	116	119	1	78.0-122			2.73	20
1,2-Dibromoethane	5.00	0.500	6.23	6.42	125	128	1	77.0-121	J5	J5	3.00	20
Dibromomethane	5.00	0.500	7.26	7.11	145	142	1	79.0-123	J5	J5	2.09	20
1,2-Dichlorobenzene	5.00	0.500	6.52	6.72	130	134	1	80.0-119	J5	J5	3.02	20
1,3-Dichlorobenzene	5.00	0.500	6.20	6.20	124	124	1	80.0-119	J5	J5	0.000	20
1,4-Dichlorobenzene	5.00	0.500	5.96	6.24	119	125	1	79.0-118	J5	J5	4.59	20
Dichlorodifluoromethane	5.00	2.00	7.45	7.60	149	152	1	32.0-152			1.99	20

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,1-Dichloroethane	5.00	0.500	7.49	7.01	150	140	1	77.0-125	J5	J5	6.62	20
1,2-Dichloroethane	5.00	0.500	7.13	6.65	143	133	1	73.0-128	J5	J5	6.97	20
1,1-Dichloroethene	5.00	0.500	8.65	8.12	173	162	1	71.0-131	J5	J5	6.32	20
cis-1,2-Dichloroethene	5.00	0.500	8.19	7.47	164	149	1	78.0-123	J5	J5	9.20	20
trans-1,2-Dichloroethene	5.00	0.500	7.97	7.83	159	157	1	75.0-124	J5	J5	1.77	20
1,2-Dichloropropane	5.00	0.500	6.64	6.55	133	131	1	78.0-122	J5	J5	1.36	20
1,3-Dichloropropane	5.00	0.500	5.99	5.80	120	116	1	80.0-119	J5		3.22	20
2,2-Dichloropropane	5.00	0.500	8.51	7.94	170	159	1	60.0-139	J5	J5	6.93	20
1,1-Dichloropropene	5.00	0.500	7.89	7.97	158	159	1	79.0-125	J5	J5	1.01	20
cis-1,3-Dichloropropene	5.00	0.500	6.13	6.30	123	126	1	75.0-124		J5	2.74	20
trans-1,3-Dichloropropene	5.00	0.500	5.32	5.51	106	110	1	73.0-127			3.51	20
Di-isopropyl ether	5.00	0.500	5.73	5.67	115	113	1	67.0-128			1.05	20
Ethylbenzene	5.00	0.500	6.80	7.29	136	146	1	79.0-121	J5	J5	6.96	20
Hexachloro-1,3-butadiene	5.00	0.750	5.34	6.08	107	122	1	66.0-134			13.0	20
Isopropylbenzene	5.00	0.500	7.45	7.53	149	151	1	72.0-131	J5	J5	1.07	20
p-Isopropyltoluene	5.00	0.500	6.58	6.71	132	134	1	77.0-127	J5	J5	1.96	20
2-Butanone (MEK)	25.0	5.00	28.4	28.2	114	113	1	56.0-143			0.707	20
Methylene Chloride	5.00	2.00	7.59	7.27	152	145	1	74.0-124	J5	J5	4.31	20
Methyl tert-butyl ether	5.00	0.500	7.30	7.23	146	145	1	71.0-124	J5	J5	0.964	20
Naphthalene	5.00	2.00	5.20	5.42	104	108	1	61.0-128			4.14	20
n-Propylbenzene	5.00	0.500	6.09	6.22	122	124	1	76.0-126			2.11	20
Styrene	5.00	0.500	6.56	6.71	131	134	1	78.0-123	J5	J5	2.26	20
1,1,1,2-Tetrachloroethane	5.00	0.500	6.51	6.73	130	135	1	78.0-124	J5	J5	3.32	20
1,1,2,2-Tetrachloroethane	5.00	0.500	6.31	6.08	126	122	1	71.0-121	J5	J5	3.71	20
Tetrachloroethene	5.00	0.600	7.23	7.35	145	147	1	74.0-129	J5	J5	1.65	20
Toluene	5.00	0.600	6.28	6.36	126	127	1	80.0-121	J5	J5	1.27	20
1,2,3-Trichlorobenzene	5.00	0.500	4.90	5.45	98.0	109	1	69.0-129			10.6	20
1,2,3-Trimethylbenzene	5.00	0.500	6.53	6.64	131	133	1	82.0-120	J5	J5	1.67	20
1,2,4-Trimethylbenzene	5.00	1.00	6.44	6.50	129	130	1	76.0-124	J5	J5	0.927	20
1,3,5-Trimethylbenzene	5.00	0.500	6.52	6.54	130	131	1	75.0-124	J5	J5	0.306	20
1,1,1-Trichloroethane	5.00	0.500	8.34	8.00	167	160	1	74.0-131	J5	J5	4.16	20
1,1,2-Trichloroethane	5.00	0.500	6.29	6.24	126	125	1	80.0-119	J5	J5	0.798	20
Trichloroethene	5.00	0.500	7.39	7.27	148	145	1	79.0-123	J5	J5	1.64	20
Trichlorofluoromethane	5.00	2.00	9.27	9.02	185	180	1	65.0-141	J5	J5	2.73	20
1,1,2-Trichlorotrifluoroethane	5.00	0.500	8.72	8.80	174	176	1	70.0-136	J5	J5	0.913	20
1,2,3-Trichloropropane	5.00	1.00	5.70	5.88	114	118	1	73.0-122			3.11	20
Vinyl chloride	5.00	0.500	8.71	8.56	174	171	1	58.0-137	J5	J5	1.74	20
Xylenes, Total	15.0	1.50	20.9	21.1	139	141	1	79.0-121	J5	J5	0.952	20
(S) Toluene-d8					*99.3*	*99.9*		*89.0-112*				
(S) 4-Bromofluorobenzene					*107*	*107*		*85.0-114*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/01/22 16:16 • (MS) R3843739-6 10/01/22 19:44 • (MSD) R3843739-7 10/01/22 20:06

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
(S) 1,2-Dichloroethane-d4					*99.6*	*96.4*		*81.0-118*				

Method Blank (MB)

(MB) R3845009-3 10/04/22 01:31

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Acetone	16.3	J	11.3	25.0	50.0
Chloromethane	2.00	U	0.960	2.00	4.00
1,2-Dibromo-3-Chloropropane	2.00	U	0.276	2.00	5.00
Hexachloro-1,3-butadiene	0.750	U	0.337	0.750	1.50
4-Methyl-2-pentanone (MIBK)	5.00	U	0.478	5.00	10.0
1,2,4-Trichlorobenzene	1.00	U	0.481	1.00	2.00
Trichlorofluoromethane	2.00	U	0.160	2.00	5.00
(S) Toluene-d8	*107*				*89.0-112*
(S) 4-Bromofluorobenzene	*110*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*114*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3845009-1 10/03/22 23:52 • (LCSD) R3845009-2 10/04/22 00:57

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	25.0	37.2	38.2	149	153	39.0-160			2.65	20
Chloromethane	5.00	4.27	4.07	85.4	81.4	50.0-139			4.80	20
1,2-Dibromo-3-Chloropropane	5.00	4.72	4.19	94.4	83.8	62.0-128			11.9	20
Hexachloro-1,3-butadiene	5.00	4.84	5.09	96.8	102	66.0-134			5.04	20
4-Methyl-2-pentanone (MIBK)	25.0	22.4	21.9	89.6	87.6	67.0-130			2.26	20
1,2,4-Trichlorobenzene	5.00	5.11	4.76	102	95.2	69.0-130			7.09	20
Trichlorofluoromethane	5.00	6.01	5.38	120	108	65.0-141			11.1	20
(S) Toluene-d8				*105*	*104*	*89.0-112*				
(S) 4-Bromofluorobenzene				*109*	*105*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*113*	*111*	*81.0-118*				

Method Blank (MB)

(MB) R3843855-1 10/01/22 17:54

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
AK102 DRO C10-C25	400	U	170	400	800
(S) o-Terphenyl	*100*				*60.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3843855-2 10/01/22 18:17 • (LCSD) R3843855-3 10/01/22 18:39

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6000	6410	6270	107	104	75.0-125			2.21	20
(S) o-Terphenyl				*83.5*	*84.3*	*60.0-120*				

L1540948-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540948-03 10/01/22 19:02 • (MS) R3843855-4 10/01/22 19:25 • (MSD) R3843855-5 10/01/22 19:48

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	5460	400	5540	6470	101	108	1	75.0-125			15.5	20
(S) o-Terphenyl					*79.8*	*85.1*		*50.0-150*				

L1540980-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1540980-01 10/02/22 03:21 • (MS) R3843855-6 10/02/22 03:44 • (MSD) R3843855-7 10/02/22 04:07

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6000	400	6560	6350	109	106	1	75.0-125			3.25	20
(S) o-Terphenyl					*83.1*	*85.4*		*50.0-150*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
C4	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Data is likely to show a low bias concerning the result.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
U	Below Detectable Limits: Indicates that the analyte was not detected.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
North Wind Site Services, LLC- AK
2525 C Street, Ste. 130
~~7910 King Street~~
Anchorage, AK ~~99518~~ 99503

Billing Information:
Accounts Payable
1425 Higham St
Idaho Falls, ID 83402

Pres Chk

Report to:
Jill Jones

Email To: Jill.Jones@northwindgp.com
~~jhansmeyer@northwindgrp.com;jill.jones@north~~

Project Description:
Port Heiden RRS

City/State Collected: PORT HEIDEN AK

Please Circle: PT MT CT ET

Phone: **907-277-5488**

Client Project #
06 0068-001

Lab Project #
NORWINDAAK-ORC

Collected by (print):
SYDNEY SOUZA

Site/Facility ID #
PORTHEIDEN (PTH)

P.O. #
6-00000738

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DODAK102 100ml Amb HCl	DODALK 250mlHDPE-NoPres +SULFATE	DODFEICP,DODMNICP 250mlHDPE-HNO3	DODNO2NO3 250mlHDPE-H2SO4 +TKN	DODSULFATE 250mlHDPE-NoPres	DODTKN 250mlHDPE-H2SO4	DODV8260BTEX 40mlAmb-HCl	DODV8260C 40mlAmb-HCl			Remarks	Sample # (lab only)
OT001-RRSMW06-091722	G	GW		09-17-22	17:48	8	✓	✓	✓	✓				✓				01
OT001-RRSMW06-091722-MS	G	GW		09-17-22	17:48	8	✓	✓	✓	✓				✓			MS	01
OT001-RRSMW06-091722-MSD	G	GW		09-17-22	17:48	8	✓	✓	✓	✓				✓			MSD	01
OT001-RRSMW05-091822	G	GW		09-18-22	12:03	8	✓	✓	✓	✓				✓				02
OT001-DSAMW02-091822	G	GW		09-18-22	12:55	8	✓	✓	✓	✓				✓				03
OT001-DSAMW05-091822	G	GW		09-18-22	15:05	8	✓	✓	✓	✓				✓				04
OT001-GLOMW04-091822	G	GW		09-18-22	16:16	8	✓	✓	✓	✓				✓				05
OT001-DSAMW06-091822	G	GW		09-18-22	1730	8	✓	✓	✓	✓				✓				06
OT001-TRIPBLNK-HCL-01		GW		09-17-22	1740	1								✓			TRIPBLANK	07
		GW																

