# RELEASE / DISCHARGE NOTIFICATION

**LOS ALAMOS NATIONAL LABORATORY LA-UR-** 16-27410

**Permit Number: NM0028355**

Calendar Year: 2016

**NPDES or Operational Spill/Release** ☑
**ER Spill/Release** ☐
**Other Spill/Release** ☐
Indicate with "X" in appropriate box.

**Release ID Number:** 430

**Responsible Facility/User Group:** ER-DO

**Contact Person:** Craig Douglass **Pager #:**

**Phone #:** **Cell Phone #:**

**Release/Discharge Location:**

**TA:** 16

**Building:** N/A

On Saturday, September 10, 2016 a release of untreated groundwater was discovered at Los Alamos National Laboratory at intermediate well CdV-16-4ip. Groundwater at CdV-16-4ip is being pumped and filtered prior to being land applied. The primary contaminant being removed is RDX and this work is covered under Groundwater Discharge Permit 1793. At the site, groundwater is pumped into a conex container where it is filtered through granular activated carbon (GAC) vessels. Additionally, a separate flow-through cell housed in the conex container collects field parameters using an Aqua Troll 400 multi-parameter sonde . The release resulted from a leak in the flow-through cell due to a faulty O-ring on the multi-parameter sonde. The sonde was installed on Friday 9/9/2016 and was inspected a few hours after installation and no leaks were present. The release is believed to have begun in the early morning hours of 9/10/2016. Operational rounds are conducted twice a day and the leak was discovered during the morning round on 9/10/2016. Upon discovery of the release, the valve on the flow through cell was closed to stop the discharge. It is estimated that a total of 80 gallons of untreated groundwater leaked in the conex container. Approximately 50 gallons of groundwater discharged out of the container and infiltrated into the underlying basecourse. Approximately 30 gallons of groundwater was recovered from inside the conex unit and was containerized. The discharge did not leave the pad, cause erosion, or impact any Potential Release Sites or Storm Water Individual Permit sites. The flow-through cell continues to be valved off inside the conex container. Analytical data from CdV-16-4ip is being compiled and will be provided at a later date.

**If the release/discharge is associated with a NPDES Outfall, Potential Release Site (PRS) or Solid Waste Management Unit (SWMU), indicate the site/unit number and its relationship to the release/discharge:**

**NPDES Outfall:** ☐ **PRS:** ☐ **SWMU:** ☐ **PRS/SWMU Number:** N/A

Indicate with "X" in appropriate box(es).

**Relationship of the Discharge to a SWMU or PRS:**

The discharge did not reach a SWMU or PRS.

| | Date & Time |
|---|---|
| **Discharge Occurred:** | 9/10/2016 Early Morning |
| **Discharge Discovered:** | 9/10/2016 ~9:30 a.m. |
| **Discharge Stopped:** | 9/10/2016 ~9:30 a.m. |
| **Cleanup Started:** | 9/10/2016 ~9:30 a.m. |
| **Cleanup Completed:** | 9/15/2016 5:00p.m. |

**Material(s) Released / Discharged:**

Untreated groundwater from intermediate well CdV-16-4ip.

**Release/Discharge Mitigation Method:**

The flow-through cell valve was closed upon discovery of the release to stop the discharge. Residual water inside the conex container was collected and containerized.

**Weather Conditions:**

Report Printed 9/27/2016 2:33:31 PM

**Weather Conditions:**

Variable

| Duration of Release/ Discharge, in HOURS: | Unknown | Est. Volume released,in gallons: | ~80 | Est. Volume Recovered, in gallons. | ~30 |
|---|---|---|---|---|---|

**Corrective Actions Taken (ie, type of BMPs, etc):**

Immediate Release Response: The flow-through cell valve was closed upon discovery of the release to stop the discharge. Residual water inside the conex container was collected and containerized.
Administrative Actions: A fact finding meeting was held on 9/15/2016 to review the release.
Closure Actions: The flow-through cell continues to be valved off and will not be utilized for the remainder of the current pump test at CdV-16-4ip. To prevent future releases from the multi-parameter sonde, instrument o-rings will be replaced more frequently. Currently, the Aqua-Troll multi-parameter sonde o-rings are replaced by the manufacturer when they are returned every 12-18 months for recalibration. As a corrective action, the sonde o-rings will be replaced prior to being deployed in the field for future uses. Additionally, the o-rings will be regularly inspected and replaced every 6 months or more often if identified as being worn through the regular inspections.

