June 23, 2026

Ms. Maeve Wurtz, Remedial Project Manager
Western New York Remediation Section
New York Remediation Branch
Superfund and Emergency Management Division
U.S. Environmental Protection Agency, Region II
290 Broadway, 20th Floor
New York, New York 10007-1866

Subject: Revised Summary of Remedy Optimization Activities
Operable Unit 2 (OU2)
Olean Well Field Superfund Site
Olean, New York
CEC Project 300-082.0059

Dear Ms. Wurtz:

On behalf of Arconic Corporation (Arconic), the following revised report summarizes the work performed according to the Remedy Optimization Work Plan (ROWP) for Operable Unit 2 (OU2) at the Alcas Cutlery Corporation (Alcas) site (Site). The ROWP was developed to investigate Site conditions observed during remedy implementation at OU2. The summary report was submitted on January 28, 2026. The U.S. EPA issued comments on the report on March 13, 2026. A response to comments was submitted on April 22, 2026, and approved by the U.S. EPA on June 3, 2026.

1.0 INTRODUCTION

Remedy implementation was completed in the fall of 2022 in accordance with the Remedial Action Work Plan (RAWP) for OU2 and consisted of recirculating alkaline-activated sodium persulfate oxidant through the treatment area (**Figure 1**). During implementation, extracted groundwater production rates were substantially lower than predicted in the RAWP. The initial lower production rates are attributed to geologically driven, laterally discontinuous sequences of sediments. A secondary reduction in production developed during implementation of the remedy. This reduction in injection and extraction production rates occurred due to the in situ generation of a calcium carbonate precipitate which fouled the well screens.

In August 2023, the horizontal wells were rehabilitated using a commercially available acid well descaler. Additional rehabilitation treatments were not conducted because the 0.75-inch diameter horizontal well construction and extended distances to the screened interval from the surface (approximately 70 to 250 feet from the well vault) precluded the use of mechanical rehabilitation tools or effective induced surging. Following the well rehabilitation, individual and combinations of horizontal well screen segments in the extraction and injection wells were tested during a recirculation event. The remedy implementation, well rehabilitation, and results of the recirculation event tests were discussed in detail in the July 1, 2024, Remedy Implementation and Performance Monitoring Report.

Civil & Environmental Consultants of New York, Inc. (CEC NY) on behalf of Arconic prepared and submitted a Remedy Optimization Work Plan (ROWP) dated October 25, 2024. The ROWP outlined proposed strategies for optimizing remedy implementation at OU2 and OU3 consistent with the September 2014 Amendment to the Operable Unit Two Record of Decision for the Olean Well Field Superfund Site

Related to the Alcas Source Area (ROD). A revised ROWP was submitted to the U.S. EPA on January 8, 2025, following comments provided by the U.S. EPA and was approved on January 10, 2025. The following sections summarize the results of the activities completed according to the ROWP.

2.0 FIELD ACTIVITIES

2.1 Task 1 – Vertical Well Installation

To more effectively distribute the oxidant throughout the OU2 treatment area, five (5) vertical remediation wells (VW-1 through VW-5) were installed at the locations on **Figure 1**. Vertical remediation wells were selected to puncture the laterally discontinuous sediment sequences unavailable to existing horizontal wells. The locations of the vertical remediation wells were selected based on accessibility around the exterior of the building footprint, as well as distance between the remediation wells and existing injection and extraction wells.

The vertical remediation wells were installed according to the procedures outlined in Section 2.1.1 of the ROWP. Boring logs and well construction diagrams for each of the vertical remediation wells are included in **Appendix A**. As shown on the boring logs, the vertical remediation wells encountered sand and gravel lenses of variable thicknesses between 8 and 24 feet below ground surface (bgs), interbedded with clay and sandy clay.

Following construction, the vertical remediation wells were developed using a combination of bailing, surging and pumping as outlined in Section 2.1.1 of the ROWP and the *U.S. EPA SESD Guidance: Design and Installation of Monitoring Wells (SESDGUID-101-R2, January 16, 2018)*. Well development continued until pH, temperature, turbidity, and conductivity stabilized and water was free of visible sediment. While not specified in the SESD guidance, internal supplemental stabilization criteria of ±0.1 pH units, ±3% specific conductivity, ±10% temperature, and ±10% turbidity were used.

The above referenced SESD guidance is intended for monitoring wells. Vertical remediation wells VW-1 through VW-5 are remedy implementation wells for the purposes of oxidant recirculation and are not intended for use as monitoring wells. Wells VW-1 and VW-2 achieved all supplemental stabilization criteria. Wells VW-3 and VW-5 were developed via bailing and reached stabilization criteria for pH, specific conductivity, and temperature; however, turbidity remained elevated. At VW-4, a strong chemical odor was observed upon opening the well. The odor did not dissipate after well development was initiated, and bailing was terminated at one well volume. Although not a well development criteria, all other wells had a minimum of three well volumes removed. Furthermore, during the upcoming remedy implementation, suspended solids generated during extraction are expected to be removed by the bag filters. Extraction will function as a well-development process, and turbidity is expected to decrease as extraction continues.

Well development field forms are included in **Appendix B**.

2.2 Task 2 – Bulk Soil and Groundwater Collection

Arconic contracted Evonik Industries AG (Evonik), the oxidant manufacturer to perform remedy optimization bench testing. As requested by Evonik, approximately nine (9) kilograms (kg) of soil from within the treatment area, two (2) kg of soil from outside the treatment area, fifteen (15) liters of groundwater from within the treatment area, and four (4) liters of groundwater from outside the treatment area were required to complete the bench testing scope of work.

2.2.1 Soil Sampling

Soil from the treatment area was collected from the screened intervals (i.e. between nine (9) to twenty-four (24) feet below ground surface [bgs]) of vertical remediation wells VW-1 through VW-5.

A direct push soil boring (SB-1) was advanced at the location shown on **Figure 1** to collect soil from outside the treatment area following the procedures described in the ROWP. Soil was collected from between twelve (12) to twenty (20) ft bgs. The boring log for SB-1 is included in **Appendix A**.

Soil samples were collected in eight-ounce jars with minimal headspace, as directed by Evonik and outlined in Section 2.1.2 of the ROWP. Samples were held on ice until sufficient mass was collected. Samples were labeled, packaged for shipment, placed on ice in coolers, and delivered to the Evonik lab in Towanda, New York by commercial courier. Chain-of-custody protocols were maintained during sample collection and transport.

Soil samples collected for the bench test were analyzed for Volatile Organic Compounds (VOCs), percent solids, and pH at the direction of Evonik.

2.2.2 Groundwater Sampling

CEC NY attempted to collect groundwater from within the treatment area from RU-4 and RU-22B, as specified in the ROWP, on January 30, 2025. Due to weather conditions at the time of the remedy optimization field work, significant ice had accumulated over the flush mount wells. RU-4 and RU-22B required assistance from the drilling contractor installing the remediation wells to open on January 30, 2025. RU-4 was found to be dry. RU-22B was purged using low-flow methods; however, the well went dry during purging and did not recover sufficiently to collect the required sample volume. CEC NY returned to the Site on February 3, 2025. RU-22A was frozen and could not be opened. Performance monitoring well RU-5 was selected as an alternate well considering that the well is located in the OU2 treatment area, and is screened at a similar elevation as RU-4, RU-22A, and RU-22B. Further, RU-5 was used for the 2012 bench study performed by CDM Smith; concentrations of VOCs were comparable to those quantified at RU-4 and RU-22B (for example, 1.2 mg/L trichloroethene [TCE] was quantified in September 2023 at RU-5, compared to 1.1 mg/L at RU-4 and 2.8 mg/L at RU-22B during the same performance monitoring event); and historical well purging data suggested that RU-5 was unlikely to go dry during sampling. Other treatment area wells which may have been considered based on the criteria discussed above were also frozen, whereas RU-5 is located within the building footprint of the Cutco facility.

As specified in the ROWP, groundwater from outside the treatment area was collected from RU-17B on February 3, 2025. Groundwater purging and sampling was conducted according to the procedures outlined in Section 2.1.2 of the ROWP. Groundwater sampling logs are included in **Appendix C**.

Samples were collected in one-liter containers with minimal headspace, as directed by Evonik. As outlined in the ROWP, Evonik requested fourteen (14) liters of groundwater from within the treatment area (i.e. from RU-5). One additional liter was collected from RU-15, for a total of fifteen (15) liters, as a factor of safety. Four (4) liters were collected from RU-17B. Samples were labeled, packaged for shipment, placed on ice in coolers, and delivered to the Evonik lab in Towanda, New York by commercial courier. Chain-of-custody protocols were maintained during sample collection and transport.

Groundwater samples collected for the bench test were analyzed for VOCs, total metals, alkalinity, pH, and Oxidation Reduction Potential (ORP) at the direction of Evonik.

2.2.3 Investigation-Derived Waste

Soil (drill cuttings) and groundwater (development water) investigation-derived waste (IDW) were placed into 55-gallon drums for disposal according to the ROWP. IDW samples were previously collected as part of historic characterization and profiling. Soil and groundwater samples were analyzed for the following parameters:

Table 1: Historical Characterization Samples for Management of IDW

Soil	Groundwater
Toxicity Characteristic Leaching Procedure (TCLP) VOCs	TCLP VOCs
TCLP Semi Volatile Organic Compounds (SVOCs)	TCLP SVOCs
TCLP Metals	TCLP Metals
Ignitability/Flash Point	Ignitability/Flash Point
Total Cyanide	Total Cyanide
Sulfide	Sulfide
pH	pH
Total Solids	

Characterization samples were collected by CEC NY. IDW associated with the ROWP was managed by Republic Services (Republic) at Republic's US Ecology Detroit South treatment, storage, and disposal facility (TSDF) in Detroit, Michigan on June 9, 2025.

2.3 Task 3 – Remedy Optimization Bench Testing

The Final Report, ISCO Bench Study for the Treatment of VOCs in Groundwater and Soil from the Alcas Cutlery Site (2025 ISCO Bench Study), as prepared by Evonik, summarizes the bench testing process and is included as **Appendix D**. The following sections summarize the findings of the 2025 ISCO Bench Study.

2.3.1 Preparation of Samples

Upon arrival at the Evonik laboratory, individual sample containers of the bulk soil and groundwater samples (Section 2.2) were composited into four composite samples (one for each of the treatment area soil, non-treatment area soil, treatment area groundwater, and non-treatment area groundwater). A sample was collected from the treatment area soil and groundwater composites for baseline analysis of volatile organic compounds (VOCs) and pH. The composite groundwater sample was also analyzed for metals, alkalinity, and oxidation-reduction potential (ORP). The results of the baseline analysis are included in Tables 2 and 3 of the 2025 ISCO Bench Study (**Appendix D**).

2.3.2 Soil Oxidant Demand Testing

A Klozur® Demand Test (KDT) was performed using the non-treatment area soil and groundwater composite samples. The KDT measures the soil oxidant demand (SOD), or the demand on activated persulfate, from the untreated soil and groundwater due to oxidizing target soil organics, reduced metals, and non-target organic compounds. The design concentration of the activator must include both the SOD and the volume of persulfate requiring activation.

The SOD for three persulfate activation methods (alkaline activated, Klozur® One, and Fe-EDTA) are summarized on Table 4 of the 2025 ISCO Bench Study. After seven days, the SOD ranged from a minimum of 2.00 g sodium persulfate per kg dry soil (Klozur® One) to a maximum of 2.90 g sodium persulfate per kg dry soil (alkaline activation). For comparison, the SOD calculated in the 2012 bench study, as summarized in the July 2020 revised Final Design (OU2 Remedial Design [RD] 100% Submittal) Olean Well Field Superfund Site, Operable Unit 2 report, prepared by CDM, was 3.5 g sodium persulfate per kg dry soil for alkaline activated persulfate. There was no significant change in the baseline SOD between 2012 and 2025.

2.3.3 Base Buffering Capacity Testing

A base buffering capacity (BBC) test was performed using the non-treatment area soil and groundwater composite samples. The purpose of this test was to confirm the concentration of sodium hydroxide (NaOH) required to raise the pH of the Site soil to the pH required for alkaline activation of persulfate (pH 10.5) for seven days. The BBC is then used to develop the appropriate dosing for alkaline activation of persulfate (i.e. the OU2 100% RD remedy activation method). The Site NaOH demand was determined to be 1.67 g of 25% NaOH per kg of dry soil, as discussed in Section 5.0 of the 2025 ISCO Bench Study.

2.3.4 Precipitation Hypothesis Testing

Evonik performed precipitate hypothesis testing to recreate the calcium carbonate precipitate observed during the 2022 remedy implementation. A base buffering test was conducted using soil and groundwater from within the treatment area. The pH of (1) a mixture of soil and groundwater and (2) groundwater only was raised to pH 10.5 and pH 12, respectively, for seven days. After seven days, a small amount of floc was visually observed only in the groundwater sample. The solids in the soil and groundwater sample obscured visual observation of calcium flocculation. An additional test was conducted to raise the pH of both samples to pH 14. A small amount of floc was observed in the groundwater only sample. The presence of sediment in the soil and groundwater mixture obscured observation of potential floc formation. Evonik considers floc formation to be significant when it exceeds the 3 to 5 mL mark on the vials used for the base buffering capacity test.

The study was designed to evaluate the elevated pH conditions that were observed during the 2022 remedy implementation. As discussed in the July 1, 2024, Remedy Implementation and Performance Monitoring Report for OU2, a precipitate was observed in the groundwater recirculation system filter bags. Additional parameters (such as turbidity, total suspended solids, or total metals) were not needed, because a sample of the precipitate was analyzed by CDM Smith and identified as calcium carbonate. Further, injection and/or extraction rates decreased in several of the horizontal wells over the course of the remedy implementation event. Considering that the precipitate and well screen fouling were observed in the field, replicating the well-screen mechanism was not an objective for the bench study. The use of treatment-area groundwater that may have been exposed to alkalinity during the 2022 remedy implementation could bias bench-scale results toward reduced scaling potential. However, despite the relatively low concentration of calcium in the treatment area groundwater, precipitate formation was observed during the bench test.

The treatment area groundwater collected from RU-5 was exposed to the alkaline activated persulfate injections performed in 2022. The pH at RU-5 has been consistently above 9 Standard Units (S.U.) since the 2022 remedy implementation, with no apparent seasonality. As shown on the tables summarizing the performance monitoring data for OU2 (**Appendix E)**, previously submitted in the Remedy Implementation and Performance Monitoring Report, the pH at RU-5 increased following the 2022 remedy implementation,

from 6.98 S.U. in September 2022 to 11.24 S.U. during the one-month performance monitoring event. The pH remained elevated during the three-month (9.36 S.U.) and six-month (9.62 S.U.) performance monitoring events. The pH increased again following the recirculation event to 10.98 S.U. in September 2023, likely due to the recirculation event. During the remedy optimization sampling on February 3, 2025, the pH (9.84 S.U.) was comparable to the pH during the three- and six-month performance monitoring events.

The injection altered the chemistry of the groundwater for the purpose of treatment. In review of historical data, treatment-area wells such as RU-5 which maintained elevated pH were found to contain calcium concentrations approximately an order of magnitude lower than wells with a lower pH. For example, during the September 2023 monitoring event, the pH at RU-5 was 10.98 and calcium was quantified at 24.9 mg/L, compared to RU-4, which had a pH of 6.74 and calcium quantified at 157 mg/L. Further, the concentration of calcium quantified at RU-5 in September 2023 was also nearly an order of magnitude less than the baseline concentration (quantified at 109 mg/L in September 2022). As discussed in Section 1.1 of the ROWP, the geology in the upper water bearing zone consists of laterally discontinuous sequences of sediment with variable permeability. Groundwater flow within the discontinuous lenses is likely restricted, which may create pockets of higher pH (such as the area around RU-5) which require additional time to buffer following the 2022 remedy implementation.

The elevated pH appears to drive the formation of the calcium carbonate precipitate. Evonik hypothesized that in portions of the treatment area where pH is greater than 10, bicarbonate is present primarily as carbonate and will precipitate out as calcium carbonate. The decrease in calcium in the area monitored by RU-5 is attributed to this reaction. The formation of floc during the base buffering capacity test confirms that a precipitate is formed from the treatment area groundwater in response to raising the pH above 10. However, the quantity of floc observed during this test was less than hypothesized based on the precipitate observed during the 2022 remedy implementation. The limited floc production is likely due to the lower concentration of calcium present in the treatment area composite sample (13 mg/L) compared to the concentration present in the treatment area during the September 2022 baseline monitoring (greater than 100 mg/L).

Future remedy implementation events are expected to introduce groundwater with higher concentrations of calcium into the recirculation system. A portion of the groundwater captured by the extraction wells RW-1 through RW-5 will be from outside the treatment area. For example, downgradient monitoring well RU-32 is located approximately 40 feet east of RW-4 (**Figure 1**) and monitors groundwater outside of the treatment area. The concentration of calcium quantified during the September 2023 monitoring event at RU-32 was 106 mg/L (see Table 5 in **Appendix E**). In addition, groundwater from within the treatment area that was less impacted by the 2022 remedy implementation (such as the area monitored by RU-4 discussed above) may be mobilized. As such, calcium carbonate is expected to continue to precipitate within the recirculation system if untreated groundwater is subjected to raising the pH above 10 as part of alkaline activated persulfate injections.

2.3.5 Batch Treatability Study

Evonik performed a batch study to compare persulfate activation methods using treatment area soil and groundwater. The study consisted of a control sample with no added Klozur® persulfate and four activation methods (alkaline activated persulfate (Klozur® SP with 25% NaOH), a proprietary blend with built-in activator (Klozur® One, which includes 95% Klozur® SP with 5% built in activator), Fe-EDTA activated Klozur® SP, and unactivated Klozur®). Groundwater from each batch was sampled at 7 and 28 days after

setup for VOCs, pH, and ORP. On day 28, the remaining groundwater was decanted and the soil was sampled for VOCs. The results of the batch study are summarized on Table 6 of the 2025 ISCO Bench Study (**Appendix D**). Laboratory data is summarized in Appendix A of the 2025 ISCO Bench Study.

At 28 days, alkaline activated persulfate showed a reduction of 99.9% of chlorinated VOCs in groundwater and 99.5% in soil compared to the control sample. Klozur® One showed a reduction of 96.1% in groundwater and 84.9% in soil. The Fe-EDTA activated Klozur® SP showed 83.5% and 83.0% reduction in groundwater and soil, respectively. Unactivated Klozur® showed 99.5% reduction in groundwater and 91.2% reduction in soil. Evonik noted that while unactivated persulfate may perform well on a bench scale, in their experience, results in the field are mixed in comparison to activated persulfate.

Klozur® SP with Fe-EDTA consumed the highest percentage of persulfate after 28 days (68.7%), followed by alkaline activated persulfate (40.7%) and Klozur® One (27.2%). Unactivated Klozur® consumed the lowest percentage of persulfate after 28 days (16.8%). High residual persulfate percentages (i.e. low consumption rate) indicate that persulfate will remain available to continue to treat the chlorinated compounds beyond the 28 days of the bench study.

As summarized on Table A2 of the 2025 ISCO Bench Study, the pH at 28 days for the alkaline activated persulfate test was very alkaline (pH 12.58), compared to unactivated Klozur® SP and Klozur® One, which were slightly acidic (pH of 6.44 and 6.12, respectively), and Klozur® SP with Fe-EDTA, which was acidic (pH 3.52). The resultant neutral to acidic pH is not expected to result in the formation of the calcium carbonate precipitate previously observed during the 2022 remedy implementation.

3.0 SUMMARY OF RESULTS

Five vertical remediation wells were installed around the exterior of the building footprint. The wells were successful in puncturing the more permeable sand and gravel to effectively distribute amendment during future recirculation events.

The precipitation hypothesis testing generated a small amount of visible floc, likely due to the low concentrations of calcium in the sample collected from RU-5. Alkaline activation is expected to continue precipitating calcium carbonate from groundwater with higher concentrations of calcium, such as non-treatment area groundwater captured by the recovery wells during the recirculation process, which will likely affect groundwater extraction and injection rates. The alternative activation methods evaluated during the bench study explicitly avoid the geochemical conditions (i.e. elevated pH) under which calcium carbonate or hydroxide scaling occurs.

Considering the reduction in chlorinated VOCs in soil and groundwater, final pH, and concentration of residual persulfate at the conclusion of the bench study, it is recommended to amend the OU2 remedy from alkaline activated persulfate (i.e. Klozur® SP with 25% NaOH) to Klozur® One, which includes persulfate with multiple activators including chelated iron and trace permanganate. The proposed technology pivot, while still an activated persulfate, starts at neutral pH and should decrease over time with increasing persulfate decomposition (persulfate decomposes to form acid). At neutral to acidic pH, carbonate will be in the form of bicarbonate, carbonic acid, or carbon dioxide gas, and existing calcium carbonate/hydroxide is expected to dissolve. By avoiding the geochemical conditions where calcium carbonate/hydroxide are formed, the formation of the calcium carbonate floc will be avoided.

Alternative activation methods were considered by the September 2014 ROD, which states:

> Site-specific, bench-scale tests with alkaline-activated sodium persulfate were found to be successful, and this treatment chemical was assumed, for cost-estimating purposes; however, other ISCO treatment methods could also be employed as part of this remedial alternative.

Therefore, it is not expected that the OU2 ROD would require an amendment. CEC NY will prepare an addendum to the OU2 RAWP documenting the change in persulfate activation method. In collaboration with Evonik and the previously selected OU2 contractor, CEC NY will incorporate the proposed alternative activation method and vertical remediation wells into the revised design approach.

4.0 SCHEDULE

CEC NY anticipates that the OU2 RAWP Amendment can be submitted to the U.S. EPA for review and approval within 60 days of notice to proceed by U.S. EPA. The next recirculation event for OU2 is tentatively scheduled for the spring of 2027. Additional information regarding scheduling of the recirculation event will be provided in a monthly progress report following approval of the OU2 RAWP Amendment by the U.S. EPA.

5.0 CLOSING

CEC NY and Arconic appreciate the time and effort U.S. EPA Region II has put into this project. Should you have any questions concerning this submittal, please feel free to contact Robert Prezbindowski or one of the undersigned.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS OF NEW YORK, INC.

