



**TETRA TECH**

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February 12, 2015

Mr. Stephen Wolfe  
On-Scene Coordinator  
U.S. Environmental Protection Agency  
Region 5, Emergency Response Branch #1  
25063 Center Ridge Road  
West Lake, Ohio 44145

**Subject: Final Letter Report for the Joseph Street Asbestos Removal Site**  
**EPA Contract No. EP-S5-13-01**  
**Technical Direction Document No. 0001/S05-0001-1407-003**  
**Document Tracking No. 0150**

Dear Mr. Wolfe:

From September 3 to October 23, 2014, the U.S. Environmental Protection Agency (EPA) tasked Tetra Tech, Inc. (Tetra Tech), under Superfund Technical Assessment and Response Team (START) Contract No. EP-S5-13-01, to conduct oversight activities at the Joseph Street Asbestos Removal Site located in Marion, Marion County, Ohio. Oversight included the following activities:

- Recording site conditions and removal activities through photographic documentation and in a site logbook
- Collecting perimeter and activity-based asbestos air samples
- Collecting soil samples for analysis of polychlorinated biphenyls (PCB)
- Monitoring air conditions along the perimeter of the site with a particulate air monitoring device

The attached final letter report documents Tetra Tech's oversight activities and summarizes the removal activities that were completed. The report also addresses your comments on previous versions of the report that were submitted on December 9, 2014, and January 22, 2015. If you have any questions regarding this report, please call me at (312) 201-7719.

Sincerely,

Christopher R. Burns Jr.  
Project Manager

Enclosure

cc: TDD File

**FINAL LETTER REPORT  
FOR THE  
JOSEPH STREET ASBESTOS REMOVAL SITE  
MARION, MARION COUNTY, OHIO**

*Prepared for*

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*Submitted by*

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- A PHOTOGRAPHIC DOCUMENTATION LOG
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- A ANALYTICAL RESULTS AND DATA VERIFICATION REPORTS: PERIMETER AIR SAMPLES
- B ANALYTICAL RESULTS AND DATA VERIFICATION REPORTS: ACTIVITY-BASED AIR SAMPLES
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## **1.0 INTRODUCTION**

Under Technical Direction Document (TDD) 0001/S05-0001-1407-003, the U.S. Environmental Protection Agency (EPA) tasked the Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) to assist the EPA On-Scene Coordinator (OSC) in overseeing and recording, through photographic documentation (Appendix A) and site logbooks (Appendix B), the site conditions and removal activities related to the asbestos-containing demolition debris; the collection of perimeter and activity-based air samples; the collection of soil samples; and the monitoring of the ambient air conditions along the site perimeter (Appendix C, Table 1).

The air samples were collected to determine (1) if fibers of friable asbestos were detected beyond the perimeter of the site's concrete pad and (2) if fibers of friable asbestos were detected following the completion of the activity-based asbestos sampling activities. The air monitoring was carried out to determine which set of asbestos cassettes would be sent to the laboratory for analysis for each week.

In addition to the air samples collected during removal activities, Tetra Tech collected four soil samples on September 16, 2014 (including one duplicate) and three soil samples on October 8, 2014 (including one duplicate). Tetra Tech collected these samples to characterize the levels of polychlorinated biphenyls (PCB) in the soil surrounding three concrete pads that formerly staged electrical transformers.

This letter report provides a site background in Section 2.0, describes the removal-related site activities in Section 3.0, and summarizes the analytical results in Section 4.0.

## **2.0 BACKGROUND**

This section describes the site location, provides a description of the site, and summarizes previous site activities and investigations.

### **2.1 SITE LOCATION AND DESCRIPTION**

The site is located at 333 Joseph Street in Marion, Marion County, Ohio (Appendix D, Figure 1). The geographic coordinates, as measured from the center of the property, are 40°35'43.74" north latitude and 83°08'07.01" west longitude. The site, which encompasses 13.68 acres of land in a mixed residential, commercial, and light industrial area, contained a commercial/warehouse building that measured approximately 440,000 square feet (ft<sup>2</sup>). Following the demolition of the building, the site contained



multiple piles of asbestos-containing demolition debris. However, portions of the building in the northwestern portion of the site were still intact.

The site is bounded to the north by Joseph Street and light industrial and residential properties beyond, to the east by Mary Street and residential properties beyond, to the south by Silk Street and residential properties beyond, and to the west by Leader Street and light industrial properties beyond. The site layout is presented in Appendix D, Figure 2.

## **2.2 SITE HISTORY**

On May 13, 2010, HazCorp Environmental Services, Inc. (HazCorp) conducted a pre-demolition asbestos inspection of the on-site building. During the inspection, HazCorp observed asbestos containing materials (ACM), which included exterior decorative panels, sawtooth roof system materials, window glazing, several types of floor tile and mastic, linoleum, and transite. No thermal system insulation (TSI) was observed. According to the site owner, all TSI was removed from the building in 1990. The on-site building was demolished at an unspecified date, and an unknown amount of metal was reportedly salvaged and sold as scrap metal. Prior to the removal activities, portions of the building in the northwestern corner of the property were partially intact, and multiple piles of demolition debris remained at the site.

On September 14, 2012, HazCorp reportedly conducted another asbestos inspection of the demolition debris piles after the building had been demolished. The inspection indicated that the ACM identified during the May 2010 asbestos inspection, which required removal before demolition activities, had not been removed before the demolition of the building. In 2012, the Ohio Environmental Protection Agency (OEPA) conducted a site investigation and discovered the presence of asbestos within the demolition debris piles. As a result, OEPA served the property owners with a Notice of Violation.

In April and May 2013, EPA conducted a removal assessment of the site. During the site assessment, bulk material samples were collected from the piles of ACM debris and air samples were collected throughout the property. Analytical results from the bulk samples identified asbestos in 8 of the 10 large debris piles. Asbestos was also identified in the transite, mastic, and roofing materials. EPA also identified approximately twelve 55-gallon drums on the property that reportedly contained vinegar.

On July 23, 2014, EPA and the ERRS contractor (Lata-Kemron Remediation, LLC) visited the site to conduct a site walk and to plan preliminary removal activities.

### **3.0 SITE ACTIVITIES**

This section describes the removal activities overseen at the site and the air and soil sample collection activities, including perimeter ambient air samples, activity-based air samples, and soil samples collected near the concrete pads that formerly contained electrical transformers.

#### **3.1 REMOVAL OVERSIGHT**

From September 3, 2014 to November 14, 2014, the Emergency and Rapid Response Service (ERRS) contractor, Lata-Kemron, and two ERRS subcontractors, CMC, Inc. and Marine Pollution Control (MPC), completed a removal at the site. This section provides a chronological summary of the removal activities that took place during that period.

On September 3, 2014, CMC installed a fence along the northern, eastern, and southern perimeters of the site. During the removal, CMC conducted maintenance on this fence, when necessary, to ensure that trespassers could not gain access to the site. The fence was removed after the completion of site activities. In addition to the perimeter fence, Lata-Kemron also hired a security guard to maintain security at the site during non-working hours. This security measure remained in place throughout the course of the project.

From September 3 to 5, 2014, Lata-Kemron had three work trailers, one break trailer, five porta-johns, one conex box, two excavators, one CMC water truck, four scissor lifts, one skid-steer, and personal protection equipment (PPE) delivered to the site. During the week of September 8, 2014, CMC had a second water truck delivered to the site. During this time, workers from CMC also established a decontamination area (contamination reduction zone) at the western end of the concrete pad that served as an entry and exit point from the hotzone (concrete pad) to the parking lot (support zone), and scrapped tiles from the northeastern portion of the concrete pad.

From September 3 to October 23, 2014, CMC also consolidated the debris located on the concrete pad into rows so that the CMC operators could efficiently load the debris into dump trucks for disposal. As the onsite loading of the debris continued throughout the course of the project, CMC moved from the east side of the concrete pad to the west side of the pad. From September 23 to October 14, 2014, START

took photographs of the concrete pad to convey the progress made in removing the debris from the concrete pad.

From September 8 to October 23, 2014, two CMC water trucks were used at the site for the purpose of dust suppression. The water for this activity was obtained from a fire hydrant located at the northeastern corner of Universal Avenue and Joseph Street. Prior to using the water for dust suppression, the CMC drivers added liquid dishwashing detergent to the suppression water. The addition of this detergent increased the time it took for the water to evaporate after it was sprayed onto the demolition debris.

On September 9, 2014, the OSC, START, the ERRS RM, and an ERRS worker conducted an inspection of a tunnel and basement located beneath the concrete pad. The tunnel extended from the north side of the concrete pad approximately three-quarters of the way across the pad to the south-central portion of the pad. The basement was located along the northern side of the pad. The inspection was conducted in Level C PPE, using a MultiRAE five gas meter for air monitoring. The following observations were made during the tunnel inspection: (1) no elevated VOC readings; (2) no asbestos-containing debris/pipe wrap; and (3) approximately six inches of standing water. The following observations were made during the basement inspection: (1) no elevated VOC readings; (2) no asbestos-containing debris/pipe wrap; (3) one empty 55-gallon drum; and (4) two empty 5-gallon containers. Additional information concerning the tunnel and basement is provided later in this section.

During the week of September 8, 2014, workers from CMC constructed a wash pad near the western end of the concrete pad. The pad was used during the removal to wash/decontaminate the tires of the dump trucks after the trucks were loaded with demolition debris and before the trucks left the site for the landfill.

On September 11, 2014, CMC demolished a partial building located at the northwestern corner of the site, and placed the resulting demolition debris with the other debris already staged on the concrete pad. As a result, debris from the demolished building was transported to the landfill along with the previously existing demolition debris.

From September 15 to October 14, 2014, crew members from MPC used hydraulic scissor lifts to double-line the dump trucks that the CMC operators loaded with demolition debris. During this process, the dump trucks drove onto the concrete pad from the site's northeast corner with their windows closed. The trucks were then double-lined with plastic sheeting, and were driven to a location where a CMC operator

loaded the trucks with demolition debris. After each dump truck was loaded with debris, another CMC crew, in Level C PPE, used a scissor lift to enter the truck bed. Upon entering the bed, the workers folded the plastic sheeting over the debris, sealed the seams with spray adhesive, and tied the ends of each sealed load with twine. After each load of debris was sealed and tied, another CMC crew, also in Level C PPE, used power washers to remove dirt, debris, and dust from the tires before the trucks left the site at the western end of the concrete pad. During this entire process, the truck drivers did not leave their trucks, and the truck windows remained closed.

From September 15 to October 28, 2014, Lata-Kemron oversaw the disposal of approximately 8,333 tons (685 truck loads) of asbestos-containing debris, and its transportation to the County Environmental of Wyandot landfill, located in Carey, Ohio. A breakdown of the disposal information, by day, is provided in a table provided by Lata-Kemron (Appendix C, Table 5). On September 25, 2014, the OSC and the Lata-Kemron Removal Manager followed one of the loaded dump trucks to the landfill to ensure that the truck's sealed and tied load was properly secured in transit and to ensure that the transportation of the debris from the site to the landfill was being handled properly.

On September 22, 2014, one composite liquid waste disposal sample was collected from the drums located on the property. This sample was analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), PCBs, target analyte list (TAL) metals, mercury, ignitibility, total cyanide, extractable organic halides, total sulfide, corrosivity, heat of combustion, and percentage of water content. The analytical results from this sample indicated the presence of PCBs, and the OSC elected to have START collect soil samples from around three concrete pads that formally contained electrical transformers. Further detail on this sampling activity is provided in Sections 3.3.3 and 4.3.

On October 16, 2014, Lata-Kemron collected one liquid waste disposal sample from the cistern located near the south-central portion of the concrete pad. This sample was analyzed for TCL VOCs, TCL SVOCs, PCBs, TAL metals, mercury, total cyanide, total sulfide, and percentage of water content. Based on the analytical results for this sample, it was decided that the water from the cistern could be discharged to a previously identified sanitary sewer. Additional information on the discharging process is provided later in this section.

On October 21, 2014, CMC demolished a small building located along the northern side of the concrete pad so that trespassers could not gain access and use the building following the completion of the site

activities. As with the debris that resulted from demolition of the partial building on September 11, 2014, this debris was transported to the landfill along with the previously existing demolition debris.

From October 22 to November 3, 2014, a CMC operator used an excavator to remove the ceilings of: (1) a tunnel that extended from the northern side to southern side of the concrete pad; (2) the basement located along the northern side of the site; and (3) the cistern located along the south-central portion of the concrete pad. After CMC completed the removal of these ceilings, CMC backfilled each of the areas with stone and capped all three areas with concrete. Prior to filling the tunnel with stone, a worker from MPC used hydraulic cement to cap a pipe that led into the northern end of the tunnel.

On October 23, 2014, Lata-Kemron oversaw the loading and offsite disposal of the 14 drums that were sampled on September 22, 2014. The company that transported and processed the drums was the PennOhio Corporation, of Ashtabula, Ohio. Before the PennOhio truck left the site, START documented, through photographs, that the driver had placed PCB placards on all four sides of the truck.

On October 23, 2014, Lata-Kemron also procured a floor scrubber that an MPC worker used to wash and scrub the surface of the concrete pad. The floor scrubber was used to further ensure that any asbestos-containing dust was removed from the concrete pad prior to the demobilization of site personnel.

On October 27 and 28, 2014, Lata-Kemron oversaw the removal of approximately 58,000 gallons of water from the cistern located along the south-central portion of the concrete pad. The water was discharged via a 2-inch trash pump into a sanitary sewer that was previously identified by representatives of the City of Marion.

Prior to demobilizing from the site, Lata-Kemron implemented the following site safety measures: purchased and placed concrete Jersey barriers at the site to impede vehicle traffic from entering the site; removed the steel structures protruding from the concrete pad; and placed backfill in any small holes present in the concrete pad.

Tetra Tech personnel conducted photographic and written documentation of all the removal activities that took place from September 3 to October 23, 2014. Field logbook documentation was conducted in accordance with Tetra Tech SOP No. 024, "Recording Notes in Field Logbooks" and Tetra Tech's QAPP for START. Appendices A and B contain a photographic documentation log and a copy of the site logbook notes, respectively.

### **3.2 PERIMETER AIR MONITORING**

From September 4, 2014 to October 23, 2014, Tetra Tech START used a TSI® SidePak AM 510 particulate air monitoring unit to assess the ambient air conditions along the perimeter of the site. The air monitoring results were recorded each day in the site logbook.

Tetra Tech START carried out the air monitoring activities by conducting two to three monitoring runs per day, depending on weather conditions. During each monitoring run, Tetra Tech START recorded the high and low particulate levels at each air sampling location, and then averaged the high particulate readings in order to obtain an average high particulate reading for each day. The average high particulate readings were used in conjunction with the daily weather conditions to determine which perimeter air samples would be delivered to the laboratory at the end of each week.

### **3.3 SAMPLE COLLECTION**

During the removal activities, Tetra Tech START collected two types of air samples and one type of soil sample. The air samples included perimeter air samples and activity-based air samples, while the soil samples included composite samples from the soil located around three concrete pads that formerly contained electrical transformers. Sections 3.2.1 through 3.2.3 provide greater detail on each of these sampling activities.

#### **3.3.1 Perimeter Air Sampling**

Weather permitting, ambient air samples were collected daily along the perimeter of the property, immediately upwind, downwind, and crosswind of the active removal area. Throughout the course of the removal, the sample locations changed as the locations of the on-site removal activities changed and as the prevailing wind directions changed.

Each work day lasted approximately 11 hours. Therefore, after taking into account the time required to calibrate, deploy, shutdown, and re-calibrate the air sampling pumps and cassettes, the total daily air sampling time was approximately 9 hours (540 minutes). During this sampling time, Tetra Tech collected approximately 5,400 liters of air, at an average flow rate of 10 liters per minute (L/min) for the high-flow samples, and approximately 1,620 liters of air, at an average flow rate of 3 L/min for the low-flow samples.

During the first 14 days of the removal activities, each ambient air sampling location (upwind, downwind, and crosswind) consisted of one high-flow air pump (Gilian AirCon2) and one low-flow air pump (Gilian Gil Air 5). Each high-flow air pump operated at a flow rate of approximately 10 L/min, while each low-flow air pump operated at a flow rate of approximately 3 L/min.

All of the high-flow air samples collected during the first 14 days were shipped to EMSL Laboratories (EMSL), in Ann Arbor, Michigan, for analysis. Each sample was analyzed by National Institute for Occupational Safety and Health (NIOSH) method 7400 (through phase contrast microscopy-PCM) and NIOSH method 7402 (transmission electron microscopy-TEM). If any of the high-flow air samples was overloaded and could not be analyzed through direct preparation, the laboratory then analyzed the corresponding low-flow air sample. During the project, none of the high-flow air samples was overloaded. As a result, none of the low-flow air samples was analyzed.

After the first 2 weeks of removal activities, only high-flow air samples were collected each day. The selection of these samples for analysis was based on three different parameters: the highest average particulate results for each day, based on the use of a SidePak AM 510 particulate dust monitor; the lowest relative humidity for each day; and amounts of precipitation recorded on each day. This information was recorded each day on a map and in the site logbook.

The selected samples were analyzed by NIOSH Method 7400 (PCM) and, if necessary, NIOSH Method 7402 (TEM). If the results of the PCM analysis were greater than 0.005 fibers per cubic centimeter (fibers/cc), then NIOSH Method 7402 (TEM) was also completed on the sample.

Attached to each air pump was a 25-millimeter (mm)-diameter, 0.8-micron ( $\mu\text{m}$ ) mixed cellulose ester membrane (MCE) filter cassette mounted on a 4- to 5-foot-tall cassette tripod stand. The inlet cap of the filter cassette was removed during sampling (so that the cassette was open-faced); and the cassette was positioned downward and perpendicular to the prevailing wind direction.

The flow rate of each air sampling train was measured before and after sample collection using a Bios Defender 510 primary flow meter.

The air sampling was conducted in accordance with the EPA Environmental Response Team (ERT) Standard Operating Procedure (SOP) Number (No.) 2015, "Asbestos Sampling," and Tetra SOP No. 064, "Calibration of Air Sampling Pump" and Tetra Tech SOP No. 073, "Air Quality Monitoring."

Section 4.1 of this report briefly discusses the perimeter air sample results and Appendix C, Table 2, provides the following information on each perimeter air sample: Sample ID, collection date, wind direction and speed, sample location (upwind, downwind, or crosswind), sample start and stop times, total sample time, initial, end, and average flow rates, total air volume, number of fibers, fibers per square millimeter, and fibers per cubic centimeter (PCM analysis), and number of non-asbestos fibers, number of asbestos fibers, and percentage of asbestos fibers (TEM analysis).

### **3.3.2 Activity-Based Air Sampling**

On October 1, 2014, Tetra Tech collected a total of four activity-based air samples (two high-flow air samples collected at 10 L/min and two low-flow air samples collected at 3.5 L/min) from a grassy test area located near the northeast corner of the site. (Note: While four air samples were collected, only the high-flow air samples were delivered to the lab for analysis). For 120 minutes, Tetra Tech personnel raked and trimmed the grass in the test area in order to simulate human exposure to asbestos during typical yard maintenance activities.

During the sampling event, air samples were collected from the breathing zones of each participant. The breathing zone can be visualized as a hemisphere approximately 6 to 9 inches around each participant's face. The breathing zone samples provided the best approximation of the concentration of contaminants in the air that an average person may be exposed to during typical yard maintenance activities.

Each Tetra Tech representative, wearing the appropriate PPE (full-face respirator, nitrile gloves, Tyvec® suit, and latex booties), was fitted with two sampling pumps, one set at a low flow rate of 3.5 L/min and the other set at a high flow rate of 10 L/min. The pumps were contained within a backpack, with the filter cassettes secured to each participant's shoulder straps so that each inlet was within the participant's breathing zone. The high-flow sampling train consisted of a portable air sampling pump (SKC QuickTake 30 pump), with an attached 25-mm diameter, 0.8 µm MCE filter cassette. The low-flow sampling train consisted of a portable air sampling pump (Gilian Gilair 5), with an attached 25-mm diameter, 0.8 µm MCE filter cassette. The inlet caps for both the high- and low-flow filter cassettes were removed so that each cassette was open-faced during the sampling activities. Sampling was conducted following EPA/ERT SOP #2015 Asbestos Sampling and #2084 Activity-Based Air Sampling for Asbestos.



The activity-based air samples were analyzed by ISO 10312, Determination of Asbestos Fibers by Direct Transfer Transmission Electron Microscopy. While ISO Method 10312 is generally similar to the NIOSH methods used to analyze perimeter air samples, there are several differences in how the methods define a “fiber.” The NIOSH methods require a length of greater than 5 micrometers ( $\mu\text{m}$ ), a thickness greater than 0.25  $\mu\text{m}$ , and an “aspect ratio” (AR, the ratio of length to width) of 3:1 or greater. “Bundles” and other “structures” of fibers and other shapes are counted as single fibers. ISO Method 10312 requires a length of 0.5  $\mu\text{m}$  or more, an AR of 5:1 or more, and has no thickness requirement. All individually recognized fibers are counted, even if they are in a “bundle” or other structure. For these analyses, the AR was changed to 3:1 or more for consistency with the NIOSH methods. Results for ISO Method 10312 are reported both as total asbestos fibers and as PCM-equivalent fibers, which allows the results to be compared directly to PCM results from NIOSH Method 7400 and to be used in risk calculations.

Section 4.2 of this report briefly discusses activity-based air sample results and Appendix C, Table 3, provides the following information for each activity-based air sample: Sample ID, collection date, wind direction and speed, sample location (upwind, downwind, or crosswind), sample start and stop times, total sample time, initial, end, and average flow rates, total air volume, and asbestos results (number of total TEM structures and number of PCM equivalent structures).

### **3.3.3 Soil Sampling**

On September 16, 2014 and October 8, 2014, Tetra Tech collected four soil samples and three soil samples, respectively. These samples were collected around historical transformer pads to determine if any of the soil surrounding the concrete transformer pads were contaminated with polychlorinated biphenyl (PCB) oil. The transformer pads are located near the northeast corner of the site (Transformer Pad #1), the southwest corner of the site (Transformer Pad #2), and the southeast corner of the site (Transformer Pad #3) of the site (Appendix D, Figure 3).

On September 16, 2014, Tetra Tech personnel collected two four-point composite samples from the soil surrounding Transformer Pad #1 (including one duplicate), one three-point composite sample from the soil located along the southern edge of Transformer Pad #2, and one three-point composite sample from a grassy area located southeast of Transformer Pad #3. All four samples were collected from a depth of 0 to 6 inches.

On October 8, 2014, Tetra Tech personnel collected three four-point composite samples from Transformer Pad #1 (including one duplicate), with the first two samples being collected from a depth of 24 inches, and the third sample being collected from a depth of 36 inches.

Section 4.3 of this report briefly discusses soil sample results and Appendix C, Table 4, provides the following information on each PCB soil sample: Sample ID, collection date and time, sample depth and matrix, location, action level, and analytical result.

### **3.4 SAMPLE HANDLING PROCEDURES**

Samples were handled and packaged in accordance with Tetra Tech's Quality Assurance Project Plan (Tetra Tech 2014) for START. All shipping containers were delivered with signed chains-of-custody forms.

## **4.0 ANALYTICAL RESULTS**

This section discusses the analytical results of the perimeter air samples, the activity-based asbestos air samples, and the PCB soil samples.

### **4.1 PERIMETER AIR MONITORING RESULTS**

From September 4, 2014 to October 23, 2014, a total of 48 low-flow air samples, 126 high-flow air samples, and nine duplicate high-flow air samples were collected along the perimeter of the site (Appendix C, Table 2). Of these samples, a total of 73 high-flow air samples and eight duplicate high-flow air samples were delivered to EMSL for analysis. Because none of the high-low air samples was overloaded, none of the low-flow air samples was analyzed. Note: When collecting the duplicate high-flow air samples, two cassettes were attached to the same pump using a Y-splitter to ensure that both cassettes received the same volume of air at the same flow rate over the course of the sampling period. This sampling procedure resulted in each cassette having a flow rate approximately half of the usual flow rate of 10 L/min, but equal to 10 L/min when the flow rates for the duplicate cassettes were combined.

All of the high-flow air samples collected from September 4, 2014 through September 19, 2014 were analyzed by NIOSH method 7400 (PCM) and NIOSH method 7402 (TEM). All of the high-flow air samples collected from September 22, 2014 to October 23, 2014, were analyzed only by NIOSH method 7400 because the concentration of fibers in each sample was less than 0.005 fibers/cc.

The analysis of the high-flow air samples indicated the presence of one fiber of Chrysotile asbestos in one of the crosswind air samples deployed on September 4, 2014. No other asbestos fibers were detected in any of the other high-flow air samples. Copies of the analytical results and the data verification report for the perimeter air samples are included in Attachment A of this report.

