PROFESSIONAL ENVIRONMENTAL ENGINEERS, INC.
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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.
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PE Project # 021.001.01

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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 First Layer: **Second Layer:** Third Layer:	**113 LF**	 None Detected **69 % Chrysotile** 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 **Tile:** Adhesive:	**100 SF**	 **4 % Chrysotile** None Detected
A-13, 14 & 15	Main Building	**Window/Door Caulk**	**135 LF**	None Detected
A-17, 18 & 19	Main Building	**Window Glazing** 1st layer: 2nd layer:	**115 LF**	**(Lab determined same as window/door caulk)** None Detected 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: **Adhesive:**		**9 % Chrysotile** **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 **Joint Compound:** Drywall:	**1,938 SF**	Composite < 1 % **2 % Chrysotile** 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 (Main Building)	Approximately - 6 LF
~	Transite Siding: (Main Building)	Approximately - 324 SF
~	Chemical Sink Top (Caustic House)	Approximately - 24 SF
~	Fire Doors (Main Building & Caustic House)	Approximately - 8 each
~	Thermal System Pipe Insulation/Joints (Main Building, Caustic House & Outside)	Approximately - 572 LF
~	Tan 1' x 1' Floor Tile (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

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FIGURE 1
SITE LOCATION MAP

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

No Scale Determined

N

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FIGURE 2

SITE FEATURES

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

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

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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

NVLAP-01S (REV. 2005-05-19)

APPENDIX C

EMSL Analytical, Inc.
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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-1-Paint *391204554-0001*		White Non-Fibrous Heterogeneous			100%	Non-fibrous (other)		**None Detected**
A-1-Insulation *391204554-0001A*		Gray Fibrous Heterogeneous			31%	Non-fibrous (other)	**69%**	**Chrysotile**
A-1-Insulation *391204554-0001B*		Tan Fibrous Heterogeneous	96%	Cellulose	4%	Non-fibrous (other)		**None Detected**
A-2 *391204554-0002*								**Stop Positive (Not Analyzed)**
A-3 *391204554-0003*								**Stop Positive (Not Analyzed)**
A-4 *391204554-0004*		Gray Non-Fibrous Heterogeneous	39%	Min. Wool	57%	Non-fibrous (other)	**4%**	**Chrysotile**
A-5 *391204554-0005*								**Stop Positive (Not Analyzed)**
A-6 *391204554-0006*								**Stop Positive (Not Analyzed)**

Analyst(s)
Sue Ferrario (101)

Jeff Siria, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.
Samples analyzed by EMSL Analytical, Inc. Saint Louis, MO NVLAP Lab Code 200742-0

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)

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CustomerPO:	1265
ProjectID:	

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

Analyst(s)
Sue Ferrario (101)

Jeff Siria, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Saint Louis, MO NVLAP Lab Code 200742-0

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)

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

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

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

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

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

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

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

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

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

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

Analyst(s)
Sue Ferrario (101)

Jeff Siria, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Saint Louis, MO NVLAP Lab Code 200742-0

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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

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

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

Analyst(s)
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or other approved signatory

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

Analyst(s)

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or other approved signatory

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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

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

Analyst(s)
Sue Ferrario (101)

Jeff Siria, Laboratory Manager
or other approved signatory

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

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THIS IS THE LAST PAGE OF THE REPORT.

EMSL ANALYTICAL, INC.

Asbestos Lab Services Chain of Custody

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 If Bill to is Different note instructions in Comments** *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:**

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

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

Relinquished (Client): James Braido **Date:** 5-24-12 **Time:** 11.09

Received (Lab): **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)

Controlled Document – Asbestos Lab Services COC – A1.0 – 11/23/2009

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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Est. 1970

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.

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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:
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.
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

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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:
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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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Professional Environmental Engineer
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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
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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

Teresa Nienhaus
Professional Environmental Engineer
500 So. Ewing Bld.B Suite E
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:
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.
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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Professional Environmental Engineer
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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.
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.
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

Teresa Nienhaus
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St Louis, MO 63103

June 04, 2012

ESC Sample # : L576954-06

Site ID :

Project : 021.001.01

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

Sample ID : NORTH TANK LOWER LAYER

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.
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.
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.
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.
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

June 04, 2012

L576954

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.
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Teresa Nienhaus
500 So. Ewing Bld.B Suite E

St Louis, MO 63103

Quality Assurance Report
Level II

L576954

June 04, 2012

Analyte	Units	Laboratory Control Sample 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

Analyte	Units	Laboratory Control Sample Duplicate 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

Analyte	Units	Matrix Spike 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

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Quality Assurance Report
Level II

L576954

June 04, 2012

Analyte	Units	MSD	Matrix Spike 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.
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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

Analysis/Container/Preservative

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

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

CoCode PROEN (lab use only)

Template/Prelogin

Shipped Via:

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

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

pH_____ Temp_____

Flow_____ Other_____

Remarks: 5040 0628 9317

Relinquisher by:(Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: FedEx_____ UPS_____ Courier_____ Other_____		Condition (lab use only)
T Nienhaus	5-18-12	12:20	Tom			OK
Relinquisher by:(Signature	Date:	Time:	Received by: (Signature)	Temp: 11.6 °C	Bottles Received: 5 F	
Relinquisher by:(Signature	Date:	Time:	Received for lab by: (Signature) Greg Neuman	Date: 5-21-12	Time: 1000	pH Checked: NCF: ✓

~~Greg~~ Jeff

ESC
L·A·B S·C·I·E·N·C·E·S

NON-CONFORMANCE FORM

Login No.: L576954

Date: 5-21-12

Evaluated by: Greg 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 Fed ex 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: J

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