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1548980
G071

Acctnum: **NORWINDAAK**
Template:**T215484**
Prelogin: **P948323**
PM: **546 - Jared Starkey**
PB:

Shipped Via: **FedEX 2nd Day**

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
NPDL: 21-034
COOLER NAME: URSULA

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 5862 7555 4710

Sample Receipt Checklist
COC Seal Present/Intact: NP ✓ Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: X N
Preservation Correct/Checked: X N
RAD Screen <0.5 mR/hr: X N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	09-20-22	12:30	Renee Lafata
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Renee Lafata	09-28-22	12:30	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
	09/28/22	12:40	

Trip Blank Received: (Yes) No
HCL / MeoH
TBR

Temp: GBA7 °C Bottles Received: 64
4.6+0-4.6

Date: 9/29/22 Time: 0930

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

ANALYTICAL REPORT

February 14, 2023

Revised Report

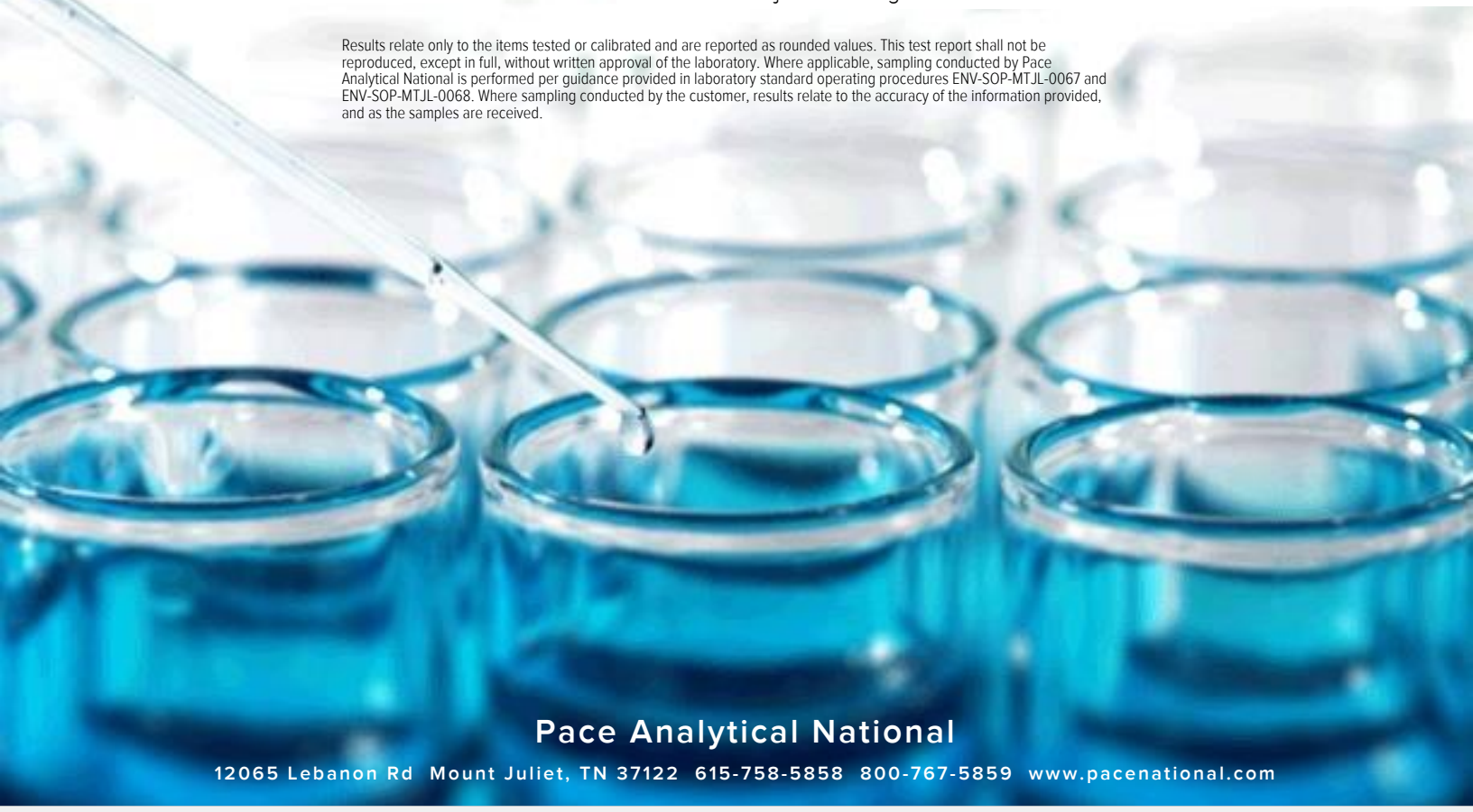
North Wind Site Services, LLC- AK

Sample Delivery Group:	L1566427
Samples Received:	12/10/2022
Project Number:	060068-001
Description:	Port Heiden RRS 21-034
Site:	PORT HEIDEN
Report To:	Jill Jones 7910 King Street Anchorage, AK 99518

Entire Report Reviewed By:

Jared Starkey
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SS006-TRIPBLANK-HCL-01 L1566427-01 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 09:00 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/15/22 23:58	12/15/22 23:58	JHH	Mt. Juliet, TN

SS006-066MW06-120622 L1566427-02 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 16:50 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 01:20	12/16/22 01:20	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 10:55	DMG	Mt. Juliet, TN

SS006-215MW09-120622 L1566427-03 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 11:34 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 01:41	12/16/22 01:41	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 11:19	DMG	Mt. Juliet, TN

SS006-215MW99-120622 L1566427-04 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 11:35 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 02:01	12/16/22 02:01	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 11:42	DMG	Mt. Juliet, TN

SS006-215MW08-120622 L1566427-05 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 12:42 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 02:21	12/16/22 02:21	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 12:05	DMG	Mt. Juliet, TN

SS006-066MW05-120622 L1566427-06 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 14:22 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 02:42	12/16/22 02:42	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 12:28	DMG	Mt. Juliet, TN

SS006-066MW04-120622 L1566427-07 GW

Collected by: Lauren Jennings | Collected date/time: 12/06/22 15:14 | Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 03:02	12/16/22 03:02	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 12:51	DMG	Mt. Juliet, TN

SAMPLE SUMMARY

SS006-066MW07-120622 L1566427-08 GW

Collected by: Lauren Jennings
Collected date/time: 12/06/22 15:55
Received date/time: 12/10/22 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1975380	1	12/16/22 03:23	12/16/22 03:23	JHH	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method AK102	WG1974005	1	12/14/22 17:23	12/15/22 13:14	DMG	Mt. Juliet, TN

CASE NARRATIVE

Unless qualified or notated within the narrative below, all sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jared Starkey
Project Manager

Report Revision History

Level II Report - Version 1: 12/22/22 16:14
Level IV Report - Version 2: 12/22/22 16:18
Level II Report - Version 3: 02/06/23 12:20
Level IV Report - Version 4: 02/06/23 13:46

Project Comments

ID Corrections

Volatile Organic Compounds (GC/MS) by Method 8260D

The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Batch	Lab Sample ID	Analytes
WG1975380	(MSD) R3873285-5, L1566427-08	Benzene

Semi-Volatile Organic Compounds (GC) by Method AK102

Surrogate recovery limits have been exceeded; values are outside lower control limits.

Batch	Analyte	Lab Sample ID
WG1974005	o-Terphenyl	L1566427-06

DETECTION SUMMARY

Semi-Volatile Organic Compounds (GC) by Method AK102

Client ID	Lab Sample ID	Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
				ug/l		ug/l	ug/l	ug/l		date / time	
SS006-066MW05-120622	L1566427-06	AK102 DRO C10-C25	C10-C25	2410		170	400	800	1	12/15/2022 12:28	WG1974005

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/15/2022 23:58	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/15/2022 23:58	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/15/2022 23:58	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/15/2022 23:58	WG1975380
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*12/15/2022 23:58*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*100*				*85.0-114*		*12/15/2022 23:58*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*90.8*				*81.0-118*		*12/15/2022 23:58*	WG1975380

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/16/2022 01:20	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 01:20	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 01:20	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 01:20	WG1975380
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*12/16/2022 01:20*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*102*				*85.0-114*		*12/16/2022 01:20*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*90.6*				*81.0-118*		*12/16/2022 01:20*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	12/15/2022 10:55	WG1974005
(S) o-Terphenyl	*84-15-1*	*69.2*				*50.0-150*		*12/15/2022 10:55*	WG1974005

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/16/2022 01:41	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 01:41	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 01:41	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 01:41	WG1975380
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*12/16/2022 01:41*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*12/16/2022 01:41*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*91.6*				*81.0-118*		*12/16/2022 01:41*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	12/15/2022 11:19	WG1974005
(S) o-Terphenyl	*84-15-1*	*76.2*				*50.0-150*		*12/15/2022 11:19*	WG1974005

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/16/2022 02:01	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 02:01	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 02:01	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 02:01	WG1975380
(S) Toluene-d8	*2037-26-5*	*103*				*89.0-112*		*12/16/2022 02:01*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*100*				*85.0-114*		*12/16/2022 02:01*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*89.6*				*81.0-118*		*12/16/2022 02:01*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	12/15/2022 11:42	WG1974005
(S) o-Terphenyl	*84-15-1*	*76.0*				*50.0-150*		*12/15/2022 11:42*	WG1974005

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/16/2022 02:21	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 02:21	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 02:21	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 02:21	WG1975380
(S) Toluene-d8	*2037-26-5*	*105*				*89.0-112*		*12/16/2022 02:21*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*99.4*				*85.0-114*		*12/16/2022 02:21*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*88.9*				*81.0-118*		*12/16/2022 02:21*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	12/15/2022 12:05	WG1974005
(S) o-Terphenyl	*84-15-1*	*79.2*				*50.0-150*		*12/15/2022 12:05*	WG1974005

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/16/2022 02:42	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 02:42	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 02:42	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 02:42	WG1975380
(S) Toluene-d8	*2037-26-5*	*99.6*				*89.0-112*		*12/16/2022 02:42*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*103*				*85.0-114*		*12/16/2022 02:42*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*91.1*				*81.0-118*		*12/16/2022 02:42*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	2410		170	400	800	1	12/15/2022 12:28	WG1974005
(S) o-Terphenyl	*84-15-1*	*13.6*	J2			*50.0-150*		*12/15/2022 12:28*	WG1974005

Sample Narrative:

L1566427-06 WG1974005: Sample produced emulsion during Extraction process, low surr/spike recoveries due to matrix.

