**PROFESSIONAL ENVIRONMENTAL ENGINEERS, INC.**
*"Providing cost-effective environmental solutions"*
Consulting • Engineering Design • Remediation • Abatement • Emergency Response

500 S. Ewing, Suite E
St. Louis, MO 63103
(314) 531-0060
Fax (314) 531-0068

July 9, 2012

PE Project No. 021.001.01

Mr. Chadwick E. Howell, CHMM
Engineer Project Manager
St. Louis Development Corporation
1520 Market Street, Suite 2000
St. Louis, MO 63103

RE: Municipal Terminal
14 N. Market Street, St. Louis, Missouri

Mr. Howell:

Professional Environmental Engineers, Inc. (PE), as the environmental consultant for St. Louis Development Corporation, is pleased to present the Final Report for Asbestos Survey, Household Hazardous Waste Survey, and Tank Sludge Waste Characterization for the above-referenced site.

PE appreciates the opportunity to present this information and looks forward to working with you in the future. Please feel free to contact our office at 314-531-0060 if you have any questions, comments, or require additional information.

Respectfully submitted,

PROFESSIONAL ENVIRONMENTAL ENGINEERS, INC.

Teresa M. Nienhaus, R.G.
Project Manager

# FINAL REPORT

# ASBESTOS SURVEY, HOUSEHOLD HAZARDOUS WASTE SURVEY, & TANK SLUDGE WASTE CHARACTERIZATION

## Municipal Terminal
## 14 N. Market Street
## St. Louis, Missouri

***Prepared for:***

Mr. Chadwick E. Howell, CHMM
Engineer Project Manager
St. Louis Development Corporation
1520 Market Street, Suite 2000
St. Louis, MO 63103

## July 9, 2012

***Prepared by:***

Professional Environmental Engineers, Inc.
500 S. Ewing, Suite E
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Office: (314) 531-0060
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PE Project # 021.001.01

# TABLE OF CONTENTS

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACM | Asbestos-Containing Material |
| AHERA | Asbestos Hazard Emergency Response Act |
| AST | Above-ground Storage Tank |
| CFR | Code of Federal Regulations |
| CSR | Missouri Code of State Regulations |
| ESC | Environmental Science Corporation |
| HHW | Household Hazardous Waste |
| HUD | Housing and Urban Development |
| MDNR | Missouri Department of Natural Resources |
| NESHAP | National Emissions Standard for Hazardous Air Pollutants |
| NOB | Non-friable Organically Bound |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| OSHA | Occupational Safety and Health Administration |
| PACM | Presumed Asbestos-Containing Material |
| PE | Professional Environmental Engineers, Inc. |
| PLM | Polarized Light Microscopy |
| RACM | Regulated Asbestos-Containing Material |
| RCRA | Resource Conservation and Recovery Act |
| SLDC | St. Louis Development Corporation |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TSI | Thermal System Insulation |
| USEPA | United States Environmental Protection Agency |

## 1.0 INTRODUCTION

Professional Environmental Engineers, Inc. (PE) was contracted by St. Louis Development Corporation (SLDC) to perform a suspect asbestos-containing material (ACM) survey, a household hazardous waste (HHW) survey, and a tank sludge waste characterization at the facility located at 14 N. Market Street along the western bank of the Mississippi River in the City of St. Louis, Missouri. A Site Location Map is presented as **Figure 1.** SLDC plans to redevelop the site, which may include demolition of on-site structures.

Structures on site consist of a two-story office building with no basement (the "Main Building"), a pump house (the "Caustic House"), a 630,000 gallon above-ground storage tank (AST), and a 650,000 gallon AST. An aerial photo showing site features is presented as **Figure 2**. The office building was built in the 1950s and is currently occupied by a trucking business. The ASTs were built in the early 1960s, and the carbon steel tank walls were relined and recertified in approximately 2002. Tank use was grandfathered in to current municipal codes, and therefore no secondary containment system was required. Several years ago, brake failure of a truck parked on the dock caused the truck to crash into the North Tank, puncturing the wall. The insulation at this damaged area has not been restored. The North Tank stored calcium chloride. The South Tank stored calcium chloride, molasses, and caustic soda, which is highly corrosive.

This report summarizes the results of the ACM survey, HHW survey, and tank sludge waste characterization. All work was conducted in accordance with the "Community-Wide Quality Assurance Project Plan" and associated Technical Sampling and Analysis Plan approved by the United Stated Environmental Protection Agency (USEPA) on May 11, 2012.

Bill Pietroburgo and James Braido, licensed asbestos inspectors in the State of Missouri, performed the surveys on May 17 and 21, 2012. Mr. Pietroburgo's and Mr. Braido's asbestos licenses are included in **Appendix A**.

## 2.0 SCOPE OF WORK

### 2.1 Asbestos-Containing Material (ACM) Survey

The suspect ACM inspection was performed to determine if any ACM was present in the site property buildings and aboveground storage tanks which could be impacted or disrupted during future redevelopment/demolition activities. The scope of work is presented below.

1. Conduct a suspect ACM survey of the buildings and tanks in accordance with standard National Emissions Standard for Hazardous Air Pollutants (NESHAP) protocols for building renovations/demolition activities and the "Community-Wide Quality Assurance Project Plan" and associated Technical Sampling and Analysis Plan approved by the USEPA on May 11 2012.
2. Utilize all previous sampling data that can be validated to reduce sampling costs.
3. Perform a condition assessment and quantify all suspect ACMs per homogeneous materials.
4. Collect suspect ACM samples and have samples analyzed by polarized light microscopy (PLM) in accordance with the USEPA Method 600/R-93/116.
5. Utilize a licensed Asbestos Inspector to conduct all site activities in compliance with applicable regulations.
6. Provide a comprehensive report of findings detailing the suspect ACMs identified.

### 2.2 Household Hazardous Waste (HHW) Survey

A HHW Survey consisted of a building walk-through within the facility to inventory observable HHW and provide a summary of types and quantities of HHW and Universal Wastes that will be left when building is vacated.

### 2.3 Tank Sludge Waste Characterization

Waste Characterization consisted of the collection and analysis of existing sludge materials located within the two ASTs for characterization purposes in connection with removal, transportation, and disposal of the sludge. PE consulted with Illini Environmental, Inc., a local waste management services company, which advised that the waste should be tested for pH, flashpoint/ignitability, and Toxicity Characteristic Leaching Procedure (TCLP) Metals.

## 3.0 REGULATORY SUMMARY

### 3.1 Asbestos-Containing Materials

Occupational exposure to asbestos is regulated by the Occupational Safety and Health Administration (OSHA) in all industries under 29 Code of Federal Regulations (CFR) 1910.1001 and construction work under 29 CFR 1926.1101. To establish applicability of these regulations, the presence of asbestos must be determined by analytical testing or, for some materials, presumed to contain asbestos based on pre-1981 installation date. Additionally, regulations covering asbestos have also been established by USEPA and Missouri Department of Natural Resources (MDNR) as well as local governing bodies. For a material to be considered ACM, it must contain more than one percent asbestos. Facilities with ACM or Presumed Asbestos-Containing Material (PACM) may be required to comply with the following regulations:

- 29 CFR 1926.1101 OSHA Construction Standard
- 40 CFR Part 61, Subpart M National Emission Standard for Asbestos

Asbestos exposure in the following situations is regulated by the OSHA Construction Standard 29 CFR 1926.1101:

1) *Demolition or salvage of structures where asbestos is present;*

2) *Removal or encapsulation of materials containing asbestos;*

3) *Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos;*

4) *Installation of products containing asbestos;*

5) *Asbestos spill/emergency cleanup; and*

6) *Transportation, disposal, storage, containment of, and housekeeping activities involving asbestos or products containing asbestos on the site or location at which construction activities are performed.*

7) *Coverage under this standard shall be based on the nature of the work operation involving asbestos exposure.*

Examples of suspect Thermal System Insulation (TSI) materials include pipe and tank insulation. Suspect surfacing materials include items applied to walls, ceilings, and structural beams such as sprayed-on fireproofing. Suspect miscellaneous materials include ceiling and floor tile, transite wallboard, and roofing material.

### 3.2 Household Hazardous Wastes and Tank Sludge Waste

The USEPA defines a hazardous waste within the Resource Conservation and Recovery Act (RCRA) (40 CFR Part 260). In addition, a universal waste in defined within RCRA (40 CFR Part 273).

- 40 CFR Part 260 Hazardous Waste Characterization
- 40 CFR Part 273 Universal Waste Characterization
- Missouri Code of State Regulations (CSR) Title 10, Division 25, Hazardous Waste Management

## 4.0 BUILDING SURVEYS

### 4.1 Asbestos-Containing Materials

Seventy nine (79) suspect ACM samples were collected by PE personnel in May 2012 and analyzed by EMSL Analytical, Inc., 3029 South Jefferson, St. Louis, Missouri 63118. Blind duplicate quality control samples were obtained at a frequency of five percent. All samples were analyzed by PLM in accordance with the USEPA Method 600/R-93/116. The laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk sample analysis. A copy of EMSL's NVLAP accreditation is included in **Appendix B**. Destructive sampling behind wall partitions and ceilings was not performed within the Main Building and Caustic House due to current building and facility operations, and quantities are estimates within these buildings. The USEPA classifies an ACM as containing one percent (1%) or greater asbestos by content. The bulk sampling laboratory analytical reports are included in **Appendix C**. The quantities are estimated to reflect both visual determinations of ACMs as well as estimated quantities behind wall partitions and pipe chases. A summary of identified ACMs is presented in **Table 1**, below.

**TABLE 1**

**SUMMARY OF ASBESTOS-CONTAINING MATERIALS**
**Municipal Terminal, 14 North Market Street, St. Louis, Missouri**

| Sample Number | Location | Description | Quantity | PLM Result % Asbestos by Weight |
|---|---|---|---|---|
| | Main Building | **Vent Pipe** | **6 LF** | **Assumed** |
| | Main Building | **Transite Siding** | **324 SF** | **Assumed** |
| | Caustic House | **Chemical Sink Top** | **24 SF** | **Assumed** |
| | Main Building and Caustic House | **Fire Doors** | **8 Each** | **Assumed** |
| A-01, 02 & 03 | Main Building | TSI Pipe Insulation<br>First Layer:<br>**Second Layer:**<br>Third Layer: | **113 LF** | <br>None Detected<br>**69 % Chrysotile**<br>None Detected |
| A-04, 05 & 06 | Main Building | **TSI Pipe Joints** | **36 Each** | **4 % Chrysotile** |
| A-07, 08 & 09 | Main Building | 1' x 1' Tan Floor tile<br>**Tile:**<br>Adhesive: | **100 SF** | <br>**4 % Chrysotile**<br>None Detected |
| A-13, 14 & 15 | Main Building | **Window/Door Caulk** | **135 LF** | None Detected |
| A-17, 18 & 19 | Main Building | **Window Glazing**<br>1st layer:<br>2nd layer: | **115 LF** | **(Lab determined same as window/door caulk)**<br>None Detected<br>None Detected |
| A-40, 41 & 42 | Main Building | 9" x 9" White Floor Tile | **3,351 SF** | |

| Sample Number | Location | Description | Quantity | PLM Result % Asbestos by Weight |
|---|---|---|---|---|
| | | **Tile:**<br>**Adhesive:** | | **9 % Chrysotile**<br>**9 % Chrysotile** |
| A-52, 53 & 54 | Caustic House | **Window/Door Caulk** | **12 LF** | **4 % Chrysotile** |
| A-58, 59 & 60 | Caustic House | **TSI Pipe Insulation (3" Diameter)** | **198 lf** | **89 % Amosite** |
| A-61, 62 & 63 | Caustic House | **TSI Pipe Insulation (8" Diameter)** | **75 lf** | **89 % Amosite** |
| * A-71, 72 & 73 | Caustic House | Drywall/Joint Compound<br>**Joint Compound:**<br>Drywall: | **1,938 SF** | Composite < 1 %<br>**2 % Chrysotile**<br>None Detected |
| A-74, 75 &76 | Outside | **TSI Pipe Insulation** | **150 LF** | **89 % Amosite** |

**Composite of the Drywall/Joint Compound was analyzed as being < 1 % asbestos.*

### 4.2 Household Hazardous Wastes

An inventory of all HHW and Universal Wastes were inventoried throughout the buildings in accordance with State of Missouri Code of Regulations and the USEPA RCRA regulations. The buildings were occupied, so inventory was based on what will stay after the building has been vacated. Materials may change. The results of the HHW inventory are presented in **Table 2**, below.

