



---

2655 Park Center Dr., Suite A  
Simi Valley, CA 93065  
T: +1 805 526 7161  
F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

## LABORATORY REPORT

April 4, 2016

Rob Nieman  
ALS Environmental  
4388 Glendale Milford Road  
Cincinnati, OH 45242

**RE: Keystone Landfill/PADOH/PADEP / 1603756**

Dear Rob:

Enclosed are the results of the sample submitted to our laboratory on March 22, 2016. For your reference, these analyses have been assigned our service request number P1601497.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

By Kate Aguilera at 6:05 pm, Apr 04, 2016

Kate Aguilera  
Project Manager



2655 Park Center Dr., Suite A  
Simi Valley, CA 93065  
T: +1 805 526 7161  
F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

Client: ALS Environmental  
Project: Keystone Landfill/PADOH/PADEP / 1603756

Service Request No: P1601497

---

## CASE NARRATIVE

The sample was received intact under chain of custody on March 22, 2016 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

### Sulfur Analysis

The sample was analyzed for twenty sulfur compounds per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP accreditation.

### Volatile Organic Compound Analysis

The sample was also analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation, however it is not part of the AIHA-LAP accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The container was cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

---

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



2655 Park Center Dr., Suite A  
 Simi Valley, CA 93065  
 T: +1 805 526 7161  
 F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

| Agency                 | Web Site  | Number                  |
|------------------------|---|-------------------------|
| AIHA                   | <a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>   | 101661                  |
| Arizona DHS            | <a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>   | AZ0694                  |
| DoD ELAP               | <a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>   | L15-398                 |
| Florida DOH (NELAP)    | <a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>   | E871020                 |
| Maine DHHS             | <a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>                           | 2014025                 |
| Minnesota DOH (NELAP)  | <a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>   | 977273                  |
| New Jersey DEP (NELAP) | <a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>   | CA009                   |
| New York DOH (NELAP)   | <a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>   | 11221                   |
| Oregon PHD (NELAP)     | <a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a> | 4068-003                |
| Pennsylvania DEP       | <a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>   | 68-03307 (Registration) |
| Texas CEQ (NELAP)      | <a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>   | T104704413-15-6         |
| Utah DOH (NELAP)       | <a href="http://www.health.utah.gov/lab/labimp/certification/index.html">http://www.health.utah.gov/lab/labimp/certification/index.html</a>   | CA01627201 5-5          |
| Washington DOE         | <a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>   | C946                    |

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at [www.alsglobal.com](http://www.alsglobal.com), or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

**ALS ENVIRONMENTAL**

DETAIL SUMMARY REPORT

Client: ALS Environmental  
 Project ID: Keystone Landfill/PADOH/PADEP / 1603756

Service Request: P1601497

Date Received: 3/22/2016  
 Time Received: 09:30

|                             |
|-----------------------------|
| ASTM D 5504-12 - Sulfur Can |
| TO-15 - VOC Cans            |

| Client Sample ID              | Lab Code     | Matrix | Date Collected | Time Collected | Container ID | Pi1 (psig) | Pf1 (psig) | ASTM D 5504-12 - Sulfur Can | TO-15 - VOC Cans |
|-------------------------------|--------------|--------|----------------|----------------|--------------|------------|------------|-----------------------------|------------------|
| 1603756-06A (KSL032016-Summa) | P1601497-001 | Air    | 3/20/2016      | 09:09          | AS00975      | -3.47      | 3.17       | X                           | X                |

Date: **23-Mar-16**  
COC ID: **3806**  
Due Date: **03-Apr-16**

# CHAIN-OF-CUSTODY RECORD

Page 1 of 1

P1601497

**Subcontractor:**  
ALS Simi Valley  
2655 Park Center Drive  
Suite A  
Simi Valley,

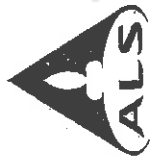
TEL: (805) 526-7161  
FAX: (805) 526-7270  
Acct #:

**Salesperson**

| Customer Information |                               | Project Information |                          | Parameter/Method Request for Analysis |  |  |  |  |  |  |  |  |  |  |  |
|----------------------|-------------------------------|---------------------|--------------------------|---------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Purchase Order       | 31-1995                       | Project Name        | 1603756                  | A                                     | Sulfur gases by ASTM 5504 Mod. (A5504) |  |  |  |  |  |  |  |  |  |  |
| Work Order           |                               | Project Number      |                          | B                                     | TO-15 by GC/MS (ETO-15)                |  |  |  |  |  |  |  |  |  |  |
| Company Name         | ALS Group USA, Corp           | Bill To Company     | ALS Group USA, Corp      | C                                     |  |  |  |  |  |  |  |  |  |  |  |
| Send Report To       | Rob Nieman                    | Inv Attn            | Accounts Payable         | D                                     |  |  |  |  |  |  |  |  |  |  |  |
| Address              | 4388 Glendale Milford Rd      | Address             | 4388 Glendale Milford Rd | E                                     |  |  |  |  |  |  |  |  |  |  |  |
| City/State/Zip       | Cincinnati, Ohio 45242-       | City/State/Zip      | Cincinnati, Ohio 45242-  | F                                     |  |  |  |  |  |  |  |  |  |  |  |
| Phone                | (513) 733-5336                | Phone               | (513) 733-5336           | G                                     |  |  |  |  |  |  |  |  |  |  |  |
| Fax                  | (513) 733-5347                | Fax                 | (513) 733-5347           | H                                     |  |  |  |  |  |  |  |  |  |  |  |
| eMail Address        | alsen.reporting@alsglobal.com | eMail CC            |                          | I                                     |  |  |  |  |  |  |  |  |  |  |  |
|                      |                               |                     |                          | J                                     |  |  |  |  |  |  |  |  |  |  |  |

| Sample ID                     | Matrix | Collection Date | 24hr      | Bottle | A | B | C | D | E | F | G | H | I | J |
|-------------------------------|--------|-----------------|-----------|--------|---|---|---|---|---|---|---|---|---|---|
| 1603756-06A (KSL032016-Summa) | Air    | 23/Mar/2016     | (1) SUMMA |        | X | B | X |   |   |   |   |   |   |   |

| Comments:   |           |              |                  | Report/QC Level |
|---|-----------|--------------|------------------|-----------------|
| Sub CoC received for P1601497 via email on 3/23/16-Kate |           |              |                  | Std             |
|   |           |              |                  |                 |
| Relinquished by:  | Date/Time | Received by: | Date/Time        | Cooler IDs      |
|   |           | AI David     | 03/22/16 @ 09:30 |                 |