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	U	0.0941	0.500	1.00	1	12/16/2022 03:02	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 03:02	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 03:02	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 03:02	WG1975380
(S) Toluene-d8	*2037-26-5*	*106*				*89.0-112*		*12/16/2022 03:02*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*102*				*85.0-114*		*12/16/2022 03:02*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*88.6*				*81.0-118*		*12/16/2022 03:02*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	12/15/2022 12:51	WG1974005
(S) o-Terphenyl	*84-15-1*	*81.3*				*50.0-150*		*12/15/2022 12:51*	WG1974005

Additional Information - Results for field analyses are not accredited to ISO 17025

Analyte	Result	Units
Cooler#	1	
Cooler Temperature	4.3	Deg. C

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
Benzene	71-43-2	0.500	J6 U	0.0941	0.500	1.00	1	12/16/2022 03:23	WG1975380
Ethylbenzene	100-41-4	0.500	U	0.137	0.500	1.00	1	12/16/2022 03:23	WG1975380
Toluene	108-88-3	0.600	U	0.278	0.600	1.20	1	12/16/2022 03:23	WG1975380
Total Xylenes	1330-20-7	1.50	U	0.174	1.50	3.00	1	12/16/2022 03:23	WG1975380
(S) Toluene-d8	*2037-26-5*	*104*				*89.0-112*		*12/16/2022 03:23*	WG1975380
(S) 4-Bromofluorobenzene	*460-00-4*	*101*				*85.0-114*		*12/16/2022 03:23*	WG1975380
(S) 1,2-Dichloroethane-d4	*17060-07-0*	*91.4*				*81.0-118*		*12/16/2022 03:23*	WG1975380

Semi-Volatile Organic Compounds (GC) by Method AK102

Analyte	CAS #	Result	Qualifier	DL	LOD	LOQ	Dilution	Analysis	Batch
		ug/l		ug/l	ug/l	ug/l		date / time	
AK102 DRO C10-C25	C10-C25	400	U	170	400	800	1	12/15/2022 13:14	WG1974005
(S) o-Terphenyl	*84-15-1*	*77.0*				*50.0-150*		*12/15/2022 13:14*	WG1974005

Method Blank (MB)

(MB) R3873285-3 12/15/22 23:27

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
Benzene	0.500	U	0.0941	0.500	1.00
Ethylbenzene	0.500	U	0.137	0.500	1.00
Toluene	0.600	U	0.278	0.600	1.20
Xylenes, Total	1.50	U	0.174	1.50	3.00
(S) Toluene-d8	*106*				*89.0-112*
(S) 4-Bromofluorobenzene	*99.9*				*85.0-114*
(S) 1,2-Dichloroethane-d4	*89.1*				*81.0-118*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3873285-1 12/15/22 22:25 • (LCSD) R3873285-2 12/15/22 22:46

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	5.00	4.61	4.87	92.2	97.4	79.0-120			5.49	20
Ethylbenzene	5.00	4.86	5.10	97.2	102	79.0-121			4.82	20
Toluene	5.00	4.72	4.82	94.4	96.4	80.0-121			2.10	20
Xylenes, Total	15.0	14.6	14.7	97.3	98.0	79.0-121			0.683	20
(S) Toluene-d8				*101*	*102*	*89.0-112*				
(S) 4-Bromofluorobenzene				*98.6*	*100*	*85.0-114*				
(S) 1,2-Dichloroethane-d4				*91.7*	*92.8*	*81.0-118*				

L1566427-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1566427-08 12/16/22 03:23 • (MS) R3873285-4 12/16/22 06:48 • (MSD) R3873285-5 12/16/22 07:09

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	5.00	0.500	4.18	3.75	83.6	75.0	1	79.0-120		J6	10.8	20
Ethylbenzene	5.00	0.500	4.84	4.19	96.8	83.8	1	79.0-121			14.4	20
Toluene	5.00	0.600	4.37	4.01	87.4	80.2	1	80.0-121			8.59	20
Xylenes, Total	15.0	1.50	14.0	13.3	93.3	88.7	1	79.0-121			5.13	20
(S) Toluene-d8					*103*	*103*		*89.0-112*				
(S) 4-Bromofluorobenzene					*102*	*101*		*85.0-114*				
(S) 1,2-Dichloroethane-d4					*95.8*	*94.8*		*81.0-118*				

Method Blank (MB)

(MB) R3872338-1 12/15/22 09:47

Analyte	MB Result ug/l	MB Qualifier	MB DL ug/l	MB LOD ug/l	MB LOQ ug/l
AK102 DRO C10-C25	400	U	170	400	800
(S) o-Terphenyl	*72.8*				*60.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3872338-2 12/15/22 10:10 • (LCSD) R3872338-3 12/15/22 10:32

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	6000	5820	5990	97.0	99.8	75.0-125			2.88	20
(S) o-Terphenyl				*94.3*	*94.1*	*60.0-120*				

L1566427-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1566427-08 12/15/22 13:14 • (MS) R3872338-4 12/15/22 13:37 • (MSD) R3872338-5 12/15/22 14:00

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
AK102 DRO C10-C25	5460	400	4890	4290	89.6	78.6	1	75.0-125			13.1	20
(S) o-Terphenyl					*95.1*	*85.9*		*50.0-150*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
North Wind Site Services, LLC- AK

2525 C Street, Ste. 130
Anchorage, AK 99503

Billing Information:
Accounts Payable
1425 Higham St
Idaho Falls, ID 83402

Pres Chk

Report to:
Jill Jones

Email To: jill.jones@northwindgrp.com, rlafata@northwindgrp.com

Project Description:
Port Heiden RRS SORC.

City/State Collected: Port Heiden, Ak

Please Circle: PT MT CT ET

Phone: (907) 891-7338

Client Project #
060068-001

Lab Project #
NORWINDAAK-ORC

Collected by (print):
Lauren Jennings

Site/Facility ID #
Port Heiden

P.O. #
6-00000738

Collected by (signature):
Lauren Jennings

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DODAK102 100ml Amb HCl	DODALK 250mlHDPE-NoPres	DODFEICP,DODMNICP 250mlHDPE-HNO3	DODNO2NO3 250mlHDPE-H2SO4	DODSULFATE 250mlHDPE-NoPres	DODTKN 250mlHDPE-H2SO4	DODV8260BTEX 40mlAmb-HCl	DODV8260C 40mlAmb-HCl			Remarks	Sample # (lab only)
SS006-TRIPBLNK-HCL-01	G	GW		12/06/22	09:00	1							X	R#			TRIP BLANK	-01
SS006-MW06-120622	G	GW		12/06/22	16:50	5	X						X					-02
SS006-215MW09-120622	G	GW		12/06/22	11:34	5	X						X					-03
SS006-215MW99-120622	G	GW		12/06/22	11:35	5	X						X					-04
SS006-215MW08-120622	G	GW		12/06/22	12:42	5	X						X					-05
SS006-066MW05-120622	G	GW		12/06/22	14:22	5	X						X					-06
SS006-066MW04-120622	G	GW		12/06/22	15:14	5	X						X					-07
SS006-066MW07-120622	G	GW		12/06/22	15:55	5	X						X					-08
SS006-066MW07MS-120622	G	GW		12/06/22	15:56	5	X						X					-09
SS006-066MW07MSD-120622	G	GW		12/06/22	15:56	5	X						X					-10

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 156627
1204

Acctnum: NORWINDAAK
Template: T215484
Prelogin: P948323
PM: 546 - Jared Starkey
PB:

Shipped Via: FedEX 2nd Day

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:
NPDL: 21-0834
Cooler name: Maisy + Roxy

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 5882 7555 4755

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Lauren Jennings	12/09/22	11:20		1
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: GBA 4.3 2°C Bottles Received: 45
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 12/10/22 Time: 10:00
			Caleb Tapp	Hold: Condition: NCF / OK

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APPENDIX F

Mann-Kendall Analysis

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Well ID	Date	Event	DRO	D_DRO
066-MW-04	2009	1	0.504	1
066-MW-04	2010	2	NS	0
066-MW-04	2011	3	NS	0
066-MW-04	2012	4	NS	0
066-MW-04	2013	5	0.018	1
066-MW-04	2014	6	NS	0
066-MW-04	2015	7	NS	0
066-MW-04	2016	8	0.32	1
066-MW-04	2017	9	0.055	1
066-MW-04	2019	10	0.2	1
066-MW-04	2020	11	0.274	1
066-MW-04	2021	12	0.0858	1
066-MW-04	2022	13	0.4	0
066-MW-05	2009	1	2.25	1
066-MW-05	2010	2	4.5	1
066-MW-05	2011	3	NS	0
066-MW-05	2012	4	2.02	1
066-MW-05	2013	5	1.6	1
066-MW-05	2014	6	1.3	1
066-MW-05	2015	7	3.1	1
066-MW-05	2016	8	2.4	1
066-MW-05	2017	9	3.7	1
066-MW-05	2019	10	1.5	1
066-MW-05	2020	11	1.76	1
066-MW-05	2021	12	1.29	1
066-MW-05	2022	13	2.41	1
066-MW-06	2013	1	0.019	1
066-MW-06	2014	2	0.032	1
066-MW-06	2015	3	NS	0
066-MW-06	2016	4	0.063	1
066-MW-06	2017	5	0.091	1
066-MW-06	2019	6	0.08	0
066-MW-06	2020	7	0.211	1
066-MW-06	2021	8	0.0481	1
066-MW-06	2022	9	0.4	0
066-MW-07	2013	1	0.024	1
066-MW-07	2014	2	NS	0
066-MW-07	2015	3	NS	0
066-MW-07	2016	4	0.056	1
066-MW-07	2017	5	0.047	1
066-MW-07	2019	6	0.08	0
066-MW-07	2020	7	NS	0
066-MW-07	2021	8	0.0247	0
066-MW-07	2022	9	0.4	0
215-MW-08	2009	1	4.18	1
215-MW-08	2010	2	NS	0

215-MW-08	2011	3	1.17	1
215-MW-08	2012	4	NS	0
215-MW-08	2013	5	0.019	1
215-MW-08	2014	6	0.036	1
215-MW-08	2015	7	0.048	1
215-MW-08	2016	8	NS	0
215-MW-08	2017	9	0.08	0
215-MW-08	2019	10	0.08	0
215-MW-08	2020	11	0.08	0
215-MW-08	2021	12	0.0524	1
215-MW-08	2022	13	0.4	0
215-MW-09	2009	1	3.99	1
215-MW-09	2010	2	9.68	1
215-MW-09	2011	3	14	1
215-MW-09	2012	4	8.85	1
215-MW-09	2013	5	11	1
215-MW-09	2014	6	12	1
215-MW-09	2015	7	NS	0
215-MW-09	2016	8	12	1
215-MW-09	2017	9	6.8	1
215-MW-09	2019	10	3.9	1
215-MW-09	2020	11	3.96	1
215-MW-09	2021	12	3.43	1
215-MW-09	2022	13	0.4	0
215-MW-12	2016	1	0.15	1
215-MW-12	2017	2	0.075	1
215-MW-12	2019	3	0.08	0
215-MW-12	2020	4	0.475	1
215-MW-12	2021	5	0.125	1
215-MW-12	2022	6	0.4	0
BLO-MW-01	2010	1	15,600	1
BLO-MW-01	2011	2	70.5	1
BLO-MW-01	2012	3	26.5	1
BLO-MW-01	2013	4	1,300	1
BLO-MW-01	2014	5	16,002	1
BLO-MW-01	2015	6	NS	0
BLO-MW-01	2016	7	63	1
BLO-MW-01	2017	8	NS	0
BLO-MW-01	2019	9	20	1
BLO-MW-01	2020	10	15	1
BLO-MW-01	2021	11	13	1
BLO-MW-01	2022	12	13.7	1
BLO-MW-05	2011	1	0.242	1
BLO-MW-05	2012	2	NS	0
BLO-MW-05	2013	3	0.075	1
BLO-MW-05	2014	4	0.032	1
BLO-MW-05	2015	5	NS	0