## **4.2 ACTIVITY-BASED AIR SAMPLE RESULTS**

On October 1, 2014, two high-flow activity-based air samples (10 L/min) and two corresponding low-flow activity-based air samples (3.5 L/min) were collected from a grassy area located along the northern perimeter of the site (Appendix C, Table 3). In the event that the high-flow air samples were overloaded to a point that the laboratory could not analyze them, the low-flow air samples would have been analyzed. Because the high-flow air samples were not overloaded, only the high-flow air samples were analyzed by the laboratory.

During this sampling event, the sample train for Sample JS-ABS-001H-100114 collected only 524.69 liters of air because the pump failed after 48-minutes. The sample train for Sample JS-ABS-002H-100114 collected 1,320.48 liters of air over the planned 120-minute activity-based sampling period. Both samples were submitted for analysis. The detection and sensitivity limits specified in the sampling and analysis plan were met for both samples, thus making both samples valid. The data validation report for the activity-based asbestos samples is provided in Attachment B.

One fiber of Tremolite asbestos was detected in one of the two high-flow activity-based samples, and the result was reported as a total asbestos and PCM-equivalent concentration of 0.00099 fibers/cc. Asbestos fibers were not detected in the second activity-based air sample nor in the four perimeter air samples collected on October 1, 2014. Copies of the analytical results and the data verification reports, for the activity-based asbestos air samples, are included in Attachment B of this report.

Exposure scenarios and calculation methods described in EPA's *Framework for Investigating Asbestos-Contaminated Superfund Sites* (EPA 2008) can be used to evaluate the significance of the 0.00099 fibers/cc concentration measured in one of the two activity-based air samples. For example, this concentration corresponds to an excess lifetime cancer risk (ELCR) of 4.2 E-06 for a gardening scenario that includes (1) a 30-year exposure period beginning at age 20 and (2) exposure of 10 hours per day and 50 days per year over this period. Similarly, for an adult recreational exposure scenario that includes (1)

a 30-year exposure period beginning at age 20 and (2) exposure of 1 hour per day and 156 days per year over this period, the calculated ELCR is 1.3 E-06.

#### **4.3 PCB SOIL SAMPLE RESULTS**

On September 16, 2014 and October 8, 2014, a total of seven soil samples, including two duplicate samples, were collected from the soil surrounding three different concrete pads that originally contained electrical transformers (Appendix C, Table 4). PCBs were detected in three of the seven samples collected at concentrations ranging from 0.64 to 1.6 parts per million. Copies of the analytical results and the data validation reports for the soil samples are included in Attachment C of this report.

### **5.0 REMOVAL SUMMARY**

From September 3 to November 14, 2014, EPA, START, and ERRS conducted a removal action at the Joseph Street Asbestos Removal site in Marion, Marion County, Ohio. From September 4 to October 23, 2014, START conducted daily perimeter air monitoring activities for particulates and collected a total of 81 perimeter air samples for analysis of asbestos fibers. During this time period, only one fiber of Chrysotile asbestos was detected at the site. On October 1, 2014, START collected two high-volume activity-based asbestos samples from the northern perimeter of the site. The laboratory analysis of these samples indicated the presence of only one fiber of Tremolite asbestos, which is below the applicable safety standard for asbestos fibers.

From September 15 to October 28, 2014, ERRS removed a total of 8,333 tons (685 loads) of asbestos-contaminated demolition debris from the site's concrete pad. ERRS also conducted activities related to public safety by removing the ceilings of a tunnel, basement, and cistern located on the site's concrete pad, backfilling each of these structures with stone, and capping the structures with concrete.

## 6.0 REFERENCES

- Tetra Tech Inc. 2014. "Quality Assurance Project Plan" Prepared for EPA under Contract No. EP-S5-13-01. April 2014.
- U.S. Environmental Protection Agency (EPA). 2008. *Framework for Investigating Asbestos-Contaminated Superfund Sites*. OSWER Directive #9200.0-68. September.

**APPENDIX A**  
**PHOTOGRAPHIC DOCUMENTATION LOG**



### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 1

**Direction:** East

**Date:** 09/03/14

**Photographer:**  
Michael Browning

**Description:**  
Installation of orange snow fencing along the southern perimeter of the site.



**Photograph:** 2

**Direction:** Northwest

**Date:** 09/04/14

**Photographer:**  
Michael Browning

**Description:**  
Workers removing tiles from the concrete located near the northeast corner of the site.







### *Photographic Documentation Log*

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**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 3

**Direction:** Southeast

**Date:** 09/15/14

**Photographer:**  
Michael Browning

**Description:**  
Ongoing demolition debris consolidation and dust suppression activities near the northern perimeter of the site.



**Photograph:** 4

**Direction:** Down

**Date:** 09/16/14

**Photographer:**  
Michael Browning

**Description:**  
Collection of Sample JS-PCB-001-091614 near a concrete pad that previously contained an electrical transformer.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 5

**Direction:** Southwest

**Date:** 09/16/14

**Photographer:**  
Michael Browning

**Description:**  
Excavator operator  
loading demolition  
debris into the lined bed  
of a dump truck.



**Photograph:** 6

**Direction:** Southeast

**Date:** 09/17/14

**Photographer:**  
Michael Browning

**Description:**  
Water truck cleaning the  
concrete pad that lies  
along the northern  
perimeter of the site.





### *Photographic Documentation Log*

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**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 7

**Direction:** Northeast

**Date:** 09/18/14

**Photographer:**  
Michael Browning

**Description:**  
Workers clearing debris and vegetation from the southeastern corner of the site's concrete pad.



**Photograph:** 8

**Direction:** East

**Date:** 09/18/14

**Photographer:**  
Michael Browning

**Description:**  
Poly 55-gallon drums staged on the site's concrete pad.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 9

**Direction:** East

**Date:** 09/18/14

**Photographer:**  
Michael Browning

**Description:**  
Two rows of demolition debris located on the site's concrete pad.



**Photograph:** 10

**Direction:** East

**Date:** 09/18/14

**Photographer:**  
Michael Browning

**Description:**  
Excavator operator and workers overpacking the poly 55-gallon drums that were staged on the site's concrete pad.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 11

**Direction:** West

**Date:** 09/19/14

**Photographer:**  
Michael Browning

**Description:**  
Worker using a weed trimmer near an air sampling location placed along the site's northern perimeter.



**Photograph:** 12

**Direction:** Southwest

**Date:** 09/19/14

**Photographer:**  
Michael Browning

**Description:**  
Water truck cleaning the concrete pad that lies along the southern perimeter of the site.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 13

**Direction:** Southwest

**Date:** 09/19/14

**Photographer:**  
Michael Browning

**Description:**  
Water truck applying water for dust suppression purposes along a central portion of the site's concrete pad.



**Photograph:** 14

**Direction:** Southeast

**Date:** 09/22/14

**Photographer:**  
Michael Browning

**Description:**  
Collection of a waste characterization sample from one of the poly 55-gallon drums that was staged on the site's concrete pad.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 15

**Direction:** Northwest

**Date:** 08/22/14

**Photographer:**  
Michael Browning

**Description:**  
Worker pulling poly over  
the debris and sealing the  
poly around the debris  
with spray glue.



**Photograph:** 16

**Direction:** West

**Date:** 09/23/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris  
removal operations on  
09/23/14.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 17

**Direction:** North

**Date:** 09/25/14

**Photographer:**  
Stephen Wolfe

**Description:**  
Load of demolition  
debris being dumped at  
the landfill.



**Photograph:** 18

**Direction:** South

**Date:** 09/25/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris piles  
located at the western  
end of the site's concrete  
pad.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 19

**Direction:** Southeast

**Date:** 09/25/14

**Photographer:**  
Michael Browning

**Description:**  
Debris-loading and dust suppression activities near the southeastern corner of the site.



**Photograph:** 20

**Direction:** West

**Date:** 09/29/14

**Photographer:**  
Michael Browning

**Description:**  
Debris-loading and dust suppression activities near the southeastern corner of the site.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 21

**Direction:** West

**Date:** 09/30/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris removal operations on 09/30/14.



**Photograph:** 22

**Direction:** South

**Date:** 10/02/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris piles located at the western end of the site's concrete pad.





### *Photographic Documentation Log*

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**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 23

**Direction:** Down

**Date:** 10/02/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS worker covering demolition debris with poly prior to the debris leaving the site.



**Photograph:** 24

**Direction:** Down

**Date:** 10/02/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS worker applying spray glue to the poly covering the demolition debris prior to folding additional poly over the debris.



**TETRA TECH**





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 25

**Direction:** Down

**Date:** 10/02/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS worker using  
twine to tie the end of  
the poly that contains the  
demolition debris.



**Photograph:** 26

**Direction:** Down

**Date:** 10/02/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS worker using  
twine to tie the end of  
the poly that contains the  
demolition debris.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 27

**Direction:** West

**Date:** 10/07/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris  
removal operations on  
10/07/14.



**Photograph:** 28

**Direction:** West

**Date:** 10/07/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS worker preparing  
the bed of a dump truck  
for the placement of poly  
along the sides and  
bottom of the dump  
truck bed.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 29

**Direction:** Northwest

**Date:** 10/07/14

**Photographer:**  
Michael Browning

**Description:**  
The bed of a dump truck following the placement of poly along the sides and bottom of the dump truck bed.



**Photograph:** 30

**Direction:** West

**Date:** 10/07/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris removal operations on 10/07/14.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 31

**Direction:** NA

**Date:** 10/08/14

**Photographer:**  
Michael Browning

**Description:**  
Depth of the soil prior to the collection of soil samples from the side of the concrete pad that is located near the northeast corner of the site.



**Photograph:** 32

**Direction:** West

**Date:** 10/09/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris removal operations on 10/09/14.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 33

**Direction:** South

**Date:** 10/09/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris piles located at the western end of the site's concrete pad.



**Photograph:** 34

**Direction:** North

**Date:** 10/16/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS worker using a broom to further consolidate the demolition debris located near the northwest corner of the site.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 35

**Direction:** Down

**Date:** 10/16/14

**Photographer:**  
Michael Browning

**Description:**  
View of the water  
located in the cistern  
located near the southern  
edge of the site.



**Photograph:** 36

**Direction:** South

**Date:** 10/16/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris piles  
located at the western  
end of the site's concrete  
pad.







### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 37

**Direction:** South

**Date:** 10/16/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris piles located at the western end of the site's concrete pad.



**Photograph:** 38

**Direction:** West

**Date:** 10/16/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the debris removal operations on 10/16/14.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 39

**Direction:** Southeast

**Date:** 10/22/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS operator using a  
hoe ram to open a tunnel  
located near the  
northeastern corner of  
the site.



**Photograph:** 40

**Direction:** North

**Date:** 10/22/14

**Photographer:**  
Michael Browning

**Description:**  
View of the tunnel  
located near the  
northeastern corner of  
the site.







### Photographic Documentation Log

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 41

**Direction:** Down

**Date:** 10/22/14

**Photographer:**  
Michael Browning

**Description:**  
Pipe, filled with concrete, located at the northern end of the tunnel.



**Photograph:** 42

**Direction:** NA

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
Labels placed on the overpacked drums that were shipped off site on 10/23/14.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 43

**Direction:** Northwest

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS operator loading  
the overpacked drums  
onto a truck for  
shipment offsite.



**Photograph:** 44

**Direction:** NA

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
Overpacked drums  
loaded onto the truck.







### Photographic Documentation Log

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 45

**Direction:** NA

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
PCB label placed on the side of the truck that was used to transport the overpacked drums offsite.



**Photograph:** 46

**Direction:** North

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
ERRS operator using a floor scrubber to further clean the concrete pad located near the north edge of the site.





### *Photographic Documentation Log*

**Client:** U.S. Environmental Protection Agency Region 5  
**Site Name:** Joseph Street Asbestos Removal Site  
**Location:** Marion, Marion County, Ohio

**Prepared By:** Tetra Tech, Inc.  
**TDD:** S05-0001-1407-003

**Photograph:** 47

**Direction:** Northeast

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the concrete pad following the removal of the demolition debris.



**Photograph:** 48

**Direction:** East

**Date:** 10/23/14

**Photographer:**  
Michael Browning

**Description:**  
Status of the concrete pad following the removal of the demolition debris.



**APPENDIX B**  
**FIELD LOGBOOK NOTES**

Joseph Street  
Asbestos Site



*Rite in the Rain.*

ALL-WEATHER

**FIELD**

Nº 351

Book 1 of 2

TDD: 505-0001-1407-003



*Rite in the Rain*  
ALL-WEATHER WRITING PAPER

Logbook Tracking Number \_\_\_\_\_  
Site Name Joseph Street Asbestos Site  
Issue to \_\_\_\_\_  
Date Issued \_\_\_\_\_  
TDD # 0001/505-0001-1407-003

Project \_\_\_\_\_

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or JL Darling LLC.

## Joseph Street Asbestos Site

9/3/2014

- 0740 - START Browning arrives on site. Weather: 60°F; wind: SE at 3 mph; hazy. — MTB
- 0753 - Currently, there are 12 Lata-Kemron workers/personnel on site. — MTB
- 0755- Daily H and S and activity meeting takes place. Topics: ① chain-of-command at the site; ② hazards associated with asbestos; ③ stop-work authority at the site; ④ heat stress and dehydration; ⑤ eat well at night; ⑥ proper egress for the heavy equipment operators; ⑦ <sup>MTB</sup> proper PPE to use on site. — MTB
- 0908- START Browning leaves the site to drive the hospital route. — MTB
- 0928- START Browning arrives at the hospital. However, due to a festival being set up in downtown Marion, an alternate route to the hospital is necessary. — MTB
- 1011 - START Browning arrives back at the site after driving and writing the alternate route to the hospital from the site. — MTB
- 1034- One con-ex office and two porta-Johns arrive on site. — MTB
- 1050- A <sup>Storage, MTB</sup> ~~second office~~ trailer arrives on site.

## Joseph Street Asbestos Site

9/3/2014

- 1110- Photo: Unloading of storage con-ex box; N; MTB. — MTB
- 1140- ERS crew is installing orange fencing along the southern perimeter of the site. Other activities include the setting up the decon line supplies and equipment and the use of the excavator and the water truck in placing concrete blocks over an open manway on the site. — MTB
- 1159- Photo: Installation of orange fencing along a portion of the southern perimeter of the site; E; MTB. — MTB
- 1212- Photo: Excavator and water truck working together to cover a manway located on-site; SE; MTB. — MTB
- 1319- Work is continuing on installing orange fencing along the southern perimeter of the fence and filling/blocking a second manway that was discovered on the site. — MTB
- 1435- START Browning opens all of the boxes delivered to the hotel, and places the equipment <sup>MTB</sup> on charge. — MTB

*Rite in the Rain*



4 Joseph Street Asbestos Site 9/3/2014

1605- Activities on site include removing the building debris from the western edge of the building and consolidating wood and concrete debris within the building footprint. — MTB

1628- Photo: Excavator and water truck consolidating wood and concrete; SE. MTB. — MTB

1700- Site personnel leave the site for the day. — MTB

Note: For the day, no visible dust emissions were observed leaving the site and no runoff was seen leaving the site. MTB

*Michael Browning*  
9/3/14

5 Joseph Street Asbestos Site 9/4/2014

0900- START Browning arrives on site. Weather: 63°F; wind: S 8 mph; clear. — MTB

0800- Daily activity and H and S meeting takes place. Topics: ① heat stress and dehydration; ② trespassers on site; ③ nails in the wood on the site; ④ medical conditions of site personnel; ⑤ emergency contact for site personnel; ⑥ insects

0845- High volume and low-volume air samples (JS-AS-001H-090414 and JS-AS-001L-090414, respectively) are set up along the south perimeter of the site.

0900- High volume and low-volume air samples (JS-AS-002H-090414 and JS-AS-002L-090414, respectively) are set up along the west side of the site. MTB

0915- High volume and low-volume air samples (JS-AS-003H-090414 and JS-AS-003L-090414, respectively) are set up along the north side of the site. — MTB

0925- High volume and low-volume air samples (JS-AS-004H-090414 and JS-AS-004L-090414, respectively) are set up along the east side of the site. MTB

*Rite in the Rain*

## Joseph Street Asbestos Site

9/4/2014

Note: All sample locations will be placed on an aerial photo of the site each day that samples are collected. ——— MTB

- 1006 - After zero calibrating the TSI AM510, START Browning deploys the unit at the down wind location for the air sampling. ——— MTB
- 0937 - Backnote: After resolving a fault issue with the low-volume sample pump for Sample JS-AS-001L-090414, a sample pump is initiated again after lowering the intake volume. ——— MTB
- 0951 - Backnote: After resolving a fault issue with the low-volume sample pump for Sample JS-AS-003L-090414 by lowering the volume intake, the sample is initiated. MTB
- 0954 - Backnote: After solving a fault issue with the low-volume sample pump for Sample JS-AS-004L-090414 by lowering the volume intake, the sample is initiated. ——— MTB
- 1011 - ~~Back~~ After resolving a fault issue with the low-volume sample pump for Sample JS-AS-002L-090414 by lowering the intake volume, the sample is initiated. MTB  
————— MTB

## Joseph Street Asbestos Site

9/4/2014

- MTB 1127 ~~1137~~ Photo: ERRS workers scrapping tiles near the NE corner of the site. W. MTB. — MTB
- MTB 1127 ~~1137~~ Photo: Excavators consolidating piles on site. S. MTB. ——— MTB
- 1209 - AM510 reading =  $0.033 \text{ mg/m}^3$ . ——— MTB
- 1306 - AM510 reading =  $0.040 \text{ mg/m}^3$ . ——— MTB
- 1415 - Low-volume pump sample JS-AS-003L-090414 turned off after it is found not operating and wouldn't remain on after several attempts. ——— MTB
- 1601 Photo: Consolidation of debris piles. S. MTB. ——— MTB
- 1601 Photo: Workers scraping tiles near the northeastern corner of the site. S. MTB. ——— MTB
- 1630 - AM510 reading =  $0.043 \text{ mg/m}^3$ . ——— MTB
- 1705 - AM510 reading =  $0.039 \text{ mg/m}^3$ . ——— MTB
- 1706 - AM510 reading (TWA) =  $0.036 \text{ mg/m}^3$ . — MTB
- 1615 - Backnote: Sample JS-AS-002L-090414 collected after pump shut down. ——— MTB
- 1645 - Backnote: Sample JS-AS-001H-090414 and JS-AS-001L-090415 collected. MTB
- 1700 - Backnote: Sample JS-AS-002H-090414 collected. ——— MTB



## Joseph Street Asbestos Site

9/4/2014

- 1715 - Sample JS-AS-003H-090414 collected.
- 1725 - Samples JS-AS-004H-090414 and JS-AS-004L-090414 collected. MTB
- 1730 - START Browning leaves the site for the day. Note: For the day, no visible emissions were observed and no water runoff was seen leaving the site. MTB

Michael Browning  
9/4/14

## Joseph Street Asbestos Site

9/5/2014

- 0800 - START Browning arrives on site. Weather: 68°F, wind: S out of, 5 mph, mostly cloudy.
- 0800 - Daily activity and H and S meeting takes place. Topics: ① heat stress and hydration; ② be mindful of the heavy equipment; ③ keep hoods on the PPE; ④ sunscreen.
- 0835 - Pumps and Samples for JS-AS-001H-090514 and JS-AS-001L-090514 are deployed along the southern perimeter of the site. MTB
- 0835 - Pumps and Samples for JS-AS-002H-090514 and JS-AS-002L-090514 are deployed along the <sup>western</sup> ~~southern~~ MTB perimeter of the site. MTB
- 0850 - Pumps and Samples for JS-AS-003H-090514 and JS-AS-003L-090514 are deployed along the northern perimeter of the site. MTB
- 0900 - Pumps and JS-AS-004H-090514 and JS-AS-004<sup>samples</sup>L-090514 are deployed along the eastern perimeter of the site. MTB
- 0906 - AM510 particulate monitor is deployed at the downwind air sampling location (003H and 003L). MTB

Rite in the Rain

Joseph Street Asbestos Site 9/5/2014

0925 - Activities: ① Water use as a dust suppression agent; ② consolidation of demolition debris; and ③ scraping of tiles near the northeastern corner of the site. ——— HTB

0948 - During the debris consolidation activities along the northern perimeter of the site, START Browning observes dust emanating from the debris that appear to remain within the footprint of the buildings. In any case, START Browning notifies the RM about the situation, and water is then applied to the area. ——— HTB

1000 - Site activities: ① continued consolidation of building debris; ② continued use of the water truck as a <sup>HTB</sup> dust suppression method; and ③ continued scraping of the tiles located at the northeastern corner of the site. ——— HTB

1316 - The AM 510 monitor is found on the ground near the downwind air sampling location. Due to the <sup>HTB</sup> monitoring monitor showing a reading of  $0.000 \text{ mg/m}^3$  <sup>HTB</sup>  $\text{mg/m}^3$ , even after zeroing, the reading is likely inaccurate.

Joseph Street Asbestos 9/5/14

As a result, even after START Browning consults with an air monitoring technician at Field Environmental, START Browning orders a replacement AM 510 for delivery on Monday morning between 10 and 11, and the original AM 510 will be shipped back to Field Environmental.

1502 - A check of all four high-volume and 1508 four low-volume sampling pumps indicate that all pumps are operating. Note: All activities currently taking place are the same as those that took place between 1000 and 1100. HTB

1539 Photo: Workers scraping tiles; S; HTB. ——— HTB

1540 Photo: Heavy equipment consolidating building debris; SW. HTB. ——— HTB

1625 - Collection of Samples JS-AS-001H-090514 and JS-AS-001L-090514 takes place. Final volumes are 5,186.4 and 1,456.8 liters, respectively. HTB

————— HTB  
————— HTB



## Joseph Street Asbestos Site

9/5/2014

1635 - Collection of Samples JS-AS-002H-090514 and JS-AS-002L-090514 takes place. Final volumes are 4,831.2 and 1,459.2 liters, respectively. ——— MTB

1650 - Collection of Samples JS-AS-003H-090514 and JS-AS-003L-090514 takes place. Final volumes are 4,567.2 and 1,442.4 liters, respectively. ——— MTB

1652 - Collection of Sample JS-AS-004H-090514 and JS-AS-004L-090514 takes place. Final volumes are 4,741.24 and 1,425.44 liters, respectively. ——— MTB

1830 - After preparing the samples for shipment, writing out the chain of custody, and completing the volume calculations sheets, and updating the Tetra Tech representative about the site activities, START Browning leaves the site for the week. ——— MTB

*Michael F. Browning*  
9/5/14

9/9/2014

0940 - START (Buans) on site

## Calibration of Pumps

<sup>High</sup>		
3#	10.256 L/min	start time - 835
2#	9.607 L/min	start time - 906
1#	9.979 L/min	start time - 0900
4#	9.897 L/min	start time - 851
<sup>Low</sup>		
3#	2.806 L/min	start time - 835
2#	2.843 L/min	start time - 0906
1#	2.808 L/min	start time - 0900
4#	2.932 L/min	start time - <del>855</del> 851

## Sample locations

- 001 - upwind - First Telephone Pole located immediately N. of GRAS trailer
- 002 - 1st Telephone pole located east of intersection of Universal Ave + Joseph St.
- 003 - Telephone Pole located Directly across the fence in sideyard of 452 Mary St.
- 004 - intersection of Silk St and Commercial St.

0900 - Water Suppression / Dust Suppression being conducted on Joseph St  
Work continues on moving material & scraping of tiles

*Rite in the Rain*



9/8/14

1030 - Checked all air sampling pumps

- all are operating as designed and still in position.

1130 - Check all Air sampling units - all operating as designed

- activities on site continue to be consolidation of debris and perimeter assessment and consolidation of debris.

1340 - Checked all Air ~~mon~~ sampling trains, all are operating as designed, completed round of particulate monitoring at each station

- N. Perimeter .029 mg/m<sup>3</sup>

- S. Perimeter .088

- E. Perimeter .008

- W. Perimeter .008

1530 - Check all air sampling pumps - all working and properly

1600 - completed walk of all sampling trains, all are working properly

- Particulate levels all below

- .02 mg/m<sup>3</sup> except on N perimeter when wind changed .89 mg/m<sup>3</sup>

- suggested addition water truck

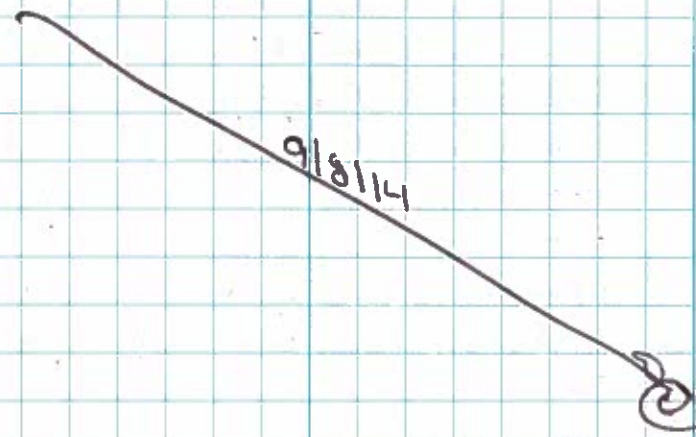
9/18/14

1630 - work continues on site to consolidate piles for removal. Minor hand work is also being done on site.

end

Pump 002 stop time -	1700	(8h) 9.342	<del>9.918</del> (9.918)
Pump 001 -	1704	(7.58h)	9.918
Pump 007 -	1709	(8.16h)	9.641
Pump 003 -	1711	(8.35)	9.979
Pump 001 -	1704	—	2.889
Pump 002 -	1700	—	2.866
Pump 003 -	1711	—	2.963
Pump 004 -	1709	—	2.43

1730 Demolition from site



Rite in the Rain

7/19/14

0730 - START Burns on site w/ERRS Contractor

Calibrated	all sampling	pumps	
Start Vol	Start time	End Vol	End time
001 H 9.722	<del>0835</del> 0855	9.153	1645 (7.50h)
002 H 9.780	0850	9.330	1641 (7.52h)
003 H 10.327	0843	9.954	1638 (7.53h)
004 H 9.843	0843	9.373	1647 (8.10h)
001 L 2.889	<del>0835</del> 0855	2.905	1645 (7.50h)
002 L 3.012	0850	<del>3.303</del> 3.030	1641 (7.52h)
003 L 2.963	843	<del>2.909</del>	1638 (7.53h)
004 L 2.913	835	2.872	1647 (8.10h)

work on site to include consolidation of material on the work pad and around perimeter. Air sampling and monitoring will continue onsite.