Laura D. Campbell
Project Manager II

Michael W. Worden
Principal

for

Robert A. Prezbindowski
Arconic Corporation

cc: Steve Moeller – NYDEC (email)
Stanley Radon – NYDEC (email)
Andrea Caprio (Skalski) – NYDEC (email)
Michele Dolan – NYDOH (email)
Wendy Kuehner – NYDOH (email)
Pietro Mannino – U.S. EPA, Region II (email)
Liana Agrios – U.S. EPA, Region II (email)

Joe Hayes – U.S. EPA, Region II (email)
Ricky Ng – U.S. EPA, Region II (email)
Chief, Environmental Enforcement Section – U.S. Department of Justice (email)
Bob Ring – Cattaraugus County Health Department (email)

FIGURE

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Civil & Environmental Consultants of New York, Inc.
2704 Cherokee Farm Way
Suite 101
Knoxville, TN 37920
Ph: 865.977.9997 · 844.828.7979
www.cecinc.com

ALCAS SOURCE AREA
OLEAN, NEW YORK

SAMPLE LOCATIONS

DRAWN BY:	NTP	CHECKED BY:	LDC	APPROVED BY:	MWW*	FIGURE NO:	1
DATE:	January 21, 2026	SCALE:	1" = 100'	PROJECT NO:	300-082		

* Hand signature on file

APPENDIX A

BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

Civil & Environmental Consultants of New York, Inc.
2704 Cherokee Farm Way
Suite 101
Knoxville, TN 37920

BORING NUMBER SB-1

CLIENT	Arconic Corporation	**PROJECT NAME**	Former Alcas Cutlery Site
PROJECT NUMBER	300-082	**PROJECT LOCATION**	Olean, NY
DATE STARTED	01/31/2025	**DATE COMPLETED**	01/31/2025
CEC FIELD REPRESENTATIVE	LJR	**REVIEWED BY**	LDC
GROUND ELEVATION	1429.00 ft amsl	**MONITORING EQUIPMENT**	MiniRAE PID Meter
LATITUDE	42.072594	**LONGITUDE**	-78.408128
DRILLING CONTRACTOR	Nothnagle Drilling, Inc.	**DRILLER**	Tom Mangefride
DRILLING METHOD	4-1/2-in Hollow Stem Auger + DP	**BACKFILL**	Backfilled
BOREHOLE DIAMETER	4.00 in	**CORE SIZE**	NA

WATER LEVELS

At Drilling: NA
After Drilling: NA
End of Drilling: NA
Temporary Well: NA

NOTES

NA - Not Available; bgs - below ground surface; amsl - above mean sea level

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
0		0.2 ft TOPSOIL, **(TOPSOIL)**	1429 / 1428.8			
		Dark Brown, Silty CLAY, with Sand, and Gravel, Moist, Organic Rich **(FILL)**				0.0
				DP-1	60	
						0.0
		2.9 ft Brown, Sandy CLAY, with Angular Gravel, and Concrete, Moist, **(FILL)**	1426.1			0.0
		Greenish Brown from 4.0-6.0 ft bgs				0.0
5						0.0
		6.0 ft Brown, FAT CLAY, with Gravel, and Silt, Moist +, **(FILL)**	1423.0	DP-2	60	0.0
		7.8 ft	1421.2			
		8.0 ft Gray, FAT CLAY, with Wood Fragments, Moist, **(FILL)**	1421.0			
		Purpleish Gray, FAT CLAY, with Gravel, Moist, **(FILL)**				0.0
		9.0 ft	1420.0	DP-3	100	0.0
		9.2 ft Greenish Brown, GRAVEL, with Silt, and Sand, Moist -, **(GLACIAL TILL)**	1419.8			
		Greenish Gray, FAT CLAY, with Angular Gravel, and Silt, Moist, **(GLACIAL TILL)**				0.0
10			1419			

(Continued Next Page)

Civil & Environmental Consultants, Inc.
2704 Cherokee Farm Way
Suite 101
Knoxville, TN 37920

BORING NUMBER SB-1

CLIENT Arconic Corporation **PROJECT NAME** Former Alcas Cutlery Site

PROJECT NUMBER 300-082 **PROJECT LOCATION** Olean, NY

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
		Greenish Gray, FAT CLAY, with Angular Gravel, and Silt, Moist, **(GLACIAL TILL)**				0.0
		11.1 ft — 1417.9				
		Greenish Gray, Sandy CLAY, with Gravel, Moist, **(GLACIAL TILL)**				0.0
				DP-4	85	
		12.5 ft — 1416.5				0.0
		Greenish Tan, ROCK FRAGMENTS, **(GLACIAL TILL)**				
		13.0 ft — 1416.0				
		Greenish Gray, Sandy CLAY, with Gravel, Moist, **(GLACIAL TILL)**				0.0
		14.2 ft — 1414.8				
		Brown, SAND, and Rock Fragments, Moist -, **(GLACIAL TILL)**				0.0
		14.7 ft — 1414.3				
		Greenish Tan, ROCK FRAGMENTS, Moist -, **(GLACIAL TILL)**				
15		15.2 ft — 1413.8				
		Greenish Gray, Sandy CLAY, with Gravel, Moist, **(GLACIAL TILL)**				0.0
				DP-5	25	
						0.0
						0.0
						0.0
				DP-6	100	
20		20.0 ft — 1409.0	1409			
		End of Boring at 20.0 feet				
25						

Civil & Environmental Consultants of New York, Inc.
2704 Cherokee Farm Way
Suite 101
Knoxville, TN 37920

MONITORING WELL NUMBER VW-1

CLIENT	Arconic Corporation	**PROJECT NAME**	Former Alcas Cutlery Site
PROJECT NUMBER	300-082	**PROJECT LOCATION**	Olean, NY
DATE STARTED	01/29/2025	**DATE COMPLETED**	01/30/2025
CEC FIELD REPRESENTATIVE	LJR	**REVIEWED BY**	LDC
GROUND ELEVATION	1424.80 ft amsl	**CASING ELEVATION**	1423.73 ft amsl
LATITUDE	42.072624	**LONGITUDE**	-78.406770
DRILLING CONTRACTOR	Nothnagle Drilling, Inc.	**DRILLER**	Tom Mangefride
DRILLING METHOD	6-1/4-in Hollow Stem Auger + DP	**BACKFILL**	4" Monitoring Well Installed
BOREHOLE DIAMETER	11.00 in	**CORE SIZE**	NA
MONITORING EQUIPMENT	MiniRAE PID Meter	**OUTER CASING**	NA
WELL INSTALLED	01/30/2025	**WELL STICKUP**	Flush Mount (Default), -1.07 ft
DEVELOPMENT METHOD	Bailing / Pump	**WELL KEY**	NA
RESULTS	Clear	**NOTES**	
YIELD	35 gal		

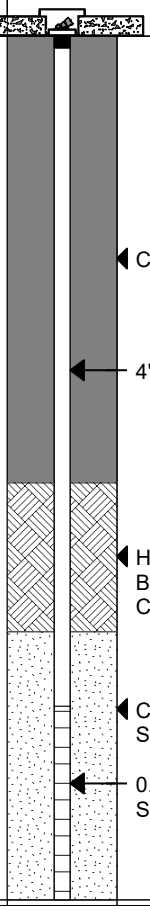
WATER LEVELS

At Time of Drilling: NA
End of Drilling: NA
After Drilling: 01/30/2025 12.54 ft bgs / Elev 1412.26 ft amsl
Temporary Well: NA
Well VW-1 : 05/01/2025 10.90 ft TOC/ Elev 1412.83 ft amsl

NA - Not Available; bgs - below ground surface; amsl - above mean sea level

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
0	Grey, CONCRETE, **(CONCRETE)**		AU-1	100	0.0
0.7 ft / 1424.1	Dark Brown, Silty GRAVEL, with Sand, and Clay, **(FILL)**				0.0
1.5 ft / 1423.3	Greenish Brown, Sandy GRAVEL AND CLAY, Moist +, **(FILL)**				0.0
1.9 ft / 1422.9	Brown, Sandy CLAY, Little Gravel, Moist to to, Moist -, **(FILL)**		DP-1	60	0.0
2.2 ft / 1422.6	Greenish Brown, Sandy GRAVEL AND CLAY, Moist to to, Moist -, **(FILL)**			61	0.0
5					0.0
					0.0
			DP-2	63	0.0
6.9 ft / 1417.9	Brown, Sandy ROCK FRAGMENTS, Moist -, **(FILL)**				0.0
7.4 ft / 1417.4	Greenish Brown, Sandy GRAVEL AND CLAY, Moist, **(GLACIAL TILL)**				0.0
9.3 ft / 1415.5	Gray, ROCK FRAGMENTS, Moist -, **(GLACIAL TILL)**		DP-3	80	0.0
10 / 10.0 ft / 1414.8	Greenish Brown, GRAVEL AND CLAY, with Silt, and Sand, Moist -, **(GLACIAL TILL)**	1415			0.0

WELL DIAGRAM



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MONITORING WELL NUMBER VW-1

CLIENT Arconic Corporation
PROJECT NAME Former Alcas Cutlery Site
PROJECT NUMBER 300-082
PROJECT LOCATION Olean, NY

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)	WELL DIAGRAM
	VW-1	Greenish Brown, GRAVEL AND CLAY, with Silt, and Sand, Moist -, **(GLACIAL TILL)**		DP-4	75		Clean Quartz Sand
		Rock fragments at 14.0-16.1 ft bgs				0.0	
15						0.0	
				DP-5	90	0.0	0.01" Slotted Screen
	17.0 ft		1407.8				
		Brown, GRAVEL, with Clay, and Silt, Wet, **(GLACIAL TILL)**					
	18.0 ft		1406.8				
		Brown, SAND, with Clay, Wet, **(GLACIAL TILL)**				0.0	
	18.9 ft		1405.9				
		Greenish Gray and Brown, FAT CLAY, Some Sand, and Gravel, Moist +, **(GLACIAL TILL)**		DP-6	100	0.0	
20			1405			0.0	
				DP-7	90		
	24.0 ft		1400.8				
		End of Monitoring Well at 24.0 feet					
25							
30			1395				

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MONITORING WELL NUMBER VW-2

CLIENT	Arconic Corporation	**PROJECT NAME**	Former Alcas Cutlery Site
PROJECT NUMBER	300-082	**PROJECT LOCATION**	Olean, NY
DATE STARTED	01/30/2025	**DATE COMPLETED**	01/30/2025
CEC FIELD REPRESENTATIVE	LJR	**REVIEWED BY**	LDC
GROUND ELEVATION	1424.65 ft amsl	**CASING ELEVATION**	1424.97 ft amsl
LATITUDE	42.072609	**LONGITUDE**	-78.406700
DRILLING CONTRACTOR	Nothnagle Drilling, Inc.	**DRILLER**	Tom Mangefride
DRILLING METHOD	6-1/4-in Hollow Stem Auger + DP	**BACKFILL**	4" Monitoring Well Installed
BOREHOLE DIAMETER	11.00 in	**CORE SIZE**	NA
MONITORING EQUIPMENT	MiniRAE PID Meter	**OUTER CASING**	NA
WELL INSTALLED	01/30/2025	**WELL STICKUP**	Flush Mount (Default), 0.32 ft
DEVELOPMENT METHOD	Pump	**WELL KEY**	NA
RESULTS	Clear	**NOTES**	
YIELD	50 gal		

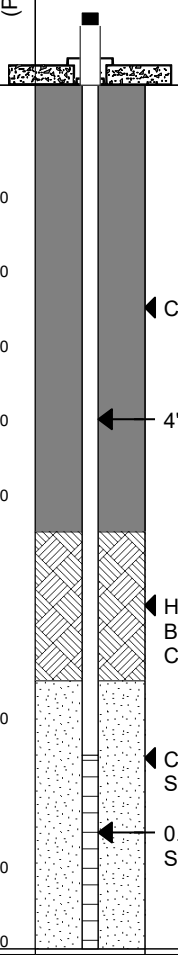
WATER LEVELS

At Time of Drilling: NA
End of Drilling: NA
After Drilling: 01/30/2025 13.37 ft bgs / Elev 1411.28 ft amsl
Temporary Well: NA
Well VW-2 : 05/01/2025 11.78 ft TOC/ Elev 1413.19 ft amsl

NA - Not Available; bgs - below ground surface; amsl - above mean sea level

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
0	CONCRETE, **(CONCRETE)**		AU-1	100	
0.8 ft	Dark Brown, Silty GRAVEL, with Sand, and Clay, Moist +, **(FILL)**	1423.8			
1.5 ft	Greenish Brown, Sandy GRAVEL AND CLAY, Moist, **(FILL)**	1423.2			0.0
2.3 ft	Brown, Sandy CLAY, with Angular Gravel, Moist, **(FILL)** *Black plastic fragment at 2.3 ft bgs*	1422.4	DP-1	101	0.0
					0.0
4.0 ft	Brown, Sandy CLAY, Moist +, **(FILL)**	1420.6			
					0.0
5					
5.5 ft	Greenish Brown, Sandy CLAY, with Angular Gravel, Moist -, **(GLACIAL TILL)**	1419.2	DP-2	100	0.0
					0.0
		1415	DP-3	100	
10					
10.9 ft	ROCK FRAGMENTS, Moist -, **(GLACIAL TILL)**	1413.8			0.0
11.4 ft VW-2	Greenish Brown, Sandy CLAY, with Angular Gravel, Moist - to to, Moist +, **(GLACIAL TILL)**	1413.2			0.0

WELL DIAGRAM



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MONITORING WELL NUMBER VW-2

CLIENT Arconic Corporation
PROJECT NAME Former Alcas Cutlery Site
PROJECT NUMBER 300-082
PROJECT LOCATION Olean, NY

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)	WELL DIAGRAM
		Greenish Brown, Sandy CLAY, with Angular Gravel, Moist - to to, Moist +, **(GLACIAL TILL)**		DP-4	100	0.0	Clean Quartz Sand
						0.0	
15				DP-5	100		0.01" Slotted Screen
						0.0	
				DP-6	100		
			1405				
20						0.0	
		21.0 ft — 1403.6					
		Brown, SAND, with Clay, Moist, **(GLACIAL TILL)**				0.0	
		21.9 ft — 1402.8					
		Brown, FAT CLAY, with Sand, Some Angular Gravel, Moist +, **(GLACIAL TILL)**		DP-7	100	0.0	
		24.0 ft — 1400.6				0.0	
		End of Monitoring Well at 24.0 feet					
25							
			1395				
30							

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MONITORING WELL NUMBER VW-3

CLIENT	Arconic Corporation	**PROJECT NAME**	Former Alcas Cutlery Site
PROJECT NUMBER	300-082	**PROJECT LOCATION**	Olean, NY
DATE STARTED	01/29/2025	**DATE COMPLETED**	01/29/2025
CEC FIELD REPRESENTATIVE	LJR	**REVIEWED BY**	LDC
GROUND ELEVATION	1425.63 ft amsl	**CASING ELEVATION**	1425.18 ft amsl
LATITUDE	42.072532	**LONGITUDE**	-78.406656
DRILLING CONTRACTOR	Nothnagle Drilling, Inc.	**DRILLER**	Tom Mangefride
DRILLING METHOD	6-1/4-in Hollow Stem Auger + DP	**BACKFILL**	4" Monitoring Well Installed
BOREHOLE DIAMETER	11.00 in	**CORE SIZE**	NA
MONITORING EQUIPMENT	MiniRAE PID Meter	**OUTER CASING**	NA
WELL INSTALLED	01/29/2025	**WELL STICKUP**	Flush Mount (Default), -0.46 ft
DEVELOPMENT METHOD	Bailing	**WELL KEY**	NA
RESULTS	Cloudy	**NOTES**	
YIELD	35 gal		

WATER LEVELS

At Time of Drilling: NA

End of Drilling: NA

After Drilling: 01/31/2025 13.52 ft bgs / Elev 1412.11 ft amsl

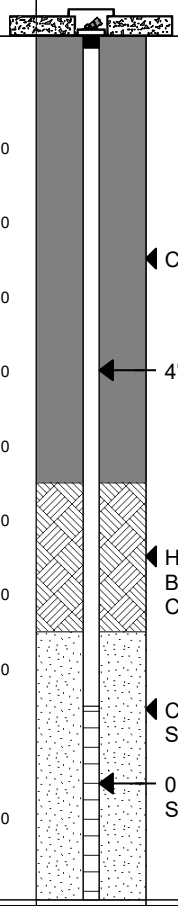
Temporary Well: NA

Well VW-3 : 04/30/2025 12.00 ft TOC/ Elev 1413.18 ft amsl

NA - Not Available; bgs - below ground surface; amsl - above mean sea level

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
0	CONCRETE, **(CONCRETE)**		AU-1	100	
0.8 ft (1424.8)	Dark Brown, Silty GRAVEL, with Sand, and Clay, Moist, **(FILL)**				
1.3 ft (1424.3)	Brown, SAND AND GRAVEL, Some Clay, and Silt, Moist, Some black plastic fibers **(FILL)**				0.0
2.3 ft (1423.3)	Greenish Brown, FAT CLAY, with Gravel, and Silt, Moist, **(FILL)**		DP-1	102	0.0
					0.0
4.0 ft (1421.6)	Greenish Brown, Sandy CLAY, Little Gravel, Moist, **(GLACIAL TILL)**				0.0
5					0.0
			DP-2	100	0.0
					0.0
8.5 ft (1417.1)	Greenish Brown, Sandy GRAVEL AND CLAY, Moist to to, Moist +, **(GLACIAL TILL)**		DP-3	100	0.0
10		1416			0.0

WELL DIAGRAM



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MONITORING WELL NUMBER VW-3

CLIENT Arconic Corporation
PROJECT NAME Former Alcas Cutlery Site
PROJECT NUMBER 300-082
PROJECT LOCATION Olean, NY

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)	WELL DIAGRAM
	VW-3	Greenish Brown, Sandy GRAVEL AND CLAY, Moist to to, Moist +, **(GLACIAL TILL)**		DP-4	30		Clean Quartz Sand
						0.0	
15		*Brownish Gray, Sandy Shale at 15.3 ft bgs*					
				DP-5	10		0.01" Slotted Screen
						0.0	
				DP-6	75		
			1406				
20						0.0	
	21.0 ft		1404.6				
		Greenish Brown, Sandy CLAY, Little Gravel, Wet, **(GLACIAL TILL)**				0.0	
	21.9 ft		1403.7				
		Greenish Brown, Sandy GRAVEL AND CLAY, Moist +, **(GLACIAL TILL)**			100	0.0	
	24.0 ft		1401.6				
		End of Monitoring Well at 24.0 feet					
25							
			1396				
30							

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MONITORING WELL NUMBER VW-4

CLIENT	Arconic Corporation	**PROJECT NAME**	Former Alcas Cutlery Site
PROJECT NUMBER	300-082	**PROJECT LOCATION**	Olean, NY
DATE STARTED	01/28/2025	**DATE COMPLETED**	01/28/2025
CEC FIELD REPRESENTATIVE	LJR	**REVIEWED BY**	LDC
GROUND ELEVATION	1424.33 ft amsl	**CASING ELEVATION**	1423.91 ft amsl
LATITUDE	42.072323	**LONGITUDE**	-78.406818
DRILLING CONTRACTOR	Nothnagle Drilling, Inc.	**DRILLER**	Tom Mangefride
DRILLING METHOD	6-1/4-in Hollow Stem Auger + DP	**BACKFILL**	4" Monitoring Well Installed
BOREHOLE DIAMETER	11.00 in	**CORE SIZE**	NA
MONITORING EQUIPMENT	MiniRAE PID Meter	**OUTER CASING**	NA
WELL INSTALLED	01/28/2025	**WELL STICKUP**	Flush Mount (Default), -0.42 ft
DEVELOPMENT METHOD	Bailing	**WELL KEY**	NA
RESULTS	Cloudy	**NOTES**	
YIELD	8.5 gal		

WATER LEVELS

At Time of Drilling: NA

End of Drilling: NA

After Drilling: 01/31/2025 12.16 ft bgs / Elev 1412.17 ft amsl

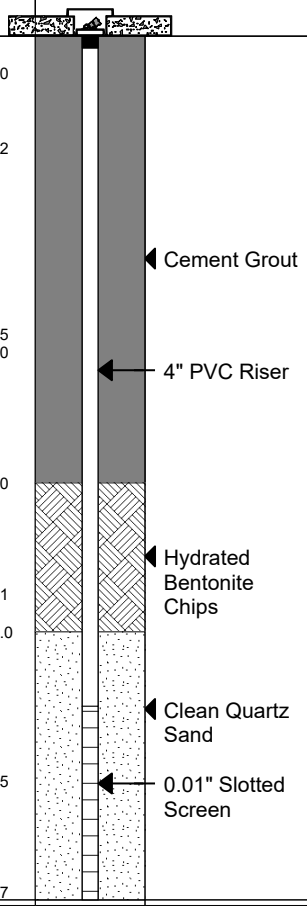
Temporary Well: NA

Well VW-4 : 05/01/2025 10.71 ft TOC/ Elev 1413.20 ft amsl

NA - Not Available; bgs - below ground surface; amsl - above mean sea level

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
0	CONCRETE, **(CONCRETE)**		AU-1	100	0.0
0.8 ft	Dark Brown, Silty GRAVEL, Some Clay, and Sand, Moist +, **(FILL)**	1423.5			3.2
1.6 ft	Greenish Brown, SAND, with Gravel, Some Clay, Moist to to, Wet, **(FILL)**	1422.7	DP-1	102	
4.2 ft	Black and Green, GRAVEL AND SILT, Wet, Oily Sheen and Sewage Odor **(FILL)**	1420.1			0.5 0.0
5					
6.0 ft	CONCRETE, **(FILL)**	1418.3	DP-2	38	0.0
7.5 ft	Greenish Brown, FAT CLAY, with Gravel, Moist +, **(GLACIAL TILL)**	1416.8			5.1 10.0
		1415	DP-3	100	
10					
10.0 ft	Greenish Brown, GRAVEL, with Clay, Wet, **(GLACIAL TILL)**	1414.3			3.5
VW-4 11.5 ft	Greenish Brown, FAT CLAY, with Gravel, Wet to to, Moist -, **(GLACIAL TILL)**	1412.8	DP-4	100	6.7

WELL DIAGRAM



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MONITORING WELL NUMBER VW-4

CLIENT Arconic Corporation
PROJECT NAME Former Alcas Cutlery Site
PROJECT NUMBER 300-082
PROJECT LOCATION Olean, NY

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)	WELL DIAGRAM
		Greenish Brown, FAT CLAY, with Gravel, Wet to to, Moist -, **(GLACIAL TILL)**				17.1	
				DP-5	100	12.7	Clean Quartz Sand
15		*Hard at 15.3-17.0 ft bgs*					
				DP-6	0		0.01" Slotted Screen
		17.0 ft — 1407.3					
		Greenish Brown, CLAY, Some Gravel, Wet, **(GLACIAL TILL)**				2.4	
		18.6 ft — 1405.7		DP-7	100	0.5	
		19.0 ft — 1405.3					
		Brown, GRAVEL, Some Silt, and Clay, Wet, **(GLACIAL TILL)**					
		Brown, FAT CLAY, Little Gravel, Wet, **(GLACIAL TILL)**	1405			2.3	
20		20.0 ft — 1404.3					
		Brownish Gray, GRAVEL AND CLAY, Moist +, **(GLACIAL TILL)**				1.2	
				DP-8	60		
		24.0 ft — 1400.3					
		End of Monitoring Well at 24.0 feet					
25							
			1395				
30							