BLO-MW-05	2016	6	0.044	1
BLO-MW-05	2017	7	0.037	1
BLO-MW-05	2019	8	0.082	1
BLO-MW-05	2020	9	0.0247	0
BLO-MW-05	2021	10	0.0247	0
BLO-MW-05	2022	11	0.4	1
BLO-MW-06	2011	1	0.883	1
BLO-MW-06	2012	2	NS	0
BLO-MW-06	2013	3	0.074	1
BLO-MW-06	2014	4	0.042	1
BLO-MW-06	2015	5	NS	0
BLO-MW-06	2016	6	NS	0
BLO-MW-06	2017	7	0.04	1
BLO-MW-06	2019	8	0.091	1
BLO-MW-06	2020	9	0.0247	0
BLO-MW-06	2021	10	0.0247	0
BLO-MW-06	2022	11	0.4	0
BLO-MW-07	2014	1	0.084	1
BLO-MW-07	2015	2	NS	0
BLO-MW-07	2016	3	NS	0
BLO-MW-07	2017	4	0.077	1
BLO-MW-07	2019	5	0.2	1
BLO-MW-07	2020	6	0.0247	0
BLO-MW-07	2021	7	0.0247	0
BLO-MW-07	2022	8	0.4	0
DSA-MW02	2011	1	0.479	1
DSA-MW02	2012	2	NS	0
DSA-MW02	2013	3	0.031	1
DSA-MW02	2014	4	0.031	1
DSA-MW02	2015	5	NS	0
DSA-MW02	2016	6	0.07	1
DSA-MW02	2017	7	NS	0
DSA-MW02	2019	8	0.21	1
DSA-MW02	2020	9	0.0397	1
DSA-MW02	2021	10	0.0247	0
DSA-MW02	2022	11	0.4	0

	A	B	C	D	E	F	G
1				**Mann-Kendall Trend Test Analysis**			
2			User Selected Options				
3			Date/Time of Computation	ProUCL 5.2 5/12/2023 9:21:55 AM			
4			From File	PH_ProUCL input file_DRO_KR.xls			
5			Full Precision	OFF			
6			Confidence Coefficient	0.95			
7			Level of Significance	0.05			
8							
9			**DRO-066-mw-04**				
10							
11			**General Statistics**				
12			Number of Events Reported (m)		13		
13			Number of Missing Events		5		
14			Number or Reported Events Used		8		
15			Number Values Reported (n)		13		
16			Number Values Missing		5		
17			Number Values Used		8		
18			Minimum		0.018		
19			Maximum		0.504		
20			Mean		0.232		
21			Geometric Mean		0.153		
22			Median		0.237		
23			Standard Deviation		0.174		
24			Coefficient of Variation		0.748		
25							
26			**Mann-Kendall Test**				
27			M-K Test Value (S)		2		
28			Tabulated p-value		0.452		
29			Standard Deviation of S		8.083		
30			Standardized Value of S		0.124		
31			Approximate p-value		0.451		
32							
33	**Insufficient evidence to identify a significant**						
34	**trend at the specified level of significance.**						
35			**DRO-066-mw-05**				
36							
37			**General Statistics**				
38			Number of Events Reported (m)		13		
39			Number of Missing Events		1		
40			Number or Reported Events Used		12		
41			Number Values Reported (n)		13		
42			Number Values Missing		1		
43			Number Values Used		12		
44			Minimum		1.29		
45			Maximum		4.5		
46			Mean		2.319		
47			Geometric Mean		2.147		
48			Median		2.135		
49			Standard Deviation		0.999		
50			Coefficient of Variation		0.431		
51							
52			**Mann-Kendall Test**				
53			M-K Test Value (S)		-12		
54			Tabulated p-value		0.23		
55			Standard Deviation of S		14.58		
56			Standardized Value of S		-0.754		
57			Approximate p-value		0.225		
58							
59	**Insufficient evidence to identify a significant**						
60	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
61	**DRO-066-mw-06**						
62							
63	**General Statistics**						
64	Number of Events Reported (m)				9		
65	Number of Missing Events				1		
66	Number or Reported Events Used				8		
67	Number Values Reported (n)				9		
68	Number Values Missing				1		
69	Number Values Used				8		
70	Minimum				0.019		
71	Maximum				0.4		
72	Mean				0.118		
73	Geometric Mean				0.0762		
74	Median				0.0715		
75	Standard Deviation				0.128		
76	Coefficient of Variation				1.088		
77							
78	**Mann-Kendall Test**						
79	M-K Test Value (S)				18		
80	Tabulated p-value				0.016		
81	Standard Deviation of S				8.083		
82	Standardized Value of S				2.103		
83	Approximate p-value				0.0177		
84							
85	**Statistically significant evidence of an increasing**						
86	**trend at the specified level of significance.**						
87	**DRO-066-mw-07**						
88							
89	**General Statistics**						
90	Number of Events Reported (m)				9		
91	Number of Missing Events				3		
92	Number or Reported Events Used				6		
93	Number Values Reported (n)				9		
94	Number Values Missing				3		
95	Number Values Used				6		
96	Minimum				0.024		
97	Maximum				0.4		
98	Mean				0.105		
99	Geometric Mean				0.0607		
100	Median				0.0515		
101	Standard Deviation				0.146		
102	Coefficient of Variation				1.386		
103							
104	**Mann-Kendall Test**						
105	M-K Test Value (S)				7		
106	Tabulated p-value				0.136		
107	Standard Deviation of S				5.323		
108	Standardized Value of S				1.127		
109	Approximate p-value				0.13		
110							
111	**Insufficient evidence to identify a significant**						
112	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
113	**DRO-215-mw-08**						
114							
115	**General Statistics**						
116	Number of Events Reported (m)				13		
117	Number of Missing Events				3		
118	Number or Reported Events Used				10		
119	Number Values Reported (n)				13		
120	Number Values Missing				3		
121	Number Values Used				10		
122	Minimum				0.019		
123	Maximum				4.18		
124	Mean				0.615		
125	Geometric Mean				0.133		
126	Median				0.08		
127	Standard Deviation				1.302		
128	Coefficient of Variation				2.118		
129							
130	**Mann-Kendall Test**						
131	M-K Test Value (S)				2		
132	Tabulated p-value				0.431		
133	Standard Deviation of S				11.02		
134	Standardized Value of S				0.0908		
135	Approximate p-value				0.464		
136							
137	**Insufficient evidence to identify a significant**						
138	**trend at the specified level of significance.**						
139	**DRO-215-mw-09**						
140							
141	**General Statistics**						
142	Number of Events Reported (m)				13		
143	Number of Missing Events				1		
144	Number or Reported Events Used				12		
145	Number Values Reported (n)				13		
146	Number Values Missing				1		
147	Number Values Used				12		
148	Minimum				0.4		
149	Maximum				14		
150	Mean				7.501		
151	Geometric Mean				5.665		
152	Median				7.825		
153	Standard Deviation				4.336		
154	Coefficient of Variation				0.578		
155							
156	**Mann-Kendall Test**						
157	M-K Test Value (S)				-31		
158	Tabulated p-value				0.022		
159	Standard Deviation of S				14.55		
160	Standardized Value of S				-2.062		
161	Approximate p-value				0.0196		
162							
163	**Statistically significant evidence of a decreasing**						
164	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
165	**DRO-215-mw-12**						
166							
167	**General Statistics**						
168	Number of Events Reported (m)				6		
169	Number of Missing Events				0		
170	Number or Reported Events Used				6		
171	Number Values Reported (n)				6		
172	Minimum				0.075		
173	Maximum				0.475		
174	Mean				0.218		
175	Geometric Mean				0.167		
176	Median				0.138		
177	Standard Deviation				0.174		
178	Coefficient of Variation				0.801		
179							
180	**Mann-Kendall Test**						
181	M-K Test Value (S)				5		
182	Tabulated p-value				0.235		
183	Standard Deviation of S				5.323		
184	Standardized Value of S				0.751		
185	Approximate p-value				0.226		
186							
187	**Insufficient evidence to identify a significant**						
188	**trend at the specified level of significance.**						
189	**DRO-blo-mw-01**						
190							
191	**General Statistics**						
192	Number of Events Reported (m)				12		
193	Number of Missing Events				2		
194	Number or Reported Events Used				10		
195	Number Values Reported (n)				12		
196	Number Values Missing				2		
197	Number Values Used				10		
198	Minimum				13		
199	Maximum				16002		
200	Mean				3312		
201	Geometric Mean				135.2		
202	Median				44.75		
203	Standard Deviation				6595		
204	Coefficient of Variation				1.991		
205							
206	**Mann-Kendall Test**						
207	M-K Test Value (S)				-29		
208	Tabulated p-value				0.005		
209	Standard Deviation of S				11.18		
210	Standardized Value of S				-2.504		
211	Approximate p-value				0.00613		
212							
213	**Statistically significant evidence of a decreasing**						
214	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
215	**DRO-blo-mw-05**						
216							
217	**General Statistics**						
218	Number of Events Reported (m)				11		
219	Number of Missing Events				2		
220	Number or Reported Events Used				9		
221	Number Values Reported (n)				11		
222	Number Values Missing				2		
223	Number Values Used				9		
224	Minimum				0.0247		
225	Maximum				0.4		
226	Mean				0.107		
227	Geometric Mean				0.0644		
228	Median				0.044		
229	Standard Deviation				0.129		
230	Coefficient of Variation				1.21		
231							
232	**Mann-Kendall Test**						
233	M-K Test Value (S)				-7		
234	Tabulated p-value				0.306		
235	Standard Deviation of S				9.539		
236	Standardized Value of S				-0.629		
237	Approximate p-value				0.265		
238							
239	**Insufficient evidence to identify a significant**						
240	**trend at the specified level of significance.**						
241	**DRO-blo-mw-06**						
242							
243	**General Statistics**						
244	Number of Events Reported (m)				11		
245	Number of Missing Events				3		
246	Number or Reported Events Used				8		
247	Number Values Reported (n)				11		
248	Number Values Missing				3		
249	Number Values Used				8		
250	Minimum				0.0247		
251	Maximum				0.883		
252	Mean				0.197		
253	Geometric Mean				0.0838		
254	Median				0.058		
255	Standard Deviation				0.304		
256	Coefficient of Variation				1.539		
257							
258	**Mann-Kendall Test**						
259	M-K Test Value (S)				-9		
260	Tabulated p-value				0.119		
261	Standard Deviation of S				8.021		
262	Standardized Value of S				-0.997		
263	Approximate p-value				0.159		
264							
265	**Insufficient evidence to identify a significant**						
266	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
267	**DRO-blo-mw-07**						
268							
269	**General Statistics**						
270	Number of Events Reported (m)				8		
271	Number of Missing Events				2		
272	Number or Reported Events Used				6		
273	Number Values Reported (n)				8		
274	Number Values Missing				2		
275	Number Values Used				6		
276	Minimum				0.0247		
277	Maximum				0.4		
278	Mean				0.135		
279	Geometric Mean				0.0825		
280	Median				0.0805		
281	Standard Deviation				0.145		
282	Coefficient of Variation				1.072		
283							
284	**Mann-Kendall Test**						
285	M-K Test Value (S)				0		
286	Tabulated p-value				0.5		
287	Standard Deviation of S				5.228		
288	Standardized Value of S				N/A		
289	Approximate p-value				N/A		
290							
291	**Insufficient evidence to identify a significant**						
292	**trend at the specified level of significance.**						
293	**DRO-dsa-mw02**						
294							
295	**General Statistics**						
296	Number of Events Reported (m)				11		
297	Number of Missing Events				3		
298	Number or Reported Events Used				8		
299	Number Values Reported (n)				11		
300	Number Values Missing				3		
301	Number Values Used				8		
302	Minimum				0.0247		
303	Maximum				0.479		
304	Mean				0.161		
305	Geometric Mean				0.0847		
306	Median				0.0549		
307	Standard Deviation				0.184		
308	Coefficient of Variation				1.143		
309							
310	**Mann-Kendall Test**						
311	M-K Test Value (S)				-1		
312	Tabulated p-value				0.548		
313	Standard Deviation of S				8.021		
314	Standardized Value of S				0		
315	Approximate p-value				0.5		
316							
317	**Insufficient evidence to identify a significant**						
318	**trend at the specified level of significance.**						