**TABLE 2**

**SUMMARY OF HOUSEHOLD HAZARDOUS WASTES**

**Municipal Terminal, 14 N. Market Street, St. Louis, Missouri**

| Item | Quantity |
|---|---|
| 4' Fluorescent Light Tubes | 124 |
| PCB Light Ballasts | 88 |
| Air Conditioning Units | 2 |
| Halogen Lights | 4 |
| Exit Signs | 4 |
| Refrigerator | 1 |
| Fire Extinguisher | 8 |
| Smoke Detectors | 6 |
| Used oil tank (200 gallon) | 1 |

## 5.0 TANK SLUDGE WASTE CHARACTERIZATION

The sludge within the two ASTs was accessed through panels located on the sides of the tanks. The interiors of the tanks were not completely entered by PE personnel, and sampling was conducted by reaching through the opened access panels.

The North Tank contained approximately 6 inches of a brown colored, clear liquid with approximately ¼ inch of clear crystals at the bottom. Upper layer samples were collected by reaching down into the liquid with a clean, non-disposable cup sampler. The liquid was transferred immediately into a sample jar provided by the laboratory. The bottom of the tank was scraped with a clean shovel to loosen any solids, and the crystals at the bottom of the North Tank were collected with the shovel. Due to their tendency to move freely in the liquid, it was not possible to collect a large number of crystals. The crystals and the liquid they were collect in were transferred immediately into a sample jar provided by the laboratory.

The sample jars were immediately labeled and placed in a cooler with ice. All non-disposable samplers were decontaminated after collection of each sample using a combination of Alconox, water, and cleaning tools.

The South Tank contained approximately 4 inches of liquid consisting of an upper layer of clear liquid and a lower layer of a milky white colored liquid. The upper layer sample was collected by reaching down into the liquid with a clean, non-disposable cup sampler. The liquid was transferred immediately into a sample jar provided by the laboratory. The bottom of the tank was scraped with a clean shovel to loosen any solids; however it appeared to only contain the milky-white liquid. This lower layer was collected with a dedicated disposable bailer and transferred immediately into a sample jar provided by the laboratory. The lower layer of the South Tank was sampled a second time as a field duplicate, and all sample jars were then labeled and placed in a cooler with ice.

The samples were sent under chain-of-custody to Environmental Science Corp. (ESC) in Mt. Juliet, Tennessee for analysis of: pH, Flashpoint/Ignitability, and TCLP Metals. ESC advised PE that, upon arrival at the lab, the "North Tank Upper Layer" which was collected as a liquid now also contained a solid phase; apparently crystals had precipitated from the liquid. Therefore, both phases were analyzed for pH and Flashpoint/Ignitability. The TCLP Metals results for this sample are from the liquid and solid phases combined. The same procedure was followed for the "North Tank Lower Layer" as the crystals collected from the bottom were containerized along with some of the surrounding liquid.

A copy of the laboratory report from ESC is included in **Appendix D.** Results of the analyses are summarized in **Table 3,** below.

## TABLE 3

**ANALYTICAL DATA OF TANK CONTENTS**
**Municipal Terminal, 14 N. Market Street, St. Louis, Missouri**

| Sample Location ID | South Tank Upper Layer | South Tank Lower Layer | South Tank Lower Layer 2 (field duplicate) | North Tank Upper Layer | North Tank Upper Layer | North Tank Lower Layer | North Tank Lower Layer | Hazardous Waste Regulatory Level |
|---|---|---|---|---|---|---|---|---|
| **Phase** | Liquid | Liquid | Liquid | Liquid | Solid | Liquid | Solid | |
| **Sample Date** | 05/18/12 | 05/18/12 | 05/18/12 | 05/18/12 | 05/18/12 | 05/18/12 | 05/18/12 | |
| pH | 7.5 | 8.3 | 7.7 | 4.8 | 5.9 | 5.1 | 6.5 | **<2 or >12.5** |
| Flashpoint/Ignitability (deg. F) | <170 | <170 | <170 | <170 | <170 | <170 | <170 | **<140** |
| TCLP Mercury (mg/l) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | | <0.0010 | | **0.2** |
| TCLP Arsenic (mg/l) | <0.50 | <0.50 | <0.50 | <0.50 | | <0.50 | | **5.0** |
| TCLP Barium (mg/l) | <1.5 | <1.5 | <1.5 | <1.5 | | <1.5 | | **100.0** |
| TCLP Cadmium (mg/l) | <0.50 | <0.50 | <0.50 | <0.50 | | <0.50 | | **1.0** |
| TCLP Chromium (mg/l) | <0.50 | <0.50 | <0.50 | <0.50 | | <0.50 | | **5.0** |
| TCLP Lead (mg/l) | <2.5 | <0.50 | <2.5 | <2.5 | | <2.5 | | **5.0** |
| TCLP Selenium (mg/l) | <0.50 | <0.50 | <0.50 | <0.50 | | <0.50 | | **1.0** |
| TCLP Silver (mg/l) | <0.50 | <0.50 | <0.50 | <0.50 | | <0.50 | | **5.0** |

## 6.0 SUMMARY AND RECOMMENDATIONS

### 6.1 Asbestos

The thermal system pipe insulation and joints, joint compound, fire doors, window/door caulk, window glazing, 9" x 9" floor tile and mastic, 1'x 1' floor tile, transite siding, transite vent pipe, and chemical sink top identified in this survey are classified as Regulated Asbestos-Containing Materials (RACM) by NESHAP 40 CFR Part 61. The thermal system pipe insulation and joints, joint compound, fire doors, window/door caulk, and window glazing identified during this ACM inspection are identified as friable ACMs by NESHAP. The asbestos 9" x 9" floor tile and mastic, 1' x 1' floor tile, transite siding, transite vent pipe, and chemical sink top identified during this asbestos inspection are identified as category 1 & 2 non-friable ACM by NESHAP.

According the NESHAP regulation, friable ACM and Category 1 & 2 non-friable ACM must be removed prior to demolition with the exception of the joint compound. A composite sample of the drywall/joint compound was analyzed as being < 1 % asbestos and can remain with the building during demolition. However, the joint compound must be removed if it is to be impacted during any renovation activities. Any asbestos abatement performed during renovation and/or demolition activities must be performed by a State of Missouri licensed asbestos abatement contractor.

Destructive sampling behind wall partitions and ceilings was not performed within the Main Building and Caustic House due to current building and facility operations, and quantities are estimates within these buildings. The quantities are estimated to reflect both visual determinations of ACMs as well as estimated quantities behind wall partitions and pipe chases. A summary is as follows:

| | | |
|---|---|---|
| ~ | Transite Vent Pipe<br>(Main Building) | Approximately - 6 LF |
| ~ | Transite Siding:<br>(Main Building) | Approximately - 324 SF |
| ~ | Chemical Sink Top<br>(Caustic House) | Approximately - 24 SF |
| ~ | Fire Doors<br>(Main Building & Caustic House) | Approximately - 8 each |
| ~ | Thermal System Pipe Insulation/Joints<br>(Main Building, Caustic House & Outside) | Approximately - 572 LF |
| ~ | Tan 1' x 1' Floor Tile<br>(Main Building) | Approximately - 100 SF |

| | | |
|---|---|---|
| ~ | White 9" x 9" Floor Tile/Mastic (Main Building) | Approximately - 3,351 SF |
| ~ | Window Glazing (Main Building) | Approximately - 115 LF |
| ~ | Window/Door Caulk (Main Building and Caustic House) | Approximately - 147 LF |
| ~ | *Joint Compound (Caustic House) | Approximately - 1,938 SF |

**A composite sample of the Drywall/Joint Compound was analyzed as being < 1 % asbestos and can remain with the building during demolition. However, the joint compound must be removed if it is to be impacted during any renovation activities.*

### 6.2 Household Hazardous Wastes

During any future renovation and/or demolition activities, it is recommended that site-specific work plans be developed based upon the planned renovations to protect the health of renovation personnel and future occupants. Any HHW and/or Universal Wastes that will be impacted must be removed and properly characterized and disposed of or recycled for reuse in accordance with USEPA RCRA Regulations and the MDNR - Hazardous Waste Regulations.

**Summary of Household Hazardous Wastes**
**Municipal Terminal, 14 N. Market Street, St. Louis, Missouri**

| Item | Quantity |
|---|---|
| 4' Fluorescent Light Tubes | 124 |
| PCB Light Ballasts | 88 |
| Air Conditioning Units | 2 |
| Halogen Lights | 4 |
| Exit Signs | 4 |
| Refrigerator | 1 |
| Fire Extinguisher | 8 |
| Smoke Detectors | 6 |
| Used oil tank (200 gallon) | 1 |

### 6.3 Tank Sludge Waste

Based on the analytical results, the contents of both tanks may be disposed of as non-hazardous waste. The waste disposal company and the landfill should be provided with a copy of the laboratory report in **Appendix C**.

Conclusions and recommendations contained in this report represent PE's professional opinions based upon currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. The Contract between PE and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of PE's client and anyone else specifically listed on this report. PE will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, PE makes no express or implied warranty as to the contents of this report.