0935 - Conducted perimeter Air monitoring and sampling pump check

- S perimeter (upwind) - .017 to .050 mg/m<sup>3</sup>
- E perimeter (Crosswind) - .017 to .048 mg/m<sup>3</sup>
- N perimeter (Downwind) - .024 to .058 mg/m<sup>3</sup>
- W Perimeter (Crosswind) - .020 to .058 mg/m<sup>3</sup>

- all pumps working as designed, work continues on pad, mostly toward western / North western area.

9/19/14

1100 START, ERRS RM (T1), and EPA OSC assessed a piping tunnel and basement on site w/level C PPE. Inspection of pipe tunnel / trench showed several pipes not containing asbestos wrap. Fiberglass wrap was seen on some piping. Tunnel does have up to 6" of water in it. Inspection of basement showed several rooms with up to 10-15' ceiling height. No asbestos pipe wrapping was identified. 55 gallon drum was identified, drum was empty w/open top. 2 - 5 gallon Buckets were also identified as empty in another room.

PID readings in both pipe tunnel and basement were found at 0.0 PID meter units. Atmosphere was found to have 20.6% O<sub>2</sub>, NOCO or H<sub>2</sub>S, 0.0% LEL was also identified.

1220 Completed check on all air sampling pumps. All pumps are running and in good working conditions.

9/9/14

1245 - particulate monitoring - No work being completed

S. perimeter - .024 - .044  $\text{mg}/\text{m}^3$  - UP

E perimeter - .027 - .071  $\text{mg}/\text{m}^3$  - XW

N perimeter - .034 - .088  $\text{mg}/\text{m}^3$  - DW

W perimeter - .031 - .057  $\text{mg}/\text{m}^3$  - XW

Conducted perimeter walk - all pumps operating as designed and in good working order. Work continued on site, specifically W/SW side of site.

1530 - Completed perimeter walk of site to check all Air sampling units. Particulate readings ranged from .025  $\text{mg}/\text{m}^3$  to .881  $\text{mg}/\text{m}^3$  (Downwind).

1630 - EARS crew beginning to shut down.

1645 - proceeded to collect all sampling trains and samples and prep'd all samples for shipment to EMSL Analytical

- Provided 3 COC of samples collected 9/4, 9/5 and 9/8 2014 to EARS Rm.

9/9/14

9/10/14

0800 - on site w/ EPA OSC and EARS crew

0805 - H&S meeting

0815 - calibration / Deployment of pumps

Pump #	start vol	start time	end vol	end time
001H	10.375	08:35	9.378	4.48h 1328
002H	9.884	0845	10.262	4.47h 1334
003H	10.308	0850	10.425	4.46h 1337
004H	9.881	0855	10.379	4.46h 1340
001L	2.905	0835	2.408	4.48h 1328
002L	3.030	0845	2.983	4.47h 1331
003L	2.899	0850	2.857	4.46h 1337
004L	2.872	0855	2.916	4.46h 1340

1100 - Assessed perimeter and checked

all sampling trains  $\text{mg}/\text{m}^3$

southern perimeter - upwind - .022 - .050

Eastern perimeter - Crosswind - .027 - .034

Northern perimeter - Downwind - .021 - .062

Western perimeter - Crosswind - .023 - .057

1200 - Assessed all sampling trains

all sampling pump are still operational. pending thunderstorms being monitored

1340 - began collecting sample trains due to impending thunderstorms.

Rite in the Rain.



9/10/14

1400 Rain showers have begun to move into area work continues on pad final perimeter consolidating material

1630 - work continued on pad until 1630 lightning occurred off area on until this point

1700 - Demolition from site, delivered samples to FedEx Drop

9/10/14

9/11/14

0800 - on site 1 H&S briefing with EPA  
GHS Crew

0815 - calibrated pumps

Pump	Start time	Start Vol	stop time	End Vol
001H	852	10.195 L/min	1644 (7.50)	10.060
002H	847	10.225	1638 (7.50)	10.213
003H	843	10.227	1634 (7.50)	10.227
004H	855	10.379	1640 (7.50)	10.320
001L	852	2.908	1644 (7.50)	3.030
002L	847	2.983	1638 (7.50)	3.092
003L	843	2.974	1634 (7.50)	3.028
004L	855	2.916	1646 (7.50)	2.919

- work continues on site - primarily the western half of site, clean area, and perimeter.

1050 - assessed all air sampling trains on site

all are still working as designed, no issues

1050 - completed round of particulate monitoring

South Perimeter 0 - 0.080 mg/m<sup>3</sup>

Particulate monitor on Zero Drift

all Pumps running correctly

ERRs begins Demo of Partial Building on NW corner of site

Rite in the Rain

9/11/14

1050 - building has been completely brought down  
work continues to consolidate this material on  
Pad for removal.

1100 - Calibrated PDR

1105 - Completed particulate monitoring  
around perimeter of site.

South - D19 - .038  $\text{mg}/\text{m}^3$

East - .008 - .011  $\text{mg}/\text{m}^3$

North - .003 - .013  $\text{mg}/\text{m}^3$

West - .006 - .017  $\text{mg}/\text{m}^3$

1130 - Fencing aligned along Western edge of Pad  
work continues on building

Weather - overcast with a NW wind @ 10-17 mph.  
No rain in forecast

1200 - checked all air sampling trains on perimeter of  
site. all samplers are working properly - No issues

1250 - checked all sample pumps - all are working  
properly with No issues

Particulate monitoring around perimeter

S Perimeter - .016 - .217  $\text{mg}/\text{m}^3$

E Perimeter - .019 - .081  $\text{mg}/\text{m}^3$

N Perimeter - .012 - .020  $\text{mg}/\text{m}^3$

W Perimeter - .015 - .054  $\text{mg}/\text{m}^3$

9/11/14

1300 work continues on the area in the NW  
corner of the site at the building and  
South central area of the pad at the  
perimeter. Both water trucks are  
being utilized at both areas.

1430 Conducted Perimeter particulate  
monitoring and sample pump check

S Perimeter - .014 - .048  $\text{mg}/\text{m}^3$

E Perimeter - .017 - .032  $\text{mg}/\text{m}^3$

N Perimeter - .013 - .041  $\text{mg}/\text{m}^3$

W Perimeter - .019 - .048  $\text{mg}/\text{m}^3$

all pumps are running as setup.

1630 - collected all sampling pumps

1700 - demobed from site

9/11/14

Site in the Rain.

9/12/14

0800 - on site w/ ERRS Crew and EPAOSC  
for H&S briefing

0815 - calibrated all pumps

Pump	Start time	Start Vol	Stop time (G40)	Stop Vol
001H	0840	10.380	1518 (640)	9.189
002H	0835	10.300	1516 (641)	10.054
003H	0830	9.943	1514 (640)	9.916
004H	0845	10.313	1521 (640)	10.674
001L	0840	3.017	1518 (640)	3.038
002L	0835	3.048	1516 (641)	3.063
003L	0830	3.049	1514 (641)	3.028
004L	0845	2.968	1521 (640)	2.972

Conducted assessment of pumps and particulate monitoring around perimeter of site  
940

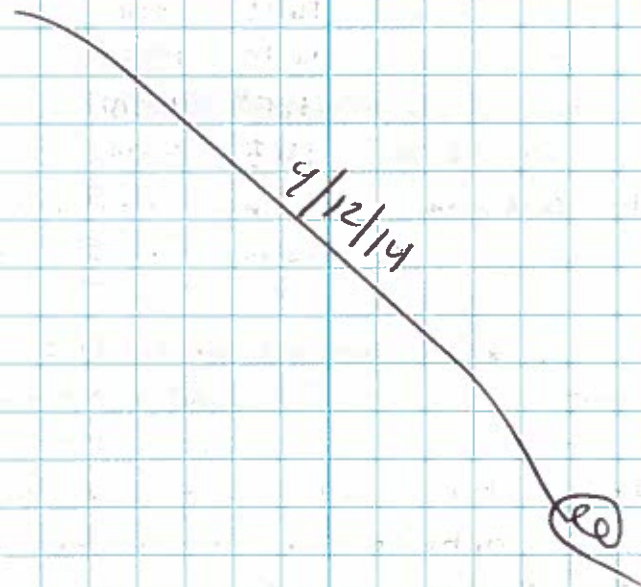
S perimeter .028 - .090 mg/m<sup>3</sup> Downwind  
E perimeter .010 - .072 mg/m<sup>3</sup> X Wind  
N perimeter .016 - .041 mg/m<sup>3</sup> ~~X~~ Upwind  
W perimeter .011 - .084 mg/m<sup>3</sup> X wind

1250 work continues on site to include delivery of liners, a second cone box, consolidation of material and set up of decon line for trucks

1300 conducted assessment of all sampling trains and particulate monitoring around Perimeter of site

9/12/14

S - perimeter .017 - .030 mg/m<sup>3</sup> Downwind  
E - perimeter .023 - .045 mg/m<sup>3</sup> X Wind  
N - perimeter .025 - .048 mg/m<sup>3</sup> Upwind  
W - perimeter .023 - .035 mg/m<sup>3</sup> X Wind  
wind out of the NE/N @ 5-10 mph  
1515 - began to bring sampling trains in  
checked all Flows  
1600 - Debrief from site



*Rite in the Rain*



9/15/14

JOSEPH STREET

A. RIVER

0700 SAFETY MEETING, 15 WORKERS +

1 CM + 2 STARTS. START WITH

8 HAUL TRUCKS TODAY. AMERICAN

WASTE MANAGEMENT IS WASTE

BROKER. LOADING (FIRST DAY) UP

0705 MEETING OVER

PUMP	START TIME	START FLOW Ym	STOP TIME	STOP FLOW Ym
001H	0840	10.681	1703	15.540
002H	0836	10.182	1646	10.162
003H	0850	10.226	1640	10.248
004H	0844	10.023	1658	10.018
001L	0840	3.074	1703	3.092
002L	0836	3.101	1646	3.123
003L	0850	3.046	1640	3.123
004L	0844	3.029	1658	3.035

0740 WEATHER: WIND 2.5 mph FROM SE TO

W, RH = 87%, SUNNY, PARTLY

CLOUDY.

0927- Weather: Wind out of the southeast at 3.4 mph; relative humidity = 64%. - MTB

0934- Particulate dust level range at Air Monitoring

0939 location 2: 0.018 - 0.054 mg/m<sup>3</sup> - MTB

0946- Particulate dust level range at Air Monitoring

0951 location 3: 0.017 - 0.042 mg/m<sup>3</sup> - MTB

9/15/14

Joseph Street

H. Browning

0957- Particulate dust level range at Air Monitoring

1002 location 4: 0.015 - 0.067 mg/m<sup>3</sup> - MTB

1007- Dust level range at Location 1: 0.015 -

1012 0.057 mg/m<sup>3</sup> - MTB

1015 Photo: Consolidation and watering of demolition debris, S. MTB. - MTB

1017- No water runoff and no visible dust clouds observed on the site. Watering of debris is ongoing and all pumps are operating. MTB

1117- Weather: Wind out of the SE at 0.0 mph; 49% relative humidity, 66°F. MTB

1128- Dust level at Location 2: 0.015 - 0.046 mg/m<sup>3</sup> - MTB

1137- Dust level at Location 1: 0.016 - 0.047

1142 mg/m<sup>3</sup> - MTB

1147- Dust level at Location 4: 0.025 - 0.348

1152 mg/m<sup>3</sup> Note: Reading of 0.348 was from the exhaust of the water truck - MTBHighest dust level, without the water truck exhaust is 0.056 mg/m<sup>3</sup> - MTB

1157- Dust level at Location 3: 0.017 - 0.122

1202 mg/m<sup>3</sup> - MTB

1144 Backnote: Photo: Lining of truck with Poly; SW; MTB. - MTB

Rite in the Rain

9/15/14

Joseph Street M. Browning

1145

Backnote: Photo: Water truck filling with water; NW; MTB. ——— MTB

1338

Weather: Wind out of the South at 3.8 mph; 31% relative humidity; 74.5°F. MTB

1351- Dust range at Location 2: 0.014 - 0.070

1356 mg/m<sup>3</sup>. ——— MTB

1400- Particulate range at Location 3: 0.016 -

1405 0.112 mg/m<sup>3</sup>. ——— MTB

1408- Particulate range at Location 4: 0.021 -

1413 0.158 mg/m<sup>3</sup>. ——— MTB1414<sup>1422</sup>- Particulate range at Location 1: 0.022 -0.033 mg/m<sup>3</sup>. ——— MTB1413

Backnote: Photo: Water truck spraying building debris; S; MTB. ——— MTB

1415

Backnote: Photo: Dawn detergent being used as a surfactant in the water truck; Down; MTB. ——— MTB

1535- Air monitoring run aborted due to rain.

1600- All pumps are operational. ——— MTB

1640- Air samples collected from Locations

1703 1 through 4. ——— MTB

1800- Following the preparation and labelling of the air samples, START Browning and Kiel leave the site for the day. MTB

32 loads of debris left the site for the day. ——— MTB

9/16/14

Joseph Street M. Browning

0700- START Browning arrives on site, along with START Kiel. Weather: 53°F. wind out of the north at 8 mph. — MTB

0700- Daily activity and Hand S meeting takes place. Topics: ① Be aware of the trucks on site; ② stay hydrated; ③ off site issue - no hot plates in the hotel; ④ wear PPE properly; ⑤ continue to wash boots. MTB

Pump	START Time	START Flow	STOP Time	STOP Flow
001H	0800	10.096	1725	10.083
002H	0810	10.107	1730	10.158
003H	0825	5.596	1710	5.595
004H	0745	10.149	1700	10.185
001L	0800	3.062	1725	3.037
002L	0810	3.037	1730	3.062
003L	0825	3.061	1710	3.086
004L	0745	3.060	1700	3.051

Note: Location 3 has a duplicate cassette.

0945- STARTs Browning and Kiel collect soil

samples JS-PCB-01-091615 and

JS-PCB-01-091615-D from a trans-

former pad area located at the north-

eastern corner of the site. This sample,

which will be analyzed for total PCBs,

*Rite in the Rain.*



9/16/14 Joseph Street M. Browning  
will be analyzed by ALS Environmental, of  
Holland, MI. MTB

1013 - STARTs Browning and Kiel collect  
soil sample JS-PCB-02-091614  
from a transformer pad area located  
near the southwestern corner of the  
site. MTB

1027 - STARTs Browning and Kiel collect  
soil Sample JS-PCB-03-091614  
from a transformer pad area located  
near the southeastern <sup>MTB</sup> corner of  
the site. Note: Samples 01 and 01-D  
were six-point composite samples;  
sample 02 was a two-point composite  
sample, and 03 was a 3-point com-  
posite sample. MTB

1050 - Activities: ① lining of trucks; ②  
loading of trucks with building debris;  
and ③ rinsing of wheels of the trucks  
prior to the trucks leaving the site.

0942 Backnote: Photo: Collection of soil  
for Samples JS-PCB-01-091614  
and JS-PCB-01-091614-D, AJK, W.  
MTB

9/16/14 Joseph Street M. Browning

1001 - Backnote: Photo: Collection of  
material (attempted) for Sample JS-  
PCB-02-091614; NW; MTB. MTB

1011 Backnote: Photo: Collection area for  
Sample JS-PCB-02-091614; S; AJK.

1011 Backnote: Photo: Hole from which  
START Kiel attempted to obtain  
soil <sup>MTB</sup> from for Sample JS-PCB-02-  
091614; Down; AJK. MTB

1011 Backnote: Photo: Area from which  
START Kiel attempted to obtain  
material for Sample JS-PCB-02-  
091614; Down; AJK. MTB

1014 Backnote: Photo: Soil for Sample  
JS-PCB-02-091614; P; MTB

1356 - Weather: Wind out of the west at 3.4  
mph; 50% relative humidity. MTB

1416 - Location 3: 0.016 - 0.054 mg/m<sup>3</sup>; MTB

1425 - Location 4: 0.015 - 0.012 - 0.078 mg/m<sup>3</sup>;

1434 - Location 1: 0.014 - 0.072 mg/m<sup>3</sup>. MTB

1442 - Location 2: 0.014 - 0.115 mg/m<sup>3</sup>. MTB

1545 - OSC Wolfe informs START that no  
shipments will take place on Wed, Thurs,  
or Fri, unless new liners arrive earlier.

*Rite in the Rain*



9/16/15 Joseph Street M. Browning

1605- Weather: Wind out of the west/NW at 4.3 mph; 49% relative humidity.

1619- Location 3: 0.009-0.037 mg/m<sup>3</sup>. -MTB1627- Location 4: 0.009-0.073 mg/m<sup>3</sup>. -MTB1636- Location 1: 0.012-0.052 mg/m<sup>3</sup>. -MTB1644- Location 2: 0.007-0.027 mg/m<sup>3</sup>. -MTB

1730- START Browning and Kiel complete the collection of the air samples. -MTB

1830- After completing the calibration and packaging of the air sampling, STARTs Browning and Kiel leave the site for the day. -MTB

1445 Backnote: Photo: Excavator loading debris into a dump truck; SE<sup>MTB</sup> SW; MTB. 41 trucks left the site for the day. MTB

*Michael Browning*  
9/16/14

9/17/14 Joseph Street M. Browning

0700- START Browning arrives on site. Weather: 44°F; Winds<sup>MTB</sup> out calm. -MTB

0700- Daily activity and Hands meeting takes

0711 place. Topics: ① properly wear PPE.

② work safely while lining the trucks

③ no hot plates in the hotel rooms. MTB

	Start Time	Start Flow	Stop Time	Stop Flow	Total
001H	0820	10.030	1615	10.100	475
002H	0800	10.092	1610	10.128	490
003H	0750	10.369	1600	9.567	490
004H	0810	10.069	1630	10.032	500
001L	0820	3.093	1615	3.089	475
002L	0800	3.067	1610	3.036	490
003L	0750	3.088	1600	3.019	490
004L	0810	3.031	1630	3.014	500

0917- Weather: Wind out of the west at 1.1 mph, 56°F; and 84% relative humidity. MTB

0922- Zero Cal of AM510 is complete. MTB

0927- Datalogging begins. -MTB

0935 Location 2: 0.017-0.113 mg/m<sup>3</sup>. -MTB0943 Location 3: 0.016-0.084 mg/m<sup>3</sup>. -MTB0952 Location 4: 0.017-0.237 mg/m<sup>3</sup>. -MTB1004 Location 1: 0.016-0.077 mg/m<sup>3</sup>. -MTB

Rite in the Rain

9/17/14 Joseph Street M. Browning

1059- Activities: ① consolidation of demolition debris on the site pad; ② removal of loose bricks and debris from the edge of the building/site perimeter; ③ use of the water trucks for dust suppression. ——— HTB

1214- Weather: Wind out of the SSW at 6.3 mph; 71°F; 32% relative humidity. HTB

1225- Location 2: 0.010 - 0.037 mg/m<sup>3</sup> - HTB

1234- Location 3: 0.011 - 0.043 mg/m<sup>3</sup> - HTB

1243- Location 4: 0.011 - 0.037 mg/m<sup>3</sup> - HTB

1251- Location 1: 0.012 - 0.039 mg/m<sup>3</sup> - HTB

1447- Weather: Winds out of the SW at 3.6 mph; 70°F; 30% relative humidity.

1507- Location 2: 0.006 - 0.040 mg/m<sup>3</sup> - HTB

1515- Location 3: 0.005 - 0.066 mg/m<sup>3</sup> - HTB

1524- Location 4: 0.010 - 0.030 mg/m<sup>3</sup> - HTB

1533- Location 1: 0.012 - 0.033 mg/m<sup>3</sup> - HTB

1535- Activities: ① removal of debris from the northern perimeter of the site; ② use of the water truck for dust suppression.

1542- Observations along the northern perimeter of the site: ① water located on the steps and sidewalk; ② not all ERRS workers are

9/17/14 Joseph Street M. Browning

wearing the hoods; and ③ dust is seen, as a small cloud, when the excavator bucket is used as a scrapping device. OSC Wolfe is informed of these observations. ——— HTB

1600- START Browning collects the low and high volume samples. ——— HTB

1705- START Browning completes the calibrating, labelling, and packaging of the samples. ——— HTB

1011 BackNote: Photo: Water truck wetting the side of the northern side of the building; SE; HTB. ——— HTB

*M. Browning*  
9/17/14



9/18/14 Joseph Street M. Browning

0700- START Browning arrives on site.

Weather: 47°F; calm wind, clear. MTB

0702- Daily activity and H and S meeting  
0709 takes place. Topics: ① wear hoods on the tyvec; ② everyone can mention a H and S issue to someone else. — MTB

	START Time	START Flow	End Time	End Flow	Total H.in.
001 H	0740	10.043	1600	9.607	500
002 H	0755	10.138	1615	10.018	500
003 H	0805	10.117	1625	10.009	500
004 H	0820	10.041	1635	9.948	495
001 L	0740	3.069	1600	3.130	500
002 L	0755	3.042	1615	3.009	500
003 L	0805	3.048	1625	3.037	500
004 L	0820	3.048	1635	2.999	495

0935- Location 1: 0.025 - 0.201 mg/m<sup>3</sup>. — MTB0944- Location 2: 0.024 - 0.112 mg/m<sup>3</sup>. — MTB0952- Location 3: 0.024 - 0.086 mg/m<sup>3</sup>. — MTB1006- Location 4: 0.016 - 0.076 mg/m<sup>3</sup>. — MTB1010- Weather: Wind out of the NNE at 4.3 mph;  
67°F; 44% relative humidity. — MTB1016- An ERRS crew is clearing brush from the  
pad, near the SE corner of the site. MTB

1021- Excavate scapping debris from the floor

9/18/14 Joseph Street M. Browning

of the building area, at the NW corner  
of the site. — MTB1135- ERRS crew continuing work at the SE  
end of the site: clearing vegetation  
and consolidating demolition debris.

1155- All pumps are operational. — MTB

1403- Location 1: 0.010 - 0.040 mg/m<sup>3</sup>. — MTB1412- Location 2: 0.012 - 0.059 mg/m<sup>3</sup>. — MTB1420- Location 3: 0.012 - 0.055 mg/m<sup>3</sup>. — MTB1431- Location 4: 0.019 - 0.044 mg/m<sup>3</sup>. — MTB1017 Photo: Backnote: ERRS crew clearing  
brush on the site concrete pad; NE; MTB

1502- START Browning enters the hot zone.

1530- START Browning leaves the hot zone. Air  
monitoring readings ranged from 0.024 -  
0.037 mg/m<sup>3</sup>. — MTB

1600- START Browning collects the air

1635 samples from Locations 1-4. — MTB

1715- After calibrating, labelling, and  
packaging the samples START  
Browning leaves the site for the day.Michael Browning  
9/18/14



9/19/14 Joseph Street M. Browning  
0700- START Browning arrives on site. Weather:  
48°F; Wind out east at 0.0 mph; 98% rh.

0700- Daily activity and H and S meeting

0712 takes place. Topics: ① Wear PPE properly and decon properly; ② watch out for holes. — MTB

	START Time	START Flow	End Time	End Flow	Total Min
001H	0820	10.153	1555	10.181	455
002H	0835	10.059	1610	10.002	455
003H	0745	10.041	1535	9.833	470 <sub>MTB</sub>
004H	0815	10.039	1545	10.099	455 <sub>450</sub>
001L	0820	3.082	1555	3.109	455
002L	0835	3.084	1610	3.017	455
003L	0745	3.063	1535	2.986	470
004L	0815	3.065	1545	3.043	450

0836- Site activities: ① excavator breaking up wood and debris near the eastern perimeter of the site; ② debris consolidation at the southeastern corner of the site; and suppression of dust through the use of the water trucks. — MTB

0948- Zero calibration of the AM 510 particulate monitor completed. — MTB

0949- Weather: Wind out of east at 2.7 mph; 64°F; 56%.