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Well ID	Date	Event	TCE	D_TCE
BLO-MW-01	2004	1	0.0056	1
BLO-MW-01	2010	2	NS	0
BLO-MW-01	2011	3	0.0036	1
BLO-MW-01	2012	4	0.0053	1
BLO-MW-01	2013	5	0.0035	1
BLO-MW-01	2014	6	0.005	1
BLO-MW-01	2016	7	0.0031	1
BLO-MW-01	2017	8	NS	0
BLO-MW-01	2019	9	0.0056	1
BLO-MW-01	2020	10	4.17	1
BLO-MW-01	2021	11	0.00531	1
BLO-MW-01	2022	12	0.025	0
BLO-MW-05	2004	1	0.00019	1
BLO-MW-05	2014	2	0.00015	1
BLO-MW-05	2016	3	NS	0
BLO-MW-05	2017	4	0.00016	1
BLO-MW-05	2019	5	0.000046	1
BLO-MW-05	2020	6	0.000032	1
BLO-MW-05	2021	7	0.00019	0
BLO-MW-05	2022	8	0.0005	0
BLO-MW-06	2013	1	0.00088	1
BLO-MW-06	2014	2	0.00014	1
BLO-MW-06	2019	3	0.000009	0
BLO-MW-06	2020	4	0.00019	0
BLO-MW-06	2021	5	0.00019	0
BLO-MW-06	2022	6	0.0005	1
BLO-MW-07	2019	1	0.00047	1
BLO-MW-07	2020	2	0.000771	1
BLO-MW-07	2021	3	0.00019	0
BLO-MW-07	2022	4	0.0005	0
DSA-MW01	2004	1	0.017	1
DSA-MW01	2010	2	0.0117	1
DSA-MW01	2011	3	0.479	1
DSA-MW01	2012	4	0.00047	1
DSA-MW01	2013	5	0.0062	1
DSA-MW01	2014	6	0.0077	1
DSA-MW01	2016	7	0.0073	1
DSA-MW01	2017	8	0.0064	1
DSA-MW01	2019	9	0.0078	1
DSA-MW01	2020	10	0.00714	1
DSA-MW01	2021	11	0.00811	1
DSA-MW01	2022	12	0.0105	1

DSA-MW02	2004	1	0.69	1
DSA-MW02	2010	2	0.508	1
DSA-MW02	2011	3	0.499	1
DSA-MW02	2012	4	0.506	1
DSA-MW02	2013	5	0.5	1
DSA-MW02	2014	6	0.49	1
DSA-MW02	2016	7	0.38	1
DSA-MW02	2017	8	0.40	1
DSA-MW02	2019	9	0.33	1
DSA-MW02	2020	10	0.44	1
DSA-MW02	2021	11	0.407	1
DSA-MW02	2022	12	0.41	1
DSA-MW05	2012	1	0.00525	1
DSA-MW05	2013	2	0.0028	1
DSA-MW05	2014	3	0.0029	1
DSA-MW05	2016	4	0.0022	1
DSA-MW05	2017	5	0.00058	1
DSA-MW05	2019	6	0.0012	1
DSA-MW05	2020	7	0.0019	1
DSA-MW05	2021	8	0.00427	1
DSA-MW05	2022	9	0.0033	1
DSA-MW06	2012	1	0.00054	1
DSA-MW06	2013	2	NS	0
DSA-MW06	2014	3	0.00015	1
DSA-MW06	2016	4	NS	0
DSA-MW06	2017	5	NS	0
DSA-MW06	2019	6	0.000096	1
DSA-MW06	2020	7	0.00019	0
DSA-MW06	2021	8	0.00019	0
DSA-MW06	2022	9	0.0005	0
DSA-MW07	2012	1	0.0447	1
DSA-MW07	2019	2	0.000047	1
DSA-MW07	2020	3	0.0000952	1
DSA-MW07	2021	4	0.00019	0
DSA-MW07	2022	5	0.5	0
GLO-MW04	2019	1	0.000094	1
GLO-MW04	2020	2	0.00019	0
GLO-MW04	2021	3	0.00019	0
GLO-MW04	2022	4	0.0005	0
RRS-MW05	2013	1	0.00011	1
RRS-MW05	2019	2	0.000009	0
RRS-MW05	2020	3	0.00011	1
RRS-MW05	2021	4	0.00019	0
RRS-MW05	2022	5	0.0005	0
RRS-MW06	2019	1	0.000009	1
RRS-MW06	2020	2	0.00019	0
RRS-MW06	2021	3	0.00019	0
RRS-MW06	2022	4	0.0005	0

1				**Mann-Kendall Trend Test Analysis**			
2			User Selected Options				
3			Date/Time of Computation	ProUCL 5.2 5/12/2023 8:58:52 AM			
4			From File	PH_ProUCL input file_TCE_KR_a.xls			
5			Full Precision	OFF			
6			Confidence Coefficient	0.95			
7			Level of Significance	0.05			
8							
9			**TCE-blo-mw-01**				
10							
11			**General Statistics**				
12			Number of Events Reported (m)		12		
13			Number of Missing Events		2		
14			Number or Reported Events Used		10		
15			Number Values Reported (n)		12		
16			Number Values Missing		2		
17			Number Values Used		10		
18			Minimum		0.0031		
19			Maximum		4.17		
20			Mean		0.423		
21			Geometric Mean		0.0106		
22			Median		0.00531		
23			Standard Deviation		1.317		
24			Coefficient of Variation		3.111		
25							
26			**Mann-Kendall Test**				
27			M-K Test Value (S)		12		
28			Tabulated p-value		0.146		
29			Standard Deviation of S		11.14		
30			Standardized Value of S		0.988		
31			Approximate p-value		0.162		
32							
33	**Insufficient evidence to identify a significant**						
34	**trend at the specified level of significance.**						
35			**TCE-blo-mw-05**				
36							
37			**General Statistics**				
38			Number of Events Reported (m)		8		
39			Number of Missing Events		1		
40			Number or Reported Events Used		7		
41			Number Values Reported (n)		8		
42			Number Values Missing		1		
43			Number Values Used		7		
44			Minimum		3.2000E-5		
45			Maximum		5.0000E-4		
46			Mean		1.8114E-4		
47			Geometric Mean		1.3030E-4		
48			Median		1.6000E-4		
49			Standard Deviation		1.5479E-4		
50			Coefficient of Variation		0.854		
51							
52			**Mann-Kendall Test**				
53			M-K Test Value (S)		2		
54			Tabulated p-value		0.386		
55			Standard Deviation of S		6.583		
56			Standardized Value of S		0.152		
57			Approximate p-value		0.44		
58							
59	**Insufficient evidence to identify a significant**						
60	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
61	**TCE-blo-mw-06**						
62							
63	**General Statistics**						
64	Number of Events Reported (m)				6		
65	Number of Missing Events				0		
66	Number or Reported Events Used				6		
67	Number Values Reported (n)				6		
68	Minimum				9.0000E-6		
69	Maximum				8.8000E-4		
70	Mean				3.1817E-4		
71	Geometric Mean				1.6477E-4		
72	Median				1.9000E-4		
73	Standard Deviation				3.1903E-4		
74	Coefficient of Variation				1.003		
75							
76	**Mann-Kendall Test**						
77	M-K Test Value (S)				2		
78	Tabulated p-value				0.36		
79	Standard Deviation of S				5.228		
80	Standardized Value of S				0.191		
81	Approximate p-value				0.424		
82							
83	**Insufficient evidence to identify a significant**						
84	**trend at the specified level of significance.**						
85	**TCE-blo-mw-07**						
86							
87	**General Statistics**						
88	Number of Events Reported (m)				4		
89	Number of Missing Events				0		
90	Number or Reported Events Used				4		
91	Number Values Reported (n)				4		
92	Minimum				1.9000E-4		
93	Maximum				7.7100E-4		
94	Mean				4.8275E-4		
95	Geometric Mean				4.3074E-4		
96	Median				4.8500E-4		
97	Standard Deviation				2.3752E-4		
98	Coefficient of Variation				0.492		
99							
100	**Mann-Kendall Test**						
101	M-K Test Value (S)				0		
102	Tabulated p-value				0.625		
103	Standard Deviation of S				2.944		
104	Standardized Value of S				N/A		
105	Approximate p-value				N/A		
106							
107	**Insufficient evidence to identify a significant**						
108	**trend at the specified level of significance.**						
109	**TCE-dsa-mw01**						
110							
111	**General Statistics**						
112	Number of Events Reported (m)				12		
113	Number of Missing Events				0		
114	Number or Reported Events Used				12		
115	Number Values Reported (n)				12		
116	Minimum				4.7000E-4		
117	Maximum				0.479		
118	Mean				0.0474		
119	Geometric Mean				0.0094		
120	Median				0.00775		
121	Standard Deviation				0.136		
122	Coefficient of Variation				2.866		
123							
124	**Mann-Kendall Test**						
125	M-K Test Value (S)				-2		
126	Tabulated p-value				0.473		
127	Standard Deviation of S				14.58		
128	Standardized Value of S				-0.0686		
129	Approximate p-value				0.473		
130							
131	**Insufficient evidence to identify a significant**						
132	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
133	**TCE-dsa-mw02**						
134							
135	**General Statistics**						
136				Number of Events Reported (m)	12		
137				Number of Missing Events	0		
138				Number or Reported Events Used	12		
139				Number Values Reported (n)	12		
140				Minimum	0.33		
141				Maximum	0.69		
142				Mean	0.463		
143				Geometric Mean	0.456		
144				Median	0.465		
145				Standard Deviation	0.0924		
146				Coefficient of Variation	0.199		
147							
148	**Mann-Kendall Test**						
149				M-K Test Value (S)	-40		
150				Tabulated p-value	0.003		
151				Standard Deviation of S	14.58		
152				Standardized Value of S	-2.674		
153				Approximate p-value	0.00374		
154							
155	**Statistically significant evidence of a decreasing**						
156	**trend at the specified level of significance.**						
157	**TCE-dsa-mw05**						
158							
159	**General Statistics**						
160				Number of Events Reported (m)	9		
161				Number of Missing Events	0		
162				Number or Reported Events Used	9		
163				Number Values Reported (n)	9		
164				Minimum	5.8000E-4		
165				Maximum	0.00525		
166				Mean	0.00271		
167				Geometric Mean	0.00229		
168				Median	0.0028		
169				Standard Deviation	0.00146		
170				Coefficient of Variation	0.538		
171							
172	**Mann-Kendall Test**						
173				M-K Test Value (S)	-4		
174				Tabulated p-value	0.381		
175				Standard Deviation of S	9.592		
176				Standardized Value of S	-0.313		
177				Approximate p-value	0.377		
178							
179	**Insufficient evidence to identify a significant**						
180	**trend at the specified level of significance.**						
181	**TCE-dsa-mw06**						
182							
183	**General Statistics**						
184				Number of Events Reported (m)	9		
185				Number of Missing Events	3		
186				Number or Reported Events Used	6		
187				Number Values Reported (n)	9		
188				Number Values Missing	3		
189				Number Values Used	6		
190				Minimum	9.6000E-5		
191				Maximum	5.4000E-4		
192				Mean	2.7767E-4		
193				Geometric Mean	2.2797E-4		
194				Median	1.9000E-4		
195				Standard Deviation	1.9127E-4		
196				Coefficient of Variation	0.689		
197							
198	**Mann-Kendall Test**						
199				M-K Test Value (S)	2		
200				Tabulated p-value	0.36		
201				Standard Deviation of S	5.228		
202				Standardized Value of S	0.191		
203				Approximate p-value	0.424		
204							
205	**Insufficient evidence to identify a significant**						
206	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
207	**TCE-dsa-mw07**						
208							
209	**General Statistics**						
210				Number of Events Reported (m)	5		
211				Number of Missing Events	0		
212				Number or Reported Events Used	5		
213				Number Values Reported (n)	5		
214				Minimum	4.7000E-5		
215				Maximum	0.5		
216				Mean	0.109		
217				Geometric Mean	0.0018		
218				Median	1.9000E-4		
219				Standard Deviation	0.219		
220				Coefficient of Variation	2.013		
221							
222	**Mann-Kendall Test**						
223				M-K Test Value (S)	4		
224				Tabulated p-value	0.242		
225				Standard Deviation of S	4.082		
226				Standardized Value of S	0.735		
227				Approximate p-value	0.231		
228							
229	**Insufficient evidence to identify a significant**						
230	**trend at the specified level of significance.**						
231	**TCE-glo-mw04**						
232							
233	**General Statistics**						
234				Number of Events Reported (m)	4		
235				Number of Missing Events	0		
236				Number or Reported Events Used	4		
237				Number Values Reported (n)	4		
238				Minimum	9.4000E-5		
239				Maximum	5.0000E-4		
240				Mean	2.4350E-4		
241				Geometric Mean	2.0296E-4		
242				Median	1.9000E-4		
243				Standard Deviation	1.7689E-4		
244				Coefficient of Variation	0.726		
245							
246	**Mann-Kendall Test**						
247				M-K Test Value (S)	5		
248				Tabulated p-value	0.167		
249				Standard Deviation of S	2.769		
250				Standardized Value of S	1.445		
251				Approximate p-value	0.0743		
252							
253	**Insufficient evidence to identify a significant**						
254	**trend at the specified level of significance.**						
255	**TCE-rrs-mw05**						
256							
257	**General Statistics**						
258				Number of Events Reported (m)	5		
259				Number of Missing Events	0		
260				Number or Reported Events Used	5		
261				Number Values Reported (n)	5		
262				Minimum	9.0000E-6		
263				Maximum	5.0000E-4		
264				Mean	1.8380E-4		
265				Geometric Mean	1.0068E-4		
266				Median	1.1000E-4		
267				Standard Deviation	1.8806E-4		
268				Coefficient of Variation	1.023		
269							
270	**Mann-Kendall Test**						
271				M-K Test Value (S)	7		
272				Tabulated p-value	0.117		
273				Standard Deviation of S	3.958		
274				Standardized Value of S	1.516		
275				Approximate p-value	0.0648		
276							
277	**Insufficient evidence to identify a significant**						
278	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
279	**TCE-rrs-mw06**						
280							
281	**General Statistics**						
282	Number of Events Reported (m)				4		
283	Number of Missing Events				0		
284	Number or Reported Events Used				4		
285	Number Values Reported (n)				4		
286	Minimum				9.0000E-6		
287	Maximum				5.0000E-4		
288	Mean				2.2225E-4		
289	Geometric Mean				1.1290E-4		
290	Median				1.9000E-4		
291	Standard Deviation				2.0388E-4		
292	Coefficient of Variation				0.917		
293							
294	**Mann-Kendall Test**						
295	M-K Test Value (S)				5		
296	Tabulated p-value				0.167		
297	Standard Deviation of S				2.769		
298	Standardized Value of S				1.445		
299	Approximate p-value				0.0743		
300							
301	**Insufficient evidence to identify a significant**						
302	**trend at the specified level of significance.**						