## 7.0 REFERENCES

OSHA General Industry Standard - 29 CFR 1910.1001

OSHA Construction Standard - 29 CFR 1926.1101

National Emission Standard for Asbestos - 40 CFR Part 61, Subpart M

USEPA 40 CFR – Resource Conservation and Recovery Act

The United States Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

State of Missouri Code of Regulations (CSR) Title 19, Division 30, Chapter 70 Lead Abatement and Assessment Licensing, Training Accreditation

State of Missouri Code of Regulations (CSR) Title 10, Division 25, Hazardous Waste Management

# FIGURES


No Scale Determined

Subject property

N

**FIGURE 1**

**SITE LOCATION MAP**

**Municipal Terminal**

**14 N. Market Street**

**St. Louis, Missouri**

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St. Louis, MO 63103
(314) 531-0060
Fax (314) 531-0068


No Scale Determined

N

**FIGURE 2**

**SITE FEATURES**

**Municipal Terminal**

**14 N. Market Street**

**St. Louis, Missouri**

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St. Louis, MO 63103
(314) 531-0060
Fax (314) 531-0068

# APPENDIX A

Expiration Date: **9/28/2012** Certificate Number: 7112090811MOIR829

Training Date: **9/8/2011**

## Missouri State Certificate for Asbestos Related Occupations

**issued by Department of Natural Resources**
**P.O. Box 176**
**Jefferson City, MO 65102**
**Phone (573) 751-4817**

# William J. Pietroburgo

has successfully completed the requirements for certification as a INSPECTOR. This Missouri State Certification is subject to review and the director may deny, suspend or revoke the certification per RSMo chapter 643.230.

9/28/2011
Date

James L. Kavanaugh
Director of Air Pollution Control Program

Expiration Date: **11/30/2012** Certificate Number: 7112111711MOIR741

Training Date: **11/17/2011**

## Missouri State Certificate for Asbestos Related Occupations

**issued by Department of Natural Resources**
**P.O. Box 176**
**Jefferson City, MO 65102**
**Phone (573) 751-4817**

# James V. Braido

has successfully completed the requirements for certification as a INSPECTOR. This Missouri State Certification is subject to review and the director may deny, suspend or revoke the certification per RSMo chapter 643.230.

12/1/2011
Date

Kyra L Moore
Director of Air Pollution Control Program

# APPENDIX B

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

# Certificate of Accreditation to ISO/IEC 17025:2005

**NVLAP LAB CODE: 200742-0**

## EMSL Analytical, Inc.

St. Louis, MO

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:*

## BULK ASBESTOS FIBER ANALYSIS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2012-04-01 through 2013-03-31

*Effective dates*

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

David F. Alderman

*For the National Institute of Standards and Technology*

National Voluntary Laboratory Accreditation Program

# SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

**EMSL Analytical, Inc.**
3029 South Jefferson
St. Louis, MO 63118
Dr. Jeff Siria, Ph.D
Phone: 314-577-0150 Fax: 314-776-3313
E-Mail: jsiria@emsl.com
URL: http://www.emsl.com

**BULK ASBESTOS FIBER ANALYSIS (PLM)** **NVLAP LAB CODE 200742-0**

| *NVLAP Code* | *Designation / Description* |
|---|---|
| 18/A01 | EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples |

2012-04-01 through 2013-03-31

*Effective dates*

David F. Alderman

*For the National Institute of Standards and Technology*

# APPENDIX C

**EMSL Analytical, Inc.**
**3029 S. Jefferson, Saint Louis, MO 63118**
Phone/Fax: (314) 577-0150 / (314) 776-3313
saintlouislab@emsl.com

| | |
|---|---|
| EMSL Order: | 391204554 |
| CustomerID: | PROF34 |
| CustomerPO: | 1265 |
| ProjectID: | |

Attn: **James Braido**
**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

| | |
|---|---|
| Phone: | (314) 531-0060 |
| Fax: | (314) 531-0068 |
| Received: | 05/25/12 9:39 AM |
| Analysis Date: | 7/9/2012 |
| Collected: | |

# Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-1-Paint<br>*391204554-0001* | | White<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-1-Insulation<br>*391204554-0001A* | | Gray<br>Fibrous<br>Heterogeneous | | 31% Non-fibrous (other) | **69% Chrysotile** |
| A-1-Insulation<br>*391204554-0001B* | | Tan<br>Fibrous<br>Heterogeneous | 96% Cellulose | 4% Non-fibrous (other) | **None Detected** |
| A-2<br>*391204554-0002* | | | | | **Stop Positive (Not Analyzed)** |
| A-3<br>*391204554-0003* | | | | | **Stop Positive (Not Analyzed)** |
| A-4<br>*391204554-0004* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% Min. Wool | 57% Non-fibrous (other) | **4% Chrysotile** |
| A-5<br>*391204554-0005* | | | | | **Stop Positive (Not Analyzed)** |
| A-6<br>*391204554-0006* | | | | | **Stop Positive (Not Analyzed)** |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
or other approved signatory



Report Amended: 07/09/2012 10:54:36 Replaces the Inital Report 06/04/2012 18:48:24. Reason Code: Client-Other (see report comment)

**EMSL Analytical, Inc.**
**3029 S. Jefferson, Saint Louis, MO 63118**
Phone/Fax: (314) 577-0150 / (314) 776-3313
saintlouislab@emsl.com

| | |
|---|---|
| EMSL Order: | 391204554 |
| CustomerID: | PROF34 |
| CustomerPO: | 1265 |
| ProjectID: | |

Attn: **James Braido**
**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

| | |
|---|---|
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| Fax: | (314) 531-0068 |
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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-7-Floor Tile<br>*391204554-0007* | | Tan<br>Non-Fibrous<br>Heterogeneous | | 96% Non-fibrous (other) | **4% Chrysotile** |
| A-7-Adhesive<br>*391204554-0007A* | | Tan<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-8-Floor Tile<br>*391204554-0008* | | | | | **Stop Positive (Not Analyzed)** |
| A-8-Adhesive<br>*391204554-0008A* | | Tan<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-9-Floor Tile<br>*391204554-0009* | | | | | **Stop Positive (Not Analyzed)** |
| A-9-Adhesive<br>*391204554-0009A* | | Tan<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-10-Ceiling Tile<br>*391204554-0010* | | White<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-10-Ceiling Tile<br>*391204554-0010A* | | Various<br>Fibrous<br>Heterogeneous | 89% Min. Wool | 11% Non-fibrous (other) | **None Detected** |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
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| EMSL Order: | 391204554 |
| CustomerID: | PROF34 |
| CustomerPO: | 1265 |
| ProjectID: | |

Attn: **James Braido**
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Project: **021.001.01**

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-11-Ceiling Tile<br>*391204554-0011* | | White<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-11-Ceiling Tile<br>*391204554-0011A* | | Various<br>Fibrous<br>Heterogeneous | 89% Min. Wool | 11% Non-fibrous (other) | **None Detected** |
| A-12-Ceiling Tile<br>*391204554-0012* | | White<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-12-Ceiling Tile<br>*391204554-0012A* | | Blue<br>Fibrous<br>Heterogeneous | 89% Min. Wool | 11% Non-fibrous (other) | **None Detected** |
| A-13-Paint<br>*391204554-0013* | | Gray<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-13-Caulk<br>*391204554-0013A* | | Gray<br>Non-Fibrous<br>Heterogeneous | | 96% Non-fibrous (other) | **4% Chrysotile** |
| A-14<br>*391204554-0014* | | | | | **Stop Positive (Not Analyzed)** |
| A-15<br>*391204554-0015* | | | | | **Stop Positive (Not Analyzed)** |

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | Asbestos |
|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | **% Type** |
| A-16-Roofing<br>*391204554-0016* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-16-Felt<br>*391204554-0016A* | | Brown<br>Fibrous<br>Heterogeneous | 49%<br>19% | Cellulose<br>Glass | 32% Non-fibrous (other) | **None Detected** |
| A-16-Insulation<br>*391204554-0016B* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-17-Paint<br>*391204554-0017* | | Red<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-17-Caulk<br>*391204554-0017A* | | Gray<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-18<br>*391204554-0018* | | | | | | **Stop Positive (Not Analyzed)** |
| A-19<br>*391204554-0019* | | | | | | **Stop Positive (Not Analyzed)** |
| A-20-Miscellaneous<br>*391204554-0020* | | Brown<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | | Asbestos |
|---|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | | **% Type** |
| A-20-Plaster<br>*391204554-0020A* | | Tan<br>Non-Fibrous<br>Heterogeneous | 2% | Cellulose | 98% | Non-fibrous (other) | **None Detected** |
| A-21-Miscellaneous<br>*391204554-0021* | | Brown<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-21-Plaster<br>*391204554-0021A* | | Tan<br>Non-Fibrous<br>Heterogeneous | 2% | Cellulose | 98% | Non-fibrous (other) | **None Detected** |
| A-22<br>*391204554-0022* | | Tan<br>Non-Fibrous<br>Heterogeneous | 2% | Cellulose | 98% | Non-fibrous (other) | **None Detected** |
| A-23<br>*391204554-0023* | | Tan<br>Non-Fibrous<br>Heterogeneous | 2% | Cellulose | 98% | Non-fibrous (other) | **None Detected** |
| A-24<br>*391204554-0024* | | Tan<br>Non-Fibrous<br>Heterogeneous | 2% | Cellulose | 98% | Non-fibrous (other) | **None Detected** |
| A-25<br>*391204554-0025* | | Tan<br>Non-Fibrous<br>Heterogeneous | 2% | Cellulose | 98% | Non-fibrous (other) | **None Detected** |
| A-26-Paint<br>*391204554-0026* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | | Asbestos |
|---|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | | **% Type** |
| A-26-Ceiling Tile<br>*391204554-0026A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>39% | Cellulose<br>Min. Wool | 3%<br>29% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-27-Paint<br>*391204554-0027* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-27-Ceiling Tile<br>*391204554-0027A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>39% | Cellulose<br>Min. Wool | 3%<br>29% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-28-Paint<br>*391204554-0028* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-28-Ceiling Tile<br>*391204554-0028A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>39% | Cellulose<br>Min. Wool | 3%<br>29% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-29-Paint<br>*391204554-0029* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-29-Ceiling Tile<br>*391204554-0029A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>49% | Cellulose<br>Min. Wool | 3%<br>19% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-30-Paint<br>*391204554-0030* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |

Analyst(s)

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | | Asbestos |
|---|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | | **% Type** |
| A-30-Ceiling Tile<br>*391204554-0030A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>49% | Cellulose<br>Min. Wool | 3%<br>19% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-31-Paint<br>*391204554-0031* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-31-Ceiling Tile<br>*391204554-0031A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>49% | Cellulose<br>Min. Wool | 3%<br>19% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-32-Paint<br>*391204554-0032* | | White<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-32-Ceiling Tile<br>*391204554-0032A* | | Tan<br>Fibrous<br>Heterogeneous | 29%<br>49% | Cellulose<br>Min. Wool | 3%<br>19% | Non-fibrous (other)<br>Perlite | **None Detected** |
| A-33-Paint<br>*391204554-0033* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-33-Drywall<br>*391204554-0033A* | | Various<br>Non-Fibrous<br>Heterogeneous | 13% | Cellulose | 87% | Non-fibrous (other) | **None Detected** |
| A-34-Paint<br>*391204554-0034* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |

Analyst(s)

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | | Asbestos |
|---|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | | **% Type** |
| A-34-Drywall<br>*391204554-0034A* | | Various<br>Non-Fibrous<br>Heterogeneous | 13% | Cellulose | 87% | Non-fibrous (other) | **None Detected** |
| A-35-Paint<br>*391204554-0035* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-35-Drywall<br>*391204554-0035A* | | Various<br>Non-Fibrous<br>Heterogeneous | 13% | Cellulose | 87% | Non-fibrous (other) | **None Detected** |
| A-36-Paint<br>*391204554-0036* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-36-Drywall<br>*391204554-0036A* | | Various<br>Non-Fibrous<br>Heterogeneous | 13% | Cellulose | 87% | Non-fibrous (other) | **None Detected** |
| A-37-Adhesive<br>*391204554-0037* | | Tan<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-37-Miscellaneous<br>*391204554-0037A* | | Brown<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |
| A-38-Adhesive<br>*391204554-0038* | | Tan<br>Non-Fibrous<br>Heterogeneous | | | 100% | Non-fibrous (other) | **None Detected** |