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MONITORING WELL NUMBER VW-5

CLIENT	Arconic Corporation	**PROJECT NAME**	Former Alcas Cutlery Site
PROJECT NUMBER	300-082	**PROJECT LOCATION**	Olean, NY
DATE STARTED	01/27/2025	**DATE COMPLETED**	01/27/2025
CEC FIELD REPRESENTATIVE	LJR	**REVIEWED BY**	LDC
GROUND ELEVATION	1424.33 ft amsl	**CASING ELEVATION**	1424.10 ft amsl
LATITUDE	42.072349	**LONGITUDE**	-78.406985
DRILLING CONTRACTOR	Nothnagle Drilling, Inc.	**DRILLER**	Tom Mangefride
DRILLING METHOD	6-1/4-in Hollow Stem Auger + DP	**BACKFILL**	4" Monitoring Well Installed
BOREHOLE DIAMETER	11.00 in	**CORE SIZE**	NA
MONITORING EQUIPMENT	MiniRAE PID Meter	**OUTER CASING**	NA
WELL INSTALLED	01/27/2025	**WELL STICKUP**	Flush Mount (Default), -0.23 ft
DEVELOPMENT METHOD	Bailing	**WELL KEY**	NA
RESULTS	Cloudy	**NOTES**	
YIELD	24 gal		

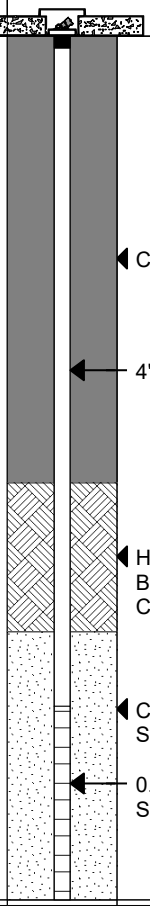
WATER LEVELS

At Time of Drilling: NA
End of Drilling: NA
After Drilling: 01/31/2025 12.53 ft bgs / Elev 1411.80 ft amsl
Temporary Well: NA
Well VW-5 : 05/01/2025 11.45 ft TOC/ Elev 1412.65 ft amsl

NA - Not Available; bgs - below ground surface; amsl - above mean sea level

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)
0	CONCRETE, **(CONCRETE)**		AV-1	100	
0.7 ft	Dark Brown, Silty CLAY, with Sand, and Gravel, Moist, **(FILL)**	1423.6			0.0
2.4 ft		1421.9	DP-1	101	
2.7 ft	Black, GRAVEL AND CLAY, Moist, **(FILL)**	1421.6			0.0
	Brown, SAND, with Clay, and Gravel, Moist, **(FILL)**				0.0
4.0 ft	Brown, GRAVEL AND CLAY, Moist +, **(FILL)**	1420.3			0.0
5 5.1 ft	Greenish Brown, FAT CLAY, and Gravel, Moist -, **(GLACIAL TILL)**	1419.2			0.0
			DP-2	100	
8.0 ft	Brown, GRAVEL AND CLAY, Moist +, **(GLACIAL TILL)**	1416.3			0.0
		1415	DP-3	25	
10 10.0 ft	Greenish Brown, GRAVEL AND CLAY, with Sand, Moist + to to, Moist -, **(GLACIAL TILL)**	1414.3			0.0

WELL DIAGRAM



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MONITORING WELL NUMBER VW-5

CLIENT Arconic Corporation
PROJECT NAME Former Alcas Cutlery Site
PROJECT NUMBER 300-082
PROJECT LOCATION Olean, NY

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)	SAMPLE TYPE NUMBER	RECOVERY %	PID (PPM)	WELL DIAGRAM
		VW-5 Greenish Brown, GRAVEL AND CLAY, with Sand, Moist + to to, Moist -, **(GLACIAL TILL)**		DP-4	90	0.0	Clean Quartz Sand
						0.0	
15				DP-5	60	0.8	0.01" Slotted Screen
		18.0 ft — 1406.3					
		Brown, SAND, Moist + to to, Wet, **(GLACIAL TILL)**				0.0	
		19.0 ft — 1405.3		DP-6	70		
		Greenish Brown, GRAVEL AND CLAY, Wet to to, Moist +, **(GLACIAL TILL)**	1405			0.0	
20							
		21.0 ft — 1403.3					
		Light Brown, Sandy GRAVEL AND CLAY, Dry, **(GLACIAL TILL)**				0.0	
		22.0 ft — 1402.3		DP-7	100		
		Greenish Brown, GRAVEL AND CLAY, Moist +, **(GLACIAL TILL)**				0.0	
						0.0	
		24.0 ft — 1400.3					
		End of Monitoring Well at 24.0 feet					
25							
			1395				
30							

APPENDIX B

WELL DEVELOPMENT FORMS

WELL DEVELOPMENT FIELD DATA SHEET

Job Number: 300-082
Site Name: Cutco OU2
Developer(s): EA 6

Well No. : VW-1
Initial Total Depth (ft TOC[a]): 24.80
Final Total Depth (ft TOC[a]): _____

Static Water Depth (ft TOC[a]): 12.97
Handling of Purged Fluids: containerize
Weather: 28°F Windy

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d] (ft, btoc)	pH[e]	Temp.[f] (C°)	Spec. Cond.[g] µS/cm	Turbidity[h]	ORP Other (mV)	Comments (ex. clarity of water, success of method)
2-4-25	1134	Bailer	—	—	8.0	13.20	10.11	12.54	1727	Turbid	30.4	Brown
↓	1140	↓	—	—	16	13.20	10.25	13.85	1611	↓	-20.4	↓
↓	1147	↓	—	—	24	13.15	10.21	13.80	1524	↓	-17.4	↓ TD 24.70'

Well Information: Diam: 4"; Material: PVC; Depth to Screen (ft. TOC): ~15; Screen Length: 10'; Well Volume (gal): ~7.75;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

WELL DEVELOPMENT FIELD DATA SHEET

Job Number: 300-082
Site Name: CATCO - OU2
Developer(s): EAG

Well No. : VW-2
Initial Total Depth (ft TOC[a]): 23.90
Final Total Depth (ft TOC[a]): _____

Static Water Depth (ft TOC[a]): 13.63
Handling of Purged Fluids: Containerize
Weather: 28°F Windy

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d] (ft, btc)	pH[e]	Temp.[f] C°	Spec. Cond.[g] (µS/cm)	Turbidity[h]	ORP Other (mv)	Comments (ex. clarity of water, success of method)
2-4-25	0950	Bailer	—	—	7.0	15.78	7.38	12.38	1284	Turbid	112.3	Brown
	1002		—	—	14.0	18.21	7.42	12.80	1304		74.3	
	1015		—	—	21.0	20.15	7.61	13.97	1301		46.4	
	1040		—	—	28.0	17.7	7.69	13.73	1310		48.4	
	1045		—	—	35.0	18.20	7.66	13.37	1305		59.5	
	1053		—	—	42	21.50	7.70	13.56	1315		68.9	23.50

Well Information: Diam: 4"; Material: PVC; Depth to Screen (ft. TOC): ~15; Screen Length: 10'; Well Volume (gal): ~6.75;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

WELL DEVELOPMENT FIELD DATA SHEET

Job Number: 300-082 **Well No. :** VW-1 **Static Water Depth (ft TOC[a]):** 10.90

Site Name: Olean OU2 **Initial Total Depth (ft TOC[a]):** 24.80 **Handling of Purged Fluids:** Drum

Developer(s): LJR **Final Total Depth (ft TOC[a]):** 24.80 **Weather:** 65°F Sun

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d]	pH[e]	Temp.[f]	Spec. Cond.[g]	Turbidity[h]	Other	Comments (ex. clarity of water, success of method)
5-1-25	1045	centrifugal pump	18	0.25	Initial	10.96	9.47	16.67	2192	5.48	—	clear
↓	1050	↓	↓	↓	1.25	10.96	9.53	16.68	2000	7.10	—	↓
	1055				2.50	↓	9.54	16.69	1993	7.98	—	
	1100				3.75		9.57	16.70	1985	8.12	—	
	1105				5.00		9.58	16.70	1981	8.65	—	
	1110				6.25		9.59	16.69	1973	8.78	—	
	1115				7.50		9.59	16.70	1970	8.81	—	
	1121				9.00		9.60	16.70	1960	8.86	—	

Well Information: Diam: 4" ; Material: PVC ; Depth to Screen (ft. TOC): 9 ; Screen Length: 15 ; Well Volume (gal): 9.07 ;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

WELL DEVELOPMENT FIELD DATA SHEET

Job Number: 300-082 **Well No. :** VW-2 **Static Water Depth (ft TOC[a]):** 11.78

Site Name: Clear OU2 **Initial Total Depth (ft TOC[a]):** 23.90 **Handling of Purged Fluids:** Drum

Developer(s): LJR **Final Total Depth (ft TOC[a]):** 23.90 **Weather:** 65°F Sun

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d]	pH[e]	Temp.[f]	Spec. Cond.[g]	Turbidity[h]	Other	Comments (ex. clarity of water, success of method)
5-1-25	1130	Centrifugal pump	18	0.25	Initial	12.14	8.01	15.55	945	1.36	—	Clear
↓	1135	↓	↓	↓	1.25	12.18	7.90	15.50	941	4.45	—	↓
	1140				2.50	12.20	7.83	15.51	937	6.70	—	
	1145				3.75	12.24	7.80	15.50	930	8.01	—	
	1150				5.00	12.26	7.78	15.49	922	8.80	—	
	1155				6.25	12.28	7.75	15.49	916	8.80	—	
	1202				8.00	12.30	7.75	15.48	914	8.89	—	

Well Information: Diam: 4"; Material: PVC; Depth to Screen (ft. TOC): 9; Screen Length: 15; Well Volume (gal): 7.91;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

WELL DEVELOPMENT FIELD DATA SHEET

Page ____ of ___

Job Number: 300-082
Site Name: Olean OU2
Developer(s): LJR

Well No. : VW-3
Initial Total Depth (ft TOC[a]): 22.80
Final Total Depth (ft TOC[a]): 22.80

Static Water Depth (ft TOC[a]): 12.00
Handling of Purged Fluids: Drum
Weather: 60°F Sun

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d]	pH[e]	Temp.[f]	Spec. Cond.[g]	Turbidity[h]	Other	Comments (ex. clarity of water, success of method)
4-30-25	1422	Bailer	—	—	Initial	12.00	7.57	16.68	1997	36.3	—	Sediment on 4" of water tape
	—		—	—	7.00	12.18	7.61	15.02	overrange 1537		—	Cloudy Brown
	—		—	—	14.00	13.23	8.45	14.44	1224		—	(Recovering fast) ↑SAA
	—		—	—	21.00	12.40	8.92	13.80	990		—	SAA
	—		—	—	28.00	12.95	8.89	14.01	999		—	SAA
	1550		—	—	35.00	12.57	8.96	13.73	995		—	SAA

Well Information: Diam: 4"; Material: PVC; Depth to Screen (ft. TOC): 9; Screen Length: 15; Well Volume (gal): 7.05;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

WELL DEVELOPMENT FIELD DATA SHEET

★ Strong Chemical Odor (& Peanut Butter odor)

Job Number: 300-082 **Well No. :** VW-4 **Static Water Depth (ft TOC[a]):** ~~23.45~~ 10.71

Site Name: Oleandr **Initial Total Depth (ft TOC[a]):** 23.45 **Handling of Purged Fluids:** Drum

Developer(s): LJR **Final Total Depth (ft TOC[a]):** _____ **Weather:** 65°F Sun

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d]	pH[e]	Temp.[f]	Sp. Cond.[g]	Turbidity[h]	Other	Comments (ex. clarity of water, success of method)
5-1-25	0835	Bailer	—	—	Initial	10.71	8.33	13.68	1158	296	Strong	Odor when opening well & 4" sediment at top
	—	↓	—	—	8.5	11.50	9.35	14.10	1288	over range >1000	strong odor	Recovering fast; Cloudy Grey

Well Information: Diam: 4" ; Material: PVC ; Depth to Screen (ft. TOC): 9 ; Screen Length: 15 ; Well Volume (gal): 8.32 ;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

WELL DEVELOPMENT FIELD DATA SHEET

Page ____ of ___

Job Number: 300-082
Site Name: Olean OU2
Developer(s): LJR

Well No. : VW-5
Initial Total Depth (ft TOC[a]): 23.55
Final Total Depth (ft TOC[a]): 23.55

Static Water Depth (ft TOC[a]): 11.45
Handling of Purged Fluids: Drum
Weather: 65°F Sun

Date	Time	Development Method[i]	Pump Depth(ft[a])	Pumping Rate[b]	Cumulative Volume Purged[c]	DTW[d]	pH[e]	Temp.[f]	Spec. Cond.[g]	Turbidity[h]	Other	Comments (ex. clarity of water, success of method)
5-1-25	945	Bailer	—	—	Initial	11.45	9.99	16.20	1222	128		
	—	↓	—	—	8	11.83	9.89	16.11	1379	overrange >1000		Cloudy Brown (Fast Recharge)
	—	↓	—	—	16	11.95	9.84	16.05	1340	↓		SAA
	1020	↓	—	—	24	11.99	9.91	16.06	1327	↓		SAA

Well Information: Diam: 4"; Material: PVC; Depth to Screen (ft. TOC): 9; Screen Length: 15; Well Volume (gal): 7.90;

a. Top of casing.
b. Gallons per minute.
c. gallons
d. Depth to water.
e. Standard units
f. °C, unless °F noted.
g. Specific conductance, µmhos/cm (or µS/cm).
h. NTU unless otherwise noted.
i. Type of development equipment:
Pump (note type)
Bailer
Surged with block

APPENDIX C

GROUNDWATER SAMPLING RECORDS

LOW FLOW SAMPLING DATA SHEET

Civil & Environmental Consultants, Inc.

Site: Olean - Cutco OU-2
Total Depth (ft): 23.6
Personnel: EAG
Well Diameter (in.): 2"
Project No.: 300-082
Date: 2-3-25
Date/Time of Pump Installation: ☐ permanent
Pump Type: Monsoon
Well #: RU-5
Static Water Level (ft): 12.52
Pump Depth (ft): 23
Water Level after Pump Installation: 12.50
Time of Purge Initiation: 1316

TIME	FLOW RATE mL/min	TURBIDITY (NTU)	pH (S.U)	ORP (mV)	Diss. Oxygen (ppm)	SP. COND. (µS/cm)	TEMP. (C°)	TDS (ppm)	WATER LEVEL	DRAW-DOWN (ft)	MAX ALLOW. DD (ft)
1321	250	Cloudy	9.40	115.7	2.31	1544	18.38	-	12.70	0.20	
1326	150		9.56	119.6	1.61	1558	18.33	-	12.65	0.05	
1331			9.68	125.7	1.40	1592	18.45	-	12.60	0.05	
1336		S.Cloudy	9.72	130.5	1.25	1605	18.60	-	12.60	0	
1341			9.75	133.3	1.12	1609	18.52	-	12.60	0	
1346			9.77	135.3	1.02	1614	18.30	-	12.60	0	
1351			9.79	135.7	0.89	1618	19.00	-	12.62	0.02	
1356			9.83	134.9	0.78	1625	19.06	-	12.62	0	

Other Field Measurements:
ALK. Total = 300 x 0.95 = 285 ppm
pH ALK. = 300 x 0.4 = 120 ppm - Double Check multiplier
Persulfate = 7.0 ppm

Comments:
OLN-RU005-F011-Contaminated

15 bottles

Deviations from SAP:

FIELD MEASUREMENTS AT TIME OF SAMPLE

Date: 2-3-25
Time: 1401
Water Level: 12.62
pH: 9.84
TDS (ppm): -
Spec. Cond. (µS/cm): 1627
ORP: (mV) 134.9
Diss. Oxygen (ppm): 0.75
Turbidity (NTU): ~~Clear~~ Slightly Cloudy
Odor: None
Volume Removed: 3.0 gal

LOW FLOW SAMPLING DATA SHEET

Site: Olean-Cutco OU-2
Total Depth (ft): 24.64
Personnel: EAG
Well Diameter (in.): 2"
Civil & Environmental Consultants, Inc.
Project No.: 300-082
Date: 2-3-25
Date/Time of Pump Installation: ☐ permanent
Pump Type: Monsoon
Well #: RU-17B
Static Water Level (ft): 19.80
Pump Depth (ft): 24.0
Water Level after Pump Installation: 19.80
Time of Purge Initiation: 1143

TIME	FLOW RATE, mL/min	TURBIDITY (NTU)	pH	ORP (mV)	Diss. Oxygen (ppm)	SP. COND. (µS/cm)	TEMP. (C°)	TDS (ppm)	WATER LEVEL	DRAW-DOWN (ft)	MAX ALLOW. DD (ft)
1153	350	Turbid	6.90	129.8	1.70	5275	14.18	–	19.88	0.08	
1158	175	Cloudy	6.90	124.9	1.77	5569	14.48	–	19.90	0.02	
1203	175	S.cloudy	6.91	114.8	1.63	5669	14.74	–	19.92	0.02	
1208	175	Clear	6.92	105.5	1.49	5687	14.78	–	19.92	0.02	
1213	175	Clear	6.91	97.0	1.34	5678	15.08	–	19.95	0.03	
1218	175	Clear	6.91	94.6	1.22	5633	15.00	–	19.96	0.01	

Other Field Measurements:
Alk. Total = 300 x 1.0 = 300ppm
Alk. pH = 0ppm
Persulfate = 0ppm

Comments: Well un Buried
Kink in casing ~10' down

OLN-RU17B-F011-clean
4 bottles

Deviations from SAP:

FIELD MEASUREMENTS AT TIME OF SAMPLE

Date: 2-3-25
Time: 1223
Water Level: 19.99
pH: 6.96
TDS (ppm): –
Spec. Cond. (µS/cm): 5585
ORP: (mV) 89.6
Diss. Oxygen (ppm): 1.15
Turbidity (NTU): Clear
Odor: ~~Clear~~ None
Volume Removed: 3.5 gal

EAG 2-3-25

APPENDIX D

FINAL REPORT, ISCO BENCH STUDY FOR THE TREATMENT OF VOCS IN GROUNDWATER AND SOIL FROM THE ALCAS CUTLERY SITE

ISCO BENCH STUDY FOR THE TREATMENT OF VOCS IN GROUNDWATER AND SOIL

FROM THE ALCAS CUTLERY SITE

FINAL REPORT

Prepared for:

Civil & Environmental Consultants, Inc.
2704 Cherokee Farm Way, Suite 101
Knoxville, TN 37920

***Submitted by*:**
Evonik Corporation
78 Sawyer Ave.
Tonawanda, NY 14150

Project No.: EVK 26376

July 2025

TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Project Background 1

1.2 Klozur® Persulfate Technology Background 1

2 PROJECT OBJECTIVES 1

3 BASELINE SAMPLING 1

3.1 Sample Receipt and Sampling 1

3.2 Results 2

4 KLOZUR® DEMAND TEST (KDT) 3

4.1 Background 3

4.2 Method 4

4.3 Results 4

5. BASE BUFFERING CAPACITY 5

5.1 Background 5

5.2 Clean Soil 5

6 PRECIPITATION HYPOTHESIS TESTING 5

6.1 Precipitation Hypothesis Testing Set Up – base buffering test 5

7 BATCH TREATABILITY STUDY 8

7.1 Set Up - Method 8

7.2 Batch Test Results 8

8 SUMMARY 9

9 APPENDIX 10

1 INTRODUCTION

1.1 Project Background

Evonik conducted a bench-scale study to evaluate Klozur® SP for the treatment of groundwater and soil impacted with volatile organic compounds (VOCs). The main contaminants of concern are trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC). Impacted groundwater and soil samples were collected by Civil & Environmental Consultants, Inc. (CEC) from the Alcas Cutlery site (Site). This report was prepared for CEC and presents the results and data interpretation of the bench-scale study completed between February 2025 and July 2025.

1.2 Klozur® Persulfate Technology Background

Because of its ability to treat a wide range of contaminants, Klozur® Activated Persulfate is the oxidant of choice for in situ chemical oxidation (ISCO). When properly activated, Klozur® Persulfate delivers an unmatched combination of oxidative power and control, making it a safe and cost-effective solution for contaminant remediation.

Successful field applications of Klozur® Activated Persulfate have been performed globally, demonstrating its effectiveness in treating diverse organic contaminants of concern including: chlorinated ethenes (TCE, PCE, DCE and vinyl chloride), chlorinated ethanes (TCA and DCA), chlorinated methanes (carbon tetrachloride and methylene chloride), BTEX, MTBE, polyaromatic hydrocarbons (PAHs), petroleum hydrocarbons (TPHs, GRO, DRO), 1,4-dioxane and pesticides.

When activated, Klozur® persulfate generates a series of powerful radicals capable of treating most organic contaminants of concern. Depending upon the activation method, these radicals can include the sulfate radical (SO_4^{-}•) and hydroxyl radicals (OH•), two of the strongest oxidizing species available, the superoxide radical (O_2^{-}•), a reductant and nucleophile, and the hydroperoxide radical (HO_2^{-}), a nucleophile, giving Klozur® Persulfate the power to destroy the most recalcitrant contaminants with oxidative, reductive, and nucleophilic pathways. Selection of the correct activation method, however, depends on many factors, including: the target contaminants, lithology, hydrogeology, and other specific site conditions.

Evonik always recommends activating the persulfate to support effective chemical oxidation, attainment of remedial objectives and expedited site closure.

2 PROJECT OBJECTIVES

The aim of this bench-scale study was to assess ISCO products for the treatment of VOCs. Specific objectives included:

- assess the precipitation formation hypothesis
- determination of the efficiency of treatments at treating contaminants
- provision of a comprehensive final report.

3 BASELINE SAMPLING

3.1 Sample Receipt and Sampling

On February 4, 2025, coolers were received from CEC. The samples received are outlined below in **Table 1.** All samples were received on ice and placed into cold room storage upon receipt.

Table 1: Summary of Samples Received

Sample Description	Sample ID	#	Size
Soil	VW-1	2	8 oz
	VW-2	4	8 oz
	VW-3	3	8 oz
	VW-4	4	8 oz
	VW-5	5	8 oz
Groundwater	OLN-RU 005-F011-contaminated	15	1L Bottle
Clean			
Sample Description	**Sample ID**	**#**	**Size**
Soil	SB-1	4	8 oz
Groundwater	OLDN-RU17B-F011-clean	4	1L Bottle

The groundwater samples were transferred from the bottles into a Tedlar bag. After sampling, the composite groundwater was placed into the cold room storage.