2655 Park Center Drive, Suite A  
Simi Valley, California 93065  
Phone (805) 526-7161  
Fax (805) 526-7270

|   |                      |   |                |  |  |   |                                |                                      |              |
|---|----------------------|---|----------------|--|--|---|--------------------------------|--------------------------------------|--------------|
| Company Name & Address (Reporting Information)<br>Pennsylvania Dept. of Environmental Protection<br>2 Public Square<br>Wilkes-Barre, PA 18701-1915  |                      |   |                | Project Name: Keystone Landfill/PADOH/PADEP<br>Project Number: _____<br>P.O. #/Billing Information: _____<br>Sampler (Print & Sign): _____ |  | Project Requirements<br>(MRLs, QA/P)  |                                |                                      |              |
| Project Manager: Roger Bellas<br>Phone: (570) 826-2511<br>Fax: (570) 826-5448<br>Email Address for Result Reporting: RBELLAS@PA.GOV   |                      |   |                | ALS Contact: _____<br>Analysis Method: _____   |  | ALS Project No: P1601497  |                                |                                      |              |
| Requested Turnaround Time in Business Days (Surcharges) please circle<br>1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard   |                      |   |                |  |  |   |                                |                                      |              |
| Client Sample ID  | Laboratory ID Number | Date Collected  | Time Collected | Canister ID (Bar code # - AC, SC, etc.)  | Flow Controller ID (Bar code # - FC #) | Canister Start Pressure "Hg   | Canister End Pressure "Hg/psig | Sample Volume                        | Legal Seal # |
| KSL032016   | ①                    | 3-20-16   | 0909 AM        | SC: 20450<br>AC: ASD075  | 0c: 5 FC 00031                         | -30.5   | -9                             |                                      | I 106576     |
| Report Tier Levels - please select<br>Tier I - Results (Default in not specified) _____<br>Tier II (Results + QC Summaries) _____<br>Tier III (Results + QC & Calibration Summaries) _____<br>Tier IV (Data Validation Package) 10% Surcharge _____ |                      | EDD required YES / No _____ Units: _____<br>Type: _____ |                | Chain of Custody Seal: (Circle)<br>INTACT / BROKEN / ABSENT  |  | Date: _____ Time: _____<br>Date: 3/21/16 Time: 0730<br>Date: 3/22/16 Time: 0730 |                                | Project Requirements<br>(MRLs, QA/P) |              |
| Relinquished by: (Signature) <i>Roger Bellas</i>  |                      | Relinquished by: (Signature) <i>[Signature]</i>         |                | Received by: (Signature) <i>[Signature]</i>  |  | Received by: (Signature) <i>[Signature]</i>                                     |                                | Cooler / Blank Temperature _____ °C  |              |

**ALS Environmental  
Sample Acceptance Check Form**

Client: ALS Environmental Work order: P1601497  
 Project: Keystone Landfill/PADOH/PADEP / 1603756  
 Sample(s) received on: 3/22/16 Date opened: 3/22/16 by: ADAVID

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- |   | <b>Yes</b>                          | <b>No</b>                           | <b>N/A</b>                          |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Did <b>sample container labels</b> and/or tags agree with custody papers?                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?                         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8 Were <b>custody seals</b> on outside of cooler/Box/Container?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Location of seal(s)? <u>Box sealing.</u> Sealing Lid?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Were signature and date included?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Were seals intact?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 9 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information? | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?       | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

| Lab Sample ID   | Container Description | Required pH * | Received pH | Adjusted pH | VOA Headspace (Presence/Absence) | Receipt / Preservation Comments |
|-----------------|-----------------------|---------------|-------------|-------------|----------------------------------|---------------------------------|
| P1601497-001.01 | 6.0 L Silonite Can    |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |
|                 |                       |               |             |             |                                  |                                 |

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** ALS Environmental  
**Client Sample ID:** 1603756-06A (KSL032016-Summa)  
**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497  
 ALS Sample ID: P1601497-001

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00975

Date Collected: 3/20/16  
 Time Collected: 09:09  
 Date Received: 3/22/16  
 Date Analyzed: 3/24/16  
 Time Analyzed: 11:50  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.47      Final Pressure (psig): 3.17

Canister Dilution Factor: 1.59

| CAS #     | Compound              | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|-----------|-----------------------|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 7783-06-4 | Hydrogen Sulfide      | ND                          | 11                       | ND             | 8.0         |                   |
| 463-58-1  | Carbonyl Sulfide      | ND                          | 20                       | ND             | 8.0         |                   |
| 74-93-1   | Methyl Mercaptan      | ND                          | 16                       | ND             | 8.0         |                   |
| 75-08-1   | Ethyl Mercaptan       | ND                          | 20                       | ND             | 8.0         |                   |
| 75-18-3   | Dimethyl Sulfide      | ND                          | 20                       | ND             | 8.0         |                   |
| 75-15-0   | Carbon Disulfide      | ND                          | 12                       | ND             | 4.0         |                   |
| 75-33-2   | Isopropyl Mercaptan   | ND                          | 25                       | ND             | 8.0         |                   |
| 75-66-1   | tert-Butyl Mercaptan  | ND                          | 29                       | ND             | 8.0         |                   |
| 107-03-9  | n-Propyl Mercaptan    | ND                          | 25                       | ND             | 8.0         |                   |
| 624-89-5  | Ethyl Methyl Sulfide  | ND                          | 25                       | ND             | 8.0         |                   |
| 110-02-1  | Thiophene             | ND                          | 27                       | ND             | 8.0         |                   |
| 513-44-0  | Isobutyl Mercaptan    | ND                          | 29                       | ND             | 8.0         |                   |
| 352-93-2  | Diethyl Sulfide       | ND                          | 29                       | ND             | 8.0         |                   |
| 109-79-5  | n-Butyl Mercaptan     | ND                          | 29                       | ND             | 8.0         |                   |
| 624-92-0  | Dimethyl Disulfide    | ND                          | 15                       | ND             | 4.0         |                   |
| 616-44-4  | 3-Methylthiophene     | ND                          | 32                       | ND             | 8.0         |                   |
| 110-01-0  | Tetrahydrothiophene   | ND                          | 29                       | ND             | 8.0         |                   |
| 638-02-8  | 2,5-Dimethylthiophene | ND                          | 36                       | ND             | 8.0         |                   |
| 872-55-9  | 2-Ethylthiophene      | ND                          | 36                       | ND             | 8.0         |                   |
| 110-81-6  | Diethyl Disulfide     | ND                          | 20                       | ND             | 4.0         |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** ALS Environmental  
**Client Sample ID:** Method Blank  
**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497  
 ALS Sample ID: P160324-MB