Analyst(s)

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## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-38-Miscellaneous<br>*391204554-0038A* | | Brown<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-39-Adhesive<br>*391204554-0039* | | Tan<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-39-Miscellaneous<br>*391204554-0039A* | | Brown<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| A-40-Floor Tile<br>*391204554-0040* | | Cream<br>Non-Fibrous<br>Heterogeneous | | 91% Non-fibrous (other) | **9% Chrysotile** |
| 4A-0-Adhesive<br>*391204554-0040A* | | Black<br>Non-Fibrous<br>Heterogeneous | | 91% Non-fibrous (other) | **9% Chrysotile** |
| A-41-Floor Tile<br>*391204554-0041* | | | | | **Stop Positive (Not Analyzed)** |
| A-41-Adhesive<br>*391204554-0041A* | | | | | **Stop Positive (Not Analyzed)** |
| A-42-Floor Tile<br>*391204554-0042* | | | | | **Stop Positive (Not Analyzed)** |

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| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-42-Adhesive<br>*391204554-0042A* | | | | | **Stop Positive (Not Analyzed)** |
| A-43<br>*391204554-0043* | | Gray<br>Fibrous<br>Heterogeneous | 98% Glass<br>Debris not analyzed. | 2% Non-fibrous (other) | **None Detected** |
| A-44<br>*391204554-0044* | | Gray<br>Fibrous<br>Heterogeneous | 98% Glass<br>Debris not analyzed. | 2% Non-fibrous (other) | **None Detected** |
| A-45<br>*391204554-0045* | | Gray<br>Fibrous<br>Heterogeneous | 98% Glass<br>Debris not analyzed. | 2% Non-fibrous (other) | **None Detected** |
| A-46<br>*391204554-0046* | | Cream<br>Fibrous<br>Heterogeneous | 98% Glass<br>Debris not analyzed. | 2% Non-fibrous (other) | **None Detected** |
| A-47<br>*391204554-0047* | | Cream<br>Fibrous<br>Heterogeneous | 98% Glass<br>Debris not analyzed. | 2% Non-fibrous (other) | **None Detected** |
| A-48<br>*391204554-0048* | | Cream<br>Fibrous<br>Heterogeneous | 98% Glass<br>Debris not analyzed. | 2% Non-fibrous (other) | **None Detected** |

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| | | | Non-Asbestos | | | | Asbestos | |
|---|---|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **%** | **Fibrous** | **%** | **Non-Fibrous** | **%** | **Type** |
| A-49-Insulation<br>*391204554-0049* | | White<br>Fibrous<br>Heterogeneous | 98% | Min. Wool | 2% | Non-fibrous (other) | | **None Detected** |
| A-49-Insulation<br>*391204554-0049A* | | Gray<br>Fibrous<br>Heterogeneous | 59% | Min. Wool | 2%<br>39% | Non-fibrous (other)<br>Perlite | | **None Detected** |
| A-50-Insulation<br>*391204554-0050* | | White<br>Fibrous<br>Heterogeneous | 98% | Min. Wool | 2% | Non-fibrous (other) | | **None Detected** |
| A-50-Insulation<br>*391204554-0050A* | | Gray<br>Fibrous<br>Heterogeneous | 59% | Min. Wool | 2%<br>39% | Non-fibrous (other)<br>Perlite | | **None Detected** |
| A-51-Insulation<br>*391204554-0051* | | White<br>Fibrous<br>Heterogeneous | 98% | Min. Wool | 2% | Non-fibrous (other) | | **None Detected** |
| A-51-Insulation<br>*391204554-0051A* | | Gray<br>Fibrous<br>Heterogeneous | 59% | Min. Wool | 2%<br>39% | Non-fibrous (other)<br>Perlite | | **None Detected** |
| A-52<br>*391204554-0052* | | Various<br>Non-Fibrous<br>Heterogeneous | | | 96% | Non-fibrous (other) | **4%** | **Chrysotile** |
| | | | Inseparable coating layer included in analysis. | | | | | |
| A-53-Paint<br>*391204554-0053* | | | | | | | | **Stop Positive (Not Analyzed)** |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
or other approved signatory



Report Amended: 07/09/2012 10:54:36 Replaces the Inital Report 06/04/2012 18:48:24. Reason Code: Client-Other (see report comment)

**EMSL Analytical, Inc.**
**3029 S. Jefferson, Saint Louis, MO 63118**
Phone/Fax: (314) 577-0150 / (314) 776-3313
saintlouislab@emsl.com

| | |
|---|---|
| EMSL Order: | 391204554 |
| CustomerID: | PROF34 |
| CustomerPO: | 1265 |
| ProjectID: | |

Attn: **James Braido**
**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

| | |
|---|---|
| Phone: | (314) 531-0060 |
| Fax: | (314) 531-0068 |
| Received: | 05/25/12 9:39 AM |
| Analysis Date: | 7/9/2012 |
| Collected: | |

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-54<br>*391204554-0054* | | | | | **Stop Positive (Not Analyzed)** |
| A-55<br>*391204554-0055* | | Various<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| | | | Inseparable coating layer included in analysis. | | |
| A-56<br>*391204554-0056* | | Various<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| | | | Inseparable coating layer included in analysis. | | |
| A-57<br>*391204554-0057* | | Various<br>Non-Fibrous<br>Heterogeneous | | 100% Non-fibrous (other) | **None Detected** |
| | | | Inseparable coating layer included in analysis. | | |
| A-58<br>*391204554-0058* | | Gray<br>Fibrous<br>Heterogeneous | | 11% Non-fibrous (other) | **89% Amosite** |
| A-59<br>*391204554-0059* | | | | | **Stop Positive (Not Analyzed)** |
| A-60<br>*391204554-0060* | | | | | **Stop Positive (Not Analyzed)** |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
or other approved signatory



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**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

| | |
|---|---|
| Phone: | (314) 531-0060 |
| Fax: | (314) 531-0068 |
| Received: | 05/25/12 9:39 AM |
| Analysis Date: | 7/9/2012 |
| Collected: | |

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | Asbestos |
|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | **% Non-Fibrous** | **% Type** |
| A-61<br>*391204554-0061* | | Gray<br>Fibrous<br>Heterogeneous | | 11% Non-fibrous (other) | **89% Amosite** |
| A-62<br>*391204554-0062* | | | | | **Stop Positive (Not Analyzed)** |
| A-63<br>*391204554-0063* | | | | | **Stop Positive (Not Analyzed)** |
| A-64<br>*391204554-0064* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% Min. Wool | 61% Non-fibrous (other) | **None Detected** |
| A-65<br>*391204554-0065* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% Min. Wool | 61% Non-fibrous (other) | **None Detected** |
| A-66<br>*391204554-0066* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% Min. Wool | 61% Non-fibrous (other) | **None Detected** |
| A-67<br>*391204554-0067* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% Min. Wool | 61% Non-fibrous (other) | **None Detected** |
| A-68-Insulation<br>*391204554-0068* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% Min. Wool | 61% Non-fibrous (other) | **None Detected** |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
or other approved signatory



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| EMSL Order: | 391204554 |
| CustomerID: | PROF34 |
| CustomerPO: | 1265 |
| ProjectID: | |

Attn: **James Braido**
**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

| | |
|---|---|
| Phone: | (314) 531-0060 |
| Fax: | (314) 531-0068 |
| Received: | 05/25/12 9:39 AM |
| Analysis Date: | 7/9/2012 |
| Collected: | |

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | | Asbestos | |
|---|---|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **%** | **Fibrous** | **%** | **Non-Fibrous** | **%** | **Type** |
| A-68-Insulation<br>*391204554-0068A* | | Tan<br>Fibrous<br>Heterogeneous | 96% | Min. Wool | 4% | Non-fibrous (other) | | **None Detected** |
| A-69-Insulation<br>*391204554-0069* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% | Min. Wool | 61% | Non-fibrous (other) | | **None Detected** |
| A-69-Insulation<br>*391204554-0069A* | | Tan<br>Fibrous<br>Heterogeneous | 96% | Min. Wool | 4% | Non-fibrous (other) | | **None Detected** |
| A-70-Insulation<br>*391204554-0070* | | Gray<br>Non-Fibrous<br>Heterogeneous | 39% | Min. Wool | 61% | Non-fibrous (other) | | **None Detected** |
| A-70-Insulation<br>*391204554-0070A* | | Tan<br>Fibrous<br>Heterogeneous | 96% | Min. Wool | 4% | Non-fibrous (other) | | **None Detected** |
| A-71-Joint Compound<br>*391204554-0071* | | Gray<br>Non-Fibrous<br>Heterogeneous | | | 94%<br>4% | Non-fibrous (other)<br>Mica | **2%** | **Chrysotile** |
| | | | Calculated composite result is <1% asbestos. | | | | | |
| A-71-Drywall<br>*391204554-0071A* | | Various<br>Non-Fibrous<br>Heterogeneous | 9%<br>17% | Cellulose<br>Glass | 72%<br>2% | Non-fibrous (other)<br>Mica | | **None Detected** |
| | | | Calculated composite result is <1% asbestos. | | | | | |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
or other approved signatory



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saintlouislab@emsl.com

| | |
|---|---|
| EMSL Order: | 391204554 |
| CustomerID: | PROF34 |
| CustomerPO: | 1265 |
| ProjectID: | |

Attn: **James Braido**
**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

| | |
|---|---|
| Phone: | (314) 531-0060 |
| Fax: | (314) 531-0068 |
| Received: | 05/25/12 9:39 AM |
| Analysis Date: | 7/9/2012 |
| Collected: | |

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | Asbestos |
|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | **% Type** |
| A-72-Joint Compound<br>*391204554-0072* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 94% Non-fibrous (other)<br>4% Mica | **2% Chrysotile** |
| | | | Calculated composite result is <1% asbestos. | | | |
| A-72-Drywall<br>*391204554-0072A* | | Various<br>Non-Fibrous<br>Heterogeneous | 9%<br>17% | Cellulose<br>Glass | 72% Non-fibrous (other)<br>2% Mica | **None Detected** |
| | | | Calculated composite result is <1% asbestos. | | | |
| A-73-Joint Compound<br>*391204554-0073* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 94% Non-fibrous (other)<br>4% Mica | **2% Chrysotile** |
| | | | Calculated composite result is <1% asbestos. | | | |
| A-73-Drywall<br>*391204554-0073A* | | Various<br>Non-Fibrous<br>Heterogeneous | 9%<br>17% | Cellulose<br>Glass | 72% Non-fibrous (other)<br>2% Mica | **None Detected** |
| | | | Calculated composite result is <1% asbestos. | | | |
| A-74<br>*391204554-0074* | | Gray<br>Fibrous<br>Heterogeneous | | | 11% Non-fibrous (other) | **89% Amosite** |
| A-75<br>*391204554-0075* | | | | | | **Stop Positive (Not Analyzed)** |
| A-76<br>*391204554-0076* | | | | | | **Stop Positive (Not Analyzed)** |