9/19/14 Joseph Street M. Browning

1001- Location 4: 0.013 - 0.078 mg/m<sup>3</sup> — MTB

1009- Location 1: 0.015 - 0.096 mg/m<sup>3</sup> — MTB

1024- Location 3: 0.014 - 0.071 mg/m<sup>3</sup> — MTB

1037- Location 2: 0.018 - 0.067 mg/m<sup>3</sup> — MTB

1039- Site activities: ① continued clearing of debris and brush from the SE corner of the site; ② use of the water truck to suppress dust; ③ use of the skid-steer brush to clean the concrete surface of the building pad; and ④ use of a weed wacker to remove high brush along the northern perimeter of the site. Also, no visible dust emissions or clouds observed.

OSC reviewing Site log book — SAW  
1320- Weather: Wind out of the east at 3.4 mph; 79°F; 21% rh. — MTB

1330- Location 2: 0.013 - 0.042 mg/m<sup>3</sup> MTB

1339 Location 3: 0.013 - 0.374 mg/m<sup>3</sup>. Notes

MTB 1339- A front-end loader was parked and running during approximately half of the air monitoring run. — MTB

1351- Location 4: 0.015 - 0.413 mg/m<sup>3</sup>. Notes: Weed-wacking was taking place near Location 4 during the air monitoring. MTB

*Rite in the Rain.*

9/19/14 Joseph Street M. Browning  
 1402- Location 1: 0.013-0.157 mg/m<sup>3</sup>. —MTB  
 1454- START Browning enters the hotzone. MTB  
 1526- START Browning leaves the hotzone. MTB  
 1535- START Browning collects the air  
 1610 samples from Locations 1-4. —MTB  
 151715 START Browning leaves the site for  
 the day after calibrating, labelling,  
 and packaging the samples. —MTB

*Michael Browning*  
 9/19/14

9/22/14 Joseph Street M. Browning  
 0700- START Browning arrives on site.  
 Weather: 49°F; wind out of the north  
 at 13 mph. —MTB  
 0700- Daily activity and H and S meeting takes  
 0705 place. Topics: ① be careful stepping  
 out of the trailer onto the manlift;  
 ② be aware of mails; and ③ stay hy-  
 drated. —MTB

	START Time	START Flow	STOP Time	STOP Flow	Total Min.
001H	0730	10.143	1655	10.241	565
002H	0745	10.169	1705	10.218	560
003H	0805	10.144	1715	10.178	550
004H	0755	10.195	1725	10.276	570
					MTB

0940- Operational check of the pumps takes  
 0955 place. All pumps are functioning properly.  
 Also, the onsite activities include: ① the  
 lining of dump trucks with poly; ② the  
 loading of trucks with demolition debris;  
 ③ the closure of the poly after debris  
 loading; ④ the rinsing of the tires of  
 the dump trucks; and ⑤ dust suppression.  
 1047- Zero cal of the AM510 is complete. MTB  
 1048- Weather: Out of N at 10.3 mph; 53°F; 45%rh.

*Rite in the Rain*



- 9/22/14 Joseph Street 158 M. Browning
- 1056- Location 4: 0.002 - 0.107  $\text{mg}/\text{m}^3$  — MTB
- 1105- Location 1: 0.000 - 0.658  $\text{mg}/\text{m}^3$  — MTB
- 1115- Location 2: 0.000 - 0.120  $\text{mg}/\text{m}^3$  — MTB
- 1124- Location 3: 0.000 - 0.024  $\text{mg}/\text{m}^3$  — MTB
- 1322- EPA and ERRS personnel are collecting samples from the overpacked drums that are located near the SW corner of the site.
- 1337- Location 3: 0.000 - 0.778  $\text{mg}/\text{m}^3$ . ERRS is loading debris into the lined dump-trucks near the eastern end of the site.
- 1347- Location 2: 0.000 - 0.089  $\text{mg}/\text{m}^3$  — MTB
- 1356- Location 1: 0.001 - 0.356  $\text{mg}/\text{m}^3$  — MTB
- 1405- Location 4: 0.000 - 0.036  $\text{mg}/\text{m}^3$  — MTB
- 1425- Weather: Wind out of west at 5.4 mph, 66°F, 27% rh. — MTB
- 1443- START Browning conducts air monitoring in the hot zone with the AM510. Readings ranged from 0.000 - 2.140  $\text{mg}/\text{m}^3$  with a TWA of 0.001  $\text{mg}/\text{m}^3$  over a 27 min, 27 sec span of time. — MTB
- 1516
- 1604- Location 4: 0.002 - 0.185  $\text{mg}/\text{m}^3$  — MTB
- 1613- Location 1: 0.002 - 0.291  $\text{mg}/\text{m}^3$  — MTB
- 1621- Location 2: 0.001 - 0.036  $\text{mg}/\text{m}^3$  — MTB
- 1630- Location 3: 0.002 - 0.298  $\text{mg}/\text{m}^3$  — MTB

- 9/22/14 Joseph Street M. Browning
- 1639- Weather: Wind out of west at 8.9 mph, 65°F, 26% rh. — MTB
- 1655- START Browning collects the four 1725 high-volume air samples located at Locations 1-4. — MTB
- 1800- After calibrating, labelling, and packaging the samples, and updating the logbook, START Browning leaves the site for the day. Note: During the day, no visible dust clouds or offsite runoff were observed. MTB
- For the day, 39 trucks left the site. — MTB

*Michael Browning*  
9/22/14



9/23/14 Joseph Street M. Browning

0700- START Browning arrives on site. Weather: 40°F; winds are calm; clear. — MTB

0700- Daily activity and H and S meeting takes

0705 place. Topics: ① location of fire extinguishers; ② muster point location; ③ use caution when removing batteries; ④ watch where one steps due to nails in the wooden debris. — MTB

	START Time	START Flow	End Time	End Flow	Total Min
001 H	0755	10.075	1720	10.331	565
002 H	0810	10.078	1730	10.097	560
003 H	0820	4.976	1655	4.139	505
003 HD	0830	4.976	1655	4.139	505
004	0820	10.079	1710	9.967	540 530

001 H 0755 10.075 1720 10.331 565

002 H 0810 10.078 1730 10.097 560

003 H 0820 4.976 1655 4.139 505

003 HD 0830 4.976 1655 4.139 505

004 0820 10.079 1710 9.967 540 530

0835- All pumps and cassettes are now deployed. Site activities include: ① lining and loading of dump trucks with debris; ② deconning of the dump trucks as they leave the site; and ③ dust suppression through the use of the water truck. — MTB

0950- Operational check of the pumps is complete.

1005 All pumps are operating. — MTB

1058- Weather: Out of SE at 3.1 mph; 66°F; 40%rh.

9/23/14 Joseph Street M. Browning

1109- Location 2: 0.003 - 0.064 mg/m<sup>3</sup>. MTB1121- Location 3: 0.008 - 0.117 mg/m<sup>3</sup>. MTB1130- Location 4: 0.000 - 0.224 mg/m<sup>3</sup>. MTB1139- Location 1: 0.013 - 0.139 mg/m<sup>3</sup>. MTB1113- Zero calibration of the ~~MS~~ AM510 is complete. — MTB

1140- Site activities: ① lining and loading of trucks;

1200 ② dust suppression; ③ truck decon. MTB

1400- Weather: Wind out of the north at 3.8 mph; 78°F; 22%rh. — MTB

1413- Location 2: 0.006 - 0.050 mg/m<sup>3</sup>. MTB1421- Location 3: 0.008 - 0.080 mg/m<sup>3</sup>. MTB1430- Location 4: 0.011 - 0.070 mg/m<sup>3</sup>. MTB1439- Location 1: 0.012 - 0.062 mg/m<sup>3</sup>. MTB

1602- Weather: Wind out of the north at 2.9

1613 mph; 78°F; 21%rh. — MTB

Location 2: 0.006 - 0.057 mg/m<sup>3</sup>. MTB1621- Location 3: 0.009 - 0.071 mg/m<sup>3</sup>. MTB1635- Location 4: 0.011 - 0.078 mg/m<sup>3</sup>. MTB1644- Location 1: 0.012 - 0.068 mg/m<sup>3</sup>. MTB

1655- START Browning collects the air samples

1730 from Locations 1-4. — MTB

1800- START Browning leaves the site for day.

37 loads of debris left the site for day.

Rite in the Rain

9/24/14 Joseph Street M. Browning  
0654- START Browning arrives on site. Weather:  
50°F; 81% rh; wind calm (0.0 mph) out of  
the east. ————— MTB

0700- Daily activity and H and S meeting takes  
0704 place. Topics: ① only wear tyre in the  
hot zone, not in the support zone; ②  
don't smoke or eat the hot zone; ③ be  
careful wear one steps; and ④ stay hy-  
drated. ————— MTB

	START Time	START Flow	End Time	End Flow	Total Run	MTB
001H	0755	10.140	1705	9.969	<del>555</del> 550	
002H	0810	10.151	1715	9.839	545	
003H	0725	10.148	1650	9.560	565	
004H	0745	10.103	1700	9.832	555	

0817- Activities: ① lining of dump trucks; ②  
loading of debris from two debris piles;  
③ sealing of poly over the loaded debris;  
④ washing the tires of the dump trucks  
prior to their departure from the site;  
and ⑤ dust suppression through the use  
of the water trucks. ————— MTB

1000- All pumps are operating at each of the  
1020 air monitoring locations. ————— MTB

1106- ~~X~~ MTB zero calibration of AM510 takes place.

9/24/14 Joseph Street M. Browning  
1106- Weather: Wind out of the SE at 4.9 mph.  
73°F; 32% rh; clear. ————— MTB

1122- Location 2: 0.007 - 0.057 mg/m<sup>3</sup>. MTB

1131- Location 3: 0.009 - 0.072 mg/m<sup>3</sup>. MTB

1140- Location 4: 0.013 - 0.046 mg/m<sup>3</sup>. MTB

1147- Location 1: 0.014 - 0.082 mg/m<sup>3</sup>. MTB

1148- Debris removal is ongoing at two debris  
piles located near the east end of the site.

1313- Weather: Wind out of the SSE at 3.1 mph;  
82°F; 20% rh. ————— MTB

1325- Location 2: 0.005 - 7.851 mg/m<sup>3</sup>. — MTB

1341- Location 3: 0.011 - 0.086 mg/m<sup>3</sup>. — MTB

1351- Location 4: 0.016 - 0.071 mg/m<sup>3</sup>. — MTB

1359- Location 1: 0.000 - 0.058 mg/m<sup>3</sup>. — MTB

Note: Average reading for Location 2  
was 0.079 mg/m<sup>3</sup>. ————— MTB

1132- Rescreen of Location 2: 0.007 - 0.202.

1341- ERRS is loading lined dump trucks.

1352 ERRS continuing to line and load trucks.

1515- Location 2: 0.007 - 0.052 mg/m<sup>3</sup>. MTB

1524- Location 3: 0.011 - 0.584 mg/m<sup>3</sup>. MTB

1537- Location 4: 0.046 - 0.432 mg/m<sup>3</sup>. MTB

1543- Location 1: 0.027 - 0.664 mg/m<sup>3</sup>. MTB

1715- START Browning completes the co-

*Rite in the Rain*



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9/24/14 Joseph Street M. Browning  
Collection of the air samples at Locations

1-4. MTB

1800- START Browning leaves the site for  
the day. MTB

For the day, 35 trucks left the site

*Michael Browning*  
9/24/14

#### ENTERING INFORMATION IN THE LOGBOOK

Enter the following information at the beginning of each day or whenever warranted during the course of a day:

- Date
- Starting time
- Specific location
- General weather conditions and approximate temperature
- Names of personnel present at the site. Note the affiliation(s) and designation(s) of all personnel
- Equipment calibration and equipment models used.
- Changes in instructions or activities at the site
- Levels of personal protective clothing and equipment
- A general title of the first task undertaken (for example, well installation at MW-11, decon at borehole BH-11, groundwater sampling at MW-11)
- Approximate scale for all diagrams. If this can't be done, write "not to scale" on the diagram.
- Indicate the north direction on all maps and cross-sections. Label features on each diagram.
- Corrections, if necessary, necessarily including a single line through the entry being corrected. Initial and date any corrections made in the logbook.
- After last entry on each page, initials of the person recording notes. No information is to be entered in the area following these initials.
- At the end of the day, signature of the person recording notes and date at the bottom of the last page. Indicate the end of the work day by writing "Left site at (time)." A diagonal line must be drawn across any remaining blank space at the bottom of this last page.

The following information should be recorded in the logbook after taking a photograph:

- Time, date, location, direction, and, if appropriate, weather conditions
- Description of the subject photographed and the reason for taking the picture
- Sequential number of the photograph and the film roll number or disposable camera used (if applicable)
- Name of the photographer.

The following information should be entered into the logbook when collecting samples:

- Location description
- Name(s) of sampler(s)
- Collection time
- Designation of sample as a grab or composite sample
- Type of sample (water, sediment, soil gas, etc.)
- On-site measurement data (pH, temperature, specific conductivity)
- Field observations (odors, colors, weather, etc.)
- Preliminary sample description
- Type of preservative used
- Instrument readings.



# Joseph Street Asbestos Site



*Rite in the Rain.*

ALL-WEATHER

**FIELD**

Nº 351

## BOOK 2 of 2

TDD: 505-0001-1407-003

Logbook Tracking Number \_\_\_\_\_  
Site Name Joseph Street Asbestos Site  
Issue to \_\_\_\_\_  
Date Issued \_\_\_\_\_  
TDD # 0001/S05-0001-1407-003

Project \_\_\_\_\_

**Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook. Helps protect your notebook from wear & tear. Contact your dealer or JL Darling LLC.**

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9/25/14 Joseph Street M. Browning

0657- START Browning arrives on site, Weather:  
Wind out of the ESE at 2.9 mph; 52°F; 83%.

0700- Daily activity and H and S meeting takes  
0702 place. Topics: ① eat properly at night;  
② stay hydrated ③ wear PPE properly.

	START Time	START Flow	END Time	END Flow	Total Min
001H	0805	10.140	1705	9.996	540
002H	0815	10.167	1710	9.946	530
003H	0735	5.092	1655	4.564	560
003HD	0735	5.092	1655	4.564	560
004H	0750	10.097	1720	9.777	570

0902- All pumps are operational at each of the  
0915 air sampling locations. Also, the ERRS  
operators are currently consolidating debris  
piles while the water truck drivers are applying  
water to the piles for dust suppression. MTB

1056- Zerocalibration of the AM510 is completed.

1057- Weather: Wind out of the NNE at 0.0 mph;  
76°F; 35% rh. MTB

1115- Location 2: 0.007-0.082 mg/m<sup>3</sup>. MTB

1125- Location 3: 0.011-0.142 mg/m<sup>3</sup>. MTB

1133- Location 4: 0.022-0.106 mg/m<sup>3</sup>. MTB

1141- Location 1: 0.025-0.169 mg/m<sup>3</sup>. MTB

1320- Weather: Winds out of WNW at 1.6 mph;  
82°F; 20% rh. MTB

9/25/14 Joseph Street M. Browning

1334- Location 2: 0.000-0.937 mg/m<sup>3</sup>. MTB

1403- Location 3: 0.014-0.079 mg/m<sup>3</sup>. MTB

1411- Location 4: 0.023-0.134 mg/m<sup>3</sup>. MTB

1420- Location 1: 0.029-0.050 mg/m<sup>3</sup>. MTB

1343- Re-zero calibration of the AM510

takes place after initial screening of  
Location 2. Location 2 will be  
screened again before moving on to  
Location 3. Re-zero due to initial zero drift.

1353- Location 2: 0.000-0.039 mg/m<sup>3</sup>. MTB

Note: Due to the "zero drift" occurrence  
during the first screening of Lo-  
cation 2 at 1334, the readings ob-  
tained at 1334 for Location 2 will  
not be included when determining  
which day's samples will be sent to  
the lab. As a result, the reading taken  
at Location 2 at 1353 will be used.

1534- Enter the hot zone. MTB

1600- Leave the hot zone. MTB

1607- Weather: Wind out of the ENE; 86°F;  
18% rh. MTB

1616- Location 2: 0.053-0.246 mg/m<sup>3</sup>.

1625- Location 3: 0.056-0.105 mg/m<sup>3</sup>.

*Rite in the Rain.*



4  
9/25/14

Joseph Street M. Browning

- 1634- Location 4: 0.047- 0.448 mg/m<sup>3</sup>. - MTB  
 1644- Location 1: 0.037- 0.080 mg/m<sup>3</sup>. - MTB  
 1655- START Browning collects the air samples  
 1720 from Locations 1-4. - MTB  
 1800- After calibrating, labelling, and packing  
 the samples, START Browning leaves the  
 site for the day. For the day, 40 trucks  
 left the site. - MTB

*Michael Browning*  
 9/25/14

9/26/14

5  
Joseph Street M. Browning

- 0652- START Browning arrives on site. MTB  
 Weather: Wind out of the NNE at 0.0 mph;  
 51°F, 89% rh. - MTB  
 0700- Daily activity and H and S meeting takes  
 0709 place. Topics: ① wear PPE properly. MTB  

	START Time	START Flow	End Time	End Flow	Total Min.
001H	0745	10.032	1600	9.776	495
002H	0800	10.190	1555	10.017	475
003H	0725	10.102	1616	9.776	525
004H	0735	10.128	1605	9.902	510

0850- Spot check of the pumps takes place. All  
 0901 pumps are operating. - MTB  
 1031- Zero calibration of the AM510 completed.  
 1034- Weather: Wind out of the SE at 4.9 mph;  
 75°F, 44% rh. - MTB  
 1044- Location 2: 0.007- 0.140 mg/m<sup>3</sup>. - MTB  
 1055- Location 3: 0.014- 0.254 mg/m<sup>3</sup>. - MTB  
 1104- Location 4: 0.019- 0.069 mg/m<sup>3</sup>. - MTB  
 1114- Location 1: 0.019- 0.133 mg/m<sup>3</sup>. MTB  
 1257- Weather: Wind out of the NNE at 2.9  
 mph; 84°F, 24% rh. - MTB  
 1304- Location 2: 0.010- 0.658 mg/m<sup>3</sup>. MTB  
 1321- Location 3: 0.015- 0.052 mg/m<sup>3</sup>. MTB  
 1330- Location 4: 0.000- 0.423 mg/m<sup>3</sup>. MTB

*Return in the Rain.*

9/26/14

Joseph Street M. Browning

- 1340- Location 1: 0.025 - 0.105 mg/m<sup>3</sup>. — MTB
- 1357- Current site activities: ① lining and loading of trucks; ② use of the water trucks for dust suppression; ③ sealing of the poly around the loaded <sup>MTB</sup> <sup>MTB</sup> debris; and ④ deconning of the tires of the dump trucks prior to the trucks leaving the site. — MTB
- 1447- Spot check on Location 2 is OK. — MTB
- 1505- Weather: Wind out of the NNW at 2.9 mph; 87°F; 18% rh. — MTB
- 1516- Location 2: 0.006 - 0.077 mg/m<sup>3</sup>. — MTB
- 1545- Location 3: 0.015 - 0.116 mg/m<sup>3</sup>. — MTB
- 1536- Location 4: 0.022 - 0.070 mg/m<sup>3</sup>. — MTB
- 1527- Location 1: 0.010 - 0.047 mg/m<sup>3</sup>. — MTB
- 1555- START Browning collects the air samples from Locations 1-4. MTB
- 1610 After calculating the highest daily averages for the week, by locations, labelling the samples collected on 9/26/14, completing the COC for the samples that will be shipped to the lab, and updating the logbook, START Browning leaves the site for the day. — MTB

9/29/14

Joseph Street M. Browning

- 0700- START Browning arrives on site. Weather: Wind out of NW; 56°F; 89% rh. — MTB
- 0700- Daily activity and H and S meeting takes place. Topics: ① look inside the trucks before stepping into beds; ② remain your concentration; ③ stay aware of vehicles
- |      | START Time | START Flow | End Time | End Flow | Total Min. |
|------|------------|------------|----------|----------|------------|
| 001H | 0740       | 10.091     | 1700     | 9.797    | 560        |
| 002H | 0750       | 10.005     | 1655     | 9.813    | 545        |
| 003H | 0800       | 10.134     | 1650     | 9.815    | 530        |
| 004H | 0810       | 10.175     | 1645     | 9.958    | 515        |
- 0932- START Browning conducts a spot check of the pumps at the four air sampling locations. All pumps are operational. — MTB
- 1046- Zero calibration of the AM 510 is complete.
- 1057- Location 4: 0.014 - 0.129 mg/m<sup>3</sup>. — MTB
- 1106- Location 1: 0.192 - 0.482 mg/m<sup>3</sup>. — MTB
- 1142- Location 2: 0.018 - 0.120 mg/m<sup>3</sup>. — MTB
- 1151- Location 3: 0.022 - 0.176 mg/m<sup>3</sup>. — MTB
- 1049- Weather: Wind out of the north at 0.0 mph; 79°F; 43% rh. — MTB
- 1133- Due to a "Zero Drift" during the monitoring of Location <sup>MTB</sup> 1; this point will be re-screened. 0.014 - 1.031 mg/m<sup>3</sup>. — MTB

Rite in the Rain



9/29/14 Joseph Street M. Browning

- 1341- Zero calibration of the AM510 is complete
- 1350- Location 4: 0.014 - 0.639 mg/m<sup>3</sup>. — MTB
- 1359- Location 1: 0.000 - 0.237 mg/m<sup>3</sup>. — MTB
- 1408- Location 2: 0.027 - 0.116 mg/m<sup>3</sup>. — MTB
- 1416- Location 3: 0.038 - 0.100 mg/m<sup>3</sup>. — MTB
- 1420- Site activities: ① lining and loading of dump trucks; ② sealing of the poly around the loaded debris; and ③ decontamination of the dump truck tires; and ④ dust suppression of the debris through the use of the water trucks. — MTB
- 1545- Location 4: 0.029 - 0.246 mg/m<sup>3</sup>. — MTB
- 1554- Location 1: 0.033 - 0.943 mg/m<sup>3</sup>. — MTB
- 1602- Location 2: 0.039 - 8.780 mg/m<sup>3</sup>. — MTB
- 1611- Location 3: 0.044 - 0.296 mg/m<sup>3</sup>. — MTB
- Average reading at Location 2 = 0.078.
- 1615- Site activities: Site personnel are preparing to stage the heavy equipment and other equipment prior to leaving the site for the day. — MTB
- 1645- START Browning collects the air samples
- 1700 at the four locations. — MTB
- 1800- After preparing the samples and some paperwork for 9/30, START leaves the site for the day. For the day, 35 loads left the site.

9/30/14 Joseph Street M. Browning

- 0700- START Browning arrives on site.
- Weather: Wind out of WNW; 58°F - 80°F.
- 0700- Daily activity and H and S meeting takes place. Topics: ① remain aware of the dump trucks; ② be careful of working in the morning darkness; ③ lightning possible today; ④ use caution <sup>MTB</sup> getting into the beds of the dump trucks.

START Time	START Flow	STOP Time	STOP Flow	Total Min
001H	10.046	No sampling	Due to Rain	
002H	10.015	↓	↓	↓
003H	10.025	↓	↓	↓
004H	10.191	↓	↓	↓

- 0715- Due to inclement weather (i.e., rain and lightning), the site activities were suspended and air sampling and monitoring activities did not place.
- 1000
- 1005- Site activities: truck bed lining and loading; liner sealing; and truck tire decontamination resumed. MTB
- 1230- Site activities continue as they did from 1005 to 1200. — MTB
- 1500
- 1515- Zero calibration of the Side Pak AM510 is completed. — MTB

*Rite in the Rain*



- 9/30/14 Joseph Street M. Browning
- 1529- START Browning conducts an air monitoring run, around the entire site perimeter, with the AM 510. The readings ranged from 0.004 - 0.110 mg/m<sup>3</sup>. MTB
- 1541
- 1600- Site activities: ① loading of trucks; ② consolidation of the debris piles located at the west end of the concrete pad. MI leaves the MTB.
- 1700
- 1800- START Browning arrives on site for the day. For the day, 32 loads left the site.