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 7890A/GC22/SCD  
 Analyst: Mike Conejo  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 3/24/16  
 Time Analyzed: 07:47  
 Volume(s) Analyzed: 1.0 ml(s)

| CAS #     | Compound              | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|-----------|-----------------------|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 7783-06-4 | Hydrogen Sulfide      | ND                          | 7.0                      | ND             | 5.0         |                   |
| 463-58-1  | Carbonyl Sulfide      | ND                          | 12                       | ND             | 5.0         |                   |
| 74-93-1   | Methyl Mercaptan      | ND                          | 9.8                      | ND             | 5.0         |                   |
| 75-08-1   | Ethyl Mercaptan       | ND                          | 13                       | ND             | 5.0         |                   |
| 75-18-3   | Dimethyl Sulfide      | ND                          | 13                       | ND             | 5.0         |                   |
| 75-15-0   | Carbon Disulfide      | ND                          | 7.8                      | ND             | 2.5         |                   |
| 75-33-2   | Isopropyl Mercaptan   | ND                          | 16                       | ND             | 5.0         |                   |
| 75-66-1   | tert-Butyl Mercaptan  | ND                          | 18                       | ND             | 5.0         |                   |
| 107-03-9  | n-Propyl Mercaptan    | ND                          | 16                       | ND             | 5.0         |                   |
| 624-89-5  | Ethyl Methyl Sulfide  | ND                          | 16                       | ND             | 5.0         |                   |
| 110-02-1  | Thiophene             | ND                          | 17                       | ND             | 5.0         |                   |
| 513-44-0  | Isobutyl Mercaptan    | ND                          | 18                       | ND             | 5.0         |                   |
| 352-93-2  | Diethyl Sulfide       | ND                          | 18                       | ND             | 5.0         |                   |
| 109-79-5  | n-Butyl Mercaptan     | ND                          | 18                       | ND             | 5.0         |                   |
| 624-92-0  | Dimethyl Disulfide    | ND                          | 9.6                      | ND             | 2.5         |                   |
| 616-44-4  | 3-Methylthiophene     | ND                          | 20                       | ND             | 5.0         |                   |
| 110-01-0  | Tetrahydrothiophene   | ND                          | 18                       | ND             | 5.0         |                   |
| 638-02-8  | 2,5-Dimethylthiophene | ND                          | 23                       | ND             | 5.0         |                   |
| 872-55-9  | 2-Ethylthiophene      | ND                          | 23                       | ND             | 5.0         |                   |
| 110-81-6  | Diethyl Disulfide     | ND                          | 12                       | ND             | 2.5         |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** ALS Environmental  
**Client Sample ID:** Lab Control Sample  
**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497  
ALS Sample ID: P160324-LCS

Test Code: ASTM D 5504-12  
Instrument ID: Agilent 7890A/GC22/SCD  
Analyst: Mike Conejo  
Sample Type: 6.0 L Silonite Canister  
Test Notes:

Date Collected: NA  
Date Received: NA  
Date Analyzed: 3/24/16  
Volume(s) Analyzed: NA ml(s)

| CAS #     | Compound         | Spike Amount<br>ppbV | Result<br>ppbV | % Recovery | ALS                  | Data<br>Qualifier |
|-----------|------------------|----------------------|----------------|------------|----------------------|-------------------|
|           |                  |                      |                |            | Acceptance<br>Limits |                   |
| 7783-06-4 | Hydrogen Sulfide | 1,000                | 824            | 82         | 65-138               |                   |
| 463-58-1  | Carbonyl Sulfide | 1,000                | 860            | 86         | 60-135               |                   |
| 74-93-1   | Methyl Mercaptan | 1,000                | 809            | 81         | 57-140               |                   |

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 3

**Client:** ALS Environmental  
**Client Sample ID:** 1603756-06A (KSL032016-Summa)  
**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497  
 ALS Sample ID: P1601497-001

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00975

Date Collected: 3/20/16  
 Date Received: 3/22/16  
 Date Analyzed: 3/25/16  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.47      Final Pressure (psig): 3.17