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Well ID	Date	Event	PCE	D_PCE
GLO-MW04	2019	1	0.087	1
GLO-MW04	2020	2	0.3	0
GLO-MW04	2021	3	0.3	0
GLO-MW04	2022	4	0.6	0
DSA-MW06	2019	1	6.2	1
DSA-MW06	2020	2	3.9	1
DSA-MW06	2021	3	0.3	0
DSA-MW06	2022	4	0.521	1
DSA-MW07	2019	1	0.083	1
DSA-MW07	2020	2	0.3	0
DSA-MW07	2021	3	0.3	0
DSA-MW07	2022	4	0.6	0
RRS-MW05	2019	1	0.049	1
RRS-MW05	2020	2	0.3	0
RRS-MW05	2021	3	0.3	0
RRS-MW06	2019	1	0.5	1
RRS-MW06	2020	2	0.3	0
RRS-MW06	2021	3	0.3	0
RRS-MW06	2022	4	0.6	0
BLO-MW05	2019	1	0.05	1
BLO-MW05	2020	2	0.3	0
BLO-MW05	2021	3	0.3	0
BLO-MW05	2022	4	0.6	0
BLO-MW06	2019	1	0.054	1
BLO-MW06	2020	2	0.3	0
BLO-MW06	2021	3	0.3	0
BLO-MW06	2022	4	0.6	0
BLO-MW07	2019	1	460	1
BLO-MW07	2020	2	0.292	1
BLO-MW07	2021	3	0.3	0
BLO-MW07	2022	4	0.6	0
DSA-MW05	2019	1	0.13	1
DSA-MW05	2020	2	0.3	0
DSA-MW05	2021	3	0.3	0
DSA-MW05	2022	4	0.6	0
DSA-MW01	2019	1	32	1
DSA-MW01	2020	2	0.3	0
DSA-MW01	2021	3	0.3	0
DSA-MW01	2022	4	0.6	0
DSA-MW02	2019	1	0.39	1
DSA-MW02	2020	2	224	1
DSA-MW02	2021	3	0.3	0
DSA-MW02	2022	4	0.6	0
BLO-MW01	2019	1	990	1
BLO-MW01	2020	2	0.254	1
BLO-MW01	2021	3	0.306	1
BLO-MW01	2022	4	0.6	0