**Nearest Watercourse (Canyon Name)** Canon de Valle

**If the release/discharge reached a watercourse, describe the estimated surface area affected, presence of release/discharge now in the watercourse, and the media the release/discharge was detected in:**

The release did not reach Canon de Valle.

**Depth to Groundwater, in FT, if known:** ~815

**Distance to Nearest Drinking Water Well, in FT, if known:** ~17,000 **Well ID#** PM-5

## *24-HOUR RELEASE / DISCHARGE NOTIFICATIONS*

| | Contact Person | Phone | Fax | Date & Time (or Comment) | |
|---|---|---|---|---|---|
| **EPA:** | Gladys Gooden-Jackson | 214-665-7494 | | 9/19/2016 | 7-Day Report |
| **NMED/SWQB:** | Sarah Holcomb | 827-2798 | | 9/12/2016 | Verbal |
| **NMED/GWQB:** | Gerald Knutson | 827-2996 | 827-2965 | 9/12/2016 | Verbal |
| **NMED/HRMB:** | Stephen Connolly | 476-6000 | 476-6030 | 9/12/2016 | Verbal |
| **NMED/DOE-OB:** | Steve Yanicak | | 661-4958 | 9/12/2016 | Verbal |
| **ENV-CP:** | Brian Iacona | | | | |
| **DOE:** | Karen Armijo | | | 9/12/2016 | Electronic |
| **OTHER:** | Arturo Duran | 665-7772 | | 9/19/2016 | 7-Day Report |
| **OTHER:** | Cheryl Rodriguez | | | 9/13/2016 | Electronic |

**Comments:** Verbal notifications were provided to NMED-SWQB, GWQB, HWB, and NMED DOE-Oversight Bureau pursuant to 20.6.2.1203 NMAC within 24 hours of EPC-CP being notified of the spill. Verbal notification was also provided to the GWQB as required by Groundwater Discharge Permit 1793.

**Form Completed By:** Brian Iacona

## *7 DAY RELEASE / DISCHARGE ACTIONS*

**7 Day Notice** ☑ **7 Day Notice Date:** 9/19/2016 **7 Day Notice By:** Brian Iacona

Mark "X" when done.

**Comments:** Immediate Release Response: The flow-through cell valve was closed upon discovery of the release to stop the discharge. Residual water inside the conex container was collected and containerized.

Administrative Actions: A fact finding meeting was held on 9/15/2016 to review the release. Ongoing Actions: The flow-through cell continues to be valved off. Analytical results from CdV-16-ip will be provided at a later date.

Additional information may be provided in the 15-Day Report.

## *15 DAY RELEASE / DISCHARGE ACTIONS*

**15 day Follow-up Due:** 9/27/2016 **15-day Follow-Up By:** Brian Iacona

**Comments:** The flow-through cell at CdV-16-4ip continues to be valved off and will not be utilized for the remainder of the current pump test at CdV-16-4ip. Water quality data for CdV-16-4ip was included in the Work Plan for Treatment and Land Application of Groundwater (DP-1793,EPC-DO-16-064) and included results from CdV-16-4ip in 2014 and 2015. RDX was the only contaminant expected to exceed New Mexico Water Quality Control Commission Regulation 3103 groundwater standards or the NMED Risk Assessment Guidance for Investigations and Remediation Soil Screening Levels for Tap Water (Table A-1, SSLs). Analytical results for VOCs and high explosives collected at CdV-16-4ip on 9/6/2016 have been received and are included at the end of this report. RDX was detected at 118 ug/L in the 9/6/2016 sample. A focused validation of the data was conducted and the high explosive results are J qualifed because the percent recovery of the continuing calibration verification was greater than the upper limit. The volatile detects are J qualified due to an exceedance of holding times . The detections with the updated qualifiers are included after the analytical results.To prevent future releases from multi-parameter sondes, instrument o-rings will be replaced more frequently. Currently, the Aqua-Troll multi-parameter sonde o-rings are replaced by the manufacturer when they are returned every 12-18 months for recalibration. As a corrective action, the sonde o-rings will be replaced prior to being deployed in the field for future uses. Additionally, the o-rings will be regularly inspected and replaced every 6 months or more often if identified as being worn through the regular inspections. All corrective actions are complete. LANS, LLC requests administrative closure of Release Report #430 pursuant to 20.6.2.1203 NMAC.