Canister Dilution Factor: 1.59

| CAS #     | Compound   | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|-----------|--|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 115-07-1  | Propene  | ND                          | 0.80                     | ND             | 0.46        |                   |
| 75-71-8   | Dichlorodifluoromethane (CFC 12)                 | <b>2.4</b>                  | 0.80                     | <b>0.48</b>    | 0.16        |                   |
| 74-87-3   | Chloromethane                                    | ND                          | 0.80                     | ND             | 0.39        |                   |
| 76-14-2   | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND                          | 0.80                     | ND             | 0.11        |                   |
| 75-01-4   | Vinyl Chloride                                   | ND                          | 0.80                     | ND             | 0.31        |                   |
| 106-99-0  | 1,3-Butadiene                                    | ND                          | 0.80                     | ND             | 0.36        |                   |
| 74-83-9   | Bromomethane                                     | ND                          | 0.80                     | ND             | 0.20        |                   |
| 75-00-3   | Chloroethane                                     | ND                          | 0.80                     | ND             | 0.30        |                   |
| 64-17-5   | Ethanol  | ND                          | 8.0                      | ND             | 4.2         |                   |
| 75-05-8   | Acetonitrile                                     | ND                          | 0.80                     | ND             | 0.47        |                   |
| 107-02-8  | Acrolein   | ND                          | 3.2                      | ND             | 1.4         |                   |
| 67-64-1   | Acetone  | ND                          | 8.0                      | ND             | 3.3         |                   |
| 75-69-4   | Trichlorofluoromethane                           | <b>1.2</b>                  | 0.80                     | <b>0.21</b>    | 0.14        |                   |
| 67-63-0   | 2-Propanol (Isopropyl Alcohol)                   | ND                          | 8.0                      | ND             | 3.2         |                   |
| 107-13-1  | Acrylonitrile                                    | ND                          | 0.80                     | ND             | 0.37        |                   |
| 75-35-4   | 1,1-Dichloroethene                               | ND                          | 0.80                     | ND             | 0.20        |                   |
| 75-09-2   | Methylene Chloride                               | ND                          | 0.80                     | ND             | 0.23        |                   |
| 107-05-1  | 3-Chloro-1-propene (Allyl Chloride)              | ND                          | 0.80                     | ND             | 0.25        |                   |
| 76-13-1   | Trichlorotrifluoroethane                         | ND                          | 0.80                     | ND             | 0.10        |                   |
| 75-15-0   | Carbon Disulfide                                 | ND                          | 8.0                      | ND             | 2.6         |                   |
| 156-60-5  | trans-1,2-Dichloroethene                         | ND                          | 0.80                     | ND             | 0.20        |                   |
| 75-34-3   | 1,1-Dichloroethane                               | ND                          | 0.80                     | ND             | 0.20        |                   |
| 1634-04-4 | Methyl tert-Butyl Ether                          | ND                          | 0.80                     | ND             | 0.22        |                   |
| 108-05-4  | Vinyl Acetate                                    | ND                          | 8.0                      | ND             | 2.3         |                   |
| 78-93-3   | 2-Butanone (MEK)                                 | ND                          | 8.0                      | ND             | 2.7         |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 3

**Client:** ALS Environmental

**Client Sample ID:** 1603756-06A (KSL032016-Summa)

**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

ALS Sample ID: P1601497-001

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00975

Date Collected: 3/20/16

Date Received: 3/22/16

Date Analyzed: 3/25/16

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.47      Final Pressure (psig): 3.17

Canister Dilution Factor: 1.59

| CAS #      | Compound                  | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|------------|---------------------------|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 156-59-2   | cis-1,2-Dichloroethene    | ND                          | 0.80                     | ND             | 0.20        |                   |
| 141-78-6   | Ethyl Acetate             | ND                          | 1.6                      | ND             | 0.44        |                   |
| 110-54-3   | n-Hexane                  | ND                          | 0.80                     | ND             | 0.23        |                   |
| 67-66-3    | Chloroform                | ND                          | 0.80                     | ND             | 0.16        |                   |
| 109-99-9   | Tetrahydrofuran (THF)     | ND                          | 0.80                     | ND             | 0.27        |                   |
| 107-06-2   | 1,2-Dichloroethane        | ND                          | 0.80                     | ND             | 0.20        |                   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND                          | 0.80                     | ND             | 0.15        |                   |
| 71-43-2    | Benzene                   | ND                          | 0.80                     | ND             | 0.25        |                   |
| 56-23-5    | Carbon Tetrachloride      | ND                          | 0.80                     | ND             | 0.13        |                   |
| 110-82-7   | Cyclohexane               | ND                          | 1.6                      | ND             | 0.46        |                   |
| 78-87-5    | 1,2-Dichloropropane       | ND                          | 0.80                     | ND             | 0.17        |                   |
| 75-27-4    | Bromodichloromethane      | ND                          | 0.80                     | ND             | 0.12        |                   |
| 79-01-6    | Trichloroethene           | ND                          | 0.80                     | ND             | 0.15        |                   |
| 123-91-1   | 1,4-Dioxane               | ND                          | 0.80                     | ND             | 0.22        |                   |
| 80-62-6    | Methyl Methacrylate       | ND                          | 1.6                      | ND             | 0.39        |                   |
| 142-82-5   | n-Heptane                 | ND                          | 0.80                     | ND             | 0.19        |                   |
| 10061-01-5 | cis-1,3-Dichloropropene   | ND                          | 0.80                     | ND             | 0.18        |                   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND                          | 0.80                     | ND             | 0.19        |                   |
| 10061-02-6 | trans-1,3-Dichloropropene | ND                          | 0.80                     | ND             | 0.18        |                   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND                          | 0.80                     | ND             | 0.15        |                   |
| 108-88-3   | Toluene                   | <b>1.0</b>                  | 0.80                     | <b>0.28</b>    | 0.21        |                   |
| 591-78-6   | 2-Hexanone                | ND                          | 0.80                     | ND             | 0.19        |                   |
| 124-48-1   | Dibromochloromethane      | ND                          | 0.80                     | ND             | 0.093       |                   |
| 106-93-4   | 1,2-Dibromoethane         | ND                          | 0.80                     | ND             | 0.10        |                   |
| 123-86-4   | n-Butyl Acetate           | ND                          | 0.80                     | ND             | 0.17        |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 3

**Client:** ALS Environmental  
**Client Sample ID:** 1603756-06A (KSL032016-Summa)  
**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497  
 ALS Sample ID: P1601497-001

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: AS00975

Date Collected: 3/20/16  
 Date Received: 3/22/16  
 Date Analyzed: 3/25/16  
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.47      Final Pressure (psig): 3.17