*Michael JB leaving*  
9/30/14

10/1/14 Joseph Street M. Browning

0700- START Browning arrives on site. Weather: 48°F; calm. MTB

0700- Daily activity and H and S meeting begins

0706 ① if fog requires it, the trucks will need to wait until the fog lifts; ② slip, trips, and falls; ③ no cell phones while

operating vehicles MTB

	START Time	START Flow	STOP Time	STOP Flow	Total Min	
001H	0725	10.046	1715	10.001	590	X
002H	0730	10.015	1710	9.958	580	
003H	<del>0750</del> 0750	10.025	1705	9.995	555	
004H	0740	10.191	1720	10.081	580	
	START Time	START Flow	STOP Time	STOP Flow	Total Min	
ABS1L	1005	3.514	1205	3.653	120	X
ABS1H	1005	<del>10.931</del> 10.931	<del>1205</del> 1205	10.931	48	
ABS2L	1005	3.53433	1205	3.484	120	
ABS2H	1005	11.004	1205	11.004	120	

1005- STARTs Browning and Burns conduct

1205 MTB also activity - based asbestos sampling, with two GilAir 5 units set to 3.5 L/min and two Quicktake 30 pumps set to 10 L/min, along the northeast portion of the site. The sampling entailed the use of a weed eater and

*Rite in the Rain*

10/1/14

Joseph Street M. Browning

rake being used in the same manner that a regular person would use a rake or a weed eater in order to determine if asbestos would become airborne by using these two tools. — MTB

1230- Activities: ① truck lining and loading;  
1300 ② poly-sealing; and ③ deconning the tires of the dump trucks as they were leaving the site. — MTB

1403- Zero calibration of the AM510 is done. — MTB

~~1403~~ 1413- Location 3: 0.000 - ~~0.0~~ 0.117 mg/m<sup>3</sup>. — MTB

1423- Location 2: 0.000 - 0.085 mg/m<sup>3</sup>.

1430- Location 1: 0.035 - 0.165 mg/m<sup>3</sup>.

1441- Location 4: 0.016 - 0.208 mg/m<sup>3</sup>.

1443- Weather: Wind out of the east at 3.1 mph; 71°F; 42% rh. — MTB

1553- Weather: Wind out of the NE at 5.4 mph; 77°F; 30% rh. — MTB

1608- Location 3: 0.007 - 0.061 mg/m<sup>3</sup>

1618- Location 4: 0.000 - ~~0.0~~ 0.547. — MTB

1627- Location 1: 0.000 - ~~0.0~~ 0.232 mg/m<sup>3</sup> — MTB

1635- Location 2: 0.000 - ~~0.0~~ 0.547 mg/m<sup>3</sup> — MTB

1705- START Browning collects the air

1720 samples from locations 1-4. — MTB

10/1/14

Joseph Street M. Browning

1800- After calibrating, labelling, and packaging all of the air samples collected during the activity-based asbestos sampling and the air samples collected from the perimeter and the soil sample collected from the northeast corner of the site, START Browning leaves the site for the day. — MTB  
For the day, 40 loads left the site.

*Michael J. Browning*  
10/1/14



10/2/14 Joseph Street M. Browning

0700 - START Browning arrives on site. Weather: 48°F; wind out of the south at 3 mph.

0700 - Daily activity and Hand Smeeting takes place. Topics: ① stay hydrated; ② continue dust control; and ③ be aware of slips, trips, and falls. — MTB

	S Time	S Flow	E Time	E Flow	Total Min.
001 H	0805	10.138	1655	9.764	530
002 H	0800	10.063	1645	9.995	525
003 H	0945	5.023	1745	4.943	480
003 HD	0945	5.023	1745	4.943	480
004 H	0745	10.102	1700	9.987	555

1103 - Weather: Wind out of the SE at 5.6 mph; 73°F; 59% rh. — MTB

1106 - Zero calibration of the AM510 is complete.

1117 - Location 2: 0.007 - 0.336 mg/m<sup>3</sup>. — MTB1126 - Location 3: 0.016 - 0.124 mg/m<sup>3</sup>. — MTB1135 - Location 4: 0.018 - 0.209 mg/m<sup>3</sup>. — MTB1144 - Location 1: 0.021 - 0.553 mg/m<sup>3</sup>. — MTB

1330 - Weather: Wind out of the SSE at 4.9 mph; 85°F; 29% rh. — MTB

1334 - Zero calibration of the AM510 complete.

1344 - Location 2: 0.028 - 0.104 mg/m<sup>3</sup>. — MTB1352 - Location 3: 0.037 - 0.173 mg/m<sup>3</sup>. — MTB

10/2/14 Joseph Street M. Browning

1401 - Location 4: 0.000 - 0.190 mg/m<sup>3</sup>. — MTB1411 - Location 1: 0.047 - 0.148 mg/m<sup>3</sup>. — MTB

1420 - Site activities: ① debris consolidation near the southern perimeter of the site; and ② dust suppression with the water truck in the area in which the debris consolidation is taking place. — MTB

1554 - Weather: Wind out of the SW at 2.7 mph; 87°F; 28% rh. — MTB

1557 - Zero calibration of the AM510 complete.

1605 - Location 2: 0.029 - 0.589 mg/m<sup>3</sup>. — MTB1614 - Location 3: 0.029 - 0.324 mg/m<sup>3</sup>. — MTB1623 - Location 4: 0.034 - 0.143 mg/m<sup>3</sup>. — MTB1631 - Location 1: 0.036 - 0.225 mg/m<sup>3</sup>. — MTB

1645 - START Browning collects the air

1745 samples from locations 1 - 4. — MTB

1800 - After completing the calibration, labelling, and packaging of the samples, START Browning leaves the site for day. — MTB

For the day 39 loads left the site. — MTB

Michael J. Browning  
10/2/14



10/13/14

Joseph Street M. Browning

- 0700- START Browning arrives on site. Weather: 68°F; wind out of the south at 14 mph. MTB
- 0727- Daily activity and H and S meeting takes place. Topics: ① only pick up work around the site due to the weather; ② for next week, be aware of heavy equipment due to work proceeding to the west side of the site. MTB
- 0731
- 0800- Due to impending <sup>MTB</sup> rain forecast for the remainder of the day, the site activities have been suspended for the day. As a result, START Browning leaves the site for the week and begins his demobe from the site. — MTB

*Michael Browning*  
10/13/14

10/16/14

Joseph Street M. Browning

- 0700- START Browning arrives on site. Weather: 45°F; wind out of the south at 9 mph
- 0700- Daily activity and H and S meeting takes place. Topics: ① complacency about the site activities. — MTB

	STime	SFlow	ETime	EFlow	TMin.
001H	0745	10.093	1700	10.239	555
002H	0820	10.149	1720	10.170	546
003H	0805	10.084	175	10.312	550
004H	0755	10.092	1710	10.206	555

- 0725- Zero calibration of the AM510 completed.
- 0800- Site activities: ① lining and loading of trucks;
- 0915 ② use of the water trucks for dust suppression, ③ sealing of poly around the debris located in the beds of the trucks; and ④ washing of the tires of the trucks prior to them leaving the site. — MTB
- 0925- Pump check takes place at all air sampling
- 0943 locations. All pumps are running. — MTB
- 1059- Location 1: 0.011 - 0.182 mg/m<sup>3</sup>. — MTB
- 1109- Location 2: 0.011 - 0.086 mg/m<sup>3</sup>. — MTB
- 1121- Location 3: 0.010 - 0.071 mg/m<sup>3</sup>. — MTB
- 1130- Location 4: 0.010 - 0.125 mg/m<sup>3</sup>. — MTB
- 1138- Weather: Wind out of SSW at 2.0 mph, 55°-75%.

*Rite in the Rain.*

- 10/6/14 Joseph Street M. Browning
- 1326- Zero calibration of the AM510 complete.
- 1327- Weather: Wind out of the SSE at 5.6 mph; 56°F; 82% rh, light sprinkle. MTB
- 1338- Location 1: 0.006 - 0.049 mg/m<sup>3</sup> — MTB
- 1347- Location 2: 0.004 - 0.066 mg/m<sup>3</sup> — MTB
- 1357- Location 3: 0.003 - 0.056 mg/m<sup>3</sup> — MTB
- 1406- Location 4: 0.001 - 0.049 mg/m<sup>3</sup> — MTB
- 1603- Weather: Wind out of SW at 4.7 mph; 60°F; 69% rh. — MTB
- 1621- Location 1: 0.029 - 0.087 mg/m<sup>3</sup> MTB
- 1632- Location 2: 0.000 - 0.035 mg/m<sup>3</sup> MTB
- 1641- Location 3: 0.000 - 0.050 mg/m<sup>3</sup> MTB
- 1650- Location 4: 0.001 - 0.081 mg/m<sup>3</sup> MTB
- 1700- START Browning collects the air
- 1720 samples from Locations 1-4. Note: the activities that took place at the site from 1000 - 1630 were the same as those that took place between 0800 and 0915. — MTB
- 1800- After processing the samples, START Browning leaves the site for the day. For the day 40 loads left the site. — MTB

*Michael J. Browning*  
10/6/14

- 10/7/14 Joseph Street M. Browning
- 0700- START Browning arrives on site Weather: 47°F; 98% rh; wind out of the S at 7.4 mph.
- 0700- Daily activity and H and S meeting takes place: ① stay hydrated; ② be aware of trucks on the pad; ③ slips, trips, and falls. — MTB
- |      | STime | SFlow  | ETime | EFlow  | Total Min          |
|------|-------|--------|-------|--------|--------------------|
| 001H | 0735  | 10.645 | 1410  | 10.159 | 395                |
| 002H | 0806  | 10.055 | 1450  | 10.310 | <del>470</del> 410 |
| 003H | 0750  | 10.055 | 1440  | 9.717  | 410                |
| 004H | 0745  | 10.010 | 1415  | 11.573 | 390                |
- 0815- Site activities: ① lining and loading of trucks; ② sealing of poly around the debris that was loaded into the trucks; ③ washing the tires of the trucks prior to the trucks leaving the site. — MTB
- 1000
- 1057- Zero calibration of AM510 completed
- 1058- Weather: Wind out of SSE at 3.9 mph; 52°F; 97% rh. — MTB
- 1108- Location 1: 0.014 - 0.108 mg/m<sup>3</sup> — MTB
- 1116- Location 2: 0.014 - 0.149 mg/m<sup>3</sup> — MTB
- 1125- Location 3: 0.015 - 0.069 mg/m<sup>3</sup> — MTB
- 1134- Location 4: 0.016 - 0.180 mg/m<sup>3</sup> — MTB
- 1125- Weather: SSW at 3.8 mph; 59°F; 83%.

*Rite in the Rain*



- 10/7/14 Joseph Street M. Browning
- 1335 - Location 1: 0.009 - 0.081 mg/m<sup>3</sup>. — MTB
- 1450 - Location 2: 0.002 - 0.044 mg/m<sup>3</sup>. — MTB
- 1354<sup>1438</sup> - Location 3: 0.000 - 0.041 mg/m<sup>3</sup>. — MTB
- 1344 - Location 4: 0.008 - 0.086 mg/m<sup>3</sup>. — MTB
- 1410 - START Browning collects the air samples
- 1450 from Location 1-4 and completes a second air monitoring run with the AM 510 at each of the air monitoring locations 2 and 3. — MTB
- 1530 - Due to inclement weather conditions, the RM elects to shut the site down for the day. As a result, START Browning leaves the site for the day. — MTB
- 31 loads left the site for the day. MTB

*M. Browning*  
10/7/14

- 10/8/14 Joseph Street M. Browning
- 0700 - START Browning arrives on site. Weather: 49°F; Wind out of west at 7 mph. — MTB
- 0700 - Daily activity and H and S <sup>MTB</sup> plan meeting
- 0707 takes place. Topics: ① pay attention to your surroundings. ② stay hydrated.
- |       | STime | SFlow  | ETime | EFlow  | TotalHIn |
|-------|-------|--------|-------|--------|----------|
| 001H  | 0740  | 10.039 | 1710  | 9.956  | 570      |
| 002H  | 0750  | 10.107 | 1700  | 10.049 | 550      |
| 003H  | 0800  | 4.992  | 1650  | 4.213  | 530      |
| 003HD | 0800  | 4.992  | 1650  | 4.213  | 530      |
| 004H  | 0810  | 10.146 | 1640  | 10.095 | 510      |
- 0815 - The first round of truck leave the site after being loaded with debris. — MTB
- 1020 - START Browning and two ERRS representatives begin the process of collecting two four-point composite soil samples from around the transformer pad located near the NE corner of the site. The first sample, JS-PCB-04-100814 and PCB-04-100814-D (a duplicate of JS-PCB-04-100814), will be collected from a depth of 2 ft. below the concrete transformer pad. The second sample,

*Rite in the Rain*



19/8/14

Joseph Street

M. Browning

JS-PCB-05-100814 will be collected from a depth of 3 ft. below the concrete transfer pad.

1122- START Browning containerizing Samples JS-PCB-04-100814 and JS-PCB-04-100814. Both of these samples will be analyzed for only PCBs. MTB

1127- START Browning containerize Sample JS-PCB-05-100814, which will also be analyzed for only PCBs.

1229- Zero calibration of the AM510 complete.

1239- Location 4: 0.004-0.053 — MTB

1305- Location 1: 0.003-0.092 — MTB

1256- Location 2: 0.004-0.584 — MTB

1248- Location 3: 0.004-0.563 — MTB

1306- Weather: W at 13.0 mph; 64°F; 27%rh

1325- Weather: SW at 12.5 mph; 65°F; 27%rh

1538- Location 4: 0.000-0.168 — MTB

1546- Location 3: 0.006-0.063 — MTB

1554- Location 2: 0.007-0.043 — MTB

1603- Location 1: 0.007-0.061 — MTB

1646- Location 4: 0.091-0.140 — MTB

1655- Location 3: 0.108-0.722 — MTB

MTB 10/8/14

Joseph Street

M. Browning

1703-1503- Location 2: 0.108-0.307 — MTB

1712- Location 1: 0.107-0.254 — MTB

1800- After processing the air samples, START Browning leaves for the day. 36 loads of debris left the site. MTB

*Michael Browning*  
10/8/14

10/9/14 Joseph Street M. Browning

0700 - START Browning arrives on site. Weather: 49°F. Wind currently out of SW. — MTB

0700 - Daily activity and H and S meeting takes place

0707 Topics: ① possible rain today; ② slip, trips, and falls; and ③ general housekeeping in the conex boxes. — MTB

	S Time	S Flow	E Time	E Flow	Total Min
001H	0755	10.096	1630	10.322	515
002H	0815	10.166	1645	10.274	510
003H	0830	5.127	1650	5.250	500
003HD	0830	5.127	1650	5.250	500
004H	0840	10.092	1700	10.104	500

0830 - Site activities include ① lining and loading dump trucks; ② sealing the poly around the debris, and ③ decomming the truck tires prior to the trucks leaving the site. — MTB

1124 - Zero calibration of AM 510 is completed.

1133 - Location 1: 0.021 - 0.161. — MTB

1141 - Location 2: 0.015 - 0.292. — MTB

1151 - Location 3: 0.000 - 0.119. — MTB

1159 - Location 4: 0.013 - 0.067. — MTB

1204 - Weather: Wind WSW at 4.0 mph; 58°F; 49%.

1320 - Weather: Wind WSW at 5.4 mph; 59°F; 49%

10/9/14 Joseph Street M. Browning

1335 - Location 1: 0.065 - 0.167. — MTB

1346 - Location 2: 0.000 - 0.138. — MTB

1355 - Location 3: 0.000 - 0.054. — MTB

1412 - Location 4: 0.000 - 0.48108. — MTB

1517 - Weather: Wind WSW at 8.1 mph; 60°F; 49%

1531 - Location 1: 0.002 - 0.077. — MTB

1540 - Location 2: 0.000 - 0.278. — MTB

1549 - Location 3: 0.000 - 0.335. — MTB

1558 - Location 4: 0.000 - 0.655. — MTB

1630 - START Browning collects the air

1700 samples from Locations 1-4. Also,

the ERRS activities from 1130 - 1630

included truck lining and loading,

poly sealing, and tire decomming.

1730 - START Browning leaves the site for

the day after processing the samples.

39 loads left the site. — MTB

Michael Browning  
10/9/14



10/10/14 Joseph Street M. Browning  
 0700 - START Browning arrives onsite. Weather:  
 43°F; Wind at 0 mph. Forecast is for winds  
 out of NNE at 4-9 mph. ——— HTB  
 0700 - Daily activity and H and S briefing  
 0707 takes place. Topics: ① stay aware of your  
 surroundings and ② work carefully in  
 the low-light conditions present early  
 in the morning. ——— HTB

	S Time	S Flow	E Time	E Flow	Total Min
003 H	0750	10.083	1500	10.381	430
004 HTB					
002 H	0825	10.071	1525	10.333	420
001 HTB					
003 H	0815	10.126	1520	10.390	425
002 HTB					
004 H	0805	10.140	1510	10.417	425

1037 - Zero calibration of AM510 completed.  
 1046 - Location 3: 0.022 - 0.091. ——— HTB  
 1056 - Location <sup>HTB</sup>4: 0.015 - 0.120. ——— HTB  
 1105 - Location 1: 0.012 - 0.083. ——— HTB  
 1115 - Location <sup>HTB</sup>4: 0.011 - 0.198. ——— HTB  
 1305 - Weather: Wind calm from north; 64°F; 35%  
 1349 - Location 3: 0.000 - 0.137. ——— HTB  
 1353 <sup>HTB</sup> Location 4: 0.000 - 0.081. ——— HTB  
 1409 - Location 1: 0.000 - 0.077. ——— HTB  
 1421 - Location 2: 0.000 - 0.017. ——— HTB  
 1453 - Weather: Wind NNW at 4 mph; 60°F; 45%

10/10/14 Joseph Street M. Browning  
 1506 Location 3: 0.006 - 0.128. ——— HTB  
 1531 <sup>HTB</sup> 1525 Location 4: 0.007 - 0.879  
 1523 - Location 1: 0.079 - 0.328. ——— HTB  
 1513 - Location 2: 0.022 - 0.347. ——— HTB  
 1457 - Zero calibration of AM510 completed.  
 1615 - Following the collection, preparation,  
 and air monitoring round, as well as  
 preparing the trailer and equipment  
 for the weekend, START Browning  
 leaves the site for the day. The  
 total number of trucks that left the  
 site were 40. ——— HTB

*Michael Browning*  
 10/10/14



10/14/14 Joseph Street M. Browning  
 0700 - START Browning arrives on site. Weather: 68°F, light rain, overcast. — MTB  
 0700 - Daily activity and H and S meeting takes place. Topics: ① slippery conditions due to rain; ② stay hydrated; ③ don't be complacent close to the end of the job.

	S Time	S Flow	E Time	E Flow	Total Min.
001H		10.056	No air	Sampling	Due to
002H		10.153	Inclement	Weather and	
003H		10.171	forecasted	weather for	
004H		10.133	the day.		

0745 Site activities: ① loading and lining of trucks; ② sealing of poly inside the trucks; ③ deconning of the tires of the dump trucks; and ④ dust suppression through the use of the water trucks.  
 0945  
 1030 - Zero calibration of AM510 is completed MTB  
 1036 - Perimeter air monitoring run takes place. Results: 0.024 - 0.091 mg/m<sup>3</sup>. — MTB  
 1048  
 1322 - Weather: Wind out of the SSE at 12.3 mph; 75°F, 51% rh. — MTB  
 1325 - Second air monitoring round takes place.  
 1337 Results: 0.000 - 0.212 mg/m<sup>3</sup>. — MTB  
 — MTB

10/14/14 Joseph Street M. Browning  
 1445 - Due to the high winds, the RM elects to shut the site activities down for the day. — MTB  
 1530 - After working on the site report, START Browning leaves the site for the day. — MTB

*Michael Browning*  
 10/14/14

10/15/14 Joseph Street M. Browning

0700 - START Browning arrives on site. Weather: 53°F; 98% rh, Wind out of SE at 3.8 mph.

0700 - Daily activity and Hand S meeting takes place. Topics: ① beware of working in the darkness; ② be aware of trucks while they are driving on site. — MTB

	S Time	S Flow	E Time	E Flow	Total Min.
001 H	0740	10.056	1530	9.069	470
002 H	0800	10.153	1600	—	480
003 H	0810	5.079	1555	4.752	465
003 HD	0810	5.079	1555	4.752	465
004 H	0750	10.133	1545	9.979	475

0730 - The ERRS workers complete the first round of truck demolition debris removal by lining and loading the trucks, sealing the poly in the trucks, and deconning/washing the truck tires prior to the trucks leaving the site. — MTB

0932 - Pump check + Kes place. All pumps are on and are operating. Also the second round of trucks is currently being lined and loaded. MTB

1032 - Zero calibration of AM510 is completed.

1033 - Weather: Wind SE; 2.7 mph; 59°F; 87% rh.

10/15/14 Joseph Street M. Browning

1042 - Location 1: 0.079 - 0.110. — MTB

1049 - Location 2: 0.058 - 0.109. — MTB

1058 - Location 3: 0.077 - 0.156. — MTB

1107 - Location 4: 0.105 - 0.131. — MTB

1111 - A truck for the third round of trucks for debris arrives on site. — MTB

1326 Zero calibration of AM510 is completed.

1327 - Weather: Wind out of ESE at 7.6 mph; 64°F; 65% rh. — MTB

1343 - Location 1: 0.000 - 0.068. — MTB

1351 - Location 2: 0.000 - 0.053. — MTB

1359 - Location 3: 0.000 - 0.546. — MTB

1409 - Location 4: 0.000 - ~~0.023~~ <sup>0.823</sup>. — MTB

1405 MTB 1605 A fourth round of trucks is currently being lined, loaded and deconned. — MTB

1526 - Weather: Wind out of ESE at 2.0 mph; 63°F; 64% rh. — MTB

1540 - Location 1: 0.020 - 0.123. — MTB

1552 - Location 2: 0.020 - 0.889. — MTB

1643 - Location 3: 0.004 - 0.080. — MTB

1651 - Location 4: 0.003 - 0.102. — MTB

1655 - Note regarding sample collection: The cassette for Sample JS-AS-002 H-101514 was unable to be collected because



10/15/14 Joseph Street M. Browning  
the bottom part of the cassette separated from the top part of the cassette, along with the filter, while initially attempted to collect the cassette. — MTB

1700- After preparing the samples and conducting the final two rounds of air monitoring, START Browning leaves the site for the day. — MTB

*Michael Browning*  
10/15/14

10/16/15 Joseph Street M. Browning  
0700- START Browning arrives on site. Vectors 51°F; wind is calm; 0.0 mph. — MTB  
0700- Daily activity and Hand Sweating takes place. Topics: ① Continue to use Level C, even given that the debris is mostly gone; and ② pay attention to your surroundings. — MTB

	S Time	S Flow	E Time	E Flow	Total Min.	
001H	0740	10.631	1635	9.963	<del>530</del> 535	MTB
002H	0750	10.117	1620	10.085	<del>500</del> 510	MTB
003H	0800	5.066	1610	4.958	490	
003HD	0800	5.066	1610	4.958	490	
004H	0815	10.067	1600	9.945	465	

0730- ERRS begins lining, loading, sealing, and deconning the trucks as they leave the site. — MTB

1058- Zero calibration of the AM510 completed.

1111- MultiRAE Pro peak readings in cistern:  
 $O_2 = 20.9$ ; LEL = 0; CO = 0;  $H_2S = 0.0$ ; and VOC = 10 ppb. — MTB

Water depth = 2 ft, 8 inches. No VOC odors, just a musty odor. — MTB

1125- ERRS RH collects a 4-ounce liquid sample from the cistern for extent of contamination.

*Rite in the Rain*



10/16/14

Joseph Street

M. Browning

~~Dimension~~ Dimensions of cistern, as measured from opening to the cistern: 30 ft to the west; 30 ft to the north; 36 feet to the east, and 6 feet to the south. Height is 8 ft.

- 1149 - Weather: Westwind at 5.4 mph; 58°F, 82%  
 1159 - Location 4: 0.012 - 0.162. — MTB  
 1206 - Location 1: 0.000 - 0.071. — MTB  
 1214 - Location 2: 0.001 - 0.055. — MTB  
 1224 - Location 3: 0.002 - 0.101. — MTB  
 1352 - Weather: Wind out of west at 4.7 mph.  
 63°F; 61%rh. — MTB  
 1430 - Weather: Wind out of the SW; 64°F, 57%.  
 1446 - Location 4: 0.000 - 0.030. — MTB  
 1454 - Location 1: 0.000 - 0.056. — MTB  
 1502 - Location 2: 0.021 - 0.057. — MTB  
 1511 - Location 3: 0.019 - 0.137. — MTB  
 1437 - Zero calibration of the AM510 complete.  
 1600 - Weather: 63°F; wind out of W; — MTB  
 1612 - Zero calibration of AM510 completed.  
 1603 - Location 4: 0.000 - 0.138. — MTB  
 1637 - Location 1: 0.068 - 0.479. — MTB  
 1629 - Location 2: 0.005 - 0.164. — MTB  
 1618 - Location 3: 0.016 - 0.183. — MTB  
 1700 - After completing the collection of the

10/16/14

Joseph Street M. Browning

air samples as well as the last air monitoring run for the day, START Browning leaves the site for the day.