***NME***

## *NMED 30 DAY APPROVAL / DISAPPROVAL*

**NMED 30 Day Response Date:** 10/12/2016

**Comments:**


**Jody Pugh, Assistant Manager**
**National Security Missions**
**Los Alamos Site Office**
**1347 West Jemez Road MS-A316**
**Los Alamos, New Mexico 87544**
**(505) 606-0397**

**John Bretzke, EPC Division Director**
**Los Alamos National Security, LLC.**
**Los Alamos National Laboratory**
**P.O. Box 1663, MS K404**
**Los Alamos, New Mexico 87544**
**(505) 667-2211**


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## Data Review Qualifier Definitions

| Qualifier | Explanation |
|---|---|
| * | A quality control analyte recovery is outside of specified acceptance criteria |
| ** | Analyte is a surrogate compound |
| < | Result is less than value reported |
| > | Result is greater than value reported |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL |
| A | The TIC is a suspected aldol-condensation product |
| B | Target analyte was detected in the associated blank |
| B | Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL |
| BD | Results are either below the MDC or tracer recovery is low |
| C | Analyte has been confirmed by GC/MS analysis |
| D | Results are reported from a diluted aliquot of the sample |
| d | 5-day BOD-The 2:1 depletion requirement was not met for this sample |
| E | Organics-Concentration of the target analyte exceeds the instrument calibration range |
| E | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria |
| H | Analytical holding time was exceeded |
| h | Preparation or preservation holding time was exceeded |
| J | Value is estimated |
| N | Metals-The Matrix spike sample recovery is not within specified control limits |
| N | Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more |
| ND | Analyte concentration is not detected above the reporting limit |
| UI | Gamma Spectroscopy-Uncertain identification |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier |
| Y | QC Samples were not spiked with this compound |
| Z | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed. |

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference. For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# Volatile Analysis

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS−LANS−MTOA6−25093−GEL)

Client SDG: 2016−2363 GEL Work Order: 405371

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria
** Analyte is a surrogate compound
B The target analyte was detected in the associated blank.
H Analytical holding time was exceeded
J Value is estimated
U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re−analyzed without re−extraction.
RE Indicates that sample is re−extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Erin Haubert **Name: Erin Haubert**

**Date: 15 SEP 2016** **Title: Data Validator**

# Sample Data Summary

# Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2016-2363** | **Date Collected:** | **09/06/2016 13:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **405371001** | **Date Received:** | **09/08/2016 09:15** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **VS-4ip-16-121416** | **Method:** | **SW-846:8260B** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1598477** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **09/14/2016 12:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **09/14/2016 12:18** | | | | |
| **Data File:** | **091416V1\1Z307.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 630-20-6 | 1,1,1,2-Tetrachloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 71-55-6 | 1,1,1-Trichloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 79-00-5 | 1,1,2-Trichloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-34-3 | 1,1-Dichloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-35-4 | 1,1-Dichloroethylene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 563-58-6 | 1,1-Dichloropropene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 87-61-6 | 1,2,3-Trichlorobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 96-18-4 | 1,2,3-Trichloropropane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 120-82-1 | 1,2,4-Trichlorobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 95-63-6 | 1,2,4-Trimethylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | HU | 0.500 | ug/L | 0.500 | 1.00 |
| 106-93-4 | 1,2-Dibromoethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 95-50-1 | 1,2-Dichlorobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 107-06-2 | 1,2-Dichloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 78-87-5 | 1,2-Dichloropropane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 108-67-8 | 1,3,5-Trimethylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 541-73-1 | 1,3-Dichlorobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 142-28-9 | 1,3-Dichloropropane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 106-46-7 | 1,4-Dichlorobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 594-20-7 | 2,2-Dichloropropane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 78-93-3 | 2-Butanone | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 126-99-8 | 2-Chloro-1,3-butadiene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 95-49-8 | 2-Chlorotoluene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 591-78-6 | 2-Hexanone | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 106-43-4 | 4-Chlorotoluene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 99-87-6 | 4-Isopropyltoluene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 108-10-1 | 4-Methyl-2-pentanone | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 67-64-1 | Acetone | HU | 1.50 | ug/L | 1.50 | 10.0 |
| 75-05-8 | Acetonitrile | HU | 8.00 | ug/L | 8.00 | 25.0 |
| 107-02-8 | Acrolein | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 107-13-1 | Acrylonitrile | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 107-05-1 | Allyl chloride | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 71-43-2 | Benzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 108-86-1 | Bromobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 74-97-5 | Bromochloromethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-27-4 | Bromodichloromethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-25-2 | Bromoform | HU | 0.300 | ug/L | 0.300 | 1.00 |

## Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2016-2363** | **Date Collected:** | **09/06/2016 13:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **405371001** | **Date Received:** | **09/08/2016 09:15** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **VS-4ip-16-121416** | **Method:** | **SW-846:8260B** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1598477** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **09/14/2016 12:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **09/14/2016 12:18** | | | | |
| **Data File:** | **091416V1\1Z307.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 74-83-9 | Bromomethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-15-0 | Carbon disulfide | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 56-23-5 | Carbon tetrachloride | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 108-90-7 | Chlorobenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-00-3 | Chloroethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 67-66-3 | Chloroform | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 74-87-3 | Chloromethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 124-48-1 | Dibromochloromethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 74-95-3 | Dibromomethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 75-71-8 | Dichlorodifluoromethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 60-29-7 | Ethyl ether | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 97-63-2 | Ethyl methacrylate | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 100-41-4 | Ethylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 87-68-3 | Hexachlorobutadiene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 74-88-4 | Iodomethane | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 78-83-1 | Isobutyl alcohol | HU | 15.0 | ug/L | 15.0 | 50.0 |
| 98-82-8 | Isopropylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 126-98-7 | Methacrylonitrile | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 80-62-6 | Methyl methacrylate | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 75-09-2 | Methylene chloride | HU | 1.00 | ug/L | 1.00 | 10.0 |
| 91-20-3 | Naphthalene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 107-12-0 | Propionitrile | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 100-42-5 | Styrene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 127-18-4 | Tetrachloroethylene | HJ | 0.950 | ug/L | 0.300 | 1.00 |
| 108-88-3 | Toluene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 79-01-6 | Trichloroethylene | HJ | 0.670 | ug/L | 0.300 | 1.00 |
| 75-69-4 | Trichlorofluoromethane | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 76-13-1 | Trichlorotrifluoroethane | HU | 2.00 | ug/L | 2.00 | 5.00 |
| 108-05-4 | Vinyl acetate | HU | 1.50 | ug/L | 1.50 | 5.00 |
| 75-01-4 | Vinyl chloride | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 156-59-2 | cis-1,2-Dichloroethylene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-01-5 | cis-1,3-Dichloropropylene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 179601-23-1 | m,p-Xylenes | HU | 0.300 | ug/L | 0.300 | 2.00 |
| 71-36-3 | n-Butyl alcohol | HU | 15.0 | ug/L | 15.0 | 50.0 |
| 104-51-8 | n-Butylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 103-65-1 | n-Propylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 95-47-6 | o-Xylene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 135-98-8 | sec-Butylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |

## Volatile
## Certificate of Analysis
## Sample Summary

| | | | | | |
|---|---|---|---|---|---|
| **SDG Number:** | **2016-2363** | **Date Collected:** | **09/06/2016 13:15** | **Matrix:** | **W** |
| **Lab Sample ID:** | **405371001** | **Date Received:** | **09/08/2016 09:15** | | |
| | | **Client:** | **ARSL004** | **Project:** | **ESHL00114** |
| **Client ID:** | **VS-4ip-16-121416** | **Method:** | **SW-846:8260B** | **SOP Ref:** | **GL-OA-E-038** |
| **Batch ID:** | **1598477** | **Inst:** | **VOA1.I** | **Dilution:** | **1** |
| **Run Date:** | **09/14/2016 12:18** | **Analyst:** | **VXY1** | **Purge Vol:** | **5 mL** |
| **Prep Date:** | **09/14/2016 12:18** | | | | |
| **Data File:** | **091416V1\1Z307.D** | **Column:** | **DB-624** | | |