Canister Dilution Factor: 1.59

| CAS #       | Compound                    | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|-------------|-----------------------------|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 111-65-9    | n-Octane                    | ND                          | 0.80                     | ND             | 0.17        |                   |
| 127-18-4    | Tetrachloroethene           | ND                          | 0.80                     | ND             | 0.12        |                   |
| 108-90-7    | Chlorobenzene               | ND                          | 0.80                     | ND             | 0.17        |                   |
| 100-41-4    | Ethylbenzene                | ND                          | 0.80                     | ND             | 0.18        |                   |
| 179601-23-1 | m,p-Xylenes                 | ND                          | 1.6                      | ND             | 0.37        |                   |
| 75-25-2     | Bromoform                   | ND                          | 0.80                     | ND             | 0.077       |                   |
| 100-42-5    | Styrene                     | ND                          | 0.80                     | ND             | 0.19        |                   |
| 95-47-6     | o-Xylene                    | ND                          | 0.80                     | ND             | 0.18        |                   |
| 111-84-2    | n-Nonane                    | ND                          | 0.80                     | ND             | 0.15        |                   |
| 79-34-5     | 1,1,2,2-Tetrachloroethane   | ND                          | 0.80                     | ND             | 0.12        |                   |
| 98-82-8     | Cumene                      | ND                          | 0.80                     | ND             | 0.16        |                   |
| 80-56-8     | alpha-Pinene                | ND                          | 0.80                     | ND             | 0.14        |                   |
| 103-65-1    | n-Propylbenzene             | ND                          | 0.80                     | ND             | 0.16        |                   |
| 622-96-8    | 4-Ethyltoluene              | ND                          | 0.80                     | ND             | 0.16        |                   |
| 108-67-8    | 1,3,5-Trimethylbenzene      | ND                          | 0.80                     | ND             | 0.16        |                   |
| 95-63-6     | 1,2,4-Trimethylbenzene      | ND                          | 0.80                     | ND             | 0.16        |                   |
| 100-44-7    | Benzyl Chloride             | ND                          | 0.80                     | ND             | 0.15        |                   |
| 541-73-1    | 1,3-Dichlorobenzene         | ND                          | 0.80                     | ND             | 0.13        |                   |
| 106-46-7    | 1,4-Dichlorobenzene         | ND                          | 0.80                     | ND             | 0.13        |                   |
| 95-50-1     | 1,2-Dichlorobenzene         | ND                          | 0.80                     | ND             | 0.13        |                   |
| 5989-27-5   | d-Limonene                  | ND                          | 0.80                     | ND             | 0.14        |                   |
| 96-12-8     | 1,2-Dibromo-3-chloropropane | ND                          | 0.80                     | ND             | 0.082       |                   |
| 120-82-1    | 1,2,4-Trichlorobenzene      | ND                          | 0.80                     | ND             | 0.11        |                   |
| 91-20-3     | Naphthalene                 | ND                          | 0.80                     | ND             | 0.15        |                   |
| 87-68-3     | Hexachlorobutadiene         | ND                          | 0.80                     | ND             | 0.075       |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 3

**Client:** ALS Environmental

**Client Sample ID:** Method Blank

**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

ALS Sample ID: P160325-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/25/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

| CAS #     | Compound   | Result            | MRL               | Result | MRL   | Data Qualifier |
|-----------|--|-------------------|-------------------|--------|-------|----------------|
|           |  | µg/m <sup>3</sup> | µg/m <sup>3</sup> | ppbV   | ppbV  |                |
| 115-07-1  | Propene  | ND                | 0.50              | ND     | 0.29  |                |
| 75-71-8   | Dichlorodifluoromethane (CFC 12)                 | ND                | 0.50              | ND     | 0.10  |                |
| 74-87-3   | Chloromethane                                    | ND                | 0.50              | ND     | 0.24  |                |
| 76-14-2   | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND                | 0.50              | ND     | 0.072 |                |
| 75-01-4   | Vinyl Chloride                                   | ND                | 0.50              | ND     | 0.20  |                |
| 106-99-0  | 1,3-Butadiene                                    | ND                | 0.50              | ND     | 0.23  |                |
| 74-83-9   | Bromomethane                                     | ND                | 0.50              | ND     | 0.13  |                |
| 75-00-3   | Chloroethane                                     | ND                | 0.50              | ND     | 0.19  |                |
| 64-17-5   | Ethanol  | ND                | 5.0               | ND     | 2.7   |                |
| 75-05-8   | Acetonitrile                                     | ND                | 0.50              | ND     | 0.30  |                |
| 107-02-8  | Acrolein   | ND                | 2.0               | ND     | 0.87  |                |
| 67-64-1   | Acetone  | ND                | 5.0               | ND     | 2.1   |                |
| 75-69-4   | Trichlorofluoromethane                           | ND                | 0.50              | ND     | 0.089 |                |
| 67-63-0   | 2-Propanol (Isopropyl Alcohol)                   | ND                | 5.0               | ND     | 2.0   |                |
| 107-13-1  | Acrylonitrile                                    | ND                | 0.50              | ND     | 0.23  |                |
| 75-35-4   | 1,1-Dichloroethene                               | ND                | 0.50              | ND     | 0.13  |                |
| 75-09-2   | Methylene Chloride                               | ND                | 0.50              | ND     | 0.14  |                |
| 107-05-1  | 3-Chloro-1-propene (Allyl Chloride)              | ND                | 0.50              | ND     | 0.16  |                |
| 76-13-1   | Trichlorotrifluoroethane                         | ND                | 0.50              | ND     | 0.065 |                |
| 75-15-0   | Carbon Disulfide                                 | ND                | 5.0               | ND     | 1.6   |                |
| 156-60-5  | trans-1,2-Dichloroethene                         | ND                | 0.50              | ND     | 0.13  |                |
| 75-34-3   | 1,1-Dichloroethane                               | ND                | 0.50              | ND     | 0.12  |                |
| 1634-04-4 | Methyl tert-Butyl Ether                          | ND                | 0.50              | ND     | 0.14  |                |
| 108-05-4  | Vinyl Acetate                                    | ND                | 5.0               | ND     | 1.4   |                |
| 78-93-3   | 2-Butanone (MEK)                                 | ND                | 5.0               | ND     | 1.7   |                |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 3

**Client:** ALS Environmental

**Client Sample ID:** Method Blank

**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

ALS Sample ID: P160325-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Analyst: Simon Cao