The site soil was a medium brown semi-moist clay, with many small sones and no odor. The soil in the pail was quickly transferred to an anaerobic bag with the headspace removed and homogenized well.

The homogenized soil was sampled in duplicate for VOCs (Method 8260), and pH. The site composite groundwater was sampled for VOCs (Method 8260), metals, alkalinity, carbonate alkalinity, pH and oxidation reduction potential (ORP). All samples were submitted to a third-party lab on ice via courier and under standard chain of custody. The pH and ORP were measured in-house.

After reviewing the baseline data, the groundwater was resubmitted for alkalinity and carbonate alkalinity and was also analyzed for bicarbonate alkalinity.

3.2 Results

The summaries of detected compounds and analyses from the baseline sampling are shown below in **Tables 2 & 3**.

Table 2: VOC concentrations and pH in the homogenized soil

Analysis	Parameter	Soil	Soil Dup	Units
CVOC's	cis-1,2-Dichloroethene	1.4 J	1.8 J	ug/Kg
	Dichlorodifluoromethane	ND (5.7)	ND (5.7)	ug/Kg
	Trichloroethene	99	86	ug/Kg
	Total CVOC's	**103**	**90.3**	**ug/Kg**
Other VOCs	2-Butanone (MEK)	ND (5.7)	5.5 J	ug/Kg
	Methylene Chloride	2.6 J	2.5 J	ug/Kg
Lab Parameters	Percent Solids	87.0	87.5	%
	pH	8.67		SI Units

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

ND = Indicates the analyte was analyzed for but not detected.

Table 3: Detected VOC concentrations, geochemical parameters, pH and ORP in the composite groundwater

Analysis	Parameter	GW Result	Units
CVOCs	Bromodichloromethane	3.2 J B	ug/L
	Chloroform	6.5 J B	ug/L
	cis-1,2-Dichloroethene	14	ug/L
	Trichloroethene	2,900	ug/L
	Methyl tert-butyl ether	ND (5.0) *+	ug/L
	Total CVOC's	**2,924**	**ug/L**
Other VOCs	Methyl tert-butyl ether	ND (5.0) *+	ug/L
Metals	Aluminum	3.4	mg/L
	Arsenic	0.33	mg/L
	Barium	0.035	mg/L
	Boron	0.24	mg/L
	Calcium	13	mg/L
	Chromium	0.0095 J	mg/L
	Copper	0.0050 J	mg/L
	Iron	1.8	mg/L
	Lead	0.0040 J	mg/L
	Magnesium	2.0	mg/L
	Manganese	0.030	mg/L
	Potassium	2.0	mg/L
	Silicon	16	mg/L
	Sodium	400	mg/L
	Strontium	0.024	mg/L
	Titanium	0.042	mg/L
	Vanadium	0.060	mg/L
	Zinc	0.0065 J	mg/L
General Lab	Alkalinity	390 B	mg/L
	Carbonate Alkalinity as CaCO3	320	mg/L
	Alkalinity	400 B	mg/L
	Bicarbonate Alkalinity as CaCO3	140 B	mg/L
	Carbonate Alkalinity as CaCO3	260	mg/L
Lab Parameters	ORP	104.8	mV
	pH	10.17	SI Units

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

B = Compound was found in the blank and sample.

*+ = LCS and/or LCSD is outside acceptance limits, high biased

ND = Indicates the analyte was analyzed for but not detected.

4 KLOZUR® DEMAND TEST (KDT)

4.1 Background

Klozur® activated persulfate is a strong oxidant capable of reacting with a wide range of contaminants, including chlorinated solvents, petroleum hydrocarbons, polyaromatic hydrocarbons, gasoline additives,

pesticides, and many others. Activation of the persulfate anion generates the sulfate radical, the primary species that drives the rapid destruction of the contaminants of concern. Activation can be accomplished by several methods: heat, transition metals, addition of hydrogen peroxide, or under alkaline conditions. Choice of the activation method will depend on the contaminant of concern and site characteristics.

The sulfate radical and reactive species in general can and will react with a wide assortment of compounds. As a result, activated persulfate will not only treat the contaminant of concern, but a portion of the oxidant will be used in oxidizing soil organics, reduced metals, and organic species that are not of concern. In addition, activated persulfate will undergo auto-decomposition, which will be a function of temperature, concentration and activation method. The demand on the activated persulfate from all of these components is measured through a coarse screening test termed, "Klozur® Demand Test". It is dependent upon the site characteristics, such as the organic content of the soil, the mineral loading, and soil type and collectively must be considered for estimating the magnitude of oxidant dosing during field application.

The Klozur® Persulfate KDT test measures the loss of persulfate in the presence of soil, groundwater, and activator over a period of 48 and 168 hours. The resulting KDT values can then be used as a guide to develop appropriate persulfate dosing for subsequent treatability testing and field applications. The KDT test is performed on clean soil collected from outside of the impacted area to obtain a measurement of the SOD independent of the demand from the contaminants.

4.2 Method

Client Sample Identification

Soil ID: SB-1
GW ID: OLDN-RU17B-F011-clean

Three activation methods were selected to be tested for the site; alkaline, Fe-EDTA and Klozur® One. A separate KDT was set up for each activation method.

Handling Procedures

- The SB-1 soil was transferred into a stainless-steel bowl and mixed well.
- The soil was a silt/clay, light brown, with many stones and no odor.
- On February 10th and 11th, 2025, the tubes were prepared according to the Evonik KDT protocol using the soil and groundwater provided.
- The experimental samples were stored at room temperature and each sample was inverted several times once per day.

4.3 Results

A summary of the KDT results for each activation is below in **Table 4.**

Table 4: Summary of the KDT values for each activation.

Activation	KDT Value		Units
	Day 2	Day 7	
Alkaline	1.95	2.90	g Sodium Persulfate/kg dry soil
Klozur® One	1.33	2.00	
Fe-EDTA	1.48	2.45	

5. BASE BUFFERING CAPACITY

5.1 Background

When high pH is chosen as a means of activation, a Base Buffering Capacity (BBC) test is recommended. The goal of a BBC test is to determine the amount of sodium hydroxide (NaOH) needed to raise the pH of a soil to pH 10.5, which is necessary for Klozur® persulfate activation. The BBC test measures the alkaline demand in the presence of soil and groundwater over a period of 7 days. The resulting value can then be used as a guide to develop appropriate dosing for subsequent treatability testing and field applications.

5.2 Clean Soil

On February 10, 2025, the standard base buffering capacity test was set up according to the Evonik BBC protocol using the homogenized SB-1 soil and OLDN-RU17B-F011-clean water.

Based on the pH titration data, the amount of NaOH required to reach and maintain a pH of 10.5 for 7 days was used to calculate the base buffering capacity.

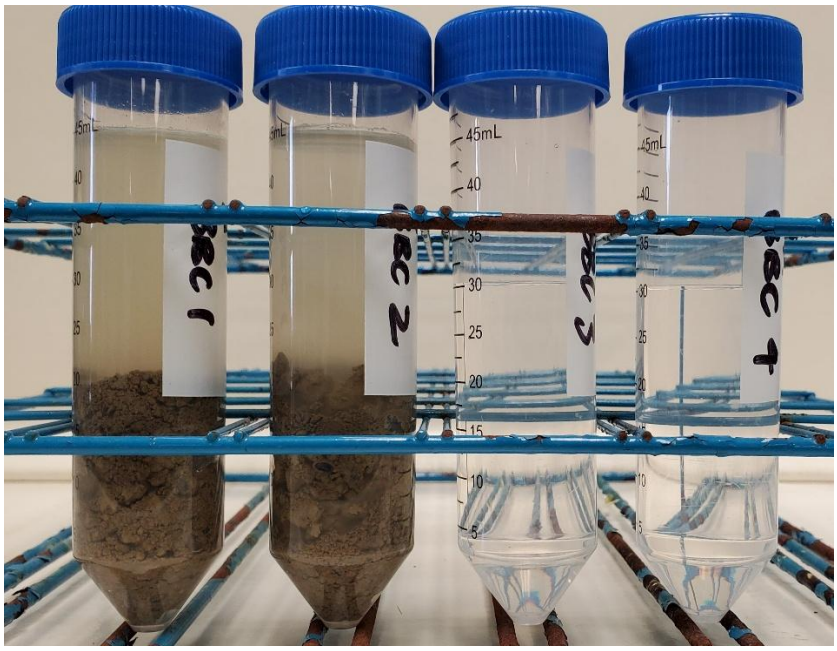
Calculated Site NaOH demand:

Homogenized Site Soil & Groundwater --> 1.67g 25% NaOH/Kg dry soil

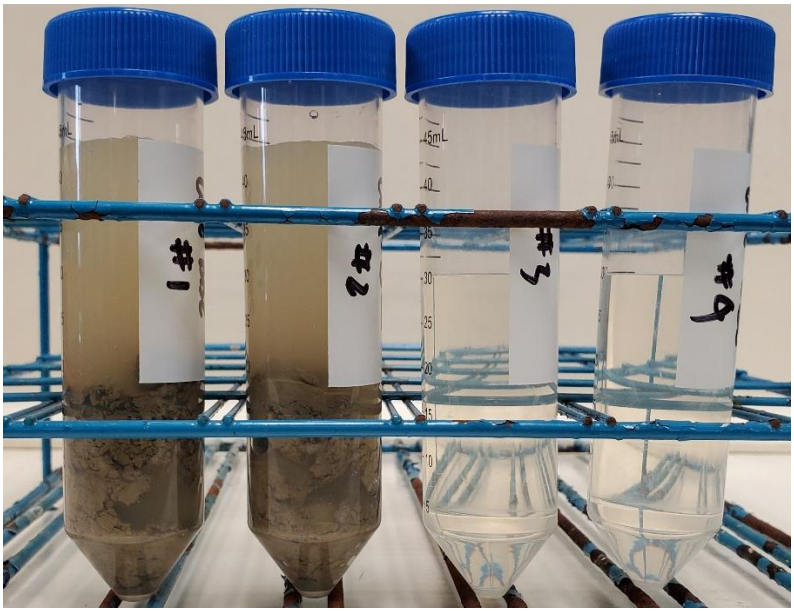
6 PRECIPITATION HYPOTHESIS TESTING

6.1 Precipitation Hypothesis Testing Set Up – base buffering test

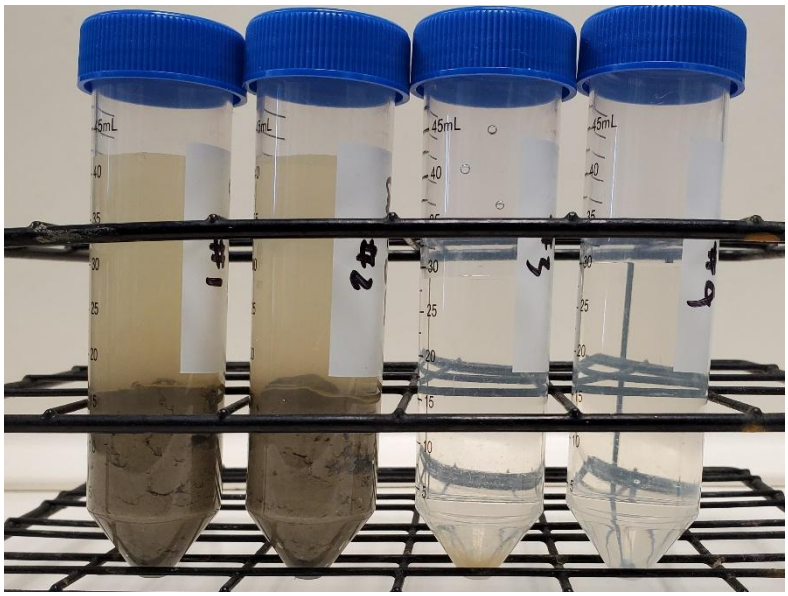
To assess the precipitate hypothesis during alkaline activation a base buffering test was performed on the contaminated groundwater (ID: OLN-RU 005-F011-contaminated) and soil (ID: Homogenized VW contaminated). Tubes were set up with soil and groundwater and raised to a pH of ~10.5 and tubes with groundwater only were raised to a pH of ~12. The tubes were adjusted daily as needed to hold the desired pH for 7 days. A tube of site groundwater with no pH adjustment was also set up for comparison.



Picture 1: Base Buffering tubes before NaOH addition, groundwater control (no pH adjustment) on right

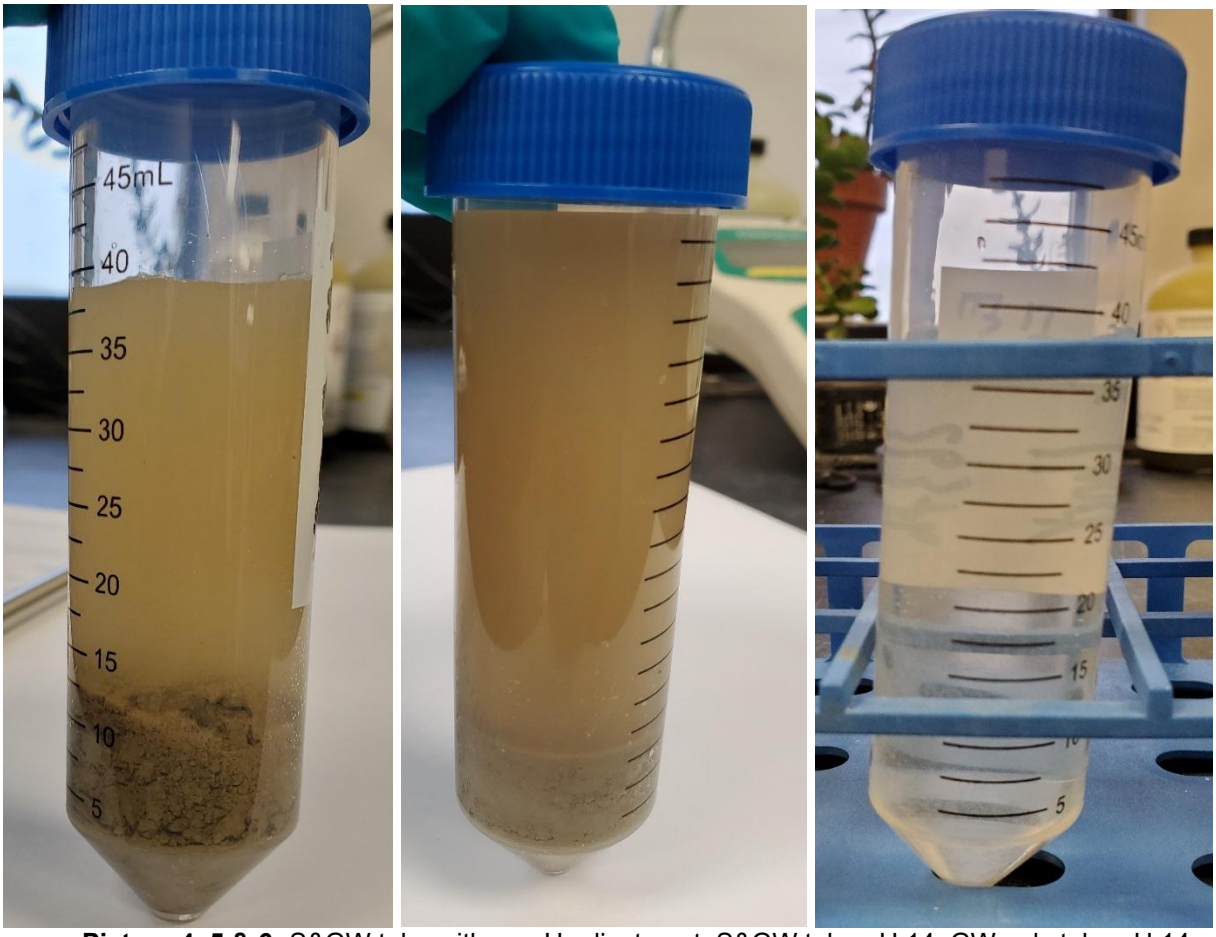


Picture 2: Base Buffering tubes immediately after NaOH addition



Picture 3: Base Buffering tubes on day 7 after NaOH addition

A small amount of floc was observed in the groundwater only tube. Evonik typically considers floc precipitation to be significant when it exceeds the 3-5 mL mark on the vial. An additional test was conducted to raise the pH of a soil & groundwater tube and a groundwater tube only to a target of 14.



Picture 4, 5 & 6: S&GW tube with no pH adjustment, S&GW tube pH 14, GW only tube pH 14

In the pH 14 set up with soil it was difficult to observe any floc with the sediment. The groundwater only tube had some floc but not a significant amount.

After review and discussion with CEC, it was noted that the sample provided and tested by Evonik was more consistent with groundwater that had already been exposed to alkalinity during the field application and that both calcium and carbonate were lower than groundwater that had not previously been exposed to alkalinity.

7 BATCH TREATABILITY STUDY

7.1 Set Up - Method

On May 14, 2025, a batch study was set up as outlined below (**Table 5**). For the study, one control, one Alkaline Activated Klozur® Persulfate (AAP), one Klozur® One, one Klozur® with Fe-EDTA activation and one Klozur® with no activation treatments were evaluated. The jars were set up with an average of 500g site soil and 728.3mL of site groundwater. Sodium hydroxide was added to the system to reach the natural demand from soil and groundwater (BBC) plus sufficient alkalinity to account for the decomposition of all of the Klozur® persulfate (1.34g 25% NaOH/ g Klozur® SP).

Table 5: Summary of Batch Study

Condition	Treatment	Klozur® SP (g/L)	Klozur® One (g/L)	Fe-EDTA (mg/L)	25% NaOH (mL)	Sampling (Days)
0	Control	---	---	---	---	7, 28
1	Klozur® One	---	15.8	---	---	7, 28
2	Klozur® SP + 25 % NaOH	15	---	---	yes	7, 28
3	Klozur® SP + Fe-EDTA	15	---	1538.5	---	7, 28
4	Unactivated Klozur® SP	15	---	---	---	7, 28

The jars were stored at ambient lab temperature, approximately 20°C, and were inverted several times per week for the duration of the study. As Klozur® One is 95% Klozur® SP and 5% built in activator, a greater mass of Klozur® One was added to be equivalent to 15 g/L Klozur and 800 mg/L activator.

On day 7 and 28 one jar from each condition was sacrificially sampled for VOCs, pH and ORP. On day 28 the remaining groundwater was decanted, and the soil was sampled for VOCs.

7.2 Batch Test Results

The summary of CVOC % removal results from the Day 7 & 28 sampling events are shown in **Table 6** below. Full analytical results can be found in the Appendix.

Table 6: CVOC % removal summary relative to the control

Treatment	Day	% GW CVOC Removal	% Soil CVOC Removal	Residual Persulfate (g/L)
Klozur® One	7	99.5%	-	13.0
	28	96.1%	84.9%	10.9
Klozur® SP + 25% NaOH	7	99.9%	-	12.2
	28	99.5%	93.3%	8.9
Klozur® SP + Fe-EDTA	7	94.7%	-	12.7
	28	83.5%	83.0%	4.7
Unactivated Klozur® SP	7	99.7%	-	13.3
	28	99.5%	91.2%	12.5

8 SUMMARY

The purpose of this bench study was to evaluate four alternative ISCO treatments for the removal of CVOCs in groundwater and soil samples collected from the client's site and assess the potential for floc formation at high pH. The following summary is provided based on the results presented here. All conditions showed treatment of CVOCs in the groundwater relative to the control.

The Klozur® Demand Tests (KDT), often referred to as a soil oxidant demand (SOD) ranged from 2.0 g Sodium Persulfate/Kg dry soil with the Klozur® One activation to 2.9 g Sodium Persulfate/Kg dry soil with the alkaline activation with the Fe-EDTA activation falling between at 2.45 g 25% NaOH/Kg dry Soil. The Base Buffer Capacity (BBC) test was 1.67 g 25% NaOH/Kg dry Soil.

All treatment conditions showed treatment of CVOCs. The Klozur® One showed 99.5% and 96.1% reduction for the contaminants in groundwater by day 7 and 28, respectively, and a reduction of 84.9% in soil by day 28. The alkaline activated Klozur® showed 99.9% and 99.5% reduction for the contaminants in groundwater by day 7 and 28, respectively, and a reduction of 93.3% in soil by day 28. The Fe-EDTA activated Klozur® showed 94.7% and 83.5% reduction for the contaminants in groundwater by day 7 and 28, respectively, and a reduction of 83.0% in soil by day 28. The unactivated Klozur® showed 99.7% and 99.5% reduction for the contaminants in groundwater by day 7 and 28, respectively, and a reduction of 91.2% in soil by day 28. All systems had remaining persulfate at the 28 day sampling allowing remaining persulfate to react with additional contamination.

Unactivated persulfate often performs well on a bench scale where establishing contact is easily accomplished. While it can be considered, historically, unactivated persulfate is more prone to mixed results in the field compared to activated persulfate. In the study summarized in this report, all methods of activated persulfate were effective with unactivated and Klozur® One both having greater than 10 g/L, or >70% , residual persulfate to continuing to treat the contaminants.

9 APPENDIX

The purpose of this bench study was to evaluate four ISCO treatments for the removal of CVOCs in groundwater and soil samples collected from the client's site. The following summary is provided based on the results presented here.

Table A1: Day 7 Groundwater results

Analysis	Parameter Name	Control	Klozur® One	Klozur® SP + 25 % NaOH	Klozur® SP + Fe-EDTA	Unactivated Klozur® SP	Units
CVOCs	Chloroethane	ND (50)	ND (10)	ND (5.0)	2.2 J	ND (5.0)	ug/L
	Chloroform	9.5 J	2.7 J	1.0 J	63	1.7 J	ug/L
	Chloromethane	ND (50)	8.1 J	ND (5.0)	90	1.6 J	ug/L
	cis-1,2-Dichloroethene	12	ND (2.0)	ND (1.0)	ND (2.0)	ND (1.0)	ug/L
	1,1-Dichloroethane	ND (10)	ND (2.0)	ND (1.0)	1.8 J	ND (1.0)	ug/L
	1,2-Dichloroethane	ND (10)	ND (2.0)	ND (1.0)	24	ND (1.0)	ug/L
	1,2-Dichloropropane	ND (10)	ND (2.0)	ND (1.0)	1.0 J	ND (1.0)	ug/L
	Tetrachloroethene	10	ND (2.0)	ND (1.0)	ND (2.0)	6.9	ug/L
	1,1,2-Trichloroethane	ND (10)	ND (2.0)	ND (1.0)	7.8	ND (1.0)	ug/L
	Trichloroethene	3600	4.5	3.6	ND (1.0)	ND (0.50)	ug/L
	Total CVOC's	**3632**	**19**	**4.6**	**194**	**10**	**ug/L**
	% CVOC Removal	**-**	**99.5%**	**99.9%**	**94.7%**	**99.7%**	**%**
Other VOCs	Acetone	ND (100)	1300	35	41	42	ug/L
	Bromochloromethane	ND (10)	ND (2.0)	ND (1.0)	53	ND (1.0)	ug/L
	Bromomethane	ND (30)	ND (6.0)	ND (3.0)	4.4 J	ND (3.0)	ug/L
	Carbon disulfide	ND (20)	3.6 J	ND (2.0)	ND (4.0)	ND (2.0)	ug/L
	Methylene Chloride	ND (50)	ND (10)	ND (5.0)	2600 E	ND (5.0)	ug/L
Lab Parameters	ORP	220	362	142	439	468	mV
	pH	9.73	6.92	12.74	6.14	6.94	SI Units
	Initial Persulfate	-	15	15	15	15	g/L
	Persulfate - Day 7	-	13.0	12.2	12.7	13.3	g/L
	% Persulfate Consumption =	-	13.3%	18.5%	15.6%	11.4%	**%**

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

ND = Indicates the analyte was analyzed for but not detected.