*M. Browning*  
 10/16/14

10/17/14 Joseph Street M. Browning  
0700 - START Browning arrives onsite. Weather:  
53°F; South wind at 16 mph. — MTB

0700 - Daily activity and H and S meeting takes

0707 place. Topics: ① Everything on the concrete  
is still Level C; ② avoid company close to  
the end of debris removal. — MTB

	S Time	S Flow	E Time	E Flow	Total H.in.
001H	0745	10.049	1500	10.130	435
002H	0800	10.153	1510	10.225	430
003H	0810	10.058	1515	10.123	425
004H	0820	10.079	1525	10.118	425

0715 - The first round of trucks are lined,  
0830 loaded, sealed and disconnected prior to  
leaving the site. A group of ERRS  
workers are also continuing to sweep  
and remove smaller pieces of demolition  
debris from the northern side of the  
concrete pad. — MTB

1052 - Zero calibration of the AM 510 complete.

1052 - Weather: Wind out of SSW at 7.2 mph; 58°F;  
72% rh. — MTB

1101 - Location 1: 0.011 - 0.103. — MTB

1111 - Location 2: 0.007 - 0.100. — MTB

1119 - Location 3: 0.006 - 0.063. — MTB

10/17/14 Joseph Street M. Browning

1128 - Location 4: 1.153 (high), 0.005 (low).

1301 - Weather: Wind out of SSE at 8.1 mph; 68°F;  
46%. — MTB

1314 - Location 1: 0.006 - 0.090. — MTB

1323 - Location 2: 0.008 - 0.097. — MTB

1331 - Location 3: 0.007 - 0.137. — MTB

1340 - Location 4: 0.009 - 0.061. — MTB

1350 - Truck loading is currently taking place.

1507 - Location 1: 0.000 - 1.032. — MTB

MB <sup>1514</sup> ~~1507~~ Location 2: 0.005 - 1.285. — MTB

1523 - Location 3: 0.006 - 3.161. — MTB

1532 - Location 4: 0.006 - 0.117. — MTB

1533 - Weather: West at 15.4 mph; 70°F; 33%.

1600 - START Browning leaves the site  
for the day.

*Michael Browning*  
10/17/14



10/20/14 Joseph Street M. Browning

0730 - START Browning arrives on site. Weather:  
Wind out of SSW at 2.7 mph; 47°F; 79%.

0730 - Daily activity and H and S meeting takes

0735 place. Topics: ① wear PPE properly;  
pay attention to your activities.

	S Time	S Flow	E Time	E Flow	Total Min
001H	0805	10.038	1505	10.178	420
002H	0815	10.034	1510	10.208	415
003H	0825	10.043	1515	<del>10.208</del>	410
004H	0835	10.080	1520	9.964	405

0750 - ERRS crew workers begin using shovels,  
1030 brooms, and the skid-steer brush to  
to pick up / consolidate the small building  
debris still located on the concrete pad.1120 - Weather: Wind out of SW at 4.3 mph; 54°F;  
71% rh. ——— MTB

1123 - Zero calibration of AM 510 completed.

1134 - Location 1: 0.014 - 0.082. ——— MTB

1144 - Location 2: 0.013 - 0.280. ——— MTB

1152 - Location 3: 0.012 - 0.062. ——— MTB

1203 - Location 4: 0.013 - 0.443. ——— MTB

1352 - Weather: SSW wind at 3.4 mph; 59°F; 57% rh.

1404 - Location 1: 0.012 - 0.060. ——— MTB

1413 - Location 2: 0.009 - 1.206. ——— MTB

10/20/14 Joseph Street M. Browning

1421 - Location 3: 0.008 - 0.076. ——— MTB

1439 - Location 4: 0.012 - 1.337. ——— MTB

Note: During the monitoring of Location  
4, a light to moderate, but steady,  
rain was falling. ——— MTB1440 - Continued shovelling, sweeping, and  
brushing of the concrete pad is  
taking place. ——— MTB1600 - START Browning leaves the site  
after recalibrating the air samples  
from Locations 1, 2, and 4. Note:  
The cassette for Sample JS-AS-003H-  
102014 was unable to be recalibrated  
because the bottom part of the  
cassette separated from the top part  
of the cassette, along with the filter,  
while initially removing the pump  
from the START vehicle. ——— MTB

Loads/day for the week ending 10/17/14.

10/14/14 = 31 loads ——— MTB

10/15/14 = 40 loads ——— MTB

10/16/14 = 8 loads 10 loads ——— MTB

10/17/14 = 8 loads ——— MTB

————— MTB



10/21/14 Joseph Street M. Browning  
 0730 - START arrives on site. Weather: Wind out of NW at 4.7 mph; 49°F; 98% rh. — MTB  
 0730 - Daily activity and Hand S meeting takes place. Topics: ① be aware of the location of the heavy equipment; ② stay hydrated; ③ be aware of weather. — MTB

	S Time	S Flow	E Time	E Flow	Tot. Min
001H	0805	10.066	1625	10.218	500
002H	0815	10.035	1630	10.126	495
003H	0830	10.076	1635	10.211	485
004H	0840	10.072	1645	10.134	485

0745 - ERRS workers continue the task of sweeping, shoveling, and brushing the remaining building debris into piles and using the water trucks for dust control. — MTB

1045 - Weather: Wind out of the WNW at 8.5 mph; 48°F; 93% rh. — MTB

1047 - Zero calibration of the AM510 completed.

1057 - Location 4: 0.004 - 0.252. — MTB

1108 - Location 1: 0.000 - 0.110. — MTB

1148 - Location 2: 0.000 - 0.064. — MTB

1156 - Location 3: 0.000 - 0.037. — MTB

Note: During the air monitoring of Locations

10/21/14 Joseph Street M. Browning  
 2 and 3, a light, but steady, rain was falling. Also, the ERRS crew is continuing to consolidate the remaining debris into a central pile for eventual disposal. — MTB

~~1113H~~ 1130 - Weather: Wind out of NW at 10.7 mph; 49°F; 92% rh. — MTB

1354 - Location 1: 0.007 - 0.082. — MTB

1407 - Location 2: 0.000 - 0.056. — MTB

1415 - Location 3: 0.000 - 0.031. — MTB

1425 - Location 4: 0.000 - 1.669. — MTB

1430 - ERRS workers are shoveling, brushing, and consolidating the remaining demolition debris into piles for eventual disposal. — MTB

1435 - An ERRS worker/operator begins using the hoe ram attachment to begin the demolition of the "safe" building located at the north side of the site. — MTB

1540 - Weather: NNW wind at 8.5 mph; 48°F; 75% rh. — MTB

1649 - Loc. 4: 0.001 - 0.043; Loc. 1: 0.003 - 0.054; — MTB

1617 - Loc. 2: 0.003 - 0.133; Loc. 3: 0.005 - 0.086.

1715 - START Browning leaves the site for the day. — MTB

10/22/14 Joseph Street M. Browning

0730- START Browning arrives on site. Weather: Wind out of NNW at 4.9 mph; 43°F. MTB

0730- Daily activity and Hand Sweeping takes place. Topics: ① be careful about the location of heavy equipment; and ② stay hydrated. MTB

004 MTB 004H	S Time	S Flow	E Time	E Flow	Total Min.
002H	0810	10.136	1600	10.676	470
003H	0835	10.135	1625	10.488	470
003HD	0825	5.091	1645	5.037	500
001 004H	0825	5.091	1645	5.037	500
004H	0840	10.021	1630	10.286	460

0858- Freshair calibration of the MultiRAE takes place. All parameters passed:  $O_2 = 20.9$ , all others 0 or 0.0. MTB0910- VOC reading in trench = 0;  $O_2 = 20.9$ ; LEL,  $H_2S$ , and CO = 0. MTB0915- ERRS RM and ERRS worker enter trench. Only odors are rusty and musty smells. MTB  
27 feet from north edge of trench opening to north end of trench; 6 feet wide.

0927- ERRS RM and ERRS worker leave the trench.

1029- An ERRS operator begins a hoe ram to remove the concrete over the trench. Also,

10/22/14 Joseph Street M. Browning

debris consolidation and dust suppression is taking place. MTB

1059- Zero calibration of AM510 completed.

1100- Weather: Wind out of NNE at 15.4 mph;

1111- 48°F; 81% rh. MTB

Location 4: 0.011-0.173. MTB

1120- Location 1: 0.006-0.145. MTB

1129- Location 2: 0.010-0.130. MTB

1137- Location 3: 0.006-0.080. MTB

1429- Weather: Wind out of NNW at 4.9 mph; 49°F; 75% rh. MTB

1440- Location 4: 0.015-0.092. MTB

1450- Location 1: 0.009-0.108. MTB

1459- Location 2: 0.010-0.060. MTB

1507- Location 3: 0.000-0.090. MTB

1550- Weather: NNW wind; 49°F; 76% rh. MTB

1604- Location 4: 0.016-0.944. MTB

1616- Location 1: 0.000-0.130. MTB

1624- Location 2: 0.008-0.080. MTB

1649- Location 3: 0.035-0.147. MTB

1730- After preparing the samples, START Browning leaves the site for the day.

Michael J. Browning  
10/22/14

Rite in the Rain



10/23/14 Joseph Street M. Browning

0730- START Browning arrives on site. Weather: Dense fog; 37°F; 98% rh. no wind. — MTB

0734- Daily activity and Hand Meeting ends. Topics: ① watch your surroundings while your working; and ② slips, trips, and falls. — MTB

	S Time	S Flow	E Time	E Flow	Total Min.
001H	0810	10.115	1620	10.233	490
002H	0820	10.056	1625	10.180	485
003H	0830	5.063	1630	5.172	480
003HD	0830	5.063	1630	5.172	480
004H	0840	10.083	1635	10.240	475

0745- Activities: ① continued brushing, shoveling and consolidation of remaining debris into the main pile; ② dust suppression; ③ placement of the overpacked drums into a truck for offsite disposal at PennOhio. — MTB

1030- Weather: No wind; 45°F; 98% rh. — MTB

1130- Zero calibration of AM510 completed.

1137- Location 4: 0.058 - 0.267. — MTB

1146- Location 1: 0.033 - 0.098. — MTB

1155- Location 2: 0.056 - 0.273. — MTB

1205- Location 3: 0.017 - 0.123. — MTB

10/23/14 Joseph Street M. Browning

1330- Weather: Wind out of the WNW at 3.6 mph; 56°F; 53% rh. — MTB

1334- Zero calibration of AM510 completed.

1343- Location 4: 0.012 - 0.379. — MTB

1352- Location 1: 0.010 - 0.080. — MTB

1402- Location 2: 0.000 - 0.072. — MTB

1413- Location 3: 0.008 - 0.140. — MTB

1516- Weather: Wind out of NNW at 5.8 mph;

1519- 61°F; 38% rh. — MTB

→ Location 4: 0.011 - 0.055. — MTB

1536- Location 1: 0.004 - 0.178. — MTB

1547- Location 2: 0.006 - 0.100. — MTB

1556- Location 3: 0.009 - 0.254. — MTB

1538- Activities: ① weed-wacking of grass along the NE corner of site; ② trash pickup along northern perimeter grassy area; use of the floor sweeper; and ④ dust suppression. — MTB

1745- START Browning leaves the site after preparing the samples for shipment and the trailer for the weekend. — MTB

Michael Browning  
10/23/14

Rite in the Rain



## **APPENDIX C**

### **TABLES**

**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
3	Northern Perimeter	Downwind	09/04/14	460	0.023	0.555
3	Northern Perimeter	Downwind	09/05/14	13	0.000	0.061
4	Northern Perimeter	Crosswind	09/08/14	5	0.000	0.029
2	Southern Perimeter	Crosswind	09/08/14	5	0.000	0.088
1	Eastern Perimeter	Upwind	09/08/14	5	0.000	0.008
3	Western Perimeter	Downwind	09/08/14	5	0.000	0.008
3	Southern Perimeter	Upwind	09/09/14	5	0.017	0.050
2	Eastern Perimeter	Crosswind	09/09/14	5	0.017	0.048
1	Northern Perimeter	Downwind	09/09/14	5	0.024	0.058
4	Western Perimeter	Crosswind	09/09/14	5	0.020	0.058
3	Southern Perimeter	Upwind	09/09/14	5	0.024	0.040
2	Eastern Perimeter	Crosswind	09/09/14	5	0.027	0.071
1	Northern Perimeter	Downwind	09/09/14	5	0.034	0.068
4	Western Perimeter	Crosswind	09/09/14	5	0.031	0.057
1	Southern Perimeter	Upwind	09/10/14	5	0.022	0.050
2	Eastern Perimeter	Crosswind	09/10/14	5	0.027	0.034
3	Northern Perimeter	Downwind	09/10/14	5	0.021	0.062
4	Western Perimeter	Crosswind	09/10/14	5	0.023	0.057
3	Southern Perimeter	Downwind	09/11/14	5	0.019	0.038
2	Eastern Perimeter	Crosswind	09/11/14	5	0.008	0.011
1	Northern Perimeter	Upwind	09/11/14	5	0.003	0.013
4	Western Perimeter	Crosswind	09/11/14	5	0.006	0.017
3	Southern Perimeter	Downwind	09/11/14	5	0.016	0.217
2	Eastern Perimeter	Crosswind	09/11/14	5	0.019	0.081
1	Northern Perimeter	Upwind	09/11/14	5	0.012	0.020
4	Western Perimeter	Crosswind	09/11/14	5	0.013	0.054
3	Southern Perimeter	Downwind	09/11/14	5	0.014	0.048
2	Eastern Perimeter	Crosswind	09/11/14	5	0.017	0.032
1	Northern Perimeter	Upwind	09/11/14	5	0.013	0.041
4	Western Perimeter	Crosswind	09/11/14	5	0.019	0.048
3	Southern Perimeter	Downwind	09/12/14	5	0.028	0.090
2	Eastern Perimeter	Crosswind	09/12/14	5	0.010	0.072
1	Northern Perimeter	Upwind	09/12/14	5	0.010	0.041
4	Western Perimeter	Crosswind	09/12/14	5	0.011	0.084
3	Southern Perimeter	Downwind	09/12/14	5	0.017	0.030
2	Eastern Perimeter	Crosswind	09/12/14	5	0.023	0.045
1	Northern Perimeter	Upwind	09/12/14	5	0.025	0.048
4	Western Perimeter	Crosswind	09/12/14	5	0.023	0.035
2	Southeastern Corner	Crosswind	09/15/14	5	0.018	0.054
3	Western Perimeter	Downwind	09/15/14	5	0.017	0.042
4	Northern Perimeter	Crosswind	09/15/14	5	0.015	0.067
1	Eastern Perimeter	Upwind	09/15/14	5	0.015	0.057
2	Southeastern Corner	Crosswind	09/15/14	5	0.015	0.046
1	Eastern Perimeter	Upwind	09/15/14	5	0.016	0.047
4	Northern Perimeter	Crosswind	09/15/14	5	0.025	0.056
3	Western Perimeter	Downwind	09/15/14	5	0.017	0.122
2	Southeastern Corner	Crosswind	09/15/14	5	0.014	0.070
3	Western Perimeter	Downwind	09/15/14	5	0.016	0.112

**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
4	Northern Perimeter	Crosswind	09/15/14	5	0.021	0.158
1	Eastern Perimeter	Upwind	09/15/14	5	0.022	0.033
3	Southern Perimeter	Downwind	09/16/14	5	0.016	0.054
4	Western Perimeter	Crosswind	09/16/14	5	0.012	0.078
1	Northern Perimeter	Upwind	09/16/14	5	0.014	0.072
2	Eastern Perimeter	Crosswind	09/16/14	5	0.014	0.115
3	Southern Perimeter	Downwind	09/16/14	5	0.009	0.037
4	Western Perimeter	Crosswind	09/16/14	5	0.009	0.073
1	Northern Perimeter	Upwind	09/16/14	5	0.012	0.052
2	Eastern Perimeter	Crosswind	09/16/14	5	0.007	0.027
2	Southern Perimeter	Crosswind	09/17/14	5	0.017	0.113
3	Western Perimeter	Downwind	09/17/14	5	0.016	0.084
4	Northern Perimeter	Crosswind	09/17/14	5	0.017	0.237
1	Eastern Perimeter	Upwind	09/17/14	5	0.016	0.077
2	Southern Perimeter	Crosswind	09/17/14	5	0.010	0.037
3	Western Perimeter	Downwind	09/17/14	5	0.011	0.043
4	Northern Perimeter	Crosswind	09/17/14	5	0.011	0.037
1	Eastern Perimeter	Upwind	09/17/14	5	0.012	0.039
2	Southern Perimeter	Crosswind	09/17/14	5	0.006	0.040
3	Western Perimeter	Downwind	09/17/14	5	0.005	0.066
4	Northern Perimeter	Crosswind	09/17/14	5	0.010	0.030
1	Eastern Perimeter	Upwind	09/17/14	5	0.012	0.033
1	Western Perimeter	Upwind	09/18/14	5	0.025	0.201
2	Northern Perimeter	Crosswind	09/18/14	5	0.024	0.112
3	Eastern Perimeter	Downwind	09/18/14	5	0.024	0.086
4	Southern Perimeter	Crosswind	09/18/14	5	0.016	0.076
1	Western Perimeter	Upwind	09/18/14	5	0.010	0.040
2	Northern Perimeter	Crosswind	09/18/14	5	0.012	0.059
3	Eastern Perimeter	Downwind	09/18/14	5	0.012	0.055
4	Southern Perimeter	Crosswind	09/18/14	5	0.019	0.044
4	Northern Perimeter	Crosswind	09/19/14	5	0.013	0.078
1	Eastern Perimeter	Upwind	09/19/14	5	0.015	0.096
3	Western Perimeter	Downwind	09/19/14	5	0.014	0.071
2	Southern Perimeter	Crosswind	09/19/14	5	0.018	0.067
2	Southern Perimeter	Crosswind	09/19/14	5	0.013	0.042
3	Western Perimeter	Downwind	09/19/14	5	0.013	0.374
4	Northern Perimeter	Crosswind	09/19/14	5	0.015	0.413
1	Eastern Perimeter	Upwind	09/19/14	5	0.013	0.157
4	Southern Perimeter	Crosswind	09/22/14	5	0.002	0.158
1	Northwestern Corner	Upwind	09/22/14	5	0.000	0.658
2	Northern Perimeter	Crosswind	09/22/14	5	0.000	0.120
3	Southeastern Corner	Downwind	09/22/14	5	0.000	0.024
3	Southeastern Corner	Downwind	09/22/14	5	0.000	0.778
2	Northern Perimeter	Crosswind	09/22/14	5	0.000	0.089
1	Northwestern Corner	Upwind	09/22/14	5	0.001	0.356
4	Southern Perimeter	Crosswind	09/22/14	5	0.000	0.036
4	Southern Perimeter	Crosswind	09/22/14	5	0.002	0.185
1	Northwestern Corner	Upwind	09/22/14	5	0.002	0.291



**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
2	Northern Perimeter	Crosswind	09/22/14	5	0.001	0.036
3	Southeastern Corner	Downwind	09/22/14	5	0.002	0.298
2	Southern Perimeter	Crosswind	09/23/14	5	0.003	0.064
3	Western Perimeter	Downwind	09/23/14	5	0.008	0.117
4	Northern Perimeter	Crosswind	09/23/14	5	0.000	0.224
1	Eastern Perimeter	Upwind	09/23/14	5	0.013	0.139
2	Southern Perimeter	Crosswind	09/23/14	5	0.006	0.050
3	Western Perimeter	Downwind	09/23/14	5	0.008	0.080
4	Northern Perimeter	Crosswind	09/23/14	5	0.011	0.070
1	Eastern Perimeter	Upwind	09/23/14	5	0.012	0.062
2	Southern Perimeter	Crosswind	09/23/14	5	0.006	0.057
3	Western Perimeter	Downwind	09/23/14	5	0.009	0.071
4	Northern Perimeter	Crosswind	09/23/14	5	0.011	0.078
1	Eastern Perimeter	Upwind	09/23/14	5	0.012	0.068
2	Southern Perimeter	Crosswind	09/24/14	5	0.007	0.057
3	Western Perimeter	Downwind	09/24/14	5	0.009	0.072
4	Northern Perimeter	Crosswind	09/24/14	5	0.013	0.046
1	Eastern Perimeter	Upwind	09/24/14	5	0.014	0.082
2	Southern Perimeter	Crosswind	09/24/14	5	0.007	0.202
3	Western Perimeter	Downwind	09/24/14	5	0.011	0.086
4	Northern Perimeter	Crosswind	09/24/14	5	0.016	0.071
1	Eastern Perimeter	Upwind	09/24/14	5	0.000	0.058
2	Southern Perimeter	Crosswind	09/24/14	5	0.007	0.052
3	Western Perimeter	Downwind	09/24/14	5	0.011	0.584
4	Northern Perimeter	Crosswind	09/24/14	5	0.046	0.432
1	Eastern Perimeter	Upwind	09/24/14	5	0.027	0.664
2	Southwestern Corner	Crosswind	09/25/14	5	0.007	0.082
3	Northwestern Corner	Downwind	09/25/14	5	0.011	0.142
4	Northeastern Corner	Crosswind	09/25/14	5	0.022	0.100
1	Southeastern Corner	Upwind	09/25/14	5	0.025	0.169
2	Southwestern Corner	Crosswind	09/25/14	5	0.000	0.039
3	Northwestern Corner	Downwind	09/25/14	5	0.014	0.079
4	Northeastern Corner	Crosswind	09/25/14	5	0.023	0.134
1	Southeastern Corner	Upwind	09/25/14	5	0.029	0.050
2	Southwestern Corner	Crosswind	09/25/14	5	0.053	0.246
3	Northwestern Corner	Downwind	09/25/14	5	0.056	0.105
4	Northeastern Corner	Crosswind	09/25/14	5	0.047	0.448
1	Southeastern Corner	Upwind	09/25/14	5	0.037	0.080
2	Southern Perimeter	Crosswind	09/26/14	5	0.007	0.140
3	Western Perimeter	Downwind	09/26/14	5	0.014	0.254
4	Northern Perimeter	Crosswind	09/26/14	5	0.019	0.069
1	Eastern Perimeter	Upwind	09/26/14	5	0.019	0.133
2	Southern Perimeter	Crosswind	09/26/14	5	0.010	0.658
3	Western Perimeter	Downwind	09/26/14	5	0.015	0.052
4	Northern Perimeter	Crosswind	09/26/14	5	0.000	0.423
1	Eastern Perimeter	Upwind	09/26/14	5	0.025	0.105
2	Southern Perimeter	Crosswind	09/26/14	5	0.006	0.077
3	Western Perimeter	Downwind	09/26/14	5	0.015	0.116

**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
4	Northern Perimeter	Crosswind	09/26/14	5	0.022	0.070
1	Eastern Perimeter	Upwind	09/26/14	5	0.010	0.047
4	Southern Perimeter	Crosswind	09/29/14	5	0.014	0.129
1	Northwestern Corner	Upwind	09/29/14	5	0.014	1.031
2	Northern Perimeter	Crosswind	09/29/14	5	0.018	0.120
3	Southeastern Corner	Downwind	09/29/14	5	0.022	0.176
4	Southern Perimeter	Crosswind	09/29/14	5	0.014	0.639
1	Northwestern Corner	Upwind	09/29/14	5	0.000	0.237
2	Northern Perimeter	Crosswind	09/29/14	5	0.027	0.116
3	Southeastern Corner	Downwind	09/29/14	5	0.038	0.100
4	Southern Perimeter	Crosswind	09/29/14	5	0.029	0.246
1	Northwestern Corner	Upwind	09/29/14	5	0.033	0.943
2	Northern Perimeter	Crosswind	09/29/14	5	0.039	8.780
3	Southeastern Corner	Downwind	09/29/14	5	0.044	0.296
3	Southwestern Corner	Downwind	10/01/14	5	0.000	0.117
2	Eastern Perimeter	Crosswind	10/01/14	5	0.000	0.085
1	Northeastern Corner	Upwind	10/01/14	5	0.035	0.165
4	Northwestern Corner	Crosswind	10/01/14	5	0.016	0.208
3	Southwestern Corner	Downwind	10/01/14	5	0.007	0.061
4	Northwestern Corner	Crosswind	10/01/14	5	0.000	0.547
1	Northeastern Corner	Upwind	10/01/14	5	0.000	0.232
2	Eastern Perimeter	Crosswind	10/01/14	5	0.000	0.547
2	Southwestern Corner	Crosswind	10/02/14	5	0.007	0.336
3	Northwestern Corner	Downwind	10/02/14	5	0.016	0.124
4	Northeastern Corner	Crosswind	10/02/14	5	0.018	0.209
1	Southeastern Corner	Upwind	10/02/14	5	0.021	0.553
2	Southwestern Corner	Crosswind	10/02/14	5	0.028	0.104
3	Northwestern Corner	Downwind	10/02/14	5	0.037	0.173
4	Northeastern Corner	Crosswind	10/02/14	5	0.000	0.190
1	Southeastern Corner	Upwind	10/02/14	5	0.047	0.148
2	Southwestern Corner	Crosswind	10/02/14	5	0.029	0.589
3	Northwestern Corner	Downwind	10/02/14	5	0.029	0.324
4	Northeastern Corner	Crosswind	10/02/14	5	0.034	0.143
1	Southeastern Corner	Upwind	10/02/14	5	0.036	0.225
1	Southern Perimeter	Upwind	10/06/14	5	0.011	0.182
2	Western Perimeter	Crosswind	10/06/14	5	0.011	0.086
3	Northern Perimeter	Downwind	10/06/14	5	0.010	0.071
4	Eastern Perimeter	Crosswind	10/06/14	5	0.010	0.125
1	Southern Perimeter	Upwind	10/06/14	5	0.006	0.049
2	Western Perimeter	Crosswind	10/06/14	5	0.004	0.066
3	Northern Perimeter	Downwind	10/06/14	5	0.003	0.056
4	Eastern Perimeter	Crosswind	10/06/14	5	0.001	0.049
1	Southern Perimeter	Upwind	10/06/14	5	0.029	0.087
2	Western Perimeter	Crosswind	10/06/14	5	0.000	0.035
3	Northern Perimeter	Downwind	10/06/14	5	0.000	0.050
4	Eastern Perimeter	Crosswind	10/06/14	5	0.001	0.081
1	Southern Perimeter	Upwind	10/07/14	5	0.014	0.108
2	Western Perimeter	Crosswind	10/07/14	5	0.014	0.149