Analyst(s)

*Sue Ferrario (101)*

Jeff Siria, Laboratory Manager
or other approved signatory



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saintlouislab@emsl.com

| | |
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| EMSL Order: | 391204554 |
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Attn: **James Braido**
**Professional Environmental Engineers**
**500 S. Ewing**
**Suite E**
**St. Louis, MO 63103**

Project: **021.001.01**

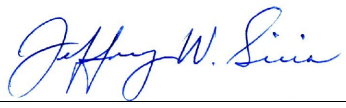
| | |
|---|---|
| Phone: | (314) 531-0060 |
| Fax: | (314) 531-0068 |
| Received: | 05/25/12 9:39 AM |
| Analysis Date: | 7/9/2012 |
| Collected: | |

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 and/or EPA 600/M4-82-020 Method(s) using Polarized Light Microscopy

| | | | Non-Asbestos | | | Asbestos |
|---|---|---|---|---|---|---|
| **Sample** | **Description** | **Appearance** | **% Fibrous** | | **% Non-Fibrous** | **% Type** |
| A-77-Roofing<br>*391204554-0077* | | Brown<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-77-Felt<br>*391204554-0077A* | | Brown<br>Fibrous<br>Heterogeneous | 49%<br>19% | Cellulose<br>Glass | 32% Non-fibrous (other) | **None Detected** |
| A-77-Insulation<br>*391204554-0077B* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-78-Roofing<br>*391204554-0078* | | Gray<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-78-Insulation<br>*391204554-0078A* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-79-Roofing<br>*391204554-0079* | | Gray<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |
| A-79-Insulation<br>*391204554-0079A* | | Cream<br>Non-Fibrous<br>Heterogeneous | | | 100% Non-fibrous (other) | **None Detected** |

Analyst(s)

*Sue Ferrario (101)*



Jeff Siria, Laboratory Manager
or other approved signatory



Report Amended: 07/09/2012 10:54:36 Replaces the Inital Report 06/04/2012 18:48:24. Reason Code: Client-Other (see report comment)

# Asbestos Lab Services Chain of Custody

EMSL ANALYTICAL, INC.

**EMSL Order Number** *(Lab Use Only):* 391204554

St. Louis, MO
3025-3029 S. Jefferson
St. Louis, MO 63118
PHONE: (314)-577-0150
FAX: (314)-776-3313

| | |
|---|---|
| **Company:** Professional Environmental Engineers | **EMSL-Bill to:** ☑ Same ☐ Different<br>If Bill to is Different note instructions in Comments**<br>*Third Party Billing requires written authorization from third party* |
| **Street:** 500 south ewing suite E | |
| **City/State/Zip:** St. louis, MO 63103 | |
| **Report To (Name):** James Braido | **Fax:** 314-531-0068 |
| **Telephone:** 314-531-0060 | **Email Address:** jimbraido@pe-engrs.com |
| **Project Name/Number:** 021.001.01 | |
| **Please Provide Results:** Email — **Purchase Order:** 1265 | **State Samples Taken:** MO |

**Turnaround Time (TAT) Options* – Please Check**

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☒ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

**For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

**PCM - Air** ☐ Check if samples are from NY
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

**PLM - Bulk (reporting limit)**
- ☒ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NIOSH 9002 (<1%)

**TEM – Air** ☐ **4-4.5hr TAT** (AHERA only)
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312

**TEM - Bulk**
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

**TEM – Water:** EPA 100.2
- Fibers >10µm ☐ Waste ☐ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

**TEM- Dust**
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

**Soil/Rock/Vermiculite**
- ☐ PLM CARB 435 - A (0.25% sensitivity)
- ☐ PLM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - C (0.01% sensitivity)
- ☐ EPA Protocol (Semi-Quantitative)
- ☐ EPA Protocol (Quantitative)

**Other:**
- ☐

☐ **Check For Positive Stop – Clearly Identify Homogenous Group** | **Filter Pore Size (Air Samples):** ☐ 0.8µm ☐ 0.45µm

**Samplers Name:** James Braido | **Samplers Signature:** [signature]

| Sample # | Sample Description | Volume/Area (Air) HA # (Bulk) | Date/Time Sampled |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Client Sample # (s):** - **Total # of Samples:** 79

**Relinquished (Client):** James Braido [signature] **Date:** 5-24-12 **Time:** 11:09

**Received (Lab):** [signature] **Date:** 5-24-12 **Time:** 11:25am

Walk in

**Comments/Special Instructions:** Test to first positive these groups (A1-3)(A4-6)(A7-9)(A10-12)(A13-15)(A17-19)(A20-22)(A23-25)(A26-28)(A29-31)(A33-35)(A37-39)(A40-42)(A43-45)(A46-48)(A49-51)(A52-54)(A55-57)(A58-60)(A61-63)(A64-66)(A68-70)(A71-73)(A74-76)

391204554



| SAMPLE NUMBER | SAMPLE DESCRIPTION/LOCATION | VOLUME (if applicable) | Time/Date Sampled |
|---|---|---|---|
| A-01 | MB Tsi aircell | | 5-17-12-9:00 |
| A-02 | MB Tsi aircell | | 5-17-12-9:00 |
| A-03 | MB Tsi aircell | | 5-17-12-9:00 |
| A-04 | MB Tsi joints | | 5-17-12-9:05 |
| A-05 | MB Tsi joints | | 5-17-12-9:05 |
| A-06 | MB Tsi joints | | 5-17-12-9:05 |
| A-07 | MB 1x1 tan floor tile | | 5-17-12-9:11 |
| A-08 | MB 1x1 tan floor tile | | 5-17-12-9:11 |
| A-09 | MB 1x1 tan floor tile | | 5-17-12-9:11 |
| A-10 | MB Ceiling tile fiberglass | | 5-17-12-9:16 |
| A-11 | MB Ceiling tile fiberglass | | 5-17-12-9:16 |
| A-12 | MB Ceiling tile fiberglass | | 5-17-12-9:16 |
| A-13 | MB Window door/Caulk | | 5-17-12-9:22 |
| A-14 | MB Window door/Caulk | | 5-17-12-9:22 |
| A-15 | MB Window door/Caulk | | 5-17-12-9:22 |
| A-16 | MB Main Roof core | | 5-17-12-10:15 |
| A-17 | MB Window Glazing | | 5-17-12-10:25 |
| A-18 | MB Window Glazing | | 5-17-12-10:25 |
| A-19 | MB Window Glazing | | 5-17-12-10:25 |
| A-20 | MB Transite | | 5-17-12-10:37 |

391204554



| SAMPLE NUMBER | SAMPLE DESCRIPTION/LOCATION | VOLUME (if applicable) | Time/Date Sampled |
|---|---|---|---|
| A-21 | MB Transite | | 5-17-12-10:37 |
| A-22 | MB Transite | | 5-17-12-10:37 |
| A-23 | MB Ceramic tile adhesive | | 5-17-12-10:46 |
| A-24 | MB Ceramic tile adhesive | | 5-17-12-10:46 |
| A-25 | MB Ceramic tile adhesive | | 5-17-12-10:46 |
| A-26 | MB Ceiling tile random fissure pattern | | 5-17-12-10:52 |
| A-27 | MB Ceiling tile random fissure pattern | | 5-17-12-10:52 |
| A-28 | MB Ceiling tile random fissure pattern | | 5-17-12-10:52 |
| A-29 | MB Ceiling tile pinhole pattern | | 5-17-12-11:06 |
| A-30 | MB Ceiling tile pinhole pattern | | 5-17-12-11:06 |
| A-31 | MB Ceiling tile pinhole pattern | | 5-17-12-11:06 |
| A-32 | MB Ceiling tile pinhole pattern D | | 5-17-12-11:06 |
| A-33 | MB Drywall | | 5-17-12-11:16 |
| A-34 | MB Drywall | | 5-17-12-11:16 |
| A-35 | MB Drywall | | 5-17-12-11:16 |
| A-36 | MB Drywall D | | 5-17-12-11:16 |
| A-37 | MB Base board adhesive | | 5-17-12-11:23 |
| A-38 | MB Base board adhesive | | 5-17-12-11:23 |
| A-39 | MB Base board adhesive | | 5-17-12-11:23 |
| A-40 | MB 9x9 white floortile | | 5-17-12-11:36 |

391204554



| SAMPLE NUMBER | SAMPLE DESCRIPTION/LOCATION | VOLUME (if applicable) | Time/Date Sampled |
|---|---|---|---|
| A-41 | MB 9x9 white floortile | | 5-17-12-11:36 |
| A-42 | MB 9x9 white floortile | | 5-17-12-11:36 |
| A-43 | CB boiler gasket | | 5-21-12-8:46 |
| A-44 | CB boiler gasket | | 5-21-12-8:46 |
| A-45 | CB boiler gasket | | 5-21-12-8:46 |
| A-46 | CB boiler rope seal | | 5-21-12-8:52 |
| A-47 | CB boiler rope seal | | 5-21-12-8:52 |
| A-48 | CB boiler rope seal | | 5-21-12-8:52 |
| A-49 | CB Boiler door insulation | | 5-21-12-9:10 |
| A-50 | CB Boiler door insulation | | 5-21-12-9:10 |
| A-51 | CB Boiler door insulation | | 5-21-12-9:10 |
| A-52 | CB window/door caulk | | 5-21-12-9:16 |
| A-53 | CB window/door caulk | | 5-21-12-9:16 |
| A-54 | CB window/door caulk | | 5-21-12-9:16 |
| A-55 | CB glazing | | 5-21-12-9:22 |
| A-56 | CB glazing | | 5-21-12-9:22 |
| A-57 | CB glazing | | 5-21-12-9:22 |
| A-58 | CB 3in Tsi | | 5-21-12-9:29 |
| A-59 | CB 3in Tsi | | 5-21-12-9:29 |
| A-60 | CB 3in Tsi | | 5-21-12-9:29 |

391204554



| SAMPLE NUMBER | SAMPLE DESCRIPTION/LOCATION | VOLUME (if applicable) | Time/Date Sampled |
|---|---|---|---|
| A-61 | CB 8 in Tsi | | 5-21-12-9:37 |
| A-62 | CB 8 in Tsi | | 5-21-12-9:37 |
| A-63 | CB 8 in Tsi | | 5-21-12-9:37 |
| A-64 | CB Tsi joints | | 5-21-12-9:48 |
| A-65 | CB Tsi joints | | 5-21-12-9:48 |
| A-66 | CB Tsi joints | | 5-21-12-9:48 |
| A-67 | CB Tsi joints D | | 5-21-12-9:48 |
| A-68 | CB tank insulation | | 5-21-12-9:56 |
| A-69 | CB tank insulation | | 5-21-12-9:56 |
| A-70 | CB tank insulation | | 5-21-12-9:56 |
| A-71 | CB drywall | | 5-21-12-10:04 |
| A-72 | CB drywall | | 5-21-12-10:04 |
| A-73 | CB drywall | | 5-21-12-10:04 |
| A-74 | OS Tsi pipe | | 5-21-12-10:13 |
| A-75 | OS Tsi pipe | | 5-21-12-10:13 |
| A-76 | OS Tsi pipe | | 5-21-12-10:13 |
| A-77 | CB roof core | | 5-21-12-10:24 |
| A-78 | OS South tank insulation | | 5-21-12-10:37 |
| A-79 | OS North tank insulation | | 5-21-12-10:52 |
| | | | |

# APPENDIX D

12065 Lebanon Rd.
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Teresa Nienhaus
Professional Environmental Engineers Inc
500 So. Ewing Bld.B Suite E
St Louis, MO 63103

# Report Summary

Monday June 04, 2012

Report Number: L576954
Samples Received: 05/21/12
Client Project: 021.001.01

Description: 14 N. Market Street

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: _____

Jeff Carr , ESC Representative

*Laboratory Certification Numbers*

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.


Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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St Louis, MO 63103

# Case Narrative

Monday June 04, 2012

Report Number: L576954
Samples Received: 05/21/12
Client Project: 021.001.01

Description: 14 N. Market Street

Other Comments

The North Tank Upper Layer sample was recieved biphasic. The reported pH and Ignitabilty results for sample -04 are from the liquid phase and for -05 are from the solid phase. The TCLP results for this sample are from the liquid and solid phases combined. The North Tank Lower Layer sample was recieved biphasic. The reported pH and Ignitabilty results for sample -06 are from the liquid phase and for -07 are from the solid phase. The TCLP results for this sample are from the liquid and solid phases combined.

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REPORT OF ANALYSIS

Teresa Nienhaus
Professional Environmental Engineer
500 So. Ewing Bld.B Suite E
St Louis, MO 63103

June 04,2012

ESC Sample # : L576954-01

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : SOUTH TANK UPPER LAYER

Project : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Limit | Method | Date/Time | By | Dil |
|---|---|---|---|---|---|---|---|---|
| Flashpoint | See Footnote | | deg F | | D93/101 | 05/26/12 1008 | MCG | 1 |
| pH | 7.5 | | su | | 9040C | 05/25/12 1542 | GWA | 1 |
| TCLP Extraction | - | | | | 1311 | 05/26/12 0734 | MVE | 1 |
| Mercury | BDL | 0.0010 | mg/l | 0.20 | 7470A | 05/28/12 0900 | JEC | 1 |
| Arsenic | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1331 | ZCS | 10 |
| Barium | BDL | 1.5 | mg/l | 100 | 6010B | 06/03/12 1331 | ZCS | 10 |
| Cadmium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1331 | ZCS | 10 |
| Chromium | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1331 | ZCS | 10 |
| Lead | BDL | 2.5 | mg/l | 5.0 | 6010B | 06/03/12 1618 | ZCS | 50 |
| Selenium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1331 | ZCS | 10 |
| Silver | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1331 | ZCS | 10 |

BDL - Below Detection Limit
Det. Limit - Estimated Quantitation Limit(EQL)
Limit - Maximum Contaminant Level as established by the US EPA
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-01 (PH) - 7.5@21.6c
L576954-01 (FLASHPOINT) - Did Not Flash @ 170 F

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REPORT OF ANALYSIS

Teresa Nienhaus
Professional Environmental Engineer
500 So. Ewing Bld.B Suite E
St Louis, MO 63103

June 04,2012

ESC Sample # : L576954-02

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : SOUTH TANK LOWER LAYER

Project : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Limit | Method | Date/Time | By | Dil |
|---|---|---|---|---|---|---|---|---|
| Flashpoint | See Footnote | | deg F | | D93/101 | 05/26/12 1008 | MCG | 1 |
| pH | 8.3 | | su | | 9040C | 05/25/12 1542 | GWA | 1 |
| TCLP Extraction | - | | | | 1311 | 05/26/12 0734 | MVE | 1 |
| Mercury | BDL | 0.0010 | mg/l | 0.20 | 7470A | 05/28/12 0940 | JEC | 1 |
| Arsenic | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1341 | ZCS | 10 |
| Barium | BDL | 1.5 | mg/l | 100 | 6010B | 06/03/12 1341 | ZCS | 10 |
| Cadmium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1341 | ZCS | 10 |
| Chromium | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1341 | ZCS | 10 |
| Lead | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1341 | ZCS | 10 |
| Selenium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1341 | ZCS | 10 |
| Silver | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1341 | ZCS | 10 |

BDL - Below Detection Limit
Det. Limit - Estimated Quantitation Limit(EQL)
Limit - Maximum Contaminant Level as established by the US EPA
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-02 (PH) - 8.3@21.7c
L576954-02 (FLASHPOINT) - Did Not Flash @ 170 F

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REPORT OF ANALYSIS

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St Louis, MO 63103

June 04,2012

ESC Sample # : L576954-03

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : SOUTH TANK LOWER LAYER 2

Project : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Limit | Method | Date/Time | By | Dil |
|---|---|---|---|---|---|---|---|---|
| Flashpoint | See Footnote | | deg F | | D93/101 | 05/26/12 1008 | MCG | 1 |
| pH | 7.7 | | su | | 9040C | 05/25/12 1542 | GWA | 1 |
| TCLP Extraction | - | | | | 1311 | 05/26/12 0734 | MVE | 1 |
| Mercury | BDL | 0.0010 | mg/l | 0.20 | 7470A | 05/28/12 1019 | JEC | 1 |
| Arsenic | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1410 | ZCS | 10 |
| Barium | BDL | 1.5 | mg/l | 100 | 6010B | 06/03/12 1410 | ZCS | 10 |
| Cadmium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1410 | ZCS | 10 |
| Chromium | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1410 | ZCS | 10 |
| Lead | BDL | 2.5 | mg/l | 5.0 | 6010B | 06/03/12 1623 | ZCS | 50 |
| Selenium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1410 | ZCS | 10 |
| Silver | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1410 | ZCS | 10 |

BDL - Below Detection Limit
Det. Limit - Estimated Quantitation Limit(EQL)
Limit - Maximum Contaminant Level as established by the US EPA
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-03 (PH) - 7.7@21.7c
L576954-03 (FLASHPOINT) - Did Not Flash @ 170 F

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REPORT OF ANALYSIS

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St Louis, MO 63103

June 04, 2012

ESC Sample # : L576954-04

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : NORTH TANK UPPER LAYER

Project : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Limit | Method | Date/Time | By | Dil |
|---|---|---|---|---|---|---|---|---|
| Flashpoint | See Footnote | | deg F | | D93/101 | 05/26/12 1008 | MCG | 1 |
| pH | 4.8 | | su | | 9040C | 05/25/12 1542 | GWA | 1 |
| TCLP Extraction | - | | | | 1311 | 05/26/12 0734 | MVE | 1 |
| Mercury | BDL | 0.0010 | mg/l | 0.20 | 7470A | 05/28/12 1022 | JEC | 1 |
| Arsenic | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1521 | ZCS | 10 |
| Barium | BDL | 1.5 | mg/l | 100 | 6010B | 06/03/12 1521 | ZCS | 10 |
| Cadmium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1521 | ZCS | 10 |
| Chromium | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1521 | ZCS | 10 |
| Lead | BDL | 2.5 | mg/l | 5.0 | 6010B | 06/03/12 1638 | ZCS | 50 |
| Selenium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1521 | ZCS | 10 |
| Silver | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1521 | ZCS | 10 |

BDL - Below Detection Limit
Det. Limit - Estimated Quantitation Limit(EQL)
Limit - Maximum Contaminant Level as established by the US EPA
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-04 (PH) - 4.8@22.7c
L576954-04 (FLASHPOINT) - Did Not Flash @ 170 F

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REPORT OF ANALYSIS

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June 04,2012

ESC Sample # : L576954-05

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : NORTH TANK UPPER LAYER

Project # : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Ignitability | See Footnote | | Deg. F | D93/1010A | 05/26/12 | 1 |
| pH | 5.9 | | su | 9045D | 05/29/12 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-05 (IGNITABILITY) - Did Not Ignite @ 170 F
L576954-05 (PH) - 5.9@23.5c

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REPORT OF ANALYSIS

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St Louis, MO 63103

June 04, 2012

ESC Sample # : L576954-06

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : NORTH TANK LOWER LAYER

Project : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Limit | Method | Date/Time | By | Dil |
|---|---|---|---|---|---|---|---|---|
| Flashpoint | See Footnote | | deg F | | D93/101 | 05/26/12 1008 | MCG | 1 |
| pH | 5.1 | | su | | 9040C | 05/25/12 1542 | GWA | 1 |
| TCLP Extraction | - | | | | 1311 | 05/26/12 0734 | MVE | 1 |
| Mercury | BDL | 0.0010 | mg/l | 0.20 | 7470A | 05/28/12 1024 | JEC | 1 |
| Arsenic | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1531 | ZCS | 10 |
| Barium | BDL | 1.5 | mg/l | 100 | 6010B | 06/03/12 1531 | ZCS | 10 |
| Cadmium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1531 | ZCS | 10 |
| Chromium | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1531 | ZCS | 10 |
| Lead | BDL | 2.5 | mg/l | 5.0 | 6010B | 06/03/12 1643 | ZCS | 50 |
| Selenium | BDL | 0.50 | mg/l | 1.0 | 6010B | 06/03/12 1531 | ZCS | 10 |
| Silver | BDL | 0.50 | mg/l | 5.0 | 6010B | 06/03/12 1531 | ZCS | 10 |

BDL - Below Detection Limit
Det. Limit - Estimated Quantitation Limit(EQL)
Limit - Maximum Contaminant Level as established by the US EPA
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-06 (FLASHPOINT) - Did Not Flash @ 170 F
L576954-06 (PH) - 5.1@22.5c

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REPORT OF ANALYSIS

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June 04, 2012

ESC Sample # : L576954-07

Date Received : May 21, 2012
Description : 14 N. Market St.