E = Result Exceeded calibration limits

Table A2: Day 28 Groundwater results

Analysis	Parameter Name	Control	Klozur® One	Klozur® SP + 25 % NaOH	Klozur® SP + Fe-EDTA	Unactivated Klozur® SP	Units
CVOCs	Chloroethane	ND (2.4)	ND (0.47)	ND (0.47)	3.0 J	ND (0.47)	ug/L
	Chloroform	6.7 J	ND (0.92)	1.5 J	18	ND (0.92)	ug/L
	Chloromethane	ND (3.9)	16	ND (0.79)	340	ND (0.79)	ug/L
	cis-1,2-Dichloroethene	15	1.4	ND (0.42)	0.46 J	ND (0.42)	ug/L
	1,1-Dichloroethane	ND (1.8)	ND (0.36)	ND (0.36)	0.80 J	ND (0.36)	ug/L
	1,2-Dichloroethane	ND (2.9)	ND (0.58)	ND (0.58)	26	ND (0.58)	ug/L
	1,1-Dichloropropene	ND (1.7)	0.83 J	ND (0.33)	ND (0.33)	ND (0.33)	ug/L
	1,1,2,2-Tetrachloroethane	ND (3.2)	ND (0.65)	ND (0.65)	8.1	ND (0.65)	ug/L
	Tetrachloroethene	13	9.6	6.8	3.8	13	ug/L
	1,1,2-Trichloroethane	ND (3.7)	ND (0.73)	ND (0.73)	7.3	ND (0.73)	ug/L
	Trichloroethene	2,600	74	4.80	27	0.29 J	ug/L
	Total CVOC's	**2,635**	**102**	**13.1**	**434**	**13.3**	**ug/L**
	% CVOC Removal	**-**	**96.1%**	**99.5%**	**83.5%**	**99.5%**	**%**
Other VOCs	Acetone	ND (22)	5,800	35	44	75	ug/L
	Benzene	ND (0.88)	0.56	0.19 J	ND (0.18)	ND (0.18)	ug/L
	Bromochloromethane	ND (2.5)	ND (0.50)	ND (0.50)	65	ND (0.50)	ug/L
	Bromomethane	ND (9.0)	3.3	ND (1.8)	14	ND (1.8)	ug/L
	2-Butanone (MEK)	ND (12)	6.0	ND (2.3)	ND (2.3)	ND (2.3)	ug/L
	Carbon disulfide	ND (5.4)	660	ND (1.1)	11	ND (1.1)	ug/L
	Dibromomethane	ND (2.9)	ND (0.58)	ND (0.58)	1.8	ND (0.58)	ug/L
	Methylene Chloride	ND (18)	ND (3.6)	ND (3.6)	350	ND (3.6)	ug/L
Lab Parameters	ORP	235	367	145	501	449	mV
	pH	9.58	6.12	12.58	3.52	6.44	SI Units
	Initial Persulfate	-	15	15	15	15	g/L
	Persulfate - Day 7	-	10.9	8.9	4.7	12.5	g/L
	% Persulfate Consumption =	**-**	**27.2%**	**40.7%**	**68.7%**	**16.8%**	**%**

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

ND = Indicates the analyte was analyzed for but not detected.

Table A3: Day 28 Soil results

Analysis	Parameter Name	Control	Klozur® One	Klozur® SP + 25 % NaOH	Klozur® SP + Fe-EDTA	Unactivated Klozur® SP	Units
CVOCs	Chloromethane	ND (1.2)	ND (1.3)	ND (1.4)	9.9	ND (1.2)	ug/Kg
	cis-1,2-Dichloroethene	1.9 J	ND (1.1)	ND (1.2)	ND (1.1)	ND (1.0)	ug/Kg
	1,2-Dichloroethane	ND (0.90)	ND (1.0)	ND (1.9)	1.9 J	ND (1.6)	ug/Kg
	Tetrachloroethene	14	4.8	12	6.4	13	ug/Kg
	Trichloroethene	460	67	20	57	25	ug/Kg
	Total CVOC's	**476**	**72**	**32**	**81**	**42**	**ug/Kg**
	% CVOC Removal	**-**	**84.9%**	**93.3%**	**83.0%**	**91.2%**	**%**
Other VOCs	Acetone	ND (10)	1300	ND (12)	ND (11)	ND (11)	ug/Kg
	Bromochloromethane	ND (1.2)	ND (1.3)	ND (1.4)	3.9	ND (1.2)	ug/Kg
	Carbon disulfide	ND (1.1)	150	ND (1.3)	5.5 J	3.9 J	ug/Kg
	Methylene Chloride	ND (2.6)	ND (2.9)	ND (3.1)	7.8	ND (2.7)	ug/Kg

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

ND = Indicates the analyte was analyzed for but not detected.