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/25/16

Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

| CAS #      | Compound                  | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|------------|---------------------------|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 156-59-2   | cis-1,2-Dichloroethene    | ND                          | 0.50                     | ND             | 0.13        |                   |
| 141-78-6   | Ethyl Acetate             | ND                          | 1.0                      | ND             | 0.28        |                   |
| 110-54-3   | n-Hexane                  | ND                          | 0.50                     | ND             | 0.14        |                   |
| 67-66-3    | Chloroform                | ND                          | 0.50                     | ND             | 0.10        |                   |
| 109-99-9   | Tetrahydrofuran (THF)     | ND                          | 0.50                     | ND             | 0.17        |                   |
| 107-06-2   | 1,2-Dichloroethane        | ND                          | 0.50                     | ND             | 0.12        |                   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND                          | 0.50                     | ND             | 0.092       |                   |
| 71-43-2    | Benzene                   | ND                          | 0.50                     | ND             | 0.16        |                   |
| 56-23-5    | Carbon Tetrachloride      | ND                          | 0.50                     | ND             | 0.080       |                   |
| 110-82-7   | Cyclohexane               | ND                          | 1.0                      | ND             | 0.29        |                   |
| 78-87-5    | 1,2-Dichloropropane       | ND                          | 0.50                     | ND             | 0.11        |                   |
| 75-27-4    | Bromodichloromethane      | ND                          | 0.50                     | ND             | 0.075       |                   |
| 79-01-6    | Trichloroethene           | ND                          | 0.50                     | ND             | 0.093       |                   |
| 123-91-1   | 1,4-Dioxane               | ND                          | 0.50                     | ND             | 0.14        |                   |
| 80-62-6    | Methyl Methacrylate       | ND                          | 1.0                      | ND             | 0.24        |                   |
| 142-82-5   | n-Heptane                 | ND                          | 0.50                     | ND             | 0.12        |                   |
| 10061-01-5 | cis-1,3-Dichloropropene   | ND                          | 0.50                     | ND             | 0.11        |                   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND                          | 0.50                     | ND             | 0.12        |                   |
| 10061-02-6 | trans-1,3-Dichloropropene | ND                          | 0.50                     | ND             | 0.11        |                   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND                          | 0.50                     | ND             | 0.092       |                   |
| 108-88-3   | Toluene                   | ND                          | 0.50                     | ND             | 0.13        |                   |
| 591-78-6   | 2-Hexanone                | ND                          | 0.50                     | ND             | 0.12        |                   |
| 124-48-1   | Dibromochloromethane      | ND                          | 0.50                     | ND             | 0.059       |                   |
| 106-93-4   | 1,2-Dibromoethane         | ND                          | 0.50                     | ND             | 0.065       |                   |
| 123-86-4   | n-Butyl Acetate           | ND                          | 0.50                     | ND             | 0.11        |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 3 of 3

**Client:** ALS Environmental

**Client Sample ID:** Method Blank

**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

ALS Sample ID: P160325-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 3/25/16

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

| CAS #       | Compound                    | Result<br>µg/m <sup>3</sup> | MRL<br>µg/m <sup>3</sup> | Result<br>ppbV | MRL<br>ppbV | Data<br>Qualifier |
|-------------|-----------------------------|-----------------------------|--------------------------|----------------|-------------|-------------------|
| 111-65-9    | n-Octane                    | ND                          | 0.50                     | ND             | 0.11        |                   |
| 127-18-4    | Tetrachloroethene           | ND                          | 0.50                     | ND             | 0.074       |                   |
| 108-90-7    | Chlorobenzene               | ND                          | 0.50                     | ND             | 0.11        |                   |
| 100-41-4    | Ethylbenzene                | ND                          | 0.50                     | ND             | 0.12        |                   |
| 179601-23-1 | m,p-Xylenes                 | ND                          | 1.0                      | ND             | 0.23        |                   |
| 75-25-2     | Bromoform                   | ND                          | 0.50                     | ND             | 0.048       |                   |
| 100-42-5    | Styrene                     | ND                          | 0.50                     | ND             | 0.12        |                   |
| 95-47-6     | o-Xylene                    | ND                          | 0.50                     | ND             | 0.12        |                   |
| 111-84-2    | n-Nonane                    | ND                          | 0.50                     | ND             | 0.095       |                   |
| 79-34-5     | 1,1,2,2-Tetrachloroethane   | ND                          | 0.50                     | ND             | 0.073       |                   |
| 98-82-8     | Cumene                      | ND                          | 0.50                     | ND             | 0.10        |                   |
| 80-56-8     | alpha-Pinene                | ND                          | 0.50                     | ND             | 0.090       |                   |
| 103-65-1    | n-Propylbenzene             | ND                          | 0.50                     | ND             | 0.10        |                   |
| 622-96-8    | 4-Ethyltoluene              | ND                          | 0.50                     | ND             | 0.10        |                   |
| 108-67-8    | 1,3,5-Trimethylbenzene      | ND                          | 0.50                     | ND             | 0.10        |                   |
| 95-63-6     | 1,2,4-Trimethylbenzene      | ND                          | 0.50                     | ND             | 0.10        |                   |
| 100-44-7    | Benzyl Chloride             | ND                          | 0.50                     | ND             | 0.097       |                   |
| 541-73-1    | 1,3-Dichlorobenzene         | ND                          | 0.50                     | ND             | 0.083       |                   |
| 106-46-7    | 1,4-Dichlorobenzene         | ND                          | 0.50                     | ND             | 0.083       |                   |
| 95-50-1     | 1,2-Dichlorobenzene         | ND                          | 0.50                     | ND             | 0.083       |                   |
| 5989-27-5   | d-Limonene                  | ND                          | 0.50                     | ND             | 0.090       |                   |
| 96-12-8     | 1,2-Dibromo-3-chloropropane | ND                          | 0.50                     | ND             | 0.052       |                   |
| 120-82-1    | 1,2,4-Trichlorobenzene      | ND                          | 0.50                     | ND             | 0.067       |                   |
| 91-20-3     | Naphthalene                 | ND                          | 0.50                     | ND             | 0.095       |                   |
| 87-68-3     | Hexachlorobutadiene         | ND                          | 0.50                     | ND             | 0.047       |                   |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