Site ID :

Sample ID : NORTH TANK LOWER LAYER

Project # : 021.001.01

Collected By : Willie Clay
Collection Date : 05/18/12 08:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Ignitability | See Footnote | | Deg. F | D93/1010A | 05/26/12 | 1 |
| pH | 6.5 | | su | 9045D | 05/29/12 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 06/04/12 14:31 Printed: 06/04/12 15:12
L576954-07 (IGNITABILITY) - Did Not Ignite @ 170 F
L576954-07 (PH) - 6.5@23.1c

Attachment A
List of Analytes with QC Qualifiers

| Sample Number | Work Group | Sample Type | Analyte | Run ID | Qualifier |
|---|---|---|---|---|---|
| L576954-01 | WG594584 | SAMP | pH | R2186896 | T8 |
| | WG594892 | SAMP | Mercury | R2186874 | J5 |
| | WG594971 | SAMP | Arsenic | R2192454 | O |
| | WG594971 | SAMP | Barium | R2192454 | O |
| | WG594971 | SAMP | Cadmium | R2192454 | O |
| | WG594971 | SAMP | Chromium | R2192454 | O |
| | WG594971 | SAMP | Lead | R2192454 | O |
| | WG594971 | SAMP | Selenium | R2192454 | O |
| | WG594971 | SAMP | Silver | R2192454 | O |
| L576954-02 | WG594584 | SAMP | pH | R2186896 | T8 |
| | WG594892 | SAMP | Mercury | R2186874 | J5 |
| | WG594971 | SAMP | Arsenic | R2192454 | O |
| | WG594971 | SAMP | Barium | R2192454 | OJ5 |
| | WG594971 | SAMP | Cadmium | R2192454 | O |
| | WG594971 | SAMP | Chromium | R2192454 | O |
| | WG594971 | SAMP | Lead | R2192454 | OJ6 |
| | WG594971 | SAMP | Selenium | R2192454 | OJ6 |
| | WG594971 | SAMP | Silver | R2192454 | O |
| L576954-03 | WG594584 | SAMP | pH | R2186896 | T8 |
| | WG594971 | SAMP | Arsenic | R2192454 | OJ6 |
| | WG594971 | SAMP | Barium | R2192454 | OJ5 |
| | WG594971 | SAMP | Cadmium | R2192454 | O |
| | WG594971 | SAMP | Chromium | R2192454 | O |
| | WG594971 | SAMP | Lead | R2192454 | OJ6 |
| | WG594971 | SAMP | Selenium | R2192454 | OJ6 |
| | WG594971 | SAMP | Silver | R2192454 | OJ6J3 |
| L576954-04 | WG594584 | SAMP | pH | R2186896 | T8 |
| | WG594971 | SAMP | Arsenic | R2192454 | O |
| | WG594971 | SAMP | Barium | R2192454 | O |
| | WG594971 | SAMP | Cadmium | R2192454 | O |
| | WG594971 | SAMP | Chromium | R2192454 | O |
| | WG594971 | SAMP | Lead | R2192454 | O |
| | WG594971 | SAMP | Selenium | R2192454 | O |
| | WG594971 | SAMP | Silver | R2192454 | O |
| L576954-05 | WG594887 | SAMP | pH | R2188074 | T8 |
| L576954-06 | WG594584 | SAMP | pH | R2186896 | T8 |
| | WG594971 | SAMP | Arsenic | R2192454 | O |
| | WG594971 | SAMP | Barium | R2192454 | O |
| | WG594971 | SAMP | Cadmium | R2192454 | O |
| | WG594971 | SAMP | Chromium | R2192454 | O |
| | WG594971 | SAMP | Lead | R2192454 | O |
| | WG594971 | SAMP | Selenium | R2192454 | O |
| | WG594971 | SAMP | Silver | R2192454 | O |
| L576954-07 | WG594887 | SAMP | pH | R2188074 | T8 |

Attachment B
Explanation of QC Qualifier Codes

| Qualifier | Meaning |
|---|---|
| J3 | The associated batch QC was outside the established quality control range for precision. |
| J5 | The sample matrix interfered with the ability to make any accurate determination; spike value is high |
| J6 | The sample matrix interfered with the ability to make any accurate determination; spike value is low |
| O | (ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution. |
| T8 | (ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration. |

## Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

## Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

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Professional Environmental Engineers Inc
Teresa Nienhaus
500 So. Ewing Bld.B Suite E

St Louis, MO 63103

Quality Assurance Report
Level II

L576954

June 04, 2012

Laboratory Blank

| Analyte | Result | Units | % Rec | Limit | Batch | Date Analyzed |
|---|---|---|---|---|---|---|
| Mercury | < .0002 | mg/l | | | WG594892 | 05/28/12 08:42 |
| pH | 5.37 | su | | | WG594584 | 05/25/12 15:42 |
| pH | 6.61 | su | | | WG594887 | 05/29/12 13:15 |
| Arsenic | < .05 | mg/l | | | WG594971 | 05/31/12 17:01 |
| Barium | < .15 | mg/l | | | WG594971 | 05/31/12 17:01 |
| Cadmium | < .05 | mg/l | | | WG594971 | 05/31/12 17:01 |
| Chromium | < .05 | mg/l | | | WG594971 | 05/31/12 17:01 |
| Lead | < .05 | mg/l | | | WG594971 | 05/31/12 17:01 |
| Selenium | < .05 | mg/l | | | WG594971 | 05/31/12 17:01 |
| Silver | < .05 | mg/l | | | WG594971 | 05/31/12 17:01 |

Duplicate

| Analyte | Units | Result | Duplicate | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|
| Mercury | mg/l | 0 | 0 | 0 | 20 | L576638-03 | WG594892 |
| pH | su | 0 | 0 | 0 | 1 | L576596-02 | WG594584 |
| pH | su | 5.10 | 5.10 | 0.781 | 1 | L576954-06 | WG594584 |
| Flashpoint | deg F | 0 | 0 | 0 | 20 | L576954-06 | WG594781 |
| Ignitability | Deg. F | 0 | 0 | 0 | 10 | L576705-01 | WG594782 |
| pH | su | 6.00 | 5.90 | 0.844 | 1 | L576858-03 | WG594887 |
| pH | su | 7.70 | 7.80 | 1.03* | 1 | L577248-22 | WG594887 |
| Arsenic | mg/l | 0 | 0 | 0 | 20 | L576891-03 | WG594971 |
| Barium | mg/l | 1.30 | 1.20 | 5.67 | 20 | L576891-03 | WG594971 |
| Cadmium | mg/l | 0.120 | 0.120 | 2.47 | 20 | L576891-03 | WG594971 |
| Chromium | mg/l | 0 | 0 | 0 | 20 | L576891-03 | WG594971 |
| Lead | mg/l | 0.240 | 0.240 | 0.830 | 20 | L576891-03 | WG594971 |
| Selenium | mg/l | 0 | 0 | 0 | 20 | L576891-03 | WG594971 |
| Silver | mg/l | 0 | 0 | 0 | 20 | L576891-03 | WG594971 |

Laboratory Control Sample

| Analyte | Units | Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| Mercury | mg/l | .003 | 0.00320 | 107. | 85-115 | WG594892 |
| pH | su | 5.7 | 5.64 | 98.9 | 98-101 | WG594584 |
| Flashpoint | deg F | 82 | 84.0 | 102. | 96-104 | WG594781 |
| Ignitability | Deg. F | 82 | 84.0 | 102. | 93-107 | WG594782 |

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Tax I.D. 62-0814289

Est. 1970

Professional Environmental Engineers Inc
Teresa Nienhaus
500 So. Ewing Bld.B Suite E

St Louis, MO 63103

Quality Assurance Report
Level II

June 04, 2012

L576954

Laboratory Control Sample

| Analyte | Units | Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| pH | su | 5.7 | 5.63 | 98.8 | 98-101 | WG594887 |
| Arsenic | mg/l | 1.13 | 1.13 | 100. | 85-115 | WG594971 |
| Barium | mg/l | 1.13 | 1.12 | 99.1 | 85-115 | WG594971 |
| Cadmium | mg/l | 1.13 | 1.15 | 102. | 85-115 | WG594971 |
| Chromium | mg/l | 1.13 | 1.16 | 103. | 85-115 | WG594971 |
| Lead | mg/l | 1.13 | 1.13 | 100. | 85-115 | WG594971 |
| Selenium | mg/l | 1.13 | 1.12 | 99.1 | 85-115 | WG594971 |
| Silver | mg/l | 1.13 | 1.13 | 100. | 85-115 | WG594971 |

Laboratory Control Sample Duplicate

| Analyte | Units | Result | Ref | %Rec | Limit | RPD | Limit | Batch |
|---|---|---|---|---|---|---|---|---|
| pH | su | 5.63 | 5.64 | 99.0 | 98-101 | 0.177 | 20 | WG594584 |
| Flashpoint | deg F | 84.0 | 84.0 | 102. | 96-104 | 0 | 7 | WG594781 |
| Ignitability | Deg. F | 84.0 | 84.0 | 102. | 93-107 | 0 | 20 | WG594782 |
| pH | su | 5.61 | 5.63 | 98.0 | 98-101 | 0.356 | 20 | WG594887 |

Matrix Spike

| Analyte | Units | MS Res | Ref Res | TV | % Rec | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|
| Mercury | mg/l | 0.00318 | 0 | .003 | 106. | 70-130 | L576638-03 | WG594892 |
| Mercury | mg/l | 0.0255 | 0 | .003 | 850.* | 70-130 | L576954-01 | WG594892 |
| Mercury | mg/l | 0.0254 | 0 | .003 | 847.* | 70-130 | L576954-02 | WG594892 |
| Arsenic | mg/l | 1.12 | 0 | 1.13 | 99.1 | 75-125 | L576891-03 | WG594971 |
| Barium | mg/l | 2.42 | 1.20 | 1.13 | 108. | 75-125 | L576891-03 | WG594971 |
| Cadmium | mg/l | 1.33 | 0.120 | 1.13 | 107. | 75-125 | L576891-03 | WG594971 |
| Chromium | mg/l | 1.16 | 0 | 1.13 | 103. | 75-125 | L576891-03 | WG594971 |
| Lead | mg/l | 1.35 | 0.240 | 1.13 | 98.2 | 75-125 | L576891-03 | WG594971 |
| Selenium | mg/l | 1.06 | 0 | 1.13 | 93.8 | 75-125 | L576891-03 | WG594971 |
| Silver | mg/l | 0.0692 | 0 | 1.13 | 6.12* | 75-125 | L576891-03 | WG594971 |
| Arsenic | mg/l | 1.08 | 0 | .113 | 95.6 | 75-125 | L576954-02 | WG594971 |
| Barium | mg/l | 1.52 | 0 | .113 | 134.* | 75-125 | L576954-02 | WG594971 |
| Cadmium | mg/l | 1.16 | 0 | .113 | 103. | 75-125 | L576954-02 | WG594971 |
| Chromium | mg/l | 1.23 | 0 | .113 | 109. | 75-125 | L576954-02 | WG594971 |
| Lead | mg/l | -0.0422 | 0 | .113 | 0* | 75-125 | L576954-02 | WG594971 |
| Selenium | mg/l | 0.717 | 0 | .113 | 63.4* | 75-125 | L576954-02 | WG594971 |
| Silver | mg/l | 1.08 | 0 | .113 | 95.6 | 75-125 | L576954-02 | WG594971 |
| Arsenic | mg/l | 0.750 | 0 | .113 | 66.4* | 75-125 | L576954-03 | WG594971 |
| Barium | mg/l | 1.73 | 0 | .113 | 153.* | 75-125 | L576954-03 | WG594971 |
| Cadmium | mg/l | 1.04 | 0 | .113 | 92.0 | 75-125 | L576954-03 | WG594971 |
| Chromium | mg/l | 1.15 | 0 | .113 | 102. | 75-125 | L576954-03 | WG594971 |
| Selenium | mg/l | 0.379 | 0 | .113 | 33.5* | 75-125 | L576954-03 | WG594971 |
| Silver | mg/l | 0.965 | 0 | .113 | 85.4 | 75-125 | L576954-03 | WG594971 |
| Lead | mg/l | -1.72 | 0 | .0226 | 0* | 75-125 | L576954-03 | WG594971 |

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

ESC LAB SCIENCES
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Est. 1970

Professional Environmental Engineers Inc
Teresa Nienhaus
500 So. Ewing Bld.B Suite E
St Louis, MO 63103