**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
3	Northern Perimeter	Downwind	10/07/14	5	0.015	0.069
4	Eastern Perimeter	Crosswind	10/07/14	5	0.016	0.180
1	Southern Perimeter	Upwind	10/07/14	5	0.009	0.081
2	Western Perimeter	Crosswind	10/07/14	5	0.002	0.044
3	Northern Perimeter	Downwind	10/07/14	5	0.000	0.041
4	Eastern Perimeter	Crosswind	10/07/14	5	0.008	0.086
4	Southern Perimeter	Crosswind	10/08/14	5	0.004	0.053
1	Western Perimeter	Upwind	10/08/14	5	0.003	0.092
2	Northern Perimeter	Crosswind	10/08/14	5	0.004	0.584
3	Eastern Perimeter	Downwind	10/08/14	5	0.004	0.563
4	Southern Perimeter	Crosswind	10/08/14	5	0.000	0.168
3	Eastern Perimeter	Downwind	10/08/14	5	0.006	0.063
2	Northern Perimeter	Crosswind	10/08/14	5	0.007	0.043
1	Western Perimeter	Upwind	10/08/14	5	0.007	0.061
4	Southern Perimeter	Crosswind	10/08/14	5	0.091	0.140
3	Eastern Perimeter	Downwind	10/08/14	5	0.108	0.722
2	Northern Perimeter	Crosswind	10/08/14	5	0.108	0.307
1	Western Perimeter	Upwind	10/08/14	5	0.107	0.254
1	Southwestern Corner	Upwind	10/09/14	5	0.021	0.161
2	Northern Perimeter	Crosswind	10/09/14	5	0.015	0.292
3	Northeastern Corner	Downwind	10/09/14	5	0.000	0.119
4	Southern Perimeter	Crosswind	10/09/14	5	0.013	0.067
1	Southwestern Corner	Upwind	10/09/14	5	0.065	0.167
2	Northern Perimeter	Crosswind	10/09/14	5	0.000	0.138
3	Northeastern Corner	Downwind	10/09/14	5	0.000	0.054
4	Southern Perimeter	Crosswind	10/09/14	5	0.000	0.108
1	Southwestern Corner	Upwind	10/09/14	5	0.002	0.077
2	Northern Perimeter	Crosswind	10/09/14	5	0.000	0.278
3	Northeastern Corner	Downwind	10/09/14	5	0.000	0.335
4	Southern Perimeter	Crosswind	10/09/14	5	0.000	0.655
3	Southwestern Corner	Downwind	10/10/14	5	0.022	0.091
4	Northern Perimeter	Crosswind	10/10/14	5	0.015	0.120
1	Northeastern Corner	Upwind	10/10/14	5	0.012	0.083
2	Southern Perimeter	Crosswind	10/10/14	5	0.011	0.198
3	Southwestern Corner	Downwind	10/10/14	5	0.000	0.137
4	Northern Perimeter	Crosswind	10/10/14	5	0.000	0.081
1	Northeastern Corner	Upwind	10/10/14	5	0.000	0.077
2	Southern Perimeter	Crosswind	10/10/14	5	0.000	0.017
3	Southwestern Corner	Downwind	10/10/14	5	0.006	0.128
4	Northern Perimeter	Crosswind	10/10/14	5	0.007	0.879
1	Northeastern Corner	Upwind	10/10/14	5	0.079	0.328
2	Southern Perimeter	Crosswind	10/10/14	5	0.022	0.347
1	Southern Perimeter	Upwind	10/15/14	5	0.079	0.110
2	Western Perimeter	Crosswind	10/15/14	5	0.058	0.109
3	Northern Perimeter	Downwind	10/15/14	5	0.077	0.156
4	Eastern Perimeter	Crosswind	10/15/14	5	0.105	0.131
1	Southern Perimeter	Upwind	10/15/14	5	0.000	0.068
2	Western Perimeter	Crosswind	10/15/14	5	0.000	0.053



**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
3	Northern Perimeter	Downwind	10/15/14	5	0.000	0.546
4	Eastern Perimeter	Crosswind	10/15/14	5	0.000	0.023
1	Southern Perimeter	Upwind	10/15/14	5	0.020	0.123
2	Western Perimeter	Crosswind	10/15/14	5	0.020	0.889
3	Northern Perimeter	Downwind	10/15/14	5	0.004	0.080
4	Eastern Perimeter	Crosswind	10/15/14	5	0.003	0.102
4	Southern Perimeter	Crosswind	10/16/14	5	0.012	0.162
1	Western Perimeter	Upwind	10/16/14	5	0.000	0.071
2	Northern Perimeter	Crosswind	10/16/14	5	0.001	0.055
3	Eastern Perimeter	Downwind	10/16/14	5	0.002	0.101
4	Southern Perimeter	Crosswind	10/16/14	5	0.000	0.030
1	Western Perimeter	Upwind	10/16/14	5	0.000	0.056
2	Northern Perimeter	Crosswind	10/16/14	5	0.021	0.057
3	Eastern Perimeter	Downwind	10/16/14	5	0.019	0.137
4	Southern Perimeter	Crosswind	10/16/14	5	0.000	0.138
1	Western Perimeter	Upwind	10/16/14	5	0.068	0.479
2	Northern Perimeter	Crosswind	10/16/14	5	0.005	0.164
3	Eastern Perimeter	Downwind	10/16/14	5	0.016	0.183
1	Southwestern Corner	Upwind	10/17/14	5	0.011	0.103
2	Northern Perimeter	Crosswind	10/17/14	5	0.007	0.100
3	Northeastern Corner	Downwind	10/17/14	5	0.006	0.063
4	Southern Perimeter	Crosswind	10/17/14	5	0.005	1.153
1	Southwestern Corner	Upwind	10/17/14	5	0.006	0.090
2	Northern Perimeter	Crosswind	10/17/14	5	0.008	0.097
3	Northeastern Corner	Downwind	10/17/14	5	0.007	0.137
4	Southern Perimeter	Crosswind	10/17/14	5	0.009	0.061
1	Southwestern Corner	Upwind	10/17/14	5	0.000	1.032
2	Northern Perimeter	Crosswind	10/17/14	5	0.005	1.285
3	Northeastern Corner	Downwind	10/17/14	5	0.006	3.161
4	Southern Perimeter	Crosswind	10/17/14	5	0.006	0.117
1	Southwestern Corner	Upwind	10/20/14	5	0.014	0.082
2	Northern Perimeter	Crosswind	10/20/14	5	0.013	0.280
3	Northeastern Corner	Downwind	10/20/14	5	0.012	0.062
4	Southern Perimeter	Crosswind	10/20/14	5	0.013	0.443
1	Southwestern Corner	Upwind	10/20/14	5	0.012	0.060
2	Northern Perimeter	Crosswind	10/20/14	5	0.009	1.206
3	Northeastern Corner	Downwind	10/20/14	5	0.008	0.076
4	Southern Perimeter	Crosswind	10/20/14	5	0.012	1.337
4	Southern Perimeter	Crosswind	10/21/14	5	0.004	0.252
1	Northwestern Corner	Upwind	10/21/14	5	0.000	0.110
2	Northern Perimeter	Crosswind	10/21/14	5	0.000	0.064
3	Eastern Perimeter	Downwind	10/21/14	5	0.000	0.037
1	Northwestern Corner	Upwind	10/21/14	5	0.007	0.082
2	Northern Perimeter	Crosswind	10/21/14	5	0.000	0.056
3	Eastern Perimeter	Downwind	10/21/14	5	0.000	0.031
4	Southern Perimeter	Crosswind	10/21/14	5	0.000	1.669
4	Southern Perimeter	Crosswind	10/21/14	5	0.001	0.043
1	Northwestern Corner	Upwind	10/21/14	5	0.003	0.540

**Table 1**  
**Perimeter Air Monitoring Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

<b>Air Monitoring/Air Sampling Location</b>	<b>Location Relative to Site Perimeter</b>	<b>Wind Direction (Upwind, Crosswind, Downwind)</b>	<b>Date</b>	<b>Duration (Minutes)</b>	<b>Minimum Reading (mg/m<sup>3</sup>)</b>	<b>Maximum Reading (mg/m<sup>3</sup>)</b>
2	Northern Perimeter	Crosswind	10/21/14	5	0.003	0.133
3	Eastern Perimeter	Downwind	10/21/14	5	0.005	0.086
4	Western Perimeter	Crosswind	10/22/14	5	0.011	0.173
1	Northern Perimeter	Upwind	10/22/14	5	0.006	0.145
2	Eastern Perimeter	Crosswind	10/22/14	5	0.010	0.130
3	Southern Perimeter	Downwind	10/22/14	5	0.006	0.080
4	Western Perimeter	Crosswind	10/22/14	5	0.015	0.092
1	Northern Perimeter	Upwind	10/22/14	5	0.009	0.108
2	Eastern Perimeter	Crosswind	10/22/14	5	0.010	0.060
3	Southern Perimeter	Downwind	10/22/14	5	0.000	0.090
4	Western Perimeter	Crosswind	10/22/14	5	0.016	0.944
1	Northern Perimeter	Upwind	10/22/14	5	0.000	0.130
2	Eastern Perimeter	Crosswind	10/22/14	5	0.008	0.080
3	Southern Perimeter	Downwind	10/22/14	5	0.035	0.147
4	Southwestern Corner	Crosswind	10/23/14	5	0.058	0.267
1	Northern Perimeter	Upwind	10/23/14	5	0.033	0.098
2	Northeastern Corner	Crosswind	10/23/14	5	0.056	0.273
3	Southern Perimeter	Downwind	10/23/14	5	0.017	0.123
4	Southwestern Corner	Crosswind	10/23/14	5	0.012	0.379
1	Northern Perimeter	Upwind	10/23/14	5	0.010	0.080
2	Northeastern Corner	Crosswind	10/23/14	5	0.000	0.072
3	Southern Perimeter	Downwind	10/23/14	5	0.008	0.140
4	Southwestern Corner	Crosswind	10/23/14	5	0.011	0.055
1	Northern Perimeter	Upwind	10/23/14	5	0.004	0.178
2	Northeastern Corner	Crosswind	10/23/14	5	0.006	0.100
3	Southern Perimeter	Downwind	10/23/14	5	0.009	0.254

mg/m<sup>3</sup> = milligrams per cubic meter

**Table 2**  
**Summary of Perimeter Air Sampling Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

Sample ID	Collection Date	Wind Direction	Wind Speed (mph)	Sample Location	Start Time	Stop Time	Total Time (min.)	Initial Flow Rate (L/min)	End Flow Rate (L/min)	Average Flow Rate (L/min) <sup>a</sup>	Volume (L)	Fibers (PCM)	Fibers/mm <sup>2</sup> (PCM)	Fiber Conc. (f/cc) (PCM)	Non-Asbestos Fibers (TEM) <sup>b</sup>	Asbestos Fibers (TEM)	Asbestos % of Total (TEM)
JS-AS-001H-090414	09/04/14	N	8	Upwind	0845	1645	480	10.040	9.950	9.995	4,797.60	<5.5	<7.01	<0.001	2	0	0
JS-AS-002H-090414	09/04/14	N	8	Crosswind	0900	1700	480	10.050	10.580	10.315	4,951.20	<5.5	<7.01	<0.001	5	0	0
JS-AS-003H-090414	09/04/14	N	8	Downwind	0915	1715	480	10.080	12.630	11.355	5,450.40	<5.5	<7.01	<0.0005	3	0	0
JS-AS-004H-090414	09/04/14	N	8	Crosswind	0925	1725	480	10.080	9.970	10.025	4,812.00	7.5	9.55	0.001	4	1	20
JS-AS-001H-090514	09/05/14	N	5	Upwind	0825	1625	480	10.050	11.560	10.805	5,186.40	7	8.92	0.001	5	0	0
JS-AS-002H-090514	09/05/14	N	5	Crosswind	0835	1635	480	10.090	10.040	10.065	4,831.20	<5.5	<7.01	<0.001	1	0	0
JS-AS-003H-090514	09/05/14	N	5	Downwind	0850	1650	480	10.040	8.990	9.515	4,567.20	<5.5	<7.01	<0.001	0	0	0
JS-AS-004H-090514	09/05/14	N	5	Crosswind	0900	1652	472	10.060	10.030	10.045	4,741.24	8	10.2	0.001	1	0	0
JS-AS-001H-090814	09/08/14	E	7 - 8	Upwind	0900	1704	478	9.979	9.918	9.948	4,755.14	8.5	10.8	0.001	1	0	0
JS-AS-002H-090814	09/08/14	E	7 - 8	Crosswind	0906	1700	480	9.607	9.342	9.474	4,547.52	5.5	7.01	0.001	0	0	0
JS-AS-003H-090814	09/08/14	E	7 - 8	Downwind	0835	1711	515	10.256	9.979	10.117	5,210.26	<5.5	<7.01	<0.001	0	0	0
JS-AS-004H-090814	09/08/14	E	7 - 8	Crosswind	0851	1709	496	9.897	9.641	9.769	4,845.42	<5.5	<7.01	<0.001	0	0	0
JS-AS-001H-090914	09/09/14	S/SE	10	Upwind	0855	1645	470	9.772	9.153	9.463	4,447.38	<5.5	<7.01	<0.001	0	0	0
JS-AS-002H-090914	09/09/14	S/SE	10	Crosswind	0850	1641	472	9.780	9.330	9.555	4,509.96	6	7.64	0.001	0	0	0
JS-AS-003H-090914	09/09/14	S/SE	10	Downwind	0843	1638	473	10.372	9.954	10.163	4,807.10	<5.5	<7.01	<0.001	0	0	0
JS-AS-004H-090914	09/09/14	S/SE	10	Crosswind	0835	1647	490	9.843	9.373	9.608	4,707.92	<5.5	<7.01	<0.001	0	0	0
JS-AS-001H-091014	09/10/14	S	10 - 20	Upwind	0835	1328	288	10.375	9.318	9.847	2,835.79	<5.5	<7.01	<0.001	0	0	0
JS-AS-002H-091014	09/10/14	S	10 - 20	Crosswind	0850	1334	287	9.884	10.262	10.073	2,890.95	5.5	7.01	0.001	0	0	0
JS-AS-003H-091014	09/10/14	S	10 - 20	Downwind	0843	1337	286	10.308	10.425	10.367	2,964.82	<5.5	<7.01	<0.001	0	0	0
JS-AS-004H-091014	09/10/14	S	10 - 20	Crosswind	0855	1340	286	9.881	10.379	10.130	2,897.18	6	7.64	0.001	0	0	0
JS-AS-001H-091114	09/11/14	NW	12	Upwind	0852	1644	470	10.195	10.660	10.428	4,900.93	<5.5	<7.01	<0.001	0	0	0
JS-AS-002H-091114	09/11/14	NW	12	Crosswind	0847	1638	470	10.228	10.213	10.221	4,803.64	<5.5	<7.01	<0.001	0	0	0
JS-AS-003H-091114	09/11/14	NW	12	Downwind	0843	1634	470	10.227	10.227	10.227	4,806.69	<5.5	<7.01	<0.001	0	0	0
JS-AS-004H-091114	09/11/14	NW	12	Crosswind	0855	1646	470	10.379	10.320	10.350	4,864.27	<5.5	<7.01	<0.001	0	0	0
JS-AS-001H-091214	09/12/14	N/NE	5 -15	Upwind	0840	1518	400	10.380	9.189	9.785	3,913.80	13	16.6	0.002	0	0	0
JS-AS-002H-091214	09/12/14	N/NE	5 -15	Crosswind	0835	1516	400	10.300	10.054	10.177	4,070.80	18	22.9	0.002	0	0	0
JS-AS-003H-091214	09/12/14	N/NE	5 -15	Downwind	0830	1514	400	9.943	9.916	9.930	3,971.80	11	14	0.001	0	0	0
JS-AS-004H-091214	09/12/14	N/NE	5 -15	Crosswind	0845	1521	400	10.313	10.674	10.494	4,197.40	12	15.3	0.001	2	0	0
JS-AS-001H-091514	09/15/14	SE	2.5	Upwind	0840	1703	503	10.681	15.540	13.111	6,594.58	11	14	0.001	1	0	0
JS-AS-002H-091514	09/15/14	SE	2.5	Crosswind	0836	1646	490	10.182	10.162	10.172	4,984.28	17	21.7	0.002	0	0	0
JS-AS-003H-091514	09/15/14	SE	2.5	Downwind	0850	1640	470	10.226	10.248	10.237	4,811.39	6	7.64	0.001	1	0	0
JS-AS-004H-091514	09/15/14	SE	2.5	Crosswind	0844	1658	494	10.023	10.018	10.021	4,950.13	8.5	10.8	0.001	2	0	0
JS-AS-001H-091614	09/16/14	N	8	Upwind	0800	1725	565	10.096	10.083	10.090	5,700.57	16.2	20.6	0.001	1	0	0
JS-AS-002H-091614	09/16/14	N	8	Crosswind	0810	1730	560	10.107	10.158	10.133	5,674.20	<5.5	<7.01	<0.0005	1	0	0
JS-AS-003H-091614	09/16/14	N	8	Downwind	0825	1710	525	5.596	5.595	5.596	2,937.64	<5.5	<7.01	<0.001	0	0	0
JS-AS-003H-091614-D	09/16/14	N	8	Downwind	0825	1710	525	5.596	5.595	5.596	2,937.64	7.2	9.17	0.001	1	0	0
JS-AS-004H-091614	09/16/14	N	8	Crossword	0745	1700	555	10.185	10.167	10.167	5,642.69	7.8	9.94	0.001	2	0	0
JS-AS-001H-091714	09/17/14	E	2 - 7	Upwind	0820	1615	475	10.030	10.100	10.065	4,780.88	10.8	13.8	0.001	1	0	0
JS-AS-002H-091714	09/17/14	E	2 - 7	Crosswind	0800	1610	490	10.092	10.128	10.110	4,953.90	7.8	9.94	0.001	2	0	0
JS-AS-003H-091714	09/17/14	E	2 - 7	Downwind	0750	1600	490	10.369	9.567	9.968	4,884.32	<5.5	<7.01	<0.001	1	0	0
JS-AS-004H-091714	09/17/14	E	2 - 7	Crosswind	0810	1630	500	10.069	10.032	10.051	5,025.25	<5.5	<7.01	<0.001	1	0	0
JS-AS-001H-091814	09/18/14	W	3 - 14	Upwind	0740	1600	500	10.042	9.607	9.825	4,912.25	<5.5	<7.01	0.001	2	0	0
JS-AS-002H-091814	09/18/14	W	3 - 14	Crosswind	0755	1615	500	10.138	10.018	10.078	5,039.00	<5.5	<7.01	0.001	2	0	0
JS-AS-003H-091814	09/18/14	W	3 - 14	Downwind	0805	1625	500	10.117	10.009	10.063	5,031.50	<5.5	<7.01	0.001	1	0	0
JS-AS-004H-091814	09/18/14	W	3 - 14	Crosswind	0820	1635	495	10.041	9.948	9.995	4,947.28	<5.5	<7.01	0.001	2	0	0
JS-AS-001H-091914	09/19/14	E/NE	3 - 9	Upwind	0820	1555	455	10.153	10.181	10.167	4,625.99	<5.5	<7.01	0.001	2	0	0
JS-AS-002H-091914	09/19/14	E/NE	3 - 9	Crosswind	0835	1610	455	10.059	10.002	10.031	4,563.88	<5.5	<7.01	0.001	1	0	0
JS-AS-003H-091914	09/19/14	E/NE	3 - 9	Downwind	0745	1535	470	10.041	9.833	9.937	4,670.39	<5.5	<7.01	0.001	4	0	0
JS-AS-004H-091914	09/19/14	E/NE	3 - 9	Crosswind	0815	1545	450	10.039	10.099	10.069	4,531.05	<5.5	<7.01	0.001	0	0	0
JS-AS-001H-092214	09/22/14	NW	13	Upwind	0730	1655	565	10.143	10.241	10.192	5758.48	12.5	15.9	0.0005	NA	NA	NA
JS-AS-002H-092214	09/22/14	NW	13	Crosswind	0745	1705	560	10.169	10.218	10.194	5708.36	<5.5	<7.01	0.0005	NA	NA	NA
JS-AS-003H-092214	09/22/14	NW	13	Downwind	0805	1715	550	10.144	10.178	10.161	5588.55	<5.5	<7.01	0.0005	NA	NA	NA
JS-AS-004H-092214	09/22/14	NW	13	Crosswind	0755	1725	570	10.195	10.276	10.236	5834.24	10.5	13.4	0.0005	NA	NA	NA
JS-AS-003H-092314	09/23/14	E	2 - 7	Upwind	0830	1655	505	4.976	4.139	4.558	2,301.54	<5.5	<7.01	<0.001	NA	NA	NA



Table 2  
Summary of Perimeter Air Sampling Results  
Joseph Street Asbestos Removal Site  
Marion, Marion County, Ohio

Sample ID	Collection Date	Wind Direction	Wind Speed (mph)	Sample Location	Start Time	Stop Time	Total Time (min.)	Initial Flow Rate (L/min)	End Flow Rate (L/min)	Average Flow Rate (L/min) <sup>a</sup>	Volume (L)	Fibers (PCM)	Fibers/mm <sup>2</sup> (PCM)	Fiber Conc. (f/cc) (PCM)	Non-Asbestos Fibers (TEM) <sup>b</sup>	Asbestos Fibers (TEM)	Asbestos % of Total (TEM)
JS-AS-003H-092314-D	09/23/14	E	2 - 7	Crosswind	0830	1655	505	4.976	4.139	4.558	2,301.54	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-092514	09/25/14	E	2 - 7	Downwind	0735	1655	560	5.092	4.564	4.828	2,703.68	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-092514-D	09/25/14	E	2 - 7	Crosswind	0735	1655	560	5.092	4.564	4.828	2,703.68	8	10.2	0.001	NA	NA	NA
JS-AS-001H-100114	10/01/14	NE	0 - 10	Upwind	0725	1715	590	10.046	10.001	10.024	5,913.87	<5.5	<7.01	<0.0005	NA	NA	NA
JS-AS-002H-100114	10/01/14	NE	0 - 10	Crosswind	0730	1710	580	10.015	9.958	9.987	5,792.17	<5.5	<7.01	<0.0005	NA	NA	NA
JS-AS-003H-100114	10/01/14	NE	0 - 10	Downwind	0750	1705	555	10.025	9.995	10.010	5,555.55	<5.5	<7.01	<0.0005	NA	NA	NA
JS-AS-004H-100114	10/01/14	NE	0 - 10	Crosswind	0740	1720	580	10.191	10.081	10.136	5,878.88	11	14	0.001	NA	NA	NA
JS-AS-001H-100814	10/08/14	W	11 - 18	Upwind	0740	1710	570	10.039	9.956	9.998	5,698.58	13.2	16.8	0.001	NA	NA	NA
JS-AS-002H-100814	10/08/14	W	11 - 18	Crosswind	0750	1700	550	10.107	10.049	10.078	5,542.90	10.8	13.8	0.001	NA	NA	NA
JS-AS-003H-100814	10/08/14	W	11 - 18	Downwind	0800	1650	530	4.992	4.213	4.603	2,439.33	9.8	12.5	0.002	NA	NA	NA
JS-AS-003H-100814-D	10/08/14	W	11 - 18	Downwind	0800	1650	530	4.992	4.213	4.603	2,439.33	6.8	8.66	0.001	NA	NA	NA
JS-AS-004H-100814	10/08/14	W	11 - 18	Upwind	0810	1640	510	10.146	10.095	10.121	5,161.46	16.8	21.4	0.002	NA	NA	NA
JS-AS-003H-100914	10/09/14	W/SW	9	Downwind	0830	1650	500	5.127	5.250	5.189	2,594.25	11.8	15	0.002	NA	NA	NA
JS-AS-003H-100914-D	10/09/14	S/SW	9	Downwind	0830	1650	500	5.127	5.250	5.189	2,594.25	6.8	8.66	0.001	NA	NA	NA
JS-AS-003H-101514	10/15/14	S	7 - 12	Downwind	0800	1610	490	5.066	4.958	5.012	2,455.88	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-101514-D	10/15/14	S	7 - 12	Downwind	0800	1610	490	5.066	4.958	5.012	2,455.88	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-101614	10/16/14	W	3 - 12	Downwind	0810	1555	465	5.079	4.752	4.916	2,285.71	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-101614-D	10/16/14	W	3 - 12	Downwind	0810	1555	465	5.079	4.752	4.916	2,285.71	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-001H-101714	10/17/14	SW	13	Upwind	0745	1500	435	10.049	10.130	10.090	4,388.93	11.5	14.6	0.001	NA	NA	NA
JS-AS-002H-101714	10/17/14	SW	13	Crosswind	0800	1510	430	10.153	10.225	10.189	4,381.27	11	14	0.001	NA	NA	NA
JS-AS-003H-101714	10/17/14	SW	13	Downwind	0810	1515	425	10.058	10.123	10.091	4,288.46	6	7.64	0.001	NA	NA	NA
JS-AS-004H-101714	10/17/14	SW	13	Crosswind	0820	1525	425	10.079	10.118	10.099	4,291.86	10	12.7	0.001	NA	NA	NA
JS-AS-001H-102314	10/23/14	N/NW	3 - 8	Upwind	0810	1620	490	10.115	10.233	10.174	4985.26	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-002H-102314	10/23/14	N/NW	3 - 8	Crosswind	8020	1625	485	10.056	10.180	10.118	4907.23	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-102314	10/23/14	N/NW	3 - 8	Downwind	0830	1630	480	5.063	5.172	5.118	2456.40	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-003H-102314-D	10/23/14	N/NW	3 - 8	Downwind	0830	1630	480	5.063	5.172	5.118	2456.40	<5.5	<7.01	<0.001	NA	NA	NA
JS-AS-004H-102314	10/23/14	N/NW	3 - 8	Crosswind	0840	1635	475	10.083	10.240	10.162	4826.71	<5.5	<7.01	<0.001	NA	NA	NA

Notes:

(a) Field duplicate samples were collected by attaching two filter cassettes to the same sampling pump using a Y-splitter. The total flow rate for the pump was divided by two to estimate the air volume for each of the two duplicate samples.