| CAS No. | Parmname | Qualifier | Result | Units | MDL/LOD | PQL/LOQ |
|---|---|---|---|---|---|---|
| 1634-04-4 | tert-Butyl methyl ether | HJ | 0.400 | ug/L | 0.300 | 1.00 |
| 98-06-6 | tert-Butylbenzene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 156-60-5 | trans-1,2-Dichloroethylene | HU | 0.300 | ug/L | 0.300 | 1.00 |
| 10061-02-6 | trans-1,3-Dichloropropylene | HU | 0.300 | ug/L | 0.300 | 1.00 |

| Surrogate/Tracer recovery | Result | Nominal | | Recovery% | Acceptable Limits |
|---|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 52.4 | 50.0 | ug/L | 105 | (71%-134%) |
| Bromofluorobenzene | 53.1 | 50.0 | ug/L | 106 | (70%-131%) |
| Toluene-d8 | 50.4 | 50.0 | ug/L | 101 | (74%-124%) |

**Tentatively Identified Compound Summary**

| CAS No. | Tentatively Identified Compound (TIC) | RT | Estimated Units | Fit | Qual |
|---|---|---|---|---|---|
| | No Tentatively Identified Compounds Found | | ug/L | | |

# Explosives by LCMSMS Analysis

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Qualifier Definition Report
for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2016-2363 GEL Work Order: 405371

**The Qualifiers in this report are defined as follows:**

* A quality control analyte recovery is outside of specified acceptance criteria
** Analyte is a surrogate compound
J Value is estimated
Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

**Review/Validation**

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

**Signature:** Michael A. Penny Jr. **Name: Michael Penny**

**Date: 15 SEP 2016** **Title: Group Leader**

# Sample Data Summary

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** VS-4ip-16-121416

**Lab Code:** GEL

**GEL Job No (SDG)** 2016-2363

**Matrix:** WATER

**GEL Sample ID:** 405371001

**Sample Amount** 950 mL

**Date Received:** 08-SEP-16

**Moisture:**

**Extraction Batch ID:** 1597655

**Extraction Type** Sol Exchange

**Date Extracted:** 12-SEP-16

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0914020.wiff

**Date Analyzed:** 14-SEP-16 19:05

**Dilution Factor:** 50

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 121-82-4 | RDX | 118 | | 2.11 | 6.58 |
| *121-82-4* | *RDX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** VS-4ip-16-121416

**Lab Code:** GEL

**GEL Job No (SDG)** 2016-2363

**Matrix:** WATER

**GEL Sample ID:** 405371001

**Sample Amount** 950 mL

**Date Received:** 08-SEP-16

**Moisture:**

**Extraction Batch ID:** 1597655

**Extraction Type** Sol Exchange

**Date Extracted:** 12-SEP-16

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0914021.wiff

**Date Analyzed:** 14-SEP-16 19:40

**Dilution Factor:** 2

**Concentration Units:** ug/L

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 118-96-7 | 2,4,6-Trinitrotoluene | .0842 | U | 0.0842 | 0.263 |
| *118-96-7* | *2,4,6-Trinitrotoluene* | | | | |
| 121-14-2 | 2,4-Dinitrotoluene | .0842 | U | 0.0842 | 0.263 |
| *121-14-2* | *2,4-Dinitrotoluene* | | | | |
| 35572-78-2 | 2-Amino-4,6-dinitrotoluene | .0842 | U | 0.0842 | 0.263 |
| *35572-78-2* | *2-Amino-4,6-dinitrotoluene* | | | | |
| 479-45-8 | Tetryl | .0842 | U | 0.0842 | 0.526 |
| *479-45-8* | *Tetryl* | | | | |
| 606-20-2 | 2,6-Dinitrotoluene | .0842 | U | 0.0842 | 0.263 |
| *606-20-2* | *2,6-Dinitrotoluene* | | | | |
| 98-95-3 | Nitrobenzene | .0842 | U | 0.0842 | 0.263 |
| *98-95-3* | *Nitrobenzene* | | | | |
| 99-08-1 | m-Nitrotoluene | .0842 | QU | 0.0842 | 0.263 |
| *99-08-1* | *m-Nitrotoluene* | | | | |
| 99-35-4 | 1,3,5-Trinitrobenzene | .0842 | U | 0.0842 | 0.263 |
| *99-35-4* | *1,3,5-Trinitrobenzene* | | | | |
| 99-65-0 | m-Dinitrobenzene | .0842 | U | 0.0842 | 0.263 |
| *99-65-0* | *m-Dinitrobenzene* | | | | |
| 88-72-2 | o-Nitrotoluene | .0863 | U | 0.0863 | 0.263 |
| *88-72-2* | *o-Nitrotoluene* | | | | |
| 78-11-5 | PETN | .105 | QU | 0.105 | 0.526 |
| *78-11-5* | *PETN* | | | | |
| 99-99-0 | p-Nitrotoluene | .158 | QU | 0.158 | 0.526 |
| *99-99-0* | *p-Nitrotoluene* | | | | |
| 13980-04-6 | TNX | .248 | J | 0.0842 | 0.263 |
| *13980-04-6* | *TNX* | | | | |