Quality Assurance Report
Level II

L576954

June 04, 2012

| Analyte | Units | Matrix Spike MSD | Duplicate Ref | %Rec | Limit | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | mg/l | 0.00319 | 0.00318 | 106. | 70-130 | 0.314 | 20 | L576638-03 | WG594892 |
| Mercury | mg/l | 0.0249 | 0.0255 | 830.* | 70-130 | 2.38 | 20 | L576954-01 | WG594892 |
| Mercury | mg/l | 0.0271 | 0.0254 | 903.* | 70-130 | 6.48 | 20 | L576954-02 | WG594892 |
| Arsenic | mg/l | 1.11 | 1.12 | 98.2 | 75-125 | 0.897 | 20 | L576891-03 | WG594971 |
| Barium | mg/l | 2.40 | 2.42 | 106. | 75-125 | 0.830 | 20 | L576891-03 | WG594971 |
| Cadmium | mg/l | 1.31 | 1.33 | 105. | 75-125 | 1.52 | 20 | L576891-03 | WG594971 |
| Chromium | mg/l | 1.14 | 1.16 | 101. | 75-125 | 1.74 | 20 | L576891-03 | WG594971 |
| Lead | mg/l | 1.33 | 1.35 | 96.5 | 75-125 | 1.49 | 20 | L576891-03 | WG594971 |
| Selenium | mg/l | 1.11 | 1.06 | 98.2 | 75-125 | 4.61 | 20 | L576891-03 | WG594971 |
| Silver | mg/l | 0.0682 | 0.0692 | 6.04* | 75-125 | 1.46 | 20 | L576891-03 | WG594971 |
| Arsenic | mg/l | 0.987 | 1.08 | 87.3 | 75-125 | 9.00 | 20 | L576954-02 | WG594971 |
| Barium | mg/l | 1.43 | 1.52 | 126.* | 75-125 | 6.10 | 20 | L576954-02 | WG594971 |
| Cadmium | mg/l | 1.09 | 1.16 | 96.5 | 75-125 | 6.22 | 20 | L576954-02 | WG594971 |
| Chromium | mg/l | 1.14 | 1.23 | 101. | 75-125 | 7.59 | 20 | L576954-02 | WG594971 |
| Lead | mg/l | -0.0786 | -0.0422 | 0* | 75-125 | -60.4* | 20 | L576954-02 | WG594971 |
| Selenium | mg/l | 0.755 | 0.717 | 66.8* | 75-125 | 5.16 | 20 | L576954-02 | WG594971 |
| Silver | mg/l | 0.955 | 1.08 | 84.5 | 75-125 | 12.3 | 20 | L576954-02 | WG594971 |
| Arsenic | mg/l | 0.707 | 0.750 | 62.6* | 75-125 | 5.90 | 20 | L576954-03 | WG594971 |
| Barium | mg/l | 1.56 | 1.73 | 138.* | 75-125 | 10.3 | 20 | L576954-03 | WG594971 |
| Cadmium | mg/l | 0.942 | 1.04 | 83.4 | 75-125 | 9.89 | 20 | L576954-03 | WG594971 |
| Chromium | mg/l | 1.03 | 1.15 | 91.2 | 75-125 | 11.0 | 20 | L576954-03 | WG594971 |
| Selenium | mg/l | 0.350 | 0.379 | 31.0* | 75-125 | 7.96 | 20 | L576954-03 | WG594971 |
| Silver | mg/l | 0.761 | 0.965 | 67.3* | 75-125 | 23.6* | 20 | L576954-03 | WG594971 |
| Lead | mg/l | -1.49 | -1.72 | 0* | 75-125 | -14.2* | 20 | L576954-03 | WG594971 |

Batch number /Run number / Sample number cross reference

WG594892: R2186874: L576954-01 02 03 04 06
WG594584: R2186896: L576954-01 02 03 04 06
WG594781: R2186954: L576954-01 02 03 04 06
WG594782: R2186973: L576954-05 07
WG594642: R2187037: L576954-01 02 03 04 06
WG594887: R2188074: L576954-05 07
WG594971: R2192454: L576954-01 02 03 04 06

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Teresa Nienhaus
500 So. Ewing Bld.B Suite E
St Louis, MO 63103

Quality Assurance Report
Level II

June 04, 2012

L576954

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Company Name/Address

**Professional Environmental Engineers**

**500 S. Ewing, Suite E**
**St. Louis, MO 63103**

Alternate billing information

Report To: Teresa Nienhaus

Email to: tnienhaus@pe-engrs.com

Project Description **14 N. Market St.**

City/stateCollected: **St. Louis, MO**

Phone # 314-531-0600

Fax#

Client Project # **021.001.01**

Lab Project #

Collected by: Willie Clay

Site/Facility ID#

P.O.#

Collected by(signature): Willie Clay

Packed on Ice N___ Y___

**Rush?** (Lab MUST be Notified)
_____Same Day.....200%
_____Next Day.....100%
_____Two Day.....50%

**Date Results Needed** Std.

Email?___No_x_Yes
FAX?___No___Yes

Analysis/Container/Preservative

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No of Cntrs | pH | FLASHPOINT | TCLP METALS 6010 | Remarks/contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| South Tank Upper Layer | Grab | OT | NA | 5-18-12 | 0800 | 1 | X | X | X | | L576954 -01 |
| South Tank Lower Layer | ↓ | ↓ | ↓ | ↓ | ↓ | 1 | X | X | X | Try to analyze solids, if any | -02 |
| South Tank Lower Layer 2 | | | | | | 1 | X | X | X | " " | -03 |
| North Tank Upper Layer | | | | | | 1 | X | X | X | | -04/-05 |
| North Tank Lower Layer | ↓ | ↓ | ↓ | ↓ | ↓ | 1 | X | X | X | " " | -06/-07 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Chain of Custody
Page___of___

Prepared by:

**ENVIRONMENTAL Science Corp**
12065 Lebanon Road
Mt. Juliet TN 37122

Phone (615)758-5858
Phone (800) 767-5859
FAX (615)758-5859

CoCode PROEN (lab use only)

Template/Prelogin

Shipped Via:

*Matrix: SS-Soil/Solid GW-Groundwater WW-Wastewater DW-Drinking Water OT-Other Storage Tank contents (unknown liquid)

Remarks: 5040 6628 9317

pH_____ Temp_____

Flow_____ Other_____

| Relinquisher by:(Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| T Nienhaus | 5-18-12 | 12:20 | Tom |
| Relinquisher by:(Signature) | Date: | Time: | Received by: (Signature) |
| Relinquisher by:(Signature) | Date: | Time: | Received for lab by: (Signature) Greg Newman |

Samples returned via: FedEx_____ UPS_____
Courier_____ Other_____

Temp: 11.6°C

Bottles Received: 5 F

Date: 5-21-12

Time: 1000

Condition (lab use only) OK

pH Checked: NCF: ✓

~~Greg~~ Jeff

ESC LAB SCIENCES

# NON-CONFORMANCE FORM

Login No.: L576954

Date: 5-21-12

Evaluated by: Grey Dearmon

Client: PROEN

## Non-Conformance (check applicable items)

- ☐ Parameter(s) past holding time
- ☐ Improper temperature
- ☐ Improper container type
- ☐ Improper preservation
- ☐ Container lid not intact
- ☐ Login Clarification Needed
- ☐ Chain of custody is incomplete
- ☐ Chain of Custody is missing (see below)
- ☐ Broken container(s) (See below)
- ☐ Broken container: sufficient sample volume remains for analysis requested (See below)

If no COC: Received by:_____

Date:_____Time:_____

Temp:_____Cont. Rec_____pH:_____

☐ Fedex ☐ UPS ☐SWA ☐ Other_____

Tracking #_____

- ☐ Insufficient packing material around container
- ☐ Insufficient packing material inside cooler
- ☐ Improper handling by carrier (FedEx / UPS / Courier)
- ☐ Sample was frozen

Comments: ① recieved out of Temp. recieved at 11.6°C, client used Saturday ~~Delivery~~ Delivery Sticker but Fedex played Monday Thru Thursday label over it. ② Did not receive South Tank Lower Layer 2. Did receive South Tank Upper Layer 2 not on the COC.

Login Instructions:

TSR Initials: JL

Client informed by call / email / fax / voice mail date: 5/23 time: 1630

Client contact: Client informed; Proceed w/ analysis

(2) log per COC

ESC LAB SCIENCES

****SATURDAY****
****DELIVERY****

****USE THESE 2 LABELS ON FRIDAY****

**(Your shipment will be delivered to ESC Saturday A.M.)**

**Time and Temperature Sensitive Shipment**

# **Saturday Delivery**

ORIGIN ID: BNAA (615) 758-5858
TOM FINOCCHIARO
ENVIRONMENTAL SCIENCE CORP. - ST. L
1512 WINDRIDGE DRIVE

ST. LOUIS, MO 63131
UNITED STATES US

SHIP DATE: 06APR12
ACTWGT: 10.0 LB MAN
CAD: 0361800/CAFE2511

BILL SENDER

TO **SHIPPING**
**ESC LAB SCIENCES**
**12065 LEBANON PIKE**

**MOUNT JULIET TN 37122**
(615) 758-5858 REF: ESCMO
PO: ESCMO

FedEx Express

**RETURNS MON-SAT**

TRK# 5040 6628 9317

FedEx
TRK# 0221 5040 0628 9317

**MON - 07 MAY A2**
**PRIORITY OVERNIGHT**

**TA BNAA**

**37122**
TN-US
**BNA**

Emp# 639041 18MAY12 SUSA 512C3/61A4/A278

**PROFESSIONAL ENVIRONMENTAL ENGINEERS, INC.**
*"Providing cost-effective environmental solutions"*
Consulting • Engineering Design • Remediation • Abatement • Emergency Response

500 S. Ewing, Suite E
St. Louis, MO 63103
(314) 531-0060
Fax (314) 531-0068

July 9, 2012

PE Project No. 021.01.001

Mr. Chadwick E. Howell, CHMM
Engineer Project Manager
St. Louis Development Corporation
1520 Market Street, Suite 2000
St. Louis, MO 63103

RE: Engineering Estimate – Municipal Terminal
14 N. Market Street, St. Louis, Missouri
Asbestos Abatement & Household Hazardous Waste

Mr. Howell:

Professional Environmental Engineers, Inc. is pleased to submit the engineering estimate for the asbestos abatement, household hazardous waste removal, and third party oversight for the environmental activities located at the Municipal Terminal Facility located at 14 N. Market Street, St. Louis, Missouri. The estimated costs are based upon conducting the environmental activities in preparation for building demolition. The estimates are as follows:

| | | | |
|---|---|---|---|
| Asbestos Abatement in Preparation for Demolition: | $ 20,000.00 | to | $ 27,500.00 |
| Household Hazardous Waste Removal: | $ 2,200.00 | to | $ 3,300.00 |
| Third Party Oversight: | $ 8,000.00 | to | $ 9,000.00 |
| | $ 30,200.00 | to | $ 39,800.00 |

Thank you for the opportunity to provide these important environmental services to the St. Louis Development Corporation. Should you require additional information please call me at (314) 531-0060.

Respectfully Submitted,

PROFESSIONAL ENVIRONMENTAL ENGINEERS, INC.

Teresa Nienhaus, R.G.
Project Manager