E = Result Exceeded calibration limits

APPENDIX E

HISTORICAL DATA

TABLE 1 (PAGE 1 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-HRW1BK	OLN-HRW1GY	OLN-HRW1YL	OLN-HRW1GN	OLN-HRW1PK	OLN-HRW1OR	OLN-HRW1RD
	Sample ID:	OLN-HRW1BK-F001	OLN-HRW1GY-F001	OLN-HRW1YL-F001	OLN-HRW1GN-F001	OLN-HRW1PK-F001	OLN-HRW1OR-F001	OLN-HRW1RD-F001
	Lab ID:	R2208811-001	R2208811-002	R2208811-015	R2208811-016	R2208811-017	R2208811-019	R2208811-020
	Date:	9/12/2022	9/12/2022	9/13/2022	9/13/2022	9/13/2022	9/13/2022	9/13/2022
	Time:	16:11	17:55	9:03	11:00	12:00	13:46	17:01
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**							
pH	*S.U.*	**7.79**	**5.96**	**6.84**	**6.99**	**7.03**	**6.99**	**7.05**
Conductance	*mS/cm*	**0.957**	**1.06**	**2.15**	**2.5**	**1.89**	**1.66**	**1.3**
Dissolved Oxygen	*mg/L*	**0.22**	**0.26**	**9.77**	**2.03**	**1.2**	**0.28**	**1.17**
Oxidation Reduction Potential	*mV*	**-27**	**234**	**421**	**336**	**326**	**435**	**342**
Field Alkalinity	*mg/l*	**0**	**480**	**213**	**222**	**213**	**210**	**216**
Field Persulfate	*mg/l*	**0**	**5.6**	**7**	**35**	**4.2**	**21**	**0**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	*mg/l*	**0.0051**	**0.35**	**0.036 D**	**0.042**	**0.1**	**0.1**	**0.68**
Tetrachloroethene	*mg/l*	<0.005	<0.025	**0.0021 DJ**	<0.01	<0.05	<0.05	<0.05
trans-1,2-Dichloroethene	*mg/l*	<0.005	**0.012 J**	**0.0014 DJ**	**0.0052 J**	<0.05	<0.05	<0.05
Trichloroethene	*mg/l*	**0.39**	**3**	**0.42 D**	**0.99**	**3.3**	**3.7**	**7.6**
Vinyl Chloride	*mg/l*	<0.005	**0.022 J**	**0.0034 DJ**	**0.0026 J**	<0.05	<0.05	**0.031 J**
Anions and General Chemistry								
Total Organic Carbon	*mg/l*	**1.8**	**1.8**	**1.1**	**1.2**	**1.1**	**0.9 J**	**3**
Chloride	*mg/l*	**131**	**124**	**544**	**596**	**473**	**382**	**269**
Sulfate	*mg/l*	**33.9**	**43**	**30.9**	**39.8**	**29.9**	**42.4**	**52.4**
Metals								
Aluminum, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.225**	**0.204**	**0.275**	**0.243**	**0.207**	**0.166**	**0.127**
Beryllium, Dissolved	*mg/l*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**142**	**140**	**127**	**122**	**122**	**121**	**144**
Chromium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	*mg/l*	**0.0009 J**	<0.05	<0.05	<0.05	**0.001 J**	**0.001 J**	**0.002 J**
Copper, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**23.1**	**22.8**	**19.7**	**19.8**	**18.5**	**18**	**22.6**
Manganese, Dissolved	*mg/l*	**0.245**	**0.187**	**0.05**	**0.057**	**0.024**	**0.026**	**0.244**
Nickel, Dissolved	*mg/l*	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium, Dissolved	*mg/l*	**1.9 J**	**2**	**2.7**	**2.8**	**2.5**	**2.6**	**2.6**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	*mg/l*	**49.4**	**56.9**	**256**	**302**	**230**	**173**	**79.3**
Titanium, Dissolved	*mg/l*	**0.007 J**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	**0.0008 J**	<0.05	<0.05	<0.05	<0.05	<0.05	**0.0008 J**
Zinc, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 1 (PAGE 2 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-HRW2BK	OLN-HRW2GY	OLN-HRW2YL	OLN-HRW2GN	OLN-HRW2PK	OLN-HRW2OR	OLN-HRW2RD
	Sample ID:	OLN-HRW2BK-F001	OLN-HRW2GY-F001	OLN-HRW2YL-F001	OLN-HRW2GN-F001	OLN-HRW2PK-F001	OLN-HRW2OR-F001	OLN-HRW2RD-F001
	Lab ID:	R2208812-016	R2208812-017	DRY	R2208812-019	R2208813-001	R2208813-002	R2208813-005
	Date:	9/14/2022	9/14/2022	--	9/14/2022	9/14/2022	9/14/2022	9/15/2022
	Time:	13:25	15:09	--	16:20	17:25	18:43	10:51
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**							
pH	*S.U.*	**7.96**	**7.12**	NA	**6.73**	**6.93**	**6.78**	**8.04**
Conductance	*mS/cm*	**1.24**	**0.963**	NA	**0.907**	**0.927**	**0.987**	**1.14**
Dissolved Oxygen	*mg/L*	**4.8**	**3.24**	NA	**4**	**2.34**	**4.13**	**0.21**
Oxidation Reduction Potential	*mV*	**391**	**378**	NA	**336**	**333**	**435**	**54**
Field Alkalinity	*mg/l*	**330**	**315**	NA	**258**	**270**	**345**	**204**
Field Persulfate	*mg/l*	**56**	**56**	NA	**0**	**0**	**0**	**0.7**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	*mg/l*	**0.0025**	**0.0036**	NA	**0.0069**	**0.0055 D**	**0.042**	**0.44**
Tetrachloroethene	*mg/l*	**0.00092 J**	**0.0015**	NA	**0.0015 J**	**0.0014 DJ**	**0.0036 J**	<0.025
trans-1,2-Dichloroethene	*mg/l*	**0.00046 J**	**0.00056 J**	NA	**0.00056 J**	**0.00045 DJ**	<0.01	**0.0071 J**
Trichloroethene	*mg/l*	**0.07**	**0.14**	NA	**0.22**	**0.19 D**	**1.7**	**2.8**
Vinyl Chloride	*mg/l*	<0.001	<0.001	NA	<0.002	<0.002	<0.01	**0.022 J**
Anions and General Chemistry								
Total Organic Carbon	*mg/l*	**0.5 J**	<1	NA	<1	<1	**0.6 J**	**4.8**
Chloride	*mg/l*	**95.5**	**93.5**	NA	**93.1**	**93.6**	**115**	**201**
Sulfate	*mg/l*	**99.2**	**37.8**	NA	**28.9**	**29.1**	**31.4**	**33.5**
Metals								
Aluminum, Dissolved	*mg/l*	<0.1	<0.1	NA	<0.1	<0.1	<0.1	**0.08 J**
Antimony, Dissolved	*mg/l*	<0.06	<0.06	NA	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.129**	**0.141**	NA	**0.146**	**0.145**	**0.153**	**0.137**
Beryllium, Dissolved	*mg/l*	<0.003	<0.003	NA	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	NA	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**102**	**115**	NA	**119**	**117**	**122**	**123**
Chromium, Dissolved	*mg/l*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	**0.012**
Cobalt, Dissolved	*mg/l*	**0.0009 J**	<0.05	NA	**0.002 J**	<0.05	<0.05	**0.002 J**
Copper, Dissolved	*mg/l*	<0.02	<0.02	NA	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	NA	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**17.1**	**15**	NA	**14.7**	**14.6**	**15.3**	**14.2**
Manganese, Dissolved	*mg/l*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	**0.065**
Nickel, Dissolved	*mg/l*	<0.04	<0.04	NA	<0.04	<0.04	<0.04	<0.04
Potassium, Dissolved	*mg/l*	**1.7 J**	**1.6 J**	NA	**1.6 J**	**1.6 J**	**1.7 J**	**3.4**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	*mg/l*	**110**	**44.3**	NA	**32.2**	**31.8**	**37.2**	**47**
Titanium, Dissolved	*mg/l*	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	<0.05	**0.0009 J**	NA	<0.05	<0.05	<0.05	**0.0009 J**
Zinc, Dissolved	*mg/l*	<0.02	<0.02	NA	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	NA	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 1 (PAGE 3 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-HRW3BK	OLN-HRW3GY	OLN-HRW3YL	OLN-HRW3GN	OLN-HRW3PK	OLN-HRW3OR	OLN-HRW3RD
	Sample ID:	OLN-HRW31BK-F001	OLN-HRW31GY-F001	OLN-HRW31YL-F001	OLN-HRW3GN-F001	OLN-HRW3PK-F001	OLN-HRW3OR-F001	OLN-HRW3RD-F001
	Lab ID:	R2208812-004	R2208812-005	R2208812-006	R2208812-007	R2208812-008	R2208812-009	R2208813-011
	Date:	9/14/2022	9/14/2022	9/14/2022	9/14/2022	9/14/2022	9/14/2022	9/15/2022
	Time:	11:06	12:45	15:30	16:30	17:35	18:45	14:20
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**							
pH	*S.U.*	**6.86**	**6.86**	**6.67**	**7.1**	**7.46**	**9.3**	**10.29**
Conductance	*mS/cm*	**1.2**	**1.24**	**0.631**	**0.69**	**1.42**	**1.1**	**1.61**
Dissolved Oxygen	*mg/L*	**1.09**	**1.22**	**5.59**	**0.83**	**0.37**	**0.82**	**1.13**
Oxidation Reduction Potential	*mV*	**29**	**58**	**94**	**-29**	**-101**	**-78**	**-160**
Field Alkalinity	*mg/l*	**375**	**420**	**420**	**435**	**276**	**159**	**195**
Field Persulfate	*mg/l*	**0**	**0.7**	**0.7**	**0**	**0.7**	**3.5**	**7**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	*mg/l*	**0.00034 J**	<0.001	**0.0033**	**0.024**	**0.032**	**0.24**	**0.37**
Tetrachloroethene	*mg/l*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.01
trans-1,2-Dichloroethene	*mg/l*	<0.001	<0.001	<0.001	**0.00023 J**	**0.00082 J**	**0.0071 J**	**0.0083 J**
Trichloroethene	*mg/l*	**0.0028**	**0.0039**	**0.04**	**0.033**	**0.15**	**2.3**	**0.89**
Vinyl Chloride	*mg/l*	<0.001	<0.001	<0.001	**0.0011**	**0.00095 J**	**0.013 J**	**0.019**
Anions and General Chemistry								
Total Organic Carbon	*mg/l*	**2**	**1.9**	**1.8**	**7.1**	**5.2**	**8.3**	**5.9**
Chloride	*mg/l*	**270**	**276**	**273**	**274**	**287**	**216**	**267**
Sulfate	*mg/l*	**32.4**	**31.7**	**32.5**	**32.6**	**42**	**43.5**	**45.4**
Metals								
Aluminum, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	**0.06 J**	**0.2**
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.296**	**0.298**	**0.305**	**0.295**	**0.212**	**0.088**	**0.047**
Beryllium, Dissolved	*mg/l*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**169**	**170**	**170**	**172**	**148**	**92.5**	**101**
Chromium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	**0.003 J**	**0.007 J**	**0.009 J**
Cobalt, Dissolved	*mg/l*	**0.0009 J**	**0.0009 J**	<0.05	**0.001 J**	**0.001 J**	<0.05	<0.05
Copper, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**30.8**	**30.9**	**30.9**	**30.8**	**23.7**	**6.7**	**0.06 J**
Manganese, Dissolved	*mg/l*	<0.01	<0.01	**0.015**	**0.041**	**0.083**	**0.059**	<0.01
Nickel, Dissolved	*mg/l*	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium, Dissolved	*mg/l*	**2.1**	**2 J**	**2.1**	**2.5**	**3.3**	**3.7**	**5.1**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	*mg/l*	**100**	**100**	**100**	**103**	**112**	**122**	**154**
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	<0.05	**0.0007 J**	**0.0008 J**	**0.001 J**	**0.002 J**	**0.005 J**	**0.007 J**
Zinc, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
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D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 1 (PAGE 4 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-HRW4BK	OLN-HRW4GY	OLN-HRW4YL	OLN-HRW4GN	OLN-HRW4PK	OLN-HRW4OR	OLN-HRW4RD
	Sample ID:	OLN-HRW4BK-F001	OLN-HRW4GY-F001	OLN-HRW4YL-F001	OLN-HRW4GN-F001	OLN-HRW4PK-F001	OLN-HRW4OR-F001	OLN-HRW4RD-F001
	Lab ID:	R2208814-012	R2208813-006	R2208813-009	R2208814-007	R2208814-013	R2208814-004	R2208814-003
	Date:	9/16/2022	9/15/2022	9/15/2022	9/15/2022	9/16/2022	9/15/2022	9/15/2022
	Time:	7:35	12:15	14:37	16:17	7:55	18:49	18:33
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**							
pH	*S.U.*	**10.87**	**7.94**	**8.42**	**9.9**	**8.34**	**7.4**	**7.82**
Conductance	*mS/cm*	**0.42**	**1.32**	**1.29**	**1.07**	**0.814**	**0.828**	**0.93**
Dissolved Oxygen	*mg/L*	**5.01**	**6.91**	**4.84**	**8.03**	**2.81**	**1.95**	**7.43**
Oxidation Reduction Potential	*mV*	**52**	**208**	**152**	**101**	**193**	**174**	**61**
Field Alkalinity	*mg/l*	**549**	**207**	**168**	**159**	**249**	**0**	**207**
Field Persulfate	*mg/l*	**5.6**	**0**	**0.7**	**0**	**3.5**	**0**	**0**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	*mg/l*	**0.013**	**0.0092**	**0.0087**	**0.081**	**0.28**	**0.066**	**0.059**
Tetrachloroethene	*mg/l*	<0.001	**0.00023 J**	**0.00032 J**	**0.012 J**	<0.05	<0.005	<0.0025
trans-1,2-Dichloroethene	*mg/l*	**0.00057 J**	**0.00064 J**	**0.00058 J**	<0.025	<0.05	**0.0025 J**	**0.0016 J**
Trichloroethene	*mg/l*	**0.19**	**0.19**	**0.15**	**2.5**	**4.8**	**0.66**	**0.33**
Vinyl Chloride	*mg/l*	**0.001**	**0.00058 J**	**0.00062 J**	<0.025	<0.05	**0.0031 J**	**0.004**
Anions and General Chemistry								
Total Organic Carbon	*mg/l*	**9**	**39.3**	**15.2**	**23.8**	**44.2**	**12.5**	**24.5**
Chloride	*mg/l*	**184**	**268**	**268**	**188**	**116**	**102**	**103**
Sulfate	*mg/l*	**751**	**54.4**	**54.5**	**35**	**45.2**	**39.7**	**33.2**
Metals								
Aluminum, Dissolved	*mg/l*	**2.03**	<0.1	<0.1	**0.08 J**	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	**0.021**	<0.01	<0.01	<0.01	**0.013**	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.023**	**0.116**	**0.08**	**0.062**	**0.051**	**0.101**	**0.156**
Beryllium, Dissolved	*mg/l*	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**16.3**	**84**	**65.4**	**74.6**	**38.2**	**77.1**	**116**
Chromium, Dissolved	*mg/l*	**0.263**	**0.004 J**	**0.015**	**0.039**	**0.009 J**	**0.005 J**	**0.007 J**
Cobalt, Dissolved	*mg/l*	<0.05	<0.05	**0.001 J**	**0.001 J**	<0.05	**0.002 J**	<0.05
Copper, Dissolved	*mg/l*	**0.01 J**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	**0.13**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	<1	**8.7**	**5.9**	**0.2 J**	**2.5**	**6.5**	**9.6**
Manganese, Dissolved	*mg/l*	<0.01	**0.083**	**0.024**	<0.01	**0.021**	**0.038**	**0.079**
Nickel, Dissolved	*mg/l*	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium, Dissolved	*mg/l*	**57**	**2.7**	**3.2**	**3.4**	**2.4**	**2.6**	**3.1**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	*mg/l*	**805**	**173**	**165**	**111**	**133**	**63.3**	**50.9**
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	**0.055**	**0.002 J**	**0.002 J**	**0.005 J**	**0.002 J**	**0.0009 J**	**0.001 J**
Zinc, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 1 (PAGE 5 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-HRW5BK	OLN-HRW5GY	OLN-HRW5YL	OLN-HRW5GN	OLN-HRW5PK	OLN-HRW5OR	OLN-HRW5RD
	Sample ID:	OLN-HRW5BK-F001	OLN-HRW5GY-F001	OLN-HRW5YL-F001	OLN-HRW5GN-F001	OLN-HRW5PK-F001	OLN-HRW5OR-F001	OLN-HRW5RD-F001
	Lab ID:	R2208814-014	DRY	R2208813-013	R2208813-012	R2208814-016	R2208812-002	R2208812-003
	Date:	9/16/2022	--	9/15/2022	9/15/2022	9/16/2022	9/13/2022	9/13/2022
	Time:	8:25	--	11:40	13:08	9:05	17:18	18:30
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**							
pH	*S.U.*	**7.08**	NA	**11.24**	**8.78**	**7.29**	**7.42**	**7.16**
Conductance	*mS/cm*	**2.67**	NA	**2.21**	**1160**	**1.11**	**1.16**	**1.31**
Dissolved Oxygen	*mg/L*	**3.16**	NA	**4.39**	**1.39**	**9.83**	**0.41**	**0.4**
Oxidation Reduction Potential	*mV*	**270**	NA	**-78**	**-58**	**248**	**-52**	**-69**
Field Alkalinity	*mg/l*	**534**	NA	**132**	**285**	**279**	**201**	**249**
Field Persulfate	*mg/l*	**0**	NA	**1.4**	**0.7**	**0**	**0**	**0**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	*mg/l*	**0.32 D**	NA	**0.096**	**0.58**	**0.038**	**0.032**	**0.015**
Tetrachloroethene	*mg/l*	<0.005	NA	<0.05	<0.25	<0.001	<0.001	<0.001
trans-1,2-Dichloroethene	*mg/l*	**0.0034 DJ**	NA	**0.024 J**	**0.066 J**	**0.00067 J**	**0.00049 J**	**0.00033 J**
Trichloroethene	*mg/l*	**0.17 D**	NA	**4.7**	**22**	**0.12**	**0.15**	**0.019**
Vinyl Chloride	*mg/l*	**0.001 DJ**	NA	<0.05	<0.25	**0.0014**	**0.0021**	**0.0027**
Anions and General Chemistry								
Total Organic Carbon	*mg/l*	**96.8**	NA	**9.8**	**4.4**	**13.8**	**4.1**	**24.4**
Chloride	*mg/l*	**563**	NA	**255**	**211**	**153**	**222**	**260**
Sulfate	*mg/l*	**51.9**	NA	**27.3**	**49.2**	**58.7**	**42**	**30.5**
Metals								
Aluminum, Dissolved	*mg/l*	<0.1	NA	**1.36**	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	<0.06	NA	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	**0.012**	NA	<0.01	<0.01	<0.01	<0.01	**0.014**
Barium, Dissolved	*mg/l*	**0.173**	NA	**0.072**	**0.164**	**0.202**	**0.11**	**0.117**
Beryllium, Dissolved	*mg/l*	<0.003	NA	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	*mg/l*	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**151**	NA	**120**	**120**	**98.3**	**69.5**	**64.9**
Chromium, Dissolved	*mg/l*	<0.01	NA	**0.029**	**0.002 J**	<0.01	<0.01	<0.01
Cobalt, Dissolved	*mg/l*	<0.05	NA	<0.05	<0.05	<0.05	<0.05	**0.001 J**
Copper, Dissolved	*mg/l*	<0.02	NA	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	**0.08 J**	NA	<0.1	<0.1	<0.1	<0.1	<0.27
Lead, Dissolved	*mg/l*	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**31.7**	NA	**0.3 J**	**14.8**	**15.4**	**12.4**	**11.4**
Manganese, Dissolved	*mg/l*	**1.28**	NA	<0.01	**0.703**	**0.337**	**0.299**	**2.88**
Nickel, Dissolved	*mg/l*	<0.04	NA	<0.04	<0.04	<0.04	<0.04	**0.008 J**
Potassium, Dissolved	*mg/l*	**2.6**	NA	**4.8**	**2.9**	**2.5**	**2.3**	**8.7**
Selenium, Dissolved	*mg/l*	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	*mg/l*	**386**	NA	**119**	**97.7**	**85.2**	**124**	**169**
Titanium, Dissolved	*mg/l*	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	<0.05	NA	**0.003 J**	**0.002 J**	**0.002 J**	<0.05	<0.05
Zinc, Dissolved	*mg/l*	**0.003 J**	NA	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	NA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
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Qualifiers:
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TABLE 1 (PAGE 6 OF 8)
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OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-RU004	OLN-RU005	OLN-RU22A	OLN-RU22B	OLN-RU029	OLN-RU030	OLN-RU031
	Sample ID:	OLN-RU004-F001	OLN-RU005-F001	OLN-RU22A-F001	OLN-RU22B-F001	OLN-RU029-F001	OLN-RU030-F001	OLN-RU031-F001
	Lab ID:	DRY	R2208813-019	R2208812-013	R2208813-015	R2208813-020	R2208814-001	R2208811-011
	Date:	--	9/15/2022	9/14/2022	9/15/2022	9/15/2022	9/15/2022	9/13/2022
	Time:	--	13:10	14:45	7:50	15:20	16:40	14:00
	Location:	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area
Field Readings	**Units**							
pH	S.U.	NA	**6.98**	**7.47**	**6.25**	**6.88**	**7.17**	**6.71**
Conductance	mS/cm	NA	**1.16**	**2.52**	**2.63**	**1.41**	**1.1**	**0.97**
Dissolved Oxygen	mg/L	NA	**0.32**	**8.07**	**3.74**	**0.56**	**8.1**	**2.28**
Oxidation Reduction Potential	mV	NA	**61**	**44**	**174**	**112**	**53**	**257**
Field Alkalinity	mg/l	NA	**180**	**210**	**600**	**420**	**195**	**405**
Field Persulfate	mg/l	NA	**0**	**0**	**0**	**0**	**1.4**	**0**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	mg/l	NA	**0.2**	**0.17**	**0.57**	**0.38**	<0.05	**0.0051**
Tetrachloroethene	mg/l	NA	**0.016 J**	**0.00021 J**	**0.0076 J**	<0.1	**0.023 J**	**0.00027 J**
trans-1,2-Dichloroethene	mg/l	NA	<0.05	**0.0014**	**0.0048 J**	<0.1	<0.05	**0.00066 J**
Trichloroethene	mg/l	NA	**6.4**	**0.06**	**0.97**	**7.2**	**5.5**	**0.20**
Vinyl Chloride	mg/l	NA	<0.05	**0.031**	**0.24**	**0.059 J**	<0.05	<0.001
Anions and General Chemistry								
Total Organic Carbon	mg/l	NA	**20.9**	**6.8**	**15.2**	**4.6**	**1.8**	**0.7 J**
Chloride	mg/l	NA	**195**	**653**	**448**	**239**	**271**	**110**
Sulfate	mg/l	NA	**35.1**	**29.6**	**63.1**	**36.9**	**22.7**	**30.4**
Metals								
Aluminum, Dissolved	mg/l	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	mg/l	NA	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	mg/l	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	mg/l	NA	**0.152**	**0.215**	**0.169**	**0.193**	**0.11**	**0.174**
Beryllium, Dissolved	mg/l	NA	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	mg/l	NA	<0.005	<0.005	**0.0065**	<0.005	<0.005	<0.005
Calcium, Dissolved	mg/l	NA	**109**	**143**	**117**	**142**	**80.6**	**125**
Chromium, Dissolved	mg/l	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	mg/l	NA	<0.05	**0.008 J**	**0.008 J**	**0.001 J**	<0.05	<0.05
Copper, Dissolved	mg/l	NA	<0.02	<0.02	**0.058**	<0.02	<0.02	<0.02
Iron, Dissolved	mg/l	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	mg/l	NA	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	mg/l	NA	**14.1**	**28.8**	**23**	**21.5**	**12.3**	**16.6**
Manganese, Dissolved	mg/l	NA	<0.01	**3.28**	**0.418**	**0.079**	**0.21**	<0.01
Nickel, Dissolved	mg/l	NA	<0.04	**0.039 J**	**0.088**	**0.003 J**	<0.04	<0.04
Potassium, Dissolved	mg/l	NA	**2.1**	**3.6**	**3.2**	**2.5**	**2**	**1.9 J**
Selenium, Dissolved	mg/l	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	mg/l	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	mg/l	NA	**91.5**	**414**	**399**	**92.9**	**128**	**35.7**
Titanium, Dissolved	mg/l	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	mg/l	NA	<0.05	<0.05	**0.009 J**	<0.05	<0.05	<0.05
Zinc, Dissolved	mg/l	NA	**0.005 J**	<0.02	**0.004 J**	**0.004 J**	<0.02	<0.02
Mercury, Dissolved	mg/l	NA	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 1 (PAGE 7 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-RU006	OLN-RU32	OLN-VERW1	OLN-P001	OLN-UA005	OLN-UC004	OLN-UC005	OLN-RW001	OLN-RW002
	Sample ID:	OLN-RU006-F001	OLN-RU32-F001	OLN-VERW1-F001	OLN-P001-F001	OLN-UA005-F001	OLN-UC004-F001	OLN-UC005-F001	OLN-RW001-F001	OLN-RW002-F001
	Lab ID:	R2208813-016	R2208813-017	R2208812-014	DRY	R2208811-005	R2208811-008	R2208811-007	R2208811-012	R2208811-013
	Date:	9/15/2022	9/15/2022	9/14/2022	--	9/12/2022	9/12/2022	9/12/2022	9/13/2022	9/13/2022
	Time:	10:30	11:40	18:00	--	9:31	18:29	15:51	16:20	17:44
	Location:	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient
Field Readings	**Units**									
pH	**S.U.**	**6.72**	**6.89**	**6.09**	**NA**	**6.47**	**7.52**	**7.54**	**6.88**	**6.84**
Conductance	**mS/cm**	**0.783**	**0.638**	**1.69**	**NA**	**0.669**	**1.14**	**1**	**0.817**	**0.66**
Dissolved Oxygen	**mg/L**	**0.27**	**2.76**	**1.41**	**NA**	**0**	**0.82**	**0.78**	**4.36**	**6.27**
Oxidation Reduction Potential	**mV**	**209**	**213**	**178**	**NA**	**164**	**206**	**133**	**280**	**255**
Field Alkalinity	**mg/l**	**330**	**240**	**390**	**NA**	**225**	**258**	**240**	**300**	**200**
Field Persulfate	**mg/l**	**2.8**	**2.8**	**0**	**NA**	**0**	**7**	**0**	**0**	**0**
Volatile Organic Compounds										
cis-1,2-Dichloroethene	**mg/l**	**0.013**	<0.001	**0.12**	**NA**	<0.001	**0.0026**	**0.00043 J**	<0.001	<0.001
Tetrachloroethene	**mg/l**	**0.0042 J**	<0.001	**0.0027 J**	**NA**	**0.00027 J**	<0.001	<0.001	**0.00034 J**	**0.00021 J**
trans-1,2-Dichloroethene	**mg/l**	<0.01	<0.001	**0.0015 J**	**NA**	<0.001	**0.0011**	<0.001	<0.001	<0.001
Trichloroethene	**mg/l**	**0.79**	**0.004**	**0.42**	**NA**	**0.0031**	**0.045**	**0.048**	**0.0059**	**0.0043**
Vinyl Chloride	**mg/l**	<0.01	<0.001	**0.089**	**NA**	<0.001	<0.001	<0.001	<0.001	<0.001
Anions and General Chemistry										
Total Organic Carbon	**mg/l**	**0.5 J**	<1	**11.8**	**NA**	<1	**0.5 J**	<1	<1	**2.5**
Chloride	**mg/l**	**90.8**	**69.5**	**332**	**NA**	**77.1**	**196**	**165**	**78.6**	**65.9**
Sulfate	**mg/l**	**29.1**	**24.9**	**50**	**NA**	**26.1**	**35.3**	**36.7**	**26.2**	**23.7**
Metals										
Aluminum, Dissolved	**mg/l**	<0.1	<0.1	<0.1	**NA**	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	**mg/l**	<0.06	<0.06	<0.06	**NA**	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	**mg/l**	<0.01	<0.01	<0.01	**NA**	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	**mg/l**	**0.146**	**0.122**	**0.126**	**NA**	**0.111**	**0.22**	**0.166**	**0.134**	**0.124**
Beryllium, Dissolved	**mg/l**	<0.003	<0.003	<0.003	**NA**	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	**mg/l**	<0.005	<0.005	<0.005	**NA**	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	**mg/l**	**106**	**112**	**115**	**NA**	**105**	**113**	**113**	**111**	**102**
Chromium, Dissolved	**mg/l**	<0.01	<0.01	<0.01	**NA**	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	**mg/l**	<0.05	<0.05	**0.007 J**	**NA**	<0.05	<0.05	**0.001 J**	**0.0009 J**	**0.001 J**
Copper, Dissolved	**mg/l**	<0.02	<0.02	<0.02	**NA**	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	**mg/l**	<0.1	<0.1	<0.11	**NA**	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	**mg/l**	<0.005	<0.005	<0.005	**NA**	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	**mg/l**	**14.9**	**12**	**16.5**	**NA**	**11**	**17.4**	**18.6**	**12.5**	**11.3**
Manganese, Dissolved	**mg/l**	**0.084**	<0.01	**7.64**	**NA**	**0.032**	<0.01	**0.063**	<0.01	<0.01
Nickel, Dissolved	**mg/l**	<0.04	<0.04	**0.031 J**	**NA**	<0.04	**0.01 J**	<0.04	<0.04	<0.04
Potassium, Dissolved	**mg/l**	**1.5 J**	**1.5 J**	**14.5**	**NA**	**1.5 J**	**3**	**2.3**	**1.6 J**	**3.7**
Selenium, Dissolved	**mg/l**	<0.01	<0.01	<0.01	**NA**	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	**mg/l**	<0.01	<0.01	<0.01	**NA**	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	**mg/l**	**42.6**	**24.9**	**180**	**NA**	**27.2**	**68.3**	**51.6**	**28.4**	**25.2**
Titanium, Dissolved	**mg/l**	<0.05	<0.05	<0.05	**NA**	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	**mg/l**	<0.05	<0.05	<0.05	**NA**	<0.05	<0.05	**0.0007 J**	**0.0007 J**	**0.001 J**
Zinc, Dissolved	**mg/l**	<0.02	<0.02	**0.005 J**	**NA**	**0.003 J**	<0.02	<0.02	<0.02	**0.005 J**
Mercury, Dissolved	**mg/l**	<0.0002	<0.0002	<0.0002	**NA**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 1 (PAGE 8 OF 8)
BASELINE GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-RW003	OLN-RW004	OLN-RW005	OLN-UA004	OLN-BC004	OLN-BC005	OLN-WW18M
	Sample ID:	OLN-RW003-F001	OLN-RW004-F001	OLN-RW005-F001	OLN-UA004-F001	OLN-BC004-F001	OLN-BC005-F001	OLN-WW18M-F001
	Lab ID:	R2208812-010	R2208812-011	R2208812-012	R2208811-010	R2208811-009	R2208811-006	R2208813-008
	Date:	9/14/2022	9/14/2022	9/14/2022	9/13/2022	9/13/2022	9/12/2022	9/15/2022
	Time:	8:45	10:00	11:34	11:33	9:36	12:38	13:00
	Location:	Downgradient	Downgradient	Downgradient	Contingency	Contingency	Contingency	Sentinel
Field Readings	**Units**							
pH	**S.U.**	**6.68**	**6.7**	**6.77**	**6.87**	**6.99**	**6.71**	**6.97**
Conductance	**mS/cm**	**0.771**	**0.853**	**0.808**	**0.701**	**0.717**	**0.493**	**0.508**
Dissolved Oxygen	**mg/L**	**2.27**	**1.82**	**3.08**	**3.47**	**2.38**	**1.22**	**2.92**
Oxidation Reduction Potential	**mV**	**71**	**151**	**165**	**241**	**202**	**165**	**295**
Field Alkalinity	**mg/l**	**210**	**288**	**255**	**240**	**180**	**183**	**182**
Field Persulfate	**mg/l**	**0**	**4.6**	**3**	**0**	**0**	**0**	**0**
Volatile Organic Compounds								
cis-1,2-Dichloroethene	**mg/l**	<0.001	<0.001	**0.003**	<0.001	<0.001	<0.001	**0.00034 J**
Tetrachloroethene	**mg/l**	**0.00024 J**	<0.001	**0.00027 J**	<0.001	<0.001	<0.001	<0.001
trans-1,2-Dichloroethene	**mg/l**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichloroethene	**mg/l**	**0.0055**	**0.019**	**0.079**	**0.0015**	<0.001	**0.0011**	**0.012**
Vinyl Chloride	**mg/l**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anions and General Chemistry								
Total Organic Carbon	**mg/l**	**0.8 J**	**2.4**	**1**	<1	**0.6 J**	<1	**1.3**
Chloride	**mg/l**	**74.3**	**72.7**	**76**	**72**	**95.2**	**46.2**	**55.6**
Sulfate	**mg/l**	**26.2**	**24.6**	**26.9**	**26.1**	**23.1**	**17.4**	**20.5**
Metals								
Aluminum, Dissolved	**mg/l**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	**mg/l**	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	**mg/l**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	**mg/l**	**0.14**	**0.151**	**0.133**	**0.117**	**0.035**	**0.032**	**0.03**
Beryllium, Dissolved	**mg/l**	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cadmium, Dissolved	**mg/l**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	**mg/l**	**104**	**114**	**108**	**112**	**71.9**	**62**	**63.3**
Chromium, Dissolved	**mg/l**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt, Dissolved	**mg/l**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper, Dissolved	**mg/l**	<0.02	<0.02	<0.02	<0.02	<0.02	**0.014 J**	<0.02
Iron, Dissolved	**mg/l**	<0.1	<0.1	<0.11	<0.1	<0.1	**0.11**	<0.1
Lead, Dissolved	**mg/l**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	**mg/l**	**11.6**	**16.3**	**12.5**	**12.8**	**12.5**	**15.3**	**11.3**
Manganese, Dissolved	**mg/l**	**0.012**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel, Dissolved	**mg/l**	<0.04	<0.04	<0.04	<0.04	**0.44**	<0.04	<0.04
Potassium, Dissolved	**mg/l**	**1.6 J**	**1.9 J**	**1.9 J**	**1.5 J**	**2.5**	**1.1 J**	**1.1 J**
Selenium, Dissolved	**mg/l**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	**mg/l**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium, Dissolved	**mg/l**	**26.9**	**29.6**	**27.7**	**22.4**	**46.9**	**14.4**	**22.2**
Titanium, Dissolved	**mg/l**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	**mg/l**	**0.001 J**	**0.0009 J**	**0.0009 J**	<0.05	<0.05	<0.05	**0.0007 J**
Zinc, Dissolved	**mg/l**	<0.02	<0.02	**0.009 J**	<0.02	<0.02	**0.012 J**	<0.02
Mercury, Dissolved	**mg/l**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 2
ONE-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OPERABLE UNIT 2 IN THE ALCAS SOURCE AREA
OLEAN WELL FIELD SUPERFUND SITE
OLEAN, NEW YORK

	Well ID:	OLN-RU005	OLN-RU22A	OLN-RU22B	OLN-RU029	OLN-RU030	OLN-RU031	OLN-RU006	OLN-RU032	OLN-VERW1	OLN-P0001	OLN-UA005
	Sample ID:	OLN-RU005-F002	OLN-RU22A-F002	OLN-RU22B-F002	OLN-RU029-F002	OLN-RU030-F002	OLN-RU031-F002	OLN-RU006-F002	OLN-RU032-F002	OLN-VERW1-F002	OLN-P0001-F002	OLN-UA005-F002
	Lab ID:	R2212021-0021	R2212021-001	R2212021-002	R2212021-003	R2212021-020	R2212021-004	R2212021-006	R2212021-005	R2212021-007	R2212021-022	R2212021-008
	Date:	12/15/2022	12/13/2022	12/13/2022	12/14/2022	12/15/2022	12/14/2022	12/14/2022	12/14/2022	12/14/2022	12/15/2022	12/14/2022
	Time:	11:43	15:45	13:55	17:05	9:48	18:50	11:50	13:00	9:05	8:00	14:43
	Location:	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient
Field Readings	**Units**											
pH	S.U.	**11.24**	**5.52**	**4.86**	**11.83**	**7.09**	**12.31**	**6.47**	**7.01**	**6.37**	**7.29**	**6.75**
Conductance	mS/cm	**14.7**	**1.98**	**1.98**	**42.1**	**1.36**	**15.8**	**9.31**	**0.856**	**1.74**	**0.484**	**5.17**
Dissolved Oxygen	mg/L	**2.35**	**10.02**	**6.94**	**2.01**	**9.66**	**0.78**	**0.75**	**4.01**	**0.4**	**8.31**	**1.17**
Oxidation Reduction Potential	mV	**239**	**207**	**137**	**231**	**311**	**150**	**364**	**257**	**180**	**214**	**320**
Field Alkalinity	mg/l	**990**	**495**	**465**	**825**	**180**	**870**	**540**	**225**	**300**	**120**	**375**
Field Persulfate	mg/l	**4900**	**14**	**0**	**70**	**0**	**2100**	**2240**	**7**	**0**	**0**	**2240**
Volatile Organic Compounds												
cis-1,2-Dichloroethene	mg/l	**0.0086**	**0.06**	**0.98**	**0.16**	**0.00075 J**	**0.0069**	**0.08**	<0.001	**0.11**	**0.004**	<0.001
Tetrachloroethene	mg/l	**0.0016 J**	**0.00093 J**	**0.0026 J**	**0.0025 J**	**0.00057 J**	<0.005	**0.0064 J**	<0.001	**0.0041 J**	<0.001	**0.00033 J**
trans-1,2-Dichloroethene	mg/l	<0.005	**0.0012**	**0.0078 J**	**0.012**	<0.002	<0.005	**0.012**	<0.001	<0.01	**0.00044 J**	<0.001
Trichloroethene	mg/l	**0.13**	**0.08**	**1.2**	**1.2**	**0.22**	**0.19**	**1.5**	**0.0025**	**1.2**	**0.0081**	**0.0047**
Vinyl Chloride	mg/l	<0.005	**0.017**	**0.61**	**0.0086 J**	<0.002	<0.005	<0.01	<0.001	**0.13**	<0.001	<0.001
Anions and General Chemistry												
Chloride, Total	mg/l	**206**	**760**	**492**	**333**	**368**	**175**	**202**	**64.0**	**252**	**31.5**	**89.1**
Sulfate, Total	mg/l	**4930**	**579**	**56**	**12300**	**20.1**	**2060**	**4080**	**61.7**	**250**	**380**	**1210**
Metals												
Aluminum, Dissolved	mg/l	**0.04 J**	<0.1	<0.1	**0.05 J**	<0.1	**6.99**	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	mg/l	<0.06	**0.013**	<0.06	**0.009**	<0.06	<0.06	**0.01**	**0.008**	<0.06	<0.06	<0.06
Arsenic, Dissolved	mg/l	**0.109**	<0.01	<0.01	**1.5**	<0.01	**1.03**	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	mg/l	**0.069**	**0.167**	**0.139**	**0.031**	**0.17**	**0.012 J**	**0.103**	**0.134**	**0.1**	**0.264**	**0.067**
Cadmium, Dissolved	mg/l	<0.005	**0.0041 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0004 J**	<0.005	<0.005
Calcium, Dissolved	mg/l	**30.3**	**245**	**131**	**35.7**	**97.7**	**29.4**	**864**	**124**	**159**	**99.3**	**269**
Chromium, Dissolved	mg/l	**0.227**	<0.01	<0.01	**0.404**	<0.01	**0.106**	**0.044**	<0.01	<0.01	<0.01	**0.052**
Cobalt, Dissolved	mg/l	<0.05	**0.008 J**	**0.006 J**	<0.05	<0.05	<0.05	<0.05	<0.05	**0.007 J**	<0.05	<0.05
Copper, Dissolved	mg/l	<0.02	**0.04**	**0.007 J**	**0.006 J**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	mg/l	**0.8 J**	**49**	**25.6**	**25.6**	**25.6**	**25.6**	**101**	**25.6**	**23.3**	**17.3**	**25.6**
Nickel, Dissolved	mg/l	**0.007 J**	**0.066**	**0.08**	**0.014 J**	<0.04	**0.004 J**	**0.003 J**	<0.04	**0.03 J**	**0.018 J**	<0.04
Potassium, Dissolved	mg/l	**7.7**	**4.9**	**3.5**	**18.5**	**2.3**	**3.4**	**9.7**	**2 J**	**16.7**	**2.7**	**5.1**
Selenium, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	mg/l	**0.002 J**	<0.01	<0.01	**0.002 J**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**0.011 J**	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	mg/l	**0.062**	**0.005 J**	<0.05	**0.231**	<0.05	**0.19**	<0.05	<0.05	<0.05	<0.05	<0.05
Zinc, Dissolved	mg/l	<0.02	**0.005 J**	**0.004 J**	<0.02	<0.02	<0.02	**0.006 J**	<0.02	**0.013 J**	**0.003 J**	**0.004 J**
Mercury, Dissolved	mg/l	**0.00101**	<0.0002	<0.0002	**0.0005**	<0.0002	**0.00009 J**	**0.00385**	<0.0002	<0.0002	<0.0002	**0.00097**