**ALS ENVIRONMENTAL**

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** ALS Environmental  
**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

Test Code: EPA TO-15  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9  
 Analyst: Simon Cao  
 Sample Type: 6.0 L Silonite Canister(s)  
 Test Notes:

Date(s) Collected: 3/20/16  
 Date(s) Received: 3/22/16  
 Date(s) Analyzed: 3/25/16

| Client Sample ID              | ALS Sample ID | 1,2-Dichloroethane-d4 | Toluene-d8        | Bromofluorobenzene | Acceptance Limits | Data Qualifier |
|-------------------------------|---------------|-----------------------|-------------------|--------------------|-------------------|----------------|
|                               |               | Percent Recovered     | Percent Recovered | Percent Recovered  |                   |                |
| Method Blank                  | P160325-MB    | <b>96</b>             | <b>98</b>         | <b>103</b>         | 70-130            |                |
| Lab Control Sample            | P160325-LCS   | <b>94</b>             | <b>101</b>        | <b>102</b>         | 70-130            |                |
| 1603756-06A (KSL032016-Summa) | P1601497-001  | <b>95</b>             | <b>103</b>        | <b>100</b>         | 70-130            |                |

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

**Client:** ALS Environmental

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

ALS Sample ID: P160325-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 3/25/16

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

| CAS #     | Compound   | Spike Amount<br>µg/m <sup>3</sup> | Result<br>µg/m <sup>3</sup> | % Recovery | ALS                  | Data<br>Qualifier |
|-----------|--|-----------------------------------|-----------------------------|------------|----------------------|-------------------|
|           |  |                                   |                             |            | Acceptance<br>Limits |                   |
| 115-07-1  | Propene  | 196                               | 190                         | 97         | 49-131               |                   |
| 75-71-8   | Dichlorodifluoromethane (CFC 12)                 | 188                               | 164                         | 87         | 65-117               |                   |
| 74-87-3   | Chloromethane                                    | 200                               | 173                         | 87         | 48-132               |                   |
| 76-14-2   | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | 204                               | 158                         | 77         | 65-122               |                   |
| 75-01-4   | Vinyl Chloride                                   | 200                               | 163                         | 82         | 65-128               |                   |
| 106-99-0  | 1,3-Butadiene                                    | 206                               | 194                         | 94         | 62-143               |                   |
| 74-83-9   | Bromomethane                                     | 202                               | 182                         | 90         | 65-130               |                   |
| 75-00-3   | Chloroethane                                     | 200                               | 189                         | 95         | 69-126               |                   |
| 64-17-5   | Ethanol  | 998                               | 977                         | 98         | 57-126               |                   |
| 75-05-8   | Acetonitrile                                     | 212                               | 188                         | 89         | 51-134               |                   |
| 107-02-8  | Acrolein   | 214                               | 214                         | 100        | 55-146               |                   |
| 67-64-1   | Acetone  | 1,080                             | 1010                        | 94         | 57-120               |                   |
| 75-69-4   | Trichlorofluoromethane                           | 216                               | 171                         | 79         | 59-139               |                   |
| 67-63-0   | 2-Propanol (Isopropyl Alcohol)                   | 418                               | 400                         | 96         | 59-129               |                   |
| 107-13-1  | Acrylonitrile                                    | 212                               | 217                         | 102        | 64-136               |                   |
| 75-35-4   | 1,1-Dichloroethene                               | 216                               | 208                         | 96         | 72-123               |                   |
| 75-09-2   | Methylene Chloride                               | 222                               | 198                         | 89         | 63-117               |                   |
| 107-05-1  | 3-Chloro-1-propene (Allyl Chloride)              | 218                               | 218                         | 100        | 50-141               |                   |
| 76-13-1   | Trichlorotrifluoroethane                         | 220                               | 202                         | 92         | 68-118               |                   |
| 75-15-0   | Carbon Disulfide                                 | 210                               | 189                         | 90         | 55-143               |                   |
| 156-60-5  | trans-1,2-Dichloroethene                         | 210                               | 222                         | 106        | 69-129               |                   |
| 75-34-3   | 1,1-Dichloroethane                               | 212                               | 198                         | 93         | 66-122               |                   |
| 1634-04-4 | Methyl tert-Butyl Ether                          | 216                               | 203                         | 94         | 55-128               |                   |
| 108-05-4  | Vinyl Acetate                                    | 1,040                             | 1110                        | 107        | 66-140               |                   |
| 78-93-3   | 2-Butanone (MEK)                                 | 220                               | 223                         | 101        | 62-127               |                   |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

|                           |  |                                    |
|---------------------------|--|------------------------------------|
| <b>Client:</b>            | <b>ALS Environmental</b>                       |                                    |
| <b>Client Sample ID:</b>  | <b>Lab Control Sample</b>                      | ALS Project ID: P1601497           |
| <b>Client Project ID:</b> | <b>Keystone Landfill/PADOH/PADEP / 1603756</b> | ALS Sample ID: P160325-LCS         |
| Test Code:                | EPA TO-15                                      | Date Collected: NA                 |
| Instrument ID:            | Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9     | Date Received: NA                  |
| Analyst:                  | Simon Cao                                      | Date Analyzed: 3/25/16             |
| Sample Type:              | 6.0 L Silonite Canister                        | Volume(s) Analyzed: 0.125 Liter(s) |
| Test Notes:               |  |                                    |