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	A	B	C	D	E	F	G
1				**Mann-Kendall Trend Test Analysis**			
2			User Selected Options				
3			Date/Time of Computation	ProUCL 5.2 5/12/2023 9:41:35 AM			
4			From File	PH_ProUCL input file_PCE_KR.xls			
5			Full Precision	OFF			
6			Confidence Coefficient	0.95			
7			Level of Significance	0.05			
8							
9			**PCE-blo-mw01**				
10							
11			**General Statistics**				
12			Number of Events Reported (m)		4		
13			Number of Missing Events		0		
14			Number or Reported Events Used		4		
15			Number Values Reported (n)		4		
16			Minimum		0.254		
17			Maximum		990		
18			Mean		247.8		
19			Geometric Mean		2.607		
20			Median		0.453		
21			Standard Deviation		494.8		
22			Coefficient of Variation		1.997		
23							
24			**Mann-Kendall Test**				
25			M-K Test Value (S)		0		
26			Tabulated p-value		0.625		
27			Standard Deviation of S		2.944		
28			Standardized Value of S		N/A		
29			Approximate p-value		N/A		
30							
31	**Insufficient evidence to identify a significant**						
32	**trend at the specified level of significance.**						
33			**PCE-blo-mw05**				
34							
35			**General Statistics**				
36			Number of Events Reported (m)		4		
37			Number of Missing Events		0		
38			Number or Reported Events Used		4		
39			Number Values Reported (n)		4		
40			Minimum		0.05		
41			Maximum		0.6		
42			Mean		0.313		
43			Geometric Mean		0.228		
44			Median		0.3		
45			Standard Deviation		0.225		
46			Coefficient of Variation		0.72		
47							
48			**Mann-Kendall Test**				
49			M-K Test Value (S)		5		
50			Tabulated p-value		0.167		
51			Standard Deviation of S		2.769		
52			Standardized Value of S		1.445		
53			Approximate p-value		0.0743		
54							
55	**Insufficient evidence to identify a significant**						
56	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
57	**PCE-blo-mw06**						
58							
59	**General Statistics**						
60	Number of Events Reported (m)				4		
61	Number of Missing Events				0		
62	Number or Reported Events Used				4		
63	Number Values Reported (n)				4		
64	Minimum				0.054		
65	Maximum				0.6		
66	Mean				0.314		
67	Geometric Mean				0.232		
68	Median				0.3		
69	Standard Deviation				0.223		
70	Coefficient of Variation				0.713		
71							
72	**Mann-Kendall Test**						
73	M-K Test Value (S)				5		
74	Tabulated p-value				0.167		
75	Standard Deviation of S				2.769		
76	Standardized Value of S				1.445		
77	Approximate p-value				0.0743		
78							
79	**Insufficient evidence to identify a significant**						
80	**trend at the specified level of significance.**						
81	**PCE-blo-mw07**						
82							
83	**General Statistics**						
84	Number of Events Reported (m)				4		
85	Number of Missing Events				0		
86	Number or Reported Events Used				4		
87	Number Values Reported (n)				4		
88	Minimum				0.292		
89	Maximum				460		
90	Mean				115.3		
91	Geometric Mean				2.217		
92	Median				0.45		
93	Standard Deviation				229.8		
94	Coefficient of Variation				1.993		
95							
96	**Mann-Kendall Test**						
97	M-K Test Value (S)				0		
98	Tabulated p-value				0.625		
99	Standard Deviation of S				2.944		
100	Standardized Value of S				N/A		
101	Approximate p-value				N/A		
102							
103	**Insufficient evidence to identify a significant**						
104	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
105	**PCE-dsa-mw01**						
106							
107	**General Statistics**						
108	Number of Events Reported (m)				4		
109	Number of Missing Events				0		
110	Number or Reported Events Used				4		
111	Number Values Reported (n)				4		
112	Minimum				0.3		
113	Maximum				32		
114	Mean				8.3		
115	Geometric Mean				1.147		
116	Median				0.45		
117	Standard Deviation				15.8		
118	Coefficient of Variation				1.904		
119							
120	**Mann-Kendall Test**						
121	M-K Test Value (S)				-1		
122	Tabulated p-value				0.625		
123	Standard Deviation of S				2.769		
124	Standardized Value of S				0		
125	Approximate p-value				0.5		
126							
127	**Insufficient evidence to identify a significant**						
128	**trend at the specified level of significance.**						
129	**PCE-dsa-mw02**						
130							
131	**General Statistics**						
132	Number of Events Reported (m)				4		
133	Number of Missing Events				0		
134	Number or Reported Events Used				4		
135	Number Values Reported (n)				4		
136	Minimum				0.3		
137	Maximum				224		
138	Mean				56.32		
139	Geometric Mean				1.991		
140	Median				0.495		
141	Standard Deviation				111.8		
142	Coefficient of Variation				1.985		
143							
144	**Mann-Kendall Test**						
145	M-K Test Value (S)				0		
146	Tabulated p-value				0.625		
147	Standard Deviation of S				2.944		
148	Standardized Value of S				N/A		
149	Approximate p-value				N/A		
150							
151	**Insufficient evidence to identify a significant**						
152	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
153	**PCE-dsa-mw05**						
154							
155	**General Statistics**						
156	Number of Events Reported (m)				4		
157	Number of Missing Events				0		
158	Number or Reported Events Used				4		
159	Number Values Reported (n)				4		
160	Minimum				0.13		
161	Maximum				0.6		
162	Mean				0.333		
163	Geometric Mean				0.289		
164	Median				0.3		
165	Standard Deviation				0.196		
166	Coefficient of Variation				0.588		
167							
168	**Mann-Kendall Test**						
169	M-K Test Value (S)				5		
170	Tabulated p-value				0.167		
171	Standard Deviation of S				2.769		
172	Standardized Value of S				1.445		
173	Approximate p-value				0.0743		
174							
175	**Insufficient evidence to identify a significant**						
176	**trend at the specified level of significance.**						
177	**PCE-dsa-mw06**						
178							
179	**General Statistics**						
180	Number of Events Reported (m)				4		
181	Number of Missing Events				0		
182	Number or Reported Events Used				4		
183	Number Values Reported (n)				4		
184	Minimum				0.3		
185	Maximum				6.2		
186	Mean				2.73		
187	Geometric Mean				1.394		
188	Median				2.211		
189	Standard Deviation				2.84		
190	Coefficient of Variation				1.04		
191							
192	**Mann-Kendall Test**						
193	M-K Test Value (S)				-4		
194	Tabulated p-value				0.167		
195	Standard Deviation of S				2.944		
196	Standardized Value of S				-1.019		
197	Approximate p-value				0.154		
198							
199	**Insufficient evidence to identify a significant**						
200	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
201	**PCE-dsa-mw07**						
202							
203	**General Statistics**						
204	Number of Events Reported (m)				4		
205	Number of Missing Events				0		
206	Number or Reported Events Used				4		
207	Number Values Reported (n)				4		
208	Minimum				0.083		
209	Maximum				0.6		
210	Mean				0.321		
211	Geometric Mean				0.259		
212	Median				0.3		
213	Standard Deviation				0.212		
214	Coefficient of Variation				0.662		
215							
216	**Mann-Kendall Test**						
217	M-K Test Value (S)				5		
218	Tabulated p-value				0.167		
219	Standard Deviation of S				2.769		
220	Standardized Value of S				1.445		
221	Approximate p-value				0.0743		
222							
223	**Insufficient evidence to identify a significant**						
224	**trend at the specified level of significance.**						
225	**PCE-glo-mw04**						
226							
227	**General Statistics**						
228	Number of Events Reported (m)				4		
229	Number of Missing Events				0		
230	Number or Reported Events Used				4		
231	Number Values Reported (n)				4		
232	Minimum				0.087		
233	Maximum				0.6		
234	Mean				0.322		
235	Geometric Mean				0.262		
236	Median				0.3		
237	Standard Deviation				0.211		
238	Coefficient of Variation				0.656		
239							
240	**Mann-Kendall Test**						
241	M-K Test Value (S)				5		
242	Tabulated p-value				0.167		
243	Standard Deviation of S				2.769		
244	Standardized Value of S				1.445		
245	Approximate p-value				0.0743		
246							
247	**Insufficient evidence to identify a significant**						
248	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
249	**PCE-rrs-mw05**						
250							
251	**General Statistics**						
252	Number of Events Reported (m)				3		
253	Number of Missing Events				0		
254	Number or Reported Events Used				3		
255	Number Values Reported (n)				3		
256	Minimum				0.049		
257	Maximum				0.3		
258	Mean				0.216		
259	Geometric Mean				0.164		
260	Median				0.3		
261	Standard Deviation				0.145		
262	Coefficient of Variation				0.67		
263							
264	**Mann-Kendall Test**						
265	M-K Test Value (S)				2		
266	Tabulated p-value				N/A		
267	Standard Deviation of S				1.633		
268	Standardized Value of S				0.612		
269	Approximate p-value				0.27		
270							
271	**Insufficient evidence to identify a significant**						
272	**trend at the specified level of significance.**						
273	**PCE-rrs-mw06**						
274							
275	**General Statistics**						
276	Number of Events Reported (m)				4		
277	Number of Missing Events				0		
278	Number or Reported Events Used				4		
279	Number Values Reported (n)				4		
280	Minimum				0.3		
281	Maximum				0.6		
282	Mean				0.425		
283	Geometric Mean				0.405		
284	Median				0.4		
285	Standard Deviation				0.15		
286	Coefficient of Variation				0.353		
287							
288	**Mann-Kendall Test**						
289	M-K Test Value (S)				1		
290	Tabulated p-value				0.625		
291	Standard Deviation of S				2.769		
292	Standardized Value of S				0		
293	Approximate p-value				0.5		
294							
295	**Insufficient evidence to identify a significant**						
296	**trend at the specified level of significance.**						

Well ID	Date	Event	Mn	D_Mn
GLO-MW04	2014	1	55	1
GLO-MW04	2016	2	49	1
GLO-MW04	2017	3	3.2	1
GLO-MW04	2019	4	710	1
GLO-MW04	2020	5	44.5	1
GLO-MW04	2021	6	62.9	1
GLO-MW05	2022	7	27.9	1
DSA-MW06	2014	1	467	1
DSA-MW06	2016	2	400	1
DSA-MW06	2017	3	450	1
DSA-MW06	2019	4	510	1
DSA-MW06	2020	5	343	1
DSA-MW06	2021	6	473	1
DSA-MW06	2022	7	211	1
DSA-MW07	2014	1	895	1
DSA-MW07	2016	2	26	1
DSA-MW07	2017	3	210	1
DSA-MW07	2019	4	73	1
DSA-MW07	2020	5	24.9	1
DSA-MW07	2021	6	2000	1
DSA-MW07	2022	7	59.9	1
RRS-MW05	2014	1	83.2	1
RRS-MW05	2016	2	39	1
RRS-MW05	2017	3	62	1
RRS-MW05	2019	4	16	1
RRS-MW05	2020	5	22.3	1
RRS-MW05	2021	6	14.3	1
RRS-MW05	2022	7	10.6	1
RRS-MW06	2014	1	9.1	1
RRS-MW06	2016	2	140	1
RRS-MW06	2017	3	2	1
RRS-MW06	2019	4	13	1
RRS-MW06	2020	5	8.4	1
RRS-MW06	2021	6	5.92	1
RRS-MW06	2022	7	2.56	1
BLO-MW05	2014	1	305	1
BLO-MW05	2016	2	13	1
BLO-MW05	2017	3	19	1
BLO-MW05	2019	4	190	1
BLO-MW05	2020	5	257	1
BLO-MW05	2021	6	354	1

BLO-MW06	2014	1	489	1
BLO-MW06	2016	2	31	1
BLO-MW06	2017	3	31	1
BLO-MW06	2019	4	110	1
BLO-MW06	2020	5	224	1
BLO-MW06	2021	6	622	1
BLO-MW06	2022	7	377	1
BLO-MW07	2014	1	839	1
BLO-MW07	2016	2	26	1
BLO-MW07	2017	3	36	1
BLO-MW07	2019	4	110	1
BLO-MW07	2020	5	1030	1
BLO-MW07	2021	6	219	1
BLO-MW07	2022	7	283	1
DSA-MW05	2014	1	217	1
DSA-MW05	2016	2	150	1
DSA-MW05	2017	3	65	1
DSA-MW05	2019	4	61	1
DSA-MW05	2020	5	71.3	1
DSA-MW05	2021	6	130	1
DSA-MW05	2022	7	64.6	1
DSA-MW01	2014	1	8.6	1
DSA-MW01	2016	2	2.3	1
DSA-MW01	2017	3	1.7	1
DSA-MW01	2019	4	15	1
DSA-MW01	2020	5	6.88	1
DSA-MW01	2021	6	9.45	1
DSA-MW01	2022	7	1.57	1
DSA-MW02	2014	1	928	1
DSA-MW02	2016	2	32	1
DSA-MW02	2017	3	29	1
DSA-MW02	2019	4	5300	1
DSA-MW02	2020	5	1340	1
DSA-MW02	2021	6	39.7	1
DSA-MW02	2022	7	62.1	1
BLO-MW01	2014	1	9400	1
BLO-MW01	2016	2	97000	1
BLO-MW01	2017	3	NS	0
BLO-MW01	2019	4	12000	1
BLO-MW01	2020	5	11900	1
BLO-MW01	2021	6	12600	1
BLO-MW01	2022	7	15600	1