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 3 (PAGE 1 OF 3)
THREE-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-HRW1RD	OLN-HRW2OR	OLN-HRW3OR	OLN-HRW4PK	OLN-HRW5YL
	Sample ID:	OLN-HRW1RD-F003	OLN-HRW2OR-F003	OLN-HRW3OR-F003	OLN-HRW4RPK-F003	OLN-HRW5YL-F003
	Lab ID:	R2301391-002	R2301391-016	R2301391-0004	R2301391-017	R2301391-014
	Date:	2/15/2023	2/16/2023	2/15/2023	2/16/2023	2/16/2023
	Time:	13:00	11:05	15:26	9:30	9:00
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**					
pH	*S.U.*	**10.4**	**8.02**	**11.37**	**11.5**	--
Conductance	*mS/cm*	**1.3**	**16.5**	**1.1**	**0.437**	**3.35**
Dissolved Oxygen	*mg/L*	**1.17**	**7.21**	**0.82**	**192.7**	**27.43**
Oxidation Reduction Potential	*mV*	**342**	**406**	**-78**	**245**	**166**
Field Alkalinity	*mg/l*	**216**	**585**	**159**	**2700**	**660**
Field Persulfate	*mg/l*	**0**	**2100**	**3.5**	**28**	**280**
Volatile Organic Compounds						
cis-1,2-Dichloroethene	*mg/l*	**0.11**	**0.011**	**0.0054**	**0.0015 J R**	**0.004**
Tetrachloroethene	*mg/l*	<0.01	**0.0022**	**0.0011**	<0.005 R	<0.001
trans-1,2-Dichloroethene	*mg/l*	<0.01	**0.0011 J**	**0.00051 J**	<0.005 R	**0.00031 J**
Trichloroethene	*mg/l*	**1.3**	**0.37**	**0.062**	**0.054 R**	**0.098**
Vinyl Chloride	*mg/l*	**0.0058 J**	<0.002	<0.001	<0.005 R	<0.001
Anions and General Chemistry						
Total Organic Carbon	*mg/l*	**14.6**	**29.7**	**20.1**	**75.9**	**0.9 J**
Chloride	*mg/l*	**118**	**165**	**338**	**94.5**	**55.9**
Sulfate	*mg/l*	**4240**	**6200**	**4120**	**17900**	**81.9**
Metals						
Aluminum, Dissolved	*mg/l*	**0.06 J**	**0.18**	**1.18**	**9.08**	<0.1
Antimony, Dissolved	*mg/l*	**0.01 J**	<0.06	**0.008 J**	<0.06	**0.009 J**
Arsenic, Dissolved	*mg/l*	**0.03**	**0.161**	**0.051**	**0.46**	<0.01
Barium, Dissolved	*mg/l*	**0.077**	**0.112**	**0.023**	**0.041**	**0.343**
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**76.7**	**285**	**63.9**	**135**	**230**
Chromium, Dissolved	*mg/l*	**0.158**	**0.138**	**0.155**	**1**	**0.015**
Cobalt, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05
Copper, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**12.3**	**39.5**	**0.7 J**	<1	<1
Nickel, Dissolved	*mg/l*	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium, Dissolved	*mg/l*	**5.9**	**8.5**	**7.7**	**20.1**	**1.4 J**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	**0.011**	<0.01
Silver, Dissolved	*mg/l*	**0.0007 J**	<0.01	<0.01	**0.002 J**	<0.01
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	**0.037 J**	**0.026 J**	**0.031 J**	**0.188**	**0.0007 J**
Zinc, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	**0.00067**	**0.00497**	**0.00034**	**0.00225**	**0.00008 J**

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts
NA - Not analyzed.

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

TABLE 3 (PAGE 2 OF 3)
THREE-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-RU004	OLN-RU005	OLN-RU22A	OLN-RU22B	OLN-RU029	OLN-RU030	OLN-RU031	OLN-RU006	OLN-RU032	OLN-VERW1
	Sample ID:	OLN-RU004-F003	OLN-RU005-F003	OLN-RU22A-F003	OLN-RU22B-F003	OLN-RU029-F003	OLN-RU030-F003	OLN-RU031-F003	OLN-RU006-F003	OLN-RU032-F003	OLN-VERW1-F003
	Lab ID:	R2301390-009	R2301390-015	R2301390-013	R2301390-014	R2301391-007	R2301391-010	R2301390-012	R2301390-008	R2301391-008	R2301391-011
	Date:	2/14/2023	2/14/2023	2/14/2023	2/14/2023	2/15/2023	2/15/2023	2/14/2023	2/14/2023	2/15/2023	2/15/2023
	Time:	15:31	18:37	15:20	16:56	9:45	15:40	13:01	13:10	12:20	17:20
	Location:	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Downgradient	Downgradient	Downgradient
Field Readings	**Units**										
pH	*S.U.*	**6.37**	**9.36**	**6.98**	**6.98**	**7.04**	**7.06**	**12.01**	**6.84**	**7.29**	**6.21**
Conductance	*mS/cm*	**17.1**	**0.12**	**0.441**	**0.258**	**11.1**	**0.149**	**0.624**	**5.74**	**0.853**	**0.191**
Dissolved Oxygen	*mg/L*	**3.14**	**9.2**	**1**	**0**	**43.1**	**16.4**	**2.3**	**0**	**23.1**	**13.2**
Oxidation Reduction Potential	*mV*	**346**	**292**	**304**	**248**	**399**	**313**	**194**	**323**	**363**	**259**
Field Alkalinity	*mg/l*	**570**	**240**	**600**	**450**	**1050**	**120**	**600**	**345**	**300**	**270**
Field Persulfate	*mg/l*	**3675**	**1750**	**5.5**	**1750**	**1050**	**2.8**	**1400**	**1050**	**5.6**	**0**
Volatile Organic Compounds											
cis-1,2-Dichloroethene	*mg/l*	**1.1**	**0.01**	**0.036**	**1.4**	**0.2**	**0.00076 J**	**0.0073**	**0.046**	<0.001	**0.11**
Tetrachloroethene	*mg/l*	**0.0073 J**	**0.0022 J**	<0.001	**0.0029 J**	<0.01	**0.00021 J**	<0.002	**0.0052 J**	**0.00023 J**	**0.0043 J**
trans-1,2-Dichloroethene	*mg/l*	**0.022 J**	**0.001 J**	**0.00082 J**	**0.0084 J**	**0.013**	<0.001	**0.00082 J**	**0.0063 J**	<0.001	<0.01
Trichloroethene	*mg/l*	**3.7**	**0.68**	**0.039**	**0.87**	**1.2**	**0.048**	**0.2**	**0.94**	**0.003**	**1.2**
Vinyl Chloride	*mg/l*	**0.29**	<0.005	**0.018**	**0.31**	<0.01	<0.001	**0.00052 J**	<0.01	<0.001	**0.075**
Anions and General Chemistry											
Total Organic Carbon	*mg/l*	**53.6**	**21.1**	**11.4**	**37**	**18.2**	<1	**16.6**	**6**	**0.7 J**	**9.9**
Chloride	*mg/l*	**328**	**232**	**974**	**487**	**750**	**394**	**138**	**275**	**79.2**	**287**
Sulfate	*mg/l*	**9340**	**4550**	**712**	**63**	**3360**	**19.9**	**1560**	**2740**	**69.4**	**217**
Metals											
Aluminum, Dissolved	*mg/l*	<0.1	**0.34**	<0.1	<0.1	**0.04 J**	<0.1	**5.49**	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	**0.008 J**	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	**0.024**	<0.01	<0.01	**0.092**	<0.01	**0.718**	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.152**	**0.116**	**0.064**	**0.173**	**0.048**	**0.186**	**0.024**	**0.112**	**0.123**	**0.069**
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	**0.0005 J**	**0.0005 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**517**	**131**	**310**	**134**	**335**	**104**	**14.8**	**580**	**121**	**148**
Chromium, Dissolved	*mg/l*	**0.33**	**0.193**	<0.01	<0.01	**0.106**	<0.01	**0.063**	**0.025**	<0.01	<0.01
Cobalt, Dissolved	*mg/l*	**0.003 J**	**0.001 J**	**0.012 J**	**0.005 J**	<0.05	<0.05	<0.05	<0.05	<0.05	**0.005 J**
Copper, Dissolved	*mg/l*	**0.06**	<0.02	**0.01 J**	<0.02	**0.009 J**	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.47**	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	**0.0026 J**	**0.0048 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**49.9**	**9.2**	**60.6**	**26.5**	**54.9**	**17.1**	**0.3 J**	**69.9**	**13.2**	**22.4**
Nickel, Dissolved	*mg/l*	**0.016 J**	<0.04	**0.068**	**0.074**	**0.019 J**	<0.04	<0.04	<0.04	<0.04	**0.029 J**
Potassium, Dissolved	*mg/l*	**19.6**	**6.4**	**5.1**	**3.3**	**10.5**	**2.4**	**2.3**	**6.6**	**1.7 J**	**13.3**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	**0.001 J**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	*mg/l*	**0.007 J**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	**0.002 J**	**0.013 J**	**0.002 J**	<0.05	**0.013 J**	<0.05	**0.142**	<0.05	<0.05	<0.05
Zinc, Dissolved	*mg/l*	**0.003 J**	<0.02	**0.005 J**	<0.02	<0.02	<0.02	<0.02	**0.006 J**	<0.02	**0.011 J**
Mercury, Dissolved	*mg/l*	**0.00106**	**0.00113**	<0.0002	<0.0002	<0.0002	<0.0002	**0.00009 J**	**0.00069**	<0.0002	<0.0002

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Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts
NA - Not analyzed.

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TABLE 3 (PAGE 3 OF 3)
THREE-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-P001	OLN-UA005	OLN-UC005	OLN-RW001	OLN-RW002	OLN-RW003	OLN-RW004	OLN-RW005	OLN-UC004	OLN-WW18M
	Sample ID:	OLN-P001-F003	OLN-UA005-F003	OLN-UC005-F003	OLN-RW001-F003	OLN-RW002-F003	OLN-RW003-F003	OLN-RW004-F003	OLN-RW005-F003	OLN-UC004-F003	OLN-RW006-F003
	Lab ID:	R2301391-020	R2301390-007	R2301391-009	R2301390-010	R2301390-0002	R2301390-0004	R2301390-0001	R2301390-0003	R2301390-017	R2301391-015
	Date:	2/14/2023	2/14/2023	2/15/2023	2/14/2023	2/13/2023	2/13/2023	2/13/2023	2/13/2023	2/14/2023	2/16/2023
	Time:	8:05	10:41	14:00	10:17	16:40	16:18	14:16	14:00	17:30	8:10
	Location:	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Contingency	Sentinel
Field Readings	**Units**										
pH	*S.U.*	**5.76**	**9.03**	**7.83**	**7.08**	**5.21**	**5.36**	**6.66**	**5.45**	**6.96**	**6.01**
Conductance	*mS/cm*	**1.4**	**1.95**	**0.518**	**0.179**	**2.14**	**1.31**	**2.88**	**0.623**	**1.23**	**0.586**
Dissolved Oxygen	*mg/L*	**3.36**	**0.84**	**49.3**	**5.7**	**0.02**	**323**	**0.02**	**19**	**3.84**	**3.11**
Oxidation Reduction Potential	*mV*	**56**	**78**	**294**	**335**	**50**	**323**	**99**	**0**	**207**	**352**
Field Alkalinity	*mg/l*	**180**	**525**	**450**	**330**	**330**	**270**	**459**	**270**	**210**	**150**
Field Persulfate	*mg/l*	**14**	**140**	**5.6**	**280**	**112**	**448**	**700**	**280**	**7**	**0**
Volatile Organic Compounds											
cis-1,2-Dichloroethene	*mg/l*	**0.0034**	<0.001	**0.0014**	<0.001	<0.001	<0.001	**0.00054 J**	**0.03 D**	**0.0021**	<0.001
Tetrachloroethene	*mg/l*	<0.001	**0.00034 J**	<0.001	**0.00024 J**	<0.001	**0.00025 J**	<0.001	<0.005	<0.001	**0.00033 J**
trans-1,2-Dichloroethene	*mg/l*	**0.00033 J**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001
Trichloroethene	*mg/l*	**0.0091**	**0.0041**	**0.11**	**0.0045**	**0.0028**	**0.0042**	**0.014**	**0.5 D**	**0.0015**	**0.012**
Vinyl Chloride	*mg/l*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001
Anions and General Chemistry											
Total Organic Carbon	*mg/l*	**6.9**	**8.4**	**1.4**	**2.4**	**2.2**	**2.9**	**4.9**	**1.9**	**1.2**	<1
Chloride	*mg/l*	**16.9**	**96.1**	**63.7**	**90.5**	**83.9**	**75.5**	**79.1**	**74.1**	**209**	**56.2**
Sulfate	*mg/l*	**143**	**274**	**35**	**390**	**442**	**448**	**913**	**146**	**27.3**	**19.5**
Metals											
Aluminum, Dissolved	*mg/l*	<0.1	**0.06 J**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	**0.007 J**	<0.06	**0.009 J**	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	**0.254**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.188**	**0.047**	**0.098**	**0.042**	**0.031**	**0.028**	**0.056**	**0.138**	**0.051**	**0.03**
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**426**	**45.3**	**63.9**	**104**	**90.9**	**88.1**	**190**	**94.8**	**97.7**	**63**
Chromium, Dissolved	*mg/l*	<0.01	**0.014**	<0.01	**0.017**	**0.027**	**0.026**	**0.046**	**0.005 J**	<0.01	<0.01
Cobalt, Dissolved	*mg/l*	**0.004 J**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**64.7**	**4**	**9.9**	**11.4**	**8.8**	**8.1**	**21.8**	**12.9**	**14.5**	**11.3**
Nickel, Dissolved	*mg/l*	**0.11**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.463**	<0.04
Potassium, Dissolved	*mg/l*	**5.9**	**1.3 J**	**2**	**2.5**	**2.4**	**2.4**	**4.2**	**2.5**	**3.6**	**1.2 J**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	<0.05	**0.046 J**	<0.05	<0.05	<0.05	**0.0009 J**	<0.05	**0.001 J**	<0.05	<0.05
Zinc, Dissolved	*mg/l*	**0.009 J**	**0.006 J**	<0.02	**0.008 J**	<0.02	<0.02	**0.025**	**0.031**	**0.004 J**	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	**0.00011 J**	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts
NA - Not analyzed.

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

TABLE 4 (Page 1 OF 3)
SIX-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-HRW1RD	OLN-HRW2RD	OLN-HRW3OR	OLN-HRW4RPK	OLN-HRW5YL
	Sample ID:	OLN-HRW1RD-F004	OLN-HRW2RD-F004	OLN-HRW3OR-F004	OLN-HRWR4RPK-F004	OLN-HRW5YL-F004
	Lab ID:	R2304461-013	R2304461-012	R2304461-008	R2304460-013	R2304461-009
	Date:	5/18/2023	5/18/2023	5/18/2023	5/17/2023	5/18/2023
	Time:	14:28	12:34	10:30	13:30	12:45
	Location:	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**					
pH	S.U.	**7.93**	**8.33**	**10.43**	**12.44**	**12.79**
Conductance	mS/cm	**3.2**	**6.23**	**12.6**	**16**	**40.4**
Dissolved Oxygen	mg/L	**0.37**	**3.59**	**0**	**12.76**	**25.73**
Oxidation Reduction Potential	mV	**228**	**148**	**196**	**179**	**318**
Field Alkalinity	mg/l	**0.8**	**308**	**240**	**1995**	**2508**
Field Persulfate	mg/l	**1750**	**1120**	**3150**	**3675**	**4200**
Volatile Organic Compounds						
cis-1,2-dichloroethene	mg/l	**0.32 D**	**0.02 J**	**0.0063**	**0.0056**	**0.0004 J**
Tetrachloroethene	mg/l	<0.025	<0.025	**0.0012**	**0.00043 J**	<0.001
trans-1,2-dichloroethene	mg/l	<0.025	<0.025	**0.0005 J**	**0.00041 J**	<0.001
Trichloroethene	mg/l	**2.7 D**	**2.9**	**0.059**	**0.066**	**0.027**
Vinyl Chloride	mg/l	**0.018 DJ**	<0.025	<0.001	<0.001	<0.001
Anions and General Chemistry						
Chloride	mg/l	**120**	**235**	**393**	**227**	**200**
Sulfate	mg/l	**1110**	**2490**	**4350**	**11500**	**28800**
Metals						
Aluminum, Dissolved	mg/l	<0.1	**0.66**	**0.09 J**	**8.72**	**9.75**
Antimony, Dissolved	mg/l	<0.06	<0.06	<0.06	<0.06	**0.008 J**
Arsenic, Dissolved	mg/l	**0.031**	**0.067**	**0.029**	**0.34**	**0.817**
Barium, Dissolved	mg/l	**0.077**	**0.014 J**	**0.018 J**	**0.025**	**0.031**
Cadmium, Dissolved	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	mg/l	**110**	**42.2**	**27.5**	**60.4**	**29.5**
Chromium, Dissolved	mg/l	**0.059**	**0.104**	**0.119**	**0.659**	**1.28**
Cobalt, Dissolved	mg/l	<0.05	<0.05	<0.05	<0.05	**0.001 J**
Copper, Dissolved	mg/l	**0.249**	<0.02	**0.082**	<0.02	**0.01 J**
Iron, Dissolved	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	mg/l	**41.5**	**5.3**	**13.6**	<1	<1
Nickel, Dissolved	mg/l	<0.04	<0.04	<0.04	**0.01 J**	<0.04
Potassium, Dissolved	mg/l	**4.5**	**3.5**	**8.3**	**17**	**31.6**
Selenium, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01	**0.018**
Silver, Dissolved	mg/l	<0.01	<0.01	<0.01	**0.001 J**	**0.003 J**
Titanium, Dissolved	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	mg/l	**0.003 J**	**0.015 J**	**0.017 J**	**0.185**	**0.296**
Zinc, Dissolved	mg/l	**0.114**	<0.02	**0.026**	<0.02	**0.004 J**
Mercury, Dissolved	mg/l	**0.00012 J**	**0.00042**	**0.00012 J**	**0.00133**	**0.00279**