| CAS #      | Compound                  | Spike Amount<br>µg/m <sup>3</sup> | Result<br>µg/m <sup>3</sup> | % Recovery | ALS                  | Data<br>Qualifier |
|------------|---------------------------|-----------------------------------|-----------------------------|------------|----------------------|-------------------|
|            |                           |                                   |                             |            | Acceptance<br>Limits |                   |
| 156-59-2   | cis-1,2-Dichloroethene    | 218                               | 214                         | 98         | 65-125               |                   |
| 141-78-6   | Ethyl Acetate             | 428                               | 450                         | 105        | 64-132               |                   |
| 110-54-3   | n-Hexane                  | 212                               | 205                         | 97         | 58-126               |                   |
| 67-66-3    | Chloroform                | 224                               | 200                         | 89         | 68-117               |                   |
| 109-99-9   | Tetrahydrofuran (THF)     | 220                               | 218                         | 99         | 64-123               |                   |
| 107-06-2   | 1,2-Dichloroethane        | 214                               | 196                         | 92         | 63-124               |                   |
| 71-55-6    | 1,1,1-Trichloroethane     | 210                               | 196                         | 93         | 68-120               |                   |
| 71-43-2    | Benzene                   | 226                               | 181                         | 80         | 61-110               |                   |
| 56-23-5    | Carbon Tetrachloride      | 230                               | 211                         | 92         | 65-137               |                   |
| 110-82-7   | Cyclohexane               | 424                               | 402                         | 95         | 68-122               |                   |
| 78-87-5    | 1,2-Dichloropropane       | 216                               | 207                         | 96         | 67-122               |                   |
| 75-27-4    | Bromodichloromethane      | 218                               | 210                         | 96         | 71-124               |                   |
| 79-01-6    | Trichloroethene           | 216                               | 186                         | 86         | 71-121               |                   |
| 123-91-1   | 1,4-Dioxane               | 210                               | 228                         | 109        | 67-122               |                   |
| 80-62-6    | Methyl Methacrylate       | 422                               | 445                         | 105        | 76-130               |                   |
| 142-82-5   | n-Heptane                 | 216                               | 209                         | 97         | 67-125               |                   |
| 10061-01-5 | cis-1,3-Dichloropropene   | 208                               | 221                         | 106        | 73-131               |                   |
| 108-10-1   | 4-Methyl-2-pentanone      | 220                               | 228                         | 104        | 66-132               |                   |
| 10061-02-6 | trans-1,3-Dichloropropene | 210                               | 228                         | 109        | 76-135               |                   |
| 79-00-5    | 1,1,2-Trichloroethane     | 216                               | 212                         | 98         | 73-121               |                   |
| 108-88-3   | Toluene                   | 218                               | 203                         | 93         | 67-117               |                   |
| 591-78-6   | 2-Hexanone                | 220                               | 243                         | 110        | 59-128               |                   |
| 124-48-1   | Dibromochloromethane      | 220                               | 235                         | 107        | 73-132               |                   |
| 106-93-4   | 1,2-Dibromoethane         | 218                               | 233                         | 107        | 73-128               |                   |
| 123-86-4   | n-Butyl Acetate           | 226                               | 249                         | 110        | 61-136               |                   |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

**Client:** ALS Environmental

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Keystone Landfill/PADOH/PADEP / 1603756

ALS Project ID: P1601497

ALS Sample ID: P160325-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 3/25/16

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

| CAS #       | Compound                    | Spike Amount<br>µg/m <sup>3</sup> | Result<br>µg/m <sup>3</sup> | % Recovery | ALS                  | Data<br>Qualifier |
|-------------|-----------------------------|-----------------------------------|-----------------------------|------------|----------------------|-------------------|
|             |                             |                                   |                             |            | Acceptance<br>Limits |                   |
| 111-65-9    | n-Octane                    | 210                               | 216                         | 103        | 67-124               |                   |
| 127-18-4    | Tetrachloroethene           | 202                               | 198                         | 98         | 65-126               |                   |
| 108-90-7    | Chlorobenzene               | 220                               | 211                         | 96         | 68-120               |                   |
| 100-41-4    | Ethylbenzene                | 218                               | 217                         | 100        | 69-123               |                   |
| 179601-23-1 | m,p-Xylenes                 | 428                               | 428                         | 100        | 67-125               |                   |
| 75-25-2     | Bromoform                   | 228                               | 227                         | 100        | 68-153               |                   |
| 100-42-5    | Styrene                     | 222                               | 239                         | 108        | 68-132               |                   |
| 95-47-6     | o-Xylene                    | 210                               | 208                         | 99         | 67-124               |                   |
| 111-84-2    | n-Nonane                    | 204                               | 209                         | 102        | 60-130               |                   |
| 79-34-5     | 1,1,2,2-Tetrachloroethane   | 210                               | 232                         | 110        | 72-128               |                   |
| 98-82-8     | Cumene                      | 208                               | 203                         | 98         | 67-124               |                   |
| 80-56-8     | alpha-Pinene                | 212                               | 207                         | 98         | 67-129               |                   |
| 103-65-1    | n-Propylbenzene             | 204                               | 204                         | 100        | 67-125               |                   |
| 622-96-8    | 4-Ethyltoluene              | 214                               | 209                         | 98         | 66-128               |                   |
| 108-67-8    | 1,3,5-Trimethylbenzene      | 214                               | 213                         | 100        | 65-125               |                   |
| 95-63-6     | 1,2,4-Trimethylbenzene      | 218                               | 226                         | 104        | 62-134               |                   |
| 100-44-7    | Benzyl Chloride             | 220                               | 259                         | 118        | 74-145               |                   |
| 541-73-1    | 1,3-Dichlorobenzene         | 228                               | 229                         | 100        | 63-133               |                   |
| 106-46-7    | 1,4-Dichlorobenzene         | 208                               | 216                         | 104        | 62-129               |                   |
| 95-50-1     | 1,2-Dichlorobenzene         | 220                               | 225                         | 102        | 62-134               |                   |
| 5989-27-5   | d-Limonene                  | 210                               | 212                         | 101        | 66-137               |                   |
| 96-12-8     | 1,2-Dibromo-3-chloropropane | 218                               | 242                         | 111        | 71-147               |                   |
| 120-82-1    | 1,2,4-Trichlorobenzene      | 230                               | 238                         | 103        | 60-145               |                   |
| 91-20-3     | Naphthalene                 | 218                               | 228                         | 105        | 56-158               |                   |
| 87-68-3     | Hexachlorobutadiene         | 230                               | 223                         | 97         | 56-139               |                   |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.