1				**Mann-Kendall Trend Test Analysis**			
2			User Selected Options				
3			Date/Time of Computation	ProUCL 5.2 5/12/2023 9:29:41 AM			
4			From File	PH_ProUCL input file_Mn_KR.xls			
5			Full Precision	OFF			
6			Confidence Coefficient	0.95			
7			Level of Significance	0.05			
8							
9			**Mn-blo-mw01**				
10							
11			**General Statistics**				
12			Number of Events Reported (m)		7		
13			Number of Missing Events		1		
14			Number or Reported Events Used		6		
15			Number Values Reported (n)		7		
16			Number Values Missing		1		
17			Number Values Used		6		
18			Minimum		9400		
19			Maximum		97000		
20			Mean		26417		
21			Geometric Mean		17167		
22			Median		12300		
23			Standard Deviation		34635		
24			Coefficient of Variation		1.311		
25							
26			**Mann-Kendall Test**				
27			M-K Test Value (S)		5		
28			Tabulated p-value		0.235		
29			Standard Deviation of S		5.323		
30			Standardized Value of S		0.751		
31			Approximate p-value		0.226		
32							
33	**Insufficient evidence to identify a significant**						
34	**trend at the specified level of significance.**						
35			**Mn-blo-mw05**				
36							
37			**General Statistics**				
38			Number of Events Reported (m)		6		
39			Number of Missing Events		0		
40			Number or Reported Events Used		6		
41			Number Values Reported (n)		6		
42			Minimum		13		
43			Maximum		354		
44			Mean		189.7		
45			Geometric Mean		104.5		
46			Median		223.5		
47			Standard Deviation		145		
48			Coefficient of Variation		0.765		
49							
50			**Mann-Kendall Test**				
51			M-K Test Value (S)		7		
52			Tabulated p-value		0.136		
53			Standard Deviation of S		5.323		
54			Standardized Value of S		1.127		
55			Approximate p-value		0.13		
56							
57	**Insufficient evidence to identify a significant**						
58	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
59	**Mn-blo-mw06**						
60							
61	**General Statistics**						
62	Number of Events Reported (m)				7		
63	Number of Missing Events				0		
64	Number or Reported Events Used				7		
65	Number Values Reported (n)				7		
66	Minimum				31		
67	Maximum				622		
68	Mean				269.1		
69	Geometric Mean				160.3		
70	Median				224		
71	Standard Deviation				232.8		
72	Coefficient of Variation				0.865		
73							
74	**Mann-Kendall Test**						
75	M-K Test Value (S)				8		
76	Tabulated p-value				0.119		
77	Standard Deviation of S				6.583		
78	Standardized Value of S				1.063		
79	Approximate p-value				0.144		
80							
81	**Insufficient evidence to identify a significant**						
82	**trend at the specified level of significance.**						
83	**Mn-blo-mw07**						
84							
85	**General Statistics**						
86	Number of Events Reported (m)				7		
87	Number of Missing Events				0		
88	Number or Reported Events Used				7		
89	Number Values Reported (n)				7		
90	Minimum				26		
91	Maximum				1030		
92	Mean				363.3		
93	Geometric Mean				177.3		
94	Median				219		
95	Standard Deviation				404.8		
96	Coefficient of Variation				1.114		
97							
98	**Mann-Kendall Test**						
99	M-K Test Value (S)				7		
100	Tabulated p-value				0.191		
101	Standard Deviation of S				6.658		
102	Standardized Value of S				0.901		
103	Approximate p-value				0.184		
104							
105	**Insufficient evidence to identify a significant**						
106	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
107	**Mn-dsa-mw01**						
108							
109	**General Statistics**						
110	Number of Events Reported (m)				7		
111	Number of Missing Events				0		
112	Number or Reported Events Used				7		
113	Number Values Reported (n)				7		
114	Minimum				1.57		
115	Maximum				15		
116	Mean				6.5		
117	Geometric Mean				4.711		
118	Median				6.88		
119	Standard Deviation				5.008		
120	Coefficient of Variation				0.77		
121							
122	**Mann-Kendall Test**						
123	M-K Test Value (S)				-3		
124	Tabulated p-value				0.386		
125	Standard Deviation of S				6.658		
126	Standardized Value of S				-0.3		
127	Approximate p-value				0.382		
128							
129	**Insufficient evidence to identify a significant**						
130	**trend at the specified level of significance.**						
131	**Mn-dsa-mw02**						
132							
133	**General Statistics**						
134	Number of Events Reported (m)				7		
135	Number of Missing Events				0		
136	Number or Reported Events Used				7		
137	Number Values Reported (n)				7		
138	Minimum				29		
139	Maximum				5300		
140	Mean				1104		
141	Geometric Mean				204.7		
142	Median				62.1		
143	Standard Deviation				1924		
144	Coefficient of Variation				1.742		
145							
146	**Mann-Kendall Test**						
147	M-K Test Value (S)				1		
148	Tabulated p-value				0.5		
149	Standard Deviation of S				6.658		
150	Standardized Value of S				0		
151	Approximate p-value				0.5		
152							
153	**Insufficient evidence to identify a significant**						
154	**trend at the specified level of significance.**						
155	**Mn-dsa-mw05**						
156							
157	**General Statistics**						
158	Number of Events Reported (m)				7		
159	Number of Missing Events				0		
160	Number or Reported Events Used				7		
161	Number Values Reported (n)				7		
162	Minimum				61		
163	Maximum				217		
164	Mean				108.4		
165	Geometric Mean				96.38		
166	Median				71.3		
167	Standard Deviation				59.74		
168	Coefficient of Variation				0.551		
169							
170	**Mann-Kendall Test**						
171	M-K Test Value (S)				-9		
172	Tabulated p-value				0.119		
173	Standard Deviation of S				6.658		
174	Standardized Value of S				-1.202		
175	Approximate p-value				0.115		
176							
177	**Insufficient evidence to identify a significant**						
178	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
179	**Mn-dsa-mw06**						
180							
181	**General Statistics**						
182	Number of Events Reported (m)				7		
183	Number of Missing Events				0		
184	Number or Reported Events Used				7		
185	Number Values Reported (n)				7		
186	Minimum				211		
187	Maximum				510		
188	Mean				407.7		
189	Geometric Mean				393.8		
190	Median				450		
191	Standard Deviation				102.4		
192	Coefficient of Variation				0.251		
193							
194	**Mann-Kendall Test**						
195	M-K Test Value (S)				-5		
196	Tabulated p-value				0.281		
197	Standard Deviation of S				6.658		
198	Standardized Value of S				-0.601		
199	Approximate p-value				0.274		
200							
201	**Insufficient evidence to identify a significant**						
202	**trend at the specified level of significance.**						
203	**Mn-dsa-mw07**						
204							
205	**General Statistics**						
206	Number of Events Reported (m)				7		
207	Number of Missing Events				0		
208	Number or Reported Events Used				7		
209	Number Values Reported (n)				7		
210	Minimum				24.9		
211	Maximum				2000		
212	Mean				469.8		
213	Geometric Mean				140.2		
214	Median				73		
215	Standard Deviation				742.8		
216	Coefficient of Variation				1.581		
217							
218	**Mann-Kendall Test**						
219	M-K Test Value (S)				-3		
220	Tabulated p-value				0.386		
221	Standard Deviation of S				6.658		
222	Standardized Value of S				-0.3		
223	Approximate p-value				0.382		
224							
225	**Insufficient evidence to identify a significant**						
226	**trend at the specified level of significance.**						
227	**Mn-glo-mw04**						
228							
229	**General Statistics**						
230	Number of Events Reported (m)				6		
231	Number of Missing Events				0		
232	Number or Reported Events Used				6		
233	Number Values Reported (n)				6		
234	Minimum				3.2		
235	Maximum				710		
236	Mean				154.1		
237	Geometric Mean				50.78		
238	Median				52		
239	Standard Deviation				273.1		
240	Coefficient of Variation				1.772		
241							
242	**Mann-Kendall Test**						
243	M-K Test Value (S)				1		
244	Tabulated p-value				0.5		
245	Standard Deviation of S				5.323		
246	Standardized Value of S				0		
247	Approximate p-value				0.5		
248							
249	**Insufficient evidence to identify a significant**						
250	**trend at the specified level of significance.**						

	A	B	C	D	E	F	G
251	**Mn-glo-mw05**						
252							
253	**General Statistics**						
254	Number of Events Reported (m)				1		
255	Number of Missing Events				0		
256	Number or Reported Events Used				1		
257	Number Values Reported (n)				1		
258	Minimum				27.9		
259	Maximum				27.9		
260	Mean				27.9		
261	Geometric Mean				27.9		
262	Median				27.9		
263	Standard Deviation				N/A		
264	Coefficient of Variation				N/A		
265	**Not enough reported values (n) to provide Mann-Kendall Statistics!**						
266							
267	**Mn-rrs-mw05**						
268							
269	**General Statistics**						
270	Number of Events Reported (m)				7		
271	Number of Missing Events				0		
272	Number or Reported Events Used				7		
273	Number Values Reported (n)				7		
274	Minimum				10.6		
275	Maximum				83.2		
276	Mean				35.34		
277	Geometric Mean				27.15		
278	Median				22.3		
279	Standard Deviation				27.73		
280	Coefficient of Variation				0.785		
281							
282	**Mann-Kendall Test**						
283	M-K Test Value (S)				-17		
284	Tabulated p-value				0.005		
285	Standard Deviation of S				6.658		
286	Standardized Value of S				-2.403		
287	Approximate p-value				0.00813		
288							
289	**Statistically significant evidence of a decreasing**						
290	**trend at the specified level of significance.**						
291	**Mn-rrs-mw06**						
292							
293	**General Statistics**						
294	Number of Events Reported (m)				7		
295	Number of Missing Events				0		
296	Number or Reported Events Used				7		
297	Number Values Reported (n)				7		
298	Minimum				2		
299	Maximum				140		
300	Mean				25.85		
301	Geometric Mean				8.839		
302	Median				8.4		
303	Standard Deviation				50.48		
304	Coefficient of Variation				1.952		
305							
306	**Mann-Kendall Test**						
307	M-K Test Value (S)				-9		
308	Tabulated p-value				0.119		
309	Standard Deviation of S				6.658		
310	Standardized Value of S				-1.202		
311	Approximate p-value				0.115		
312							
313	**Insufficient evidence to identify a significant**						
314	**trend at the specified level of significance.**						

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APPENDIX G

ADEC Correspondence

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THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

610 University Avenue
Fairbanks, AK 99709
Main: 907.451.2143
Fax: 907.451.2155

File #: 2637.38.002
2637.38.002.02
2637.38.002.05
2637.38.002.08
2637.38.002.11

January 02, 2023

Electronic Transmittal Only
Robert A. Johnston
United States Air Force
AFCEC/CZOP
10471 - 20th Street, Suite 347
JBER, AK 99506

Re: **DEC comments for the *Draft Final 2022 Remedial Action Operations and Land Use / Institutional Control Report, Port Heiden Radio Relay Station, Sites OT001, WP002, SS006, and LF007,* Dated December 2023.**

Dear Mr. Johnston:

The Alaska Department of Environmental Conservation (DEC) received the above referenced document on December 21, 2023. The report describes the 2022 Land Use Control (LUC) and landfill cap inspection activities at the Former Composite Building OT001, the Landfill LF007, the Black Lagoon WP002, and the POL Pipeline SS006 in Port Heiden Radio Relay Station, Alaska. Groundwater monitoring was also conducted at OT001, WP002, and SS006.

DEC has reviewed the above referenced document and accepts all responses to comments. Please submit a clean copy of the final for approval. Contact me at (907) 451-5960 or ginna.quesada@alaska.gov if you have any questions or comments.

Sincerely,

Ginna Quesada
Environmental Program Specialist

REVIEW COMMENTS

PROJECT: Port Heiden RRS

DOCUMENT: Draft Final 2022 Remedial Action Operations and Land Use / Institutional Control Report, Port Heiden Radio Relay Station, Sites OT001, WP002, SS006, and LF007, dated August 2023

ALASKA DEPT. OF ENVIRONMENTAL CONSERVATION	DATE: 10/26/2023 REVIEWER: Ginna Quesada PHONE: (907) 451-5960	Action taken on comment by: North Wind-EA JV

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	ADEC/EPA RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)	CONTRACTOR RESPONSE
1	Section 6.1, Page 6-2	Please include a recommendation for how to ensure that LODs for VOCs are below cleanup levels for upcoming monitoring events. During the 2021 monitoring event, VOC results also had data quality issues. Please include a recommendation for how to address unauthorized dumping at OT001.		A bullet in the recommendations will be included to read as follows: • Consideration should be given to analysis of water using low-level VOCs by EPA method 8260ULL to ensure LODs are below groundwater cleanup levels for subsequent monitoring events. Unauthorized dumping has not been observed to be an issue. Materials observed onsite are presumed to be left by contractors from previous remedial actions.	A	
2	Section 6.3, Page 6-2	Please include a recommendation to repair the fence and another recommendation to address trespassing at LF		A bullet in the recommendations was included to Section 6.3 (LF003) and the Executive Summary to read as follows: • Repair and maintain the fencing across driveway between the LUC notification signs to discourage trespassing at the landfill.	A	
3	Appendix D, Laboratory Data Review Checklist	Please fill out the Hazard ID for the laboratory data review checklist.		The ADEC File Number and ADEC Hazard IDs were added to the Laboratory Review Checklists.	A	
4	End of Comments					