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 4 (PAGE 2 OF 3)
SIX-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-RU004	OLN-RU005	OLN-RU22A	OLN-RU22B	OLN-RU029	OLN-RU030	OLN-RU031	OLN-RU006	OLN-RU032	OLN-VERW1
	Sample ID:	OLN-RU004-F004	OLN-RU005-F004	OLN-RU22A-F004	OLN-RU22B-F004	OLN-RU029-F004	OLN-RU030-F004	OLN-RU031-F004	OLN-RU006-F004	OLN-RU032-F004	OLN-VERW1-F004
	Lab ID:	R2304460-017	R2304461-011	R2304461-002	R2304461-003	R2304461-001	R2304460-016	R2304460-003	R2304460-015	R2304460-008	R2304460-001
	Date:	5/17/2023	5/18/2023	5/17/2023	5/17/2023	5/17/2023	5/17/2023	5/15/2023	5/17/2023	5/15/2023	5/17/2023
	Time:	16:25	11:26	13:56	15:04	12:08	14:30	16:22	11:45	16:17	10:06
	Location:	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Downgradient	Downgradient	Downgradient
Field Readings	**Units**										
pH	S.U.	**9.05**	**9.62**	**5.67**	**6.05**	**5.91**	**7.36**	**11.61**	**7.33**	**7.61**	**5.54**
Conductance	mS/cm	**7.16**	**3.78**	**4.87**	**2.5**	**7.61**	**1.49**	**3.77**	**3.58**	**0.613**	**1.82**
Dissolved Oxygen	mg/L	**0**	**0**	**0**	**0**	**0**	**3.12**	**0.56**	**4.32**	**4.17**	**2.22**
Oxidation Reduction Potential	mV	**144**	**137**	**255**	**177**	**266**	**228**	**28**	**235**	**158**	**194**
Field Alkalinity	mg/l	**390**	**240**	**400**	**612**	**600**	**120**	**720**	**690**	**270**	**250**
Field Persulfate	mg/l	**2100**	**560**	**7**	**0.7**	**560**	**0**	**420**	**140**	**14**	**1.4**
Volatile Organic Compounds											
cis-1,2-dichloroethene	mg/l	**0.56**	**0.0071**	**0.034**	**1.2**	**0.3 D**	**0.00088 J**	**0.0061**	**0.018 D**	<0.001	**0.095**
Tetrachloroethene	mg/l	**0.0077 J**	**0.0018 J**	**0.00022 J**	**0.0038 J**	<0.025	**0.00032 J**	**0.00047 J**	**0.0022 DJ**	<0.001	**0.0029 J**
trans-1,2-dichloroethene	mg/l	**0.012 J**	<0.005	**0.00099 J**	**0.0087 J**	**0.015 DJ**	<0.001	**0.00075 J**	**0.0019 DJ**	<0.001	<0.01
Trichloroethene	mg/l	**3.8**	**0.94**	**0.037**	**0.93**	**2.3 D**	**0.082**	**0.15**	**0.38 D**	**0.0019**	**0.79**
Vinyl Chloride	mg/l	**0.14**	<0.005	**0.014**	**0.52**	**0.021 DJ**	<0.001	**0.00065 J**	<0.005	<0.001	**0.057**
Anions and General Chemistry											
Chloride	mg/l	**217**	**230**	**1070**	**484**	**675**	**404**	**161**	**292**	**71**	**314**
Sulfate	mg/l	**3460**	**1180**	**541**	**77.2**	**2620**	**21.8**	**870**	**1980**	**33.7**	**163**
Metals											
Aluminum, Dissolved	mg/l	**0.03 J**	**0.16**	<0.1	<0.1	<0.1	<0.1	**6.69**	<0.1	<0.1	<0.1
Antimony, Dissolved	mg/l	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	mg/l	**0.138**	**0.073**	<0.01	<0.01	**0.009 J**	<0.01	**0.357**	<0.01	<0.01	<0.01
Barium, Dissolved	mg/l	**0.092**	**0.034**	**0.055**	**0.149**	**0.047**	**0.196**	**0.018 J**	**0.057**	**0.114**	**0.062**
Cadmium, Dissolved	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0004 J**
Calcium, Dissolved	mg/l	**34.1**	**20.6**	**287**	**134**	**361**	**116**	**6.9**	**395**	**109**	**146**
Chromium, Dissolved	mg/l	**0.081**	**0.057**	<0.01	<0.01	**0.03**	<0.01	**0.038**	**0.024**	<0.01	<0.01
Cobalt, Dissolved	mg/l	<0.05	<0.05	**0.011 J**	**0.007 J**	<0.05	<0.05	<0.05	<0.05	<0.05	**0.006 J**
Copper, Dissolved	mg/l	**0.005 J**	<0.02	**0.005 J**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	mg/l	<0.005	<0.005	**0.0034 J**	**0.0021 J**	**0.003 J**	<0.005	<0.005	<0.005	<0.005	**0.0021 J**
Magnesium, Dissolved	mg/l	**4**	**2.2**	**56**	**27.1**	**64.5**	**18.9**	**0.2 J**	**44.2**	**11.9**	**22.5**
Nickel, Dissolved	mg/l	**0.007 J**	<0.04	**0.064**	**0.076**	**0.021 J**	<0.04	**0.014 J**	**0.004 J**	<0.04	**0.037 J**
Potassium, Dissolved	mg/l	**5.7**	**2.3**	**5.8**	**3.4**	**10.3**	**2.8**	**1.5 J**	**5.3**	**1.6 J**	**13.1**
Selenium, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01	**0.008 J**	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	mg/l	**0.018 J**	**0.012 J**	**0.001 J**	<0.05	**0.002 J**	<0.05	**0.076**	<0.05	<0.05	<0.05
Zinc, Dissolved	mg/l	<0.02	<0.02	**0.003 J**	<0.02	**0.005 J**	<0.02	<0.02	<0.02	<0.02	**0.006 J**
Mercury, Dissolved	mg/l	**0.00019 J**	**0.00011 J**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
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D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 4 (PAGE 3 OF 3)
SIX-MONTH SAMPLING GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-P001	OLN-UA005	OLN-UC004	OLN-UC005	OLN-RW001	OLN-RW002	OLN-RW003	OLN-RW004	OLN-RW005	OLN-WW18M
	Sample ID:	OLN-P001-F004	OLN-UA005-F004	OLN-UC004-F004	OLN-UC005-F004	OLN-RW001-F004	OLN-RW002-F004	OLN-RW003-F004	OLN-RW004-F004	OLN-RW005-F004	OLN-WW18M-F004
	Lab ID:	R2304460-011	R2304460-004	R2304461-010	R2304460-014	R2304460-007	R2304460-006	R2304460-0002	R2304460-005	R2304460-001	R2304461-007
	Date:	5/16/2023	5/15/2023	5/18/2023	5/17/2023	5/15/2023	5/15/2023	5/15/2023	5/15/2023	5/15/2023	5/18/2023
	Time:	7:50	16:26	9:45	9:55	14:35	12:45	13:02	10:26	10:40	8:55
	Location:	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Sentinel
Field Readings	**Units**										
pH	S.U.	**5.84**	**7.54**	**8.73**	**8.01**	**7.35**	**7.72**	**7.2**	**7.27**	**10.13**	**6.85**
Conductance	mS/cm	**0.596**	**0.851**	**1.31**	**0.507**	**0.416**	**0.969**	**0.808**	**1.08**	**1.11**	**0.497**
Dissolved Oxygen	mg/L	**6.68**	**8.07**	**2.09**	**6.42**	**6.06**	**0.59**	**2.68**	**3.7**	**0**	**5.41**
Oxidation Reduction Potential	mV	**284**	**187**	**384**	**129**	**169**	**124**	**275**	**36**	**283**	**271**
Field Alkalinity	mg/l	**840**	**224**	**270**	**180**	**300**	**240**	**315**	**390**	**330**	**51**
Field Persulfate	mg/l	**2.8**	**4.2**	**7**	**1.4**	**14**	**21**	**28**	**420**	**35**	**0**
Volatile Organic Compounds											
cis-1,2-dichloroethene	mg/l	**0.0048**	<0.001	**0.0042**	**0.00075 J**	<0.001	<0.001	<0.001	<0.001	**0.0035**	**0.00023 J**
Tetrachloroethene	mg/l	<0.001	**0.0003 J**	<0.001	<0.001	**0.00026 J**	**0.00028 J**	**0.00029 J**	<0.001	**0.00035 J**	<0.001
trans-1,2-dichloroethene	mg/l	**0.00022 J**	<0.001	**0.00024 J**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichloroethene	mg/l	**0.013**	**0.0047**	**0.029**	**0.038**	**0.004**	**0.0039**	**0.0036**	**0.0057**	**0.07**	**0.0093**
Vinyl Chloride	mg/l	<0.001	<0.001	**0.0013**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00025 J**	<0.001
Anions and General Chemistry											
Chloride	mg/l	**15**	**72.9**	**180**	**130**	**77.7**	**74.6**	**73.6**	**38.5**	**72.1**	**49.5**
Sulfate	mg/l	**66.6**	**51**	**490**	**134**	**94.8**	**89.9**	**106**	**161**	**302**	**19.1**
Metals											
Aluminum, Dissolved	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	mg/l	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	mg/l	<0.01	**0.021**	<0.01	<0.01	<0.01	**0.011**	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	mg/l	**0.085**	**0.049**	**0.101**	**0.183**	**0.078**	**0.049**	**0.051**	**0.224**	**0.036**	**0.029**
Cadmium, Dissolved	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	mg/l	**70.6**	**42.3**	**275**	**138**	**56**	**27.3**	**32.6**	**125**	**70.3**	**59.7**
Chromium, Dissolved	mg/l	<0.01	**0.002 J**	<0.01	<0.01	**0.005 J**	**0.005 J**	**0.006 J**	**0.008 J**	**0.018**	<0.01
Cobalt, Dissolved	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper, Dissolved	mg/l	**0.004 J**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.09 J**	<0.1	<0.1
Lead, Dissolved	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0041 J**
Magnesium, Dissolved	mg/l	**12.3**	**4.4**	**40.4**	**22.3**	**6.4**	**2.6**	**3.1**	**26.2**	**7.1**	**10.6**
Nickel, Dissolved	mg/l	**0.008 J**	<0.04	**0.016 J**	<0.04	<0.04	<0.04	<0.04	**0.004 J**	<0.04	<0.04
Potassium, Dissolved	mg/l	**2.3**	**1.3 J**	**4.3**	**3.5**	**1.7 J**	**1.2 J**	**1.3 J**	**3.5**	**2.1**	**1.3 J**
Selenium, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	mg/l	<0.05	**0.003 J**	<0.05	**0.0007 J**	**0.0007 J**	**0.0008 J**	<0.05	<0.05	<0.05	<0.05
Zinc, Dissolved	mg/l	**0.011 J**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.021**	**0.009 J**	**0.012 J**
Mercury, Dissolved	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 5 (PAGE 1 OF 3)
POST-RECIRCULATION GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-HRW1RD	OLN-HRW2RD	OLN-HRW3OR	OLN-HRW4RPK	OLN-HRW5YL
	Sample ID:	OLN-HRW1RD-F005	OLN-HRW2RD-F005	OLN-HRW3OR-F005	OLN-HRW4RPK-F005	OLN-HRW5YL-F005
	Lab ID:	R2308534-018	R2308534-017	R2308534-012	R2308534-011	R2308534-013
	Date:	9/15/2023	9/15/2023	9/14/2023	9/14/2023	9/14/2023
	Time:	9:55	10:15	14:39	16:50	12:53
		Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Field Readings	**Units**					
pH	*S.U.*	**7.79**	**10.43**	**9.8**	**12**	**9.3**
Conductance	*mS/cm*	**5.302**	**1.528**	**32.27**	**49.92**	**14.04**
Dissolved Oxygen	*mg/L*	**12.07**	**0.64**	**1.58**	**2**	**2.86**
Oxidation Reduction Potential	*mV*	**163.3**	**5**	**22.3**	**-49.8**	**15.7**
Field Alkalinity	*mg/l*	**354**	**420**	**330**	**930**	**345**
Field Persulfate	*mg/l*	**1260**	**1680**	**1050**	**2100**	**280**
Volatile Organic Compounds						
cis-1,2-dichloroethene	*mg/l*	**0.33**	**0.048**	**0.022 D**	**0.049**	**0.0074**
Tetrachloroethene	*mg/l*	<0.025	<0.025	**0.0026 DJ**	**0.0062 J**	<0.001
trans-1,2-dichloroethene	*mg/l*	**0.0063 J**	<0.025	**0.0012 DJ**	<0.02	**0.00029 J**
Trichloroethene	*mg/l*	**2.5**	**2.8**	**0.34 D**	**2.1**	**0.16**
Vinyl Chloride	*mg/l*	**0.016 J**	<0.025	<0.005	<0.02	**0.00037 J**
Anions and General Chemistry						
Chloride	*mg/l*	**217**	**204**	**344**	**358**	**228**
Sulfate	*mg/l*	**2130**	**1040**	**3870**	**6070**	**1770**
Metals						
Aluminum, Dissolved	*mg/l*	<0.1	**1.46**	<0.1	**3.48**	**0.14**
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	**0.039**	**0.143**	**0.094**	**0.125**	**0.109**
Barium, Dissolved	*mg/l*	**0.099**	**0.011 J**	**0.021**	**0.012 J**	**0.026**
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**195**	**8.8**	**68**	**13.7**	**48.6**
Chromium, Dissolved	*mg/l*	**0.092**	**0.045**	**0.086**	**0.243**	**0.092**
Cobalt, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05
Copper, Dissolved	*mg/l*	**0.918**	<0.02	<0.02	<0.02	**0.007 J**
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**43.2**	**0.3 J**	**18.7**	**0.4 J**	**11.5**
Nickel, Dissolved	*mg/l*	<0.04	<0.04	<0.04	<0.04	**0.024 J**
Potassium, Dissolved	*mg/l*	**5.3**	**1.3 J**	**6.1**	**5.7**	**7.6**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	**0.0009 J**	<0.01
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	**0.005 J**	**0.044 J**	**0.039 J**	**0.076**	**0.034 J**
Zinc, Dissolved	*mg/l*	**0.479**	<0.02	<0.02	<0.02	**0.031**
Mercury, Dissolved	*mg/l*	**0.00091**	<0.0002	<0.0002	**0.00129**	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
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D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 5 (PAGE 2 OF 3)
POST-RECIRCULATION GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-RU004	OLN-RU005	OLN-RU22A	OLN-RU22B	OLN-RU029	OLN-RU030	OLN-RU031	OLN-RU006	OLN-RU032	OLN-VERW1
	Sample ID:	OLN-RU004-F005	OLN-RU005-F005	OLN-RU22A-F005	OLN-RU22B-F005	OLN-RU029-F005	OLN-RU030-F005	OLN-RU031-F005	OLN-RU006-F005	OLN-RU032-F005	OLN-VERW1-F005
	Lab ID:	R2308534-015	R2308532-016	R2308532-017	R2308534-003	R2308534-004	R2308534-005	R2308532-011	R2308532-013	R2308532-014	R2308534-006
	Date:	9/14/2023	9/13/2023	9/13/2023	9/14/2023	9/14/2023	9/14/2023	9/13/2023	9/13/2023	9/13/2023	9/14/2023
	Time:	9:40	15:15	16:52	10:52	11:50	13:45	10:28	12:03	14:20	15:55
	Location:	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Treatment Area	Downgradient	Downgradient	Downgradient
Field Readings	**Units**										
pH	*S.U.*	**6.74**	**10.98**	**7.65**	**6.65**	**8.91**	**7.32**	**11.49**	**7.23**	**8.25**	**6.58**
Conductance	*mS/cm*	**14.6**	**4.063**	**26.45**	**2.32**	**7.868**	**1.161**	**3.918**	**5.567**	**0.608**	**1.418**
Dissolved Oxygen	*mg/L*	**1.49**	**1.8**	**0.01**	**0.59**	**4.52**	**3.57**	**4.02**	**0.17**	**-30**	**0.78**
Oxidation Reduction Potential	*mV*	**54.3**	**-211.6**	**-139.8**	**143.9**	**196.7**	**191.6**	**-181.8**	**86.7**	**4.44**	**174.8**
Field Alkalinity	*mg/l*	**264**	**345**	**525**	**390**	**288**	**150**	**156**	**360**	**264**	**330**
Field Persulfate	*mg/l*	**0.7**	**70**	**42**	**0**	**350**	**2.8**	**35**	**56**	**2.1**	**0**
Volatile Organic Compounds											
cis-1,2-dichloroethene	*mg/l*	**0.78**	**0.017**	**0.058 D**	**3.1 D**	**0.13**	<0.1	**0.012**	**0.26**	<0.001	**0.1**
Tetrachloroethene	*mg/l*	**0.027**	<0.01	**0.0027 D**	**0.006 DJ**	<0.01	<0.1	<0.002	**0.0075 J**	<0.001	**0.0039 J**
trans-1,2-dichloroethene	*mg/l*	**0.0046 J**	<0.01	**0.0018 DJ**	**0.022 DJ**	**0.0073 J**	<0.1	**0.00098 J**	**0.013 J**	<0.001	<0.01
Trichloroethene	*mg/l*	**1.1**	**1.2**	**0.14 D**	**2.8 D**	**1.0**	**11 D**	**0.36**	**2.8**	**0.0022**	**0.81**
Vinyl Chloride	*mg/l*	**0.0045 J**	<0.01	**0.023 D**	**0.5 D**	**0.0084 J**	<0.1	**0.00084 J**	**0.009 J**	<0.001	**0.054**
Anions and General Chemistry											
Chloride	*mg/l*	**439**	**172**	**804**	**432**	**415**	**345**	**204**	**318**	**69.6**	**248**
Sulfate	*mg/l*	**207**	**540**	**1520**	**50.4**	**3720**	**25.4**	**350**	**1270**	**29.3**	**175**
Metals											
Aluminum, Dissolved	*mg/l*	<0.1	**0.16**	<0.1	<0.1	**0.38**	<0.1	**4.73**	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	**0.381**	<0.01	<0.01	**0.132**	<0.01	**0.265**	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.102**	**0.034**	**0.031**	**0.146**	**0.013 J**	**0.169**	**0.016 J**	**0.053**	**0.117**	**0.064**
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	**0.0015 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**157**	**24.9**	**437**	**122**	**105**	**99**	**7.2**	**200**	**106**	**140**
Chromium, Dissolved	*mg/l*	<0.01	**0.022**	<0.01	<0.01	**0.092**	<0.01	**0.014**	**0.049**	<0.01	<0.01
Cobalt, Dissolved	*mg/l*	**0.003 J**	**0.0009 J**	**0.01 J**	**0.004 J**	<0.05	<0.05	<0.05	<0.05	<0.05	**0.005 J**
Copper, Dissolved	*mg/l*	**0.009 J**	<0.02	**0.01 J**	**0.014 J**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	**0.0037 J**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**26.8**	**4.3**	**81.6**	**23.1**	**25.7**	**15.2**	**0.3 J**	**24**	**11.8**	**20.7**
Nickel, Dissolved	*mg/l*	**0.021 J**	<0.04	**0.025 J**	**0.054**	<0.04	<0.04	<0.04	<0.04	<0.04	**0.022 J**
Potassium, Dissolved	*mg/l*	**5.6**	**1.5 J**	**6.8**	**3.2**	**5.6**	**2.2**	**1 J**	**3.9**	**1.6 J**	**13.5**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	<0.05	**0.081**	**0.002 J**	<0.05	**0.033 J**	<0.05	**0.053**	<0.05	<0.05	<0.05
Zinc, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	<0.0002	<0.0002	**0.00016 J**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
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D - Concentration is a result of a dilution.
NA - Not analyzed.

TABLE 5 (PAGE 3 OF 3)
POST-RECIRCULATION GROUNDWATER ANALYTICAL RESULTS
OLEAN WELL FIELD SUPERFUND SITE - OU2
OLEAN, NEW YORK

	Well ID:	OLN-P001	OLN-UA005	OLN-UC004	OLN-UC005	OLN-RW001	OLN-RW002	OLN-RW003	OLN-RW004	OLN-RW005	OLN-WW18M
	Sample ID:	OLN-P0001-F005	OLN-UA005-F005	OLN-UC004-F005	OLN-UC005-F005	OLN-RW001-F005	OLN-RW002-F005	OLN-RW003-F005	OLN-RW004-F005	OLN-RW005-F005	OLN-WW18M-F005
	Lab ID:	R2308532-007	R2308532-010	R2308534-014	R2308532-015	R2308532-008	R2308532-009	R2308532-001	R2308532-002	R2308532-003	R2308534-019
	Date:	9/13/2023	9/13/2023	9/14/2023	9/13/2023	9/13/2023	9/13/2023	9/12/2023	9/12/2023	9/12/2023	9/15/2023
	Time:	8:50	11:50	11:10	15:42	10:30	8:53	16:16	16:37	15:03	8:50
	Location:	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Downgradient	Sentinel
Field Readings	**Units**										
pH	*S.U.*	**8.85**	**8.14**	**8.24**	**9.44**	**8.9**	**8.64**	**7.85**	**7.1**	**7.13**	**8.23**
Conductance	*mS/cm*	**0.412**	**0.452**	**6.125**	**0.765**	**0.787**	**1.45**	**3.944**	**8.096**	**4.649**	**0.333**
Dissolved Oxygen	*mg/L*	**3.72**	**4.32**	**0.35**	**3.76**	**6.73**	**0.02**	**6.1**	**0.2**	**0.7**	**5.51**
Oxidation Reduction Potential	*mV*	**42.7**	**-31**	**-30**	**-104**	**39.5**	**-161.5**	**14.5**	**106.2**	**119.7**	**0.4**
Field Alkalinity	*mg/l*	**156**	**NA**	**279**	**210**	**255**	**237**	**300**	**390**	**285**	**144**
Field Persulfate	*mg/l*	**2.1**	**NA**	**3.5**	**3.5**	**5.6**	**7**	**0.7**	**56**	**49**	**0**
Volatile Organic Compounds											
cis-1,2-dichloroethene	*mg/l*	**0.0057**	<0.001	**0.026**	**0.00035 J**	<0.001	<0.001	<0.001	**0.003**	**0.0062**	<0.001
Tetrachloroethene	*mg/l*	<0.001	**0.00022 J**	<0.001	<0.001	**0.00029 J**	**0.0003 J**	**0.0003 J**	**0.00041 J**	**0.0003 J**	<0.001
trans-1,2-dichloroethene	*mg/l*	**0.00022 J**	<0.001	**0.0015**	<0.001	<0.001	<0.001	<0.001	<0.001	**0.00024 J**	<0.001
Trichloroethene	*mg/l*	**0.0086**	**0.003**	**0.18**	**0.0077**	**0.0049**	**0.0047**	**0.0041**	**0.038**	**0.084**	**0.0079**
Vinyl Chloride	*mg/l*	<0.001	<0.001	**0.0027**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anions and General Chemistry											
Chloride	*mg/l*	**21.3**	**53.6**	**181**	**143**	**77.7**	**74.7**	**74.4**	**77**	**65.6**	**50.4**
Sulfate	*mg/l*	**66.8**	**27.7**	**408**	**144**	**74.7**	**69.7**	**37.6**	**517**	**253**	**22.7**
Metals											
Aluminum, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Antimony, Dissolved	*mg/l*	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Arsenic, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	**0.093**	**0.052**	<0.01	<0.01	<0.01	<0.01
Barium, Dissolved	*mg/l*	**0.078**	**0.073**	**0.063**	**0.166**	**0.088**	**0.053**	**0.119**	**0.086**	**0.058**	**0.028**
Cadmium, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium, Dissolved	*mg/l*	**71**	**75.7**	**177**	**126**	**44**	**33.4**	**66.1**	**91.8**	**72.3**	**59.5**
Chromium, Dissolved	*mg/l*	<0.01	**0.002 J**	<0.01	<0.01	**0.004 J**	**0.003 J**	<0.01	**0.022**	**0.008 J**	<0.01
Cobalt, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron, Dissolved	*mg/l*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, Dissolved	*mg/l*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium, Dissolved	*mg/l*	**12.7**	**7**	**28.7**	**21.5**	**4.8**	**3.2**	**6.5**	**13.2**	**7.9**	**10.6**
Nickel, Dissolved	*mg/l*	<0.04	<0.04	**0.019 J**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium, Dissolved	*mg/l*	**2 J**	**1.1 J**	**3.6**	**2.6**	**1.3**	**1.1 J**	**1.5 J**	**2.8**	**2**	**1.1 J**
Selenium, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver, Dissolved	*mg/l*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium, Dissolved	*mg/l*	<0.05	<0.05	<0.05	<0.05	**0.013**	**0.004 J**	<0.05	<0.05	<0.05	<0.05
Zinc, Dissolved	*mg/l*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury, Dissolved	*mg/l*	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:
Bolded values were detected at concentrations above the Method Detection Limit (MDL).
mg/l - Milligrams per liter
S.U. - Standard Units
mS/cm - MilliSiemens per centimeter
mV - Millivolts

Qualifiers:
< - Analyte not detected above Method Reporting Limit (MRL).
J - Estimated value due to etiher being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL.
D - Concentration is a result of a dilution.
NA - Not analyzed.