# High Explosives Analysis Data Sheet

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** VS-4ip-16-121416

**Lab Code:** GEL

**GEL Job No (SDG)** 2016-2363

**Matrix:** WATER

**GEL Sample ID:** 405371001

**Sample Amount** 950 mL

**Date Received:** 08-SEP-16

**Moisture:**

**Extraction Batch ID:** 1597655

**Extraction Type** Sol Exchange

**Date Extracted:** 12-SEP-16

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):** 50

| Cas No. | Compound | Concentration* | Q | MDL | PQL |
|---|---|---|---|---|---|
| 80251-29-2 | DNX | .258 | JQ | 0.0842 | 0.263 |
| *80251-29-2* | *DNX* | | | | |
| 3058-38-6 | TATB | .316 | U | 0.316 | 1.05 |
| *3058-38-6* | *TATB* | | | | |
| 618-87-1 | 3,5-Dinitroaniline | .316 | QU | 0.316 | 1.05 |
| *618-87-1* | *3,5-Dinitroaniline* | | | | |
| 78-30-8 | tris(o-cresyl) phosphate | .316 | QU | 0.316 | 1.05 |
| *78-30-8* | *tris(o-cresyl) phosphate* | | | | |
| 59229-75-3 | 2,6-Diamino-4-nitrotoluene | .526 | QU | 0.526 | 2.63 |
| *59229-75-3* | *2,6-Diamino-4-nitrotoluene* | | | | |
| 6629-29-4 | 2,4-Diamino-6-nitrotoluene | .526 | QU | 0.526 | 2.63 |
| *6629-29-4* | *2,4-Diamino-6-nitrotoluene* | | | | |
| 5755-27-1 | MNX | .711 | | 0.0842 | 0.263 |
| *5755-27-1* | *MNX* | | | | |
| 19406-51-0 | 4-Amino-2,6-dinitrotoluene | 1.94 | | 0.0842 | 0.263 |
| *19406-51-0* | *4-Amino-2,6-dinitrotoluene* | | | | |
| 2691-41-0 | HMX | 8.58 | | 0.0842 | 0.263 |
| *2691-41-0* | *HMX* | | | | |

| SAMPLE DATE | LOCATION ID | ANALYTICAL METHOD CATEGORY | ANALYTICAL METHOD | PARAMETER NAME | FIELD PREPARATION CODE | REPORT RESULT | REPORT UNITS | LAB QUALIFIER | Updated Validation Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| 09/06/2016 | CDV-16-4ip S1 | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | RDX | UF | 118 | ug/L | | J |
| 09/06/2016 | CDV-16-4ip S1 | VOC | SW-846:8260B | Tetrachloroethene | UF | 0.95 | ug/L | HJ | J- |
| 09/06/2016 | CDV-16-4ip S1 | VOC | SW-846:8260B | Methyl tert-Butyl Ether | UF | 0.4 | ug/L | HJ | J- |
| 09/06/2016 | CDV-16-4ip S1 | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | Amino-2,6-dinitrotoluene[4-] | UF | 1.94 | ug/L | | J |
| 09/06/2016 | CDV-16-4ip S1 | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | HMX | UF | 8.58 | ug/L | | J |
| 09/06/2016 | CDV-16-4ip S1 | VOC | SW-846:8260B | Trichloroethene | UF | 0.67 | ug/L | HJ | J- |
| 09/06/2016 | CDV-16-4ip S1 | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | DNX | UF | 0.258 | ug/L | JQ | J |
| 09/06/2016 | CDV-16-4ip S1 | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | MNX | UF | 0.711 | ug/L | | J |
| 09/06/2016 | CDV-16-4ip S1 | LCMS/MS HIGH EXPLOSIVES | SW-846:8321A_MOD | TNX | UF | 0.248 | ug/L | J | J |