(b) The samples collected from 9/22/14 through 10/23/14 were analyzed only by PCM analysis because the fibers/cc result for each sample were below 0.005 fibers/cc.

mph = miles per hour

min = minutes

L/min = liters per minute

L = liters

f/cc = fibers per cubic centimeter

PCM = Phase Contrast Microscopy

TEM = Transmission Electron Microscopy

NA = Not Analyzed

**Table 3**  
**Summary of Activity Based Air Sampling Results**  
**Joseph Street Asbestos Removal Site**  
**Marion, Marion County, Ohio**

Sample ID	Collection Date	Wind Direction	Wind Speed (mph)	Sample Location	Start Time	Stop Time	Total Time (min.)	Initial Flow Rate (L/min)	End Flow Rate (L/min)	Average Flow Rate (L/min)	Volume (L)	Asbestos Fibers (PCM Equivalent Structures)	Asbestos Fibers (Total TEM Structures)
JS-ABS-001H-100114	10/01/14	NE	0 - 10	Upwind	1005	1053	48	10.931	10.931	10.931	524.69	1	1
JS-ABS-002H-100114	10/01/14	NE	0 - 10	Upwind	1005	1205	120	11.004	11.004	11.004	1320.48	0	0

Note:

(1) The fiber detected in Sample JS-ABS-001H-100114 was identified as Tremolite.

mph = miles per hour

min. = minutes

L/min. = liters per minute

L = liters

f/cc = fibers per cubic centimeter

PCM = Particle Contrast Microscopy

TEM = Transmission Electron Microscopy

Table 4  
Summary of Polychlorinated Biphenyl Soil Sampling Results  
Joseph Street Asbestos Removal Site  
Marion, Marion County, Ohio

Parameter	Sample ID	JS-PCB-01-091614	JS-PCB-01-091614-D	JS-PCB-02-091614	JS-PCB-03-091614	JS-PCB-04-100814	JS-PCB-04-100814-D	JS-PCB-05-100814
	Collection Date	09/16/14	09/16/14	09/16/14	09/16/14	10/08/14	10/08/14	10/08/14
	Collection Time	0945	0945	1013	1027	1122	1122	1127
	Sample Depth	0 - 6 inches	0 - 6 inches	0 - 6 inches	0 - 6 inches	2 feet	2 feet	3 feet
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Location	Tranformer Pad #1	Tranformer Pad #1	Tranformer Pad #2	Tranformer Pad #3	Tranformer Pad #1	Tranformer Pad #1	Tranformer Pad #1
	Action level (µg/Kg-dry)	Analytical Result (µg/Kg-dry)	Analytical Result (µg/Kg-dry)	Analytical Result (µg/Kg-dry)	Analytical Result (µg/Kg-dry)	Analytical Result (µg/Kg-dry)	Analytical Result (µg/Kg-dry)	Analytical Result (µg/Kg-dry)
Polychlorinated Biphenyls (PCBs)								
Aroclor 1016	NA	ND	ND	ND	ND	ND	ND	ND
Aroclor 1221	NA	ND	ND	ND	ND	ND	ND	ND
Aroclor 1232	NA	ND	ND	ND	ND	ND	ND	ND
Aroclor 1242	NA	ND	ND	ND	ND	ND	ND	ND
Aroclor 1248	NA	ND	ND	ND	ND	ND	ND	ND
Aroclor 1254	NA	ND	ND	ND	380	ND	ND	ND
Aroclor 1260	NA	940 J	1600 J	ND	260	ND	ND	ND
PCBs, Total	50,000	940 J	1600 J	ND	640	ND	ND	ND

Notes:  
µg/Kg-dry = micrograms per kilograms dry weight  
NA = Not applicable  
ND = Not detected  
J = Results qualified as estimated due to high relative percent difference for field duplicate samples



Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212, PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
1	9/15/14	9/15/14	2019077	934048	Dump Trailer	19.99	24.6	\$535.05	\$450.00	\$985.05	\$985.05	148988
2	9/15/14	9/15/14	2019078	934050	Dump Trailer	19.99	27.05	\$588.35	\$450.00	\$1,038.35	\$2,023.40	148988
3	9/15/14	9/15/14	2019079	934052	Dump Trailer	19.99	27.82	\$605.10	\$450.00	\$1,055.10	\$3,078.50	148988
4	9/15/14	9/15/14	2019080	934056	Dump Trailer	19.99	26.37	\$573.56	\$450.00	\$1,023.56	\$4,102.06	148988
5	9/15/14	9/15/14	2019081	934058	Dump Trailer	19.99	26.63	\$579.20	\$450.00	\$1,029.20	\$5,131.26	148988
6	9/15/14	9/15/14	2019082	934084	Dump Trailer	19.99	21.38	\$465.02	\$450.00	\$915.02	\$6,046.28	148988
7	9/15/14	9/15/14	2019083	934061	Dump Trailer	19.99	19.57	\$425.65	\$450.00	\$875.65	\$6,921.93	148988
8	9/15/14	9/15/14	2019084	934062	Dump Trailer	19.99	22.43	\$487.85	\$450.00	\$937.85	\$7,859.78	148988
9	9/15/14	9/15/14	2019085	934070	Dump Trailer	19.99	17.76	\$386.28	\$450.00	\$836.28	\$8,696.06	148988
10	9/15/14	9/15/14	2019086	934071	Dump Trailer	19.99	20.34	\$442.40	\$450.00	\$892.40	\$9,588.45	148988
11	9/15/14	9/15/14	2019087	934077	Dump Trailer	19.99	19.03	\$413.90	\$450.00	\$863.90	\$10,452.36	148988
12	9/15/14	9/15/14	2019088	934075	Dump Trailer	19.99	18.28	\$397.59	\$450.00	\$847.59	\$11,299.95	148988
13	9/15/14	9/15/14	2019089	934080	Dump Trailer	19.99	20.85	\$453.49	\$450.00	\$903.49	\$12,203.43	148988
14	9/15/14	9/15/14	2019090	934085	Dump Trailer	19.99	21.93	\$476.98	\$450.00	\$926.98	\$13,130.41	148988
15	9/15/14	9/15/14	2019091	934087	Dump Trailer	19.99	18.68	\$406.29	\$450.00	\$856.29	\$13,986.70	148988
16	9/15/14	9/15/14	2019092	934086	Dump Trailer	19.99	21.29	\$463.06	\$450.00	\$913.06	\$14,899.76	148988
17	9/15/14	9/15/14	2019093	934095	Dump Trailer	19.99	17.53	\$381.28	\$450.00	\$831.28	\$15,731.04	148988
18	9/15/14	9/15/14	2019094	934096	Dump Trailer	19.99	17.19	\$373.88	\$450.00	\$823.88	\$16,554.92	148988
19	9/15/14	9/15/14	2019095	934099	Dump Trailer	19.99	14.75	\$320.81	\$450.00	\$770.81	\$17,325.73	148988
20	9/15/14	9/15/14	2019096	934100	Dump Trailer	19.99	17.26	\$375.41	\$450.00	\$825.41	\$18,151.14	148988
21	9/15/14	9/15/14	2019097	934104	Dump Trailer	19.99	18.34	\$398.90	\$450.00	\$848.90	\$19,000.03	148988
22	9/15/14	9/15/14	2019098	934108	Dump Trailer	19.99	15.18	\$330.17	\$450.00	\$780.17	\$19,780.20	148988
23	9/15/14	9/15/14	2019099	934114	Dump Trailer	19.99	18.21	\$396.07	\$450.00	\$846.07	\$20,626.26	148988
24	9/15/14	9/15/14	2019100	934115	Dump Trailer	19.99	20.14	\$438.05	\$450.00	\$888.05	\$21,514.31	148988
25	9/15/14	9/15/14	2019101	934117	Dump Trailer	19.99	19.11	\$415.64	\$450.00	\$865.64	\$22,379.95	148988
26	9/15/14	9/15/14	2019102	934118	Dump Trailer	19.99	15.8	\$343.65	\$450.00	\$793.65	\$23,173.60	148988
27	9/15/14	9/15/14	2019103	934119	Dump Trailer	19.99	14.8	\$321.90	\$450.00	\$771.90	\$23,945.50	148988
28	9/15/14	9/15/14	2019104	934120	Dump Trailer	19.99	16.2	\$352.35	\$450.00	\$802.35	\$24,747.85	148988
29	9/15/14	9/15/14	2019105	934121	Dump Trailer	19.99	20.6	\$448.05	\$450.00	\$898.05	\$25,645.90	148988
30	9/15/14	9/16/14	2019106	934125	Dump Trailer	19.99	23.75	\$516.56	\$450.00	\$966.56	\$26,612.46	149353
31	9/15/14	9/16/14	2019107	934124	Dump Trailer	19.99	20.07	\$436.52	\$450.00	\$886.52	\$27,498.99	149353
32	9/15/14	9/16/14	2019108	934140	Dump Trailer	19.99	16.62	\$361.49	\$450.00	\$811.49	\$28,310.47	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					32	32	639.56	\$13,910.47	\$14,400.00	\$28,310.47	\$28,310.47	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
33	9/16/14	9/16/14	2019109	934139	Dump Trailer	17.24	16.35	\$355.61	\$450.00	\$805.61	\$29,116.08	149353
34	9/16/14	9/16/14	2019110	934142	Dump Trailer	17.24	14.78	\$321.47	\$450.00	\$771.47	\$29,887.55	149353
35	9/16/14	9/16/14	2019111	934145	Dump Trailer	17.24	16.29	\$354.31	\$450.00	\$804.31	\$30,691.86	149353
36	9/16/14	9/16/14	2019112	934144	Dump Trailer	17.24	12.13	\$263.83	\$450.00	\$713.83	\$31,405.68	149353
37	9/16/14	9/16/14	2019113	934149	Dump Trailer	17.24	13.25	\$288.19	\$450.00	\$738.19	\$32,143.87	149353
38	9/16/14	9/16/14	2019114	934151	Dump Trailer	17.24	13.83	\$300.80	\$450.00	\$750.80	\$32,894.67	149353
39	9/16/14	9/16/14	2019115	934155	Dump Trailer	17.24	13.55	\$294.71	\$450.00	\$744.71	\$33,639.39	149353
40	9/16/14	9/16/14	2019116	934152	Dump Trailer	17.24	12.22	\$265.79	\$450.00	\$715.79	\$34,355.17	149353
41	9/16/14	9/16/14	2019117	934157	Dump Trailer	17.24	15.3	\$332.78	\$450.00	\$782.78	\$35,137.95	149353
42	9/16/14	9/16/14	2019118	934166	Dump Trailer	17.24	12.83	\$279.05	\$450.00	\$729.05	\$35,867.00	149353
43	9/16/14	9/16/14	2019119	934167	Dump Trailer	17.24	13	\$282.75	\$450.00	\$732.75	\$36,599.75	149353
44	9/16/14	9/16/14	2019120	934168	Dump Trailer	17.24	12.33	\$268.18	\$450.00	\$718.18	\$37,317.93	149353
45	9/16/14	9/16/14	2019121	934169	Dump Trailer	17.24	12.89	\$280.36	\$450.00	\$730.36	\$38,048.28	149353
46	9/16/14	9/16/14	2019122	934172	Dump Trailer	17.24	13.35	\$290.36	\$450.00	\$740.36	\$38,788.65	149353
47	9/16/14	9/16/14	2019123	934173	Dump Trailer	17.24	11.6	\$252.30	\$450.00	\$702.30	\$39,490.95	149353
48	9/16/14	9/16/14	2019124	934180	Dump Trailer	17.24	10.5	\$228.38	\$450.00	\$678.38	\$40,169.32	149353
49	9/16/14	9/16/14	2019125	934174	Dump Trailer	17.24	17.29	\$376.06	\$450.00	\$826.06	\$40,995.38	149353
50	9/16/14	9/16/14	2019126	934178	Dump Trailer	17.24	14.73	\$320.38	\$450.00	\$770.38	\$41,765.76	149353
51	9/16/14	9/16/14	2019127	934186	Dump Trailer	17.24	12.02	\$261.44	\$450.00	\$711.44	\$42,477.19	149353
52	9/16/14	9/16/14	2019128	934185	Dump Trailer	17.24	17.37	\$377.80	\$450.00	\$827.80	\$43,304.99	149353
53	9/16/14	9/16/14	2019129	934187	Dump Trailer	17.24	18.09	\$393.46	\$450.00	\$843.46	\$44,148.45	149353
54	9/16/14	9/16/14	2019130	934189	Dump Trailer	17.24	16.35	\$355.61	\$450.00	\$805.61	\$44,954.06	149353
55	9/16/14	9/16/14	2019131	934188	Dump Trailer	17.24	19.39	\$421.73	\$450.00	\$871.73	\$45,825.79	149353
56	9/16/14	9/16/14	2019132	934193	Dump Trailer	17.24	17.23	\$374.75	\$450.00	\$824.75	\$46,650.54	149353
57	9/16/14	9/16/14	2019133	934196	Dump Trailer	17.24	22.38	\$486.77	\$450.00	\$936.77	\$47,587.31	149353
58	9/16/14	9/16/14	2019134	934201	Dump Trailer	17.24	19.73	\$429.13	\$450.00	\$879.13	\$48,466.44	149353
59	9/16/14	9/16/14	2019135	934202	Dump Trailer	17.24	18.27	\$397.37	\$450.00	\$847.37	\$49,313.81	149353
60	9/16/14	9/16/14	2019136	934205	Dump Trailer	17.24	21.32	\$463.71	\$450.00	\$913.71	\$50,227.52	149353
61	9/16/14	9/16/14	2019137	934215	Dump Trailer	17.24	17.75	\$386.06	\$450.00	\$836.06	\$51,063.58	149353
62	9/16/14	9/16/14	2019138	934224	Dump Trailer	17.24	18.44	\$401.07	\$450.00	\$851.07	\$51,914.65	149353
63	9/16/14	9/16/14	2019139	934223	Dump Trailer	17.24	20.58	\$447.62	\$450.00	\$897.62	\$52,812.27	149353
64	9/16/14	9/16/14	2019140	934216	Dump Trailer	17.24	21.51	\$467.84	\$450.00	\$917.84	\$53,730.11	149353
65	9/16/14	9/16/14	2019141	934218	Dump Trailer	17.24	20.82	\$452.84	\$450.00	\$902.84	\$54,632.94	149353
66	9/16/14	9/16/14	2019142	934220	Dump Trailer	17.24	22.79	\$495.68	\$450.00	\$945.68	\$55,578.63	149353
67	9/16/14	9/16/14	2019143	934225	Dump Trailer	17.24	19.38	\$421.52	\$450.00	\$871.52	\$56,450.14	149353
68	9/16/14	9/16/14	2019144	934233	Dump Trailer	17.24	21.28	\$462.84	\$450.00	\$912.84	\$57,362.98	149353
69	9/16/14	9/16/14	2019145	934232	Dump Trailer	17.24	20.63	\$448.70	\$450.00	\$898.70	\$58,261.68	149353
70	9/16/14	9/16/14	2019146	934234	Dump Trailer	17.24	25.47	\$553.97	\$450.00	\$1,003.97	\$59,265.66	149353
71	9/16/14	9/16/14	2019147	934235	Dump Trailer	17.24	21.86	\$475.46	\$450.00	\$925.46	\$60,191.11	149353
72	9/16/14	9/17/14	2019148	934244	Dump Trailer	17.24	23.11	\$502.64	\$450.00	\$952.64	\$61,143.75	149353
73	9/16/14	9/17/14	2019149	934245	Dump Trailer	17.24	24.83	\$540.05	\$450.00	\$990.05	\$62,133.81	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					41	73	706.82	\$15,373.34	\$18,450.00	\$33,823.34	\$62,133.81	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
74	9/22/14	9/22/14	2019150	934520	Dump Trailer	15.72	14.52	\$315.81	\$450.00	\$765.81	\$62,899.62	149353
75	9/22/14	9/22/14	2019151	934521	Dump Trailer	15.72	18.58	\$404.12	\$450.00	\$854.12	\$63,753.73	149353
76	9/22/14	9/22/14	2019152	934528	Dump Trailer	15.72	17.66	\$384.11	\$450.00	\$834.11	\$64,587.84	149353
77	9/22/14	9/22/14	2019153	934525	Dump Trailer	15.72	19.69	\$428.26	\$450.00	\$878.26	\$65,466.09	149353
78	9/22/14	9/22/14	2019154	934530	Dump Trailer	15.72	20.00	\$435.00	\$450.00	\$885.00	\$66,351.09	149353
79	9/22/14	9/22/14	2019155	934529	Dump Trailer	15.72	15.66	\$340.61	\$450.00	\$790.61	\$67,141.70	149353
80	9/22/14	9/22/14	2019156	934533	Dump Trailer	15.72	16.09	\$349.96	\$450.00	\$799.96	\$67,941.66	149353
81	9/22/14	9/22/14	2019157	934534	Dump Trailer	15.72	15.61	\$339.52	\$450.00	\$789.52	\$68,731.17	149353
82	9/22/14	9/22/14	2019158	934552	Dump Trailer	15.72	16.05	\$349.09	\$450.00	\$799.09	\$69,530.26	149353
83	9/22/14	9/22/14	2019159	934554	Dump Trailer	15.72	21.48	\$467.19	\$450.00	\$917.19	\$70,447.45	149353
84	9/22/14	9/22/14	2019160	934555	Dump Trailer	15.72	18.34	\$398.90	\$450.00	\$848.90	\$71,296.35	149353
85	9/22/14	9/22/14	2019161	934556	Dump Trailer	15.72	19.70	\$428.48	\$450.00	\$878.48	\$72,174.82	149353
86	9/22/14	9/22/14	2019162	934557	Dump Trailer	15.72	20.39	\$443.48	\$450.00	\$893.48	\$73,068.30	149353
87	9/22/14	9/22/14	2019163	934559	Dump Trailer	15.72	17.70	\$384.98	\$450.00	\$834.98	\$73,903.28	149353
88	9/22/14	9/22/14	2019164	934560	Dump Trailer	15.72	19.57	\$425.65	\$450.00	\$875.65	\$74,778.93	149353
89	9/22/14	9/22/14	2019165	934561	Dump Trailer	15.72	16.81	\$365.62	\$450.00	\$815.62	\$75,594.54	149353
90	9/22/14	9/22/14	2019166	934575	Dump Trailer	15.72	23.37	\$508.30	\$450.00	\$958.30	\$76,552.84	149353
91	9/22/14	9/22/14	2019167	934577	Dump Trailer	15.72	22.94	\$498.95	\$450.00	\$948.95	\$77,501.79	149353
92	9/22/14	9/22/14	2019168	934579	Dump Trailer	15.72	13.34	\$290.15	\$450.00	\$740.15	\$78,241.93	149353
93	9/22/14	9/22/14	2019169	934580	Dump Trailer	15.72	8.03	\$174.65	\$450.00	\$624.65	\$78,866.58	149353
94	9/22/14	9/22/14	2019170	934583	Dump Trailer	15.72	20.85	\$453.49	\$450.00	\$903.49	\$79,770.07	149353
95	9/22/14	9/22/14	2019171	934589	Dump Trailer	15.72	7.11	\$154.64	\$450.00	\$604.64	\$80,374.71	149353
96	9/22/14	9/22/14	2019172	934586	Dump Trailer	15.72	20.23	\$440.00	\$450.00	\$890.00	\$81,264.72	149353
97	9/22/14	9/22/14	2019173	934591	Dump Trailer	15.72	20.17	\$438.70	\$450.00	\$888.70	\$82,153.41	149353
98	9/22/14	9/22/14	2019174	934601	Dump Trailer	15.72	21.52	\$468.06	\$450.00	\$918.06	\$83,071.47	149353
99	9/22/14	9/22/14	2019175	934605	Dump Trailer	15.72	21.42	\$465.89	\$450.00	\$915.89	\$83,987.36	149353
100	9/22/14	9/22/14	2019176	934607	Dump Trailer	15.72	6.96	\$151.38	\$450.00	\$601.38	\$84,588.74	149353
101	9/22/14	9/22/14	2019177	934608	Dump Trailer	15.72	27.08	\$588.99	\$450.00	\$1,038.99	\$85,627.73	149353
102	9/22/14	9/22/14	2019178	934609	Dump Trailer	15.72	10.51	\$228.59	\$450.00	\$678.59	\$86,306.32	149353
103	9/22/14	9/22/14	2019179	934616	Dump Trailer	15.72	16.81	\$365.62	\$450.00	\$815.62	\$87,121.94	149353
104	9/22/14	9/22/14	2019180	934614	Dump Trailer	15.72	14.53	\$316.03	\$450.00	\$766.03	\$87,887.97	149353
105	9/22/14	9/22/14	2019181	934624	Dump Trailer	15.72	10.43	\$226.85	\$450.00	\$676.85	\$88,564.82	149353
106	9/22/14	9/22/14	2019182	934929	Dump Trailer	15.72	10.62	\$230.99	\$450.00	\$680.99	\$89,245.80	149353
107	9/22/14	9/23/14	2019183	934632	Dump Trailer	15.72	13.14	\$285.80	\$450.00	\$735.80	\$89,981.60	149353
108	9/22/14	9/22/14	2019184	934630	Dump Trailer	15.72	5.23	\$113.75	\$450.00	\$563.75	\$90,545.35	149353
109	9/22/14	9/23/14	2019185	934636	Dump Trailer	15.72	4.93	\$107.65	\$450.00	\$557.65	\$91,103.00	149353
110	9/22/14	9/23/14	2019186	934633	Dump Trailer	15.72	5.56	\$120.93	\$450.00	\$570.93	\$91,673.93	149353
111	9/22/14	9/23/14	2019187	934634	Dump Trailer	15.72	14.85	\$322.99	\$450.00	\$772.99	\$92,446.92	149353
112	9/22/14	9/23/14	2019188	934635	Dump Trailer	15.72	5.67	\$123.32	\$450.00	\$573.32	\$93,020.24	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					39	112	613.15	\$13,336.44	\$17,550.00	\$30,886.44	\$93,020.24	



Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
113	9/23/14	9/23/14	2019189	934647	Dump Trailer	12.16	6.10	\$132.68	\$450.00	\$582.68	\$93,602.92	149353
114	9/23/14	9/23/14	2019190	934560	Dump Trailer	12.16	13.93	\$302.98	\$450.00	\$752.98	\$94,355.89	149353
115	9/23/14	9/23/14	2019191	934652	Dump Trailer	12.16	6.49	\$141.16	\$450.00	\$591.16	\$94,947.05	149353
116	9/23/14	9/23/14	2019192	934654	Dump Trailer	12.16	13.41	\$291.67	\$450.00	\$741.67	\$95,688.72	149353
117	9/23/14	9/23/14	2019193	934656	Dump Trailer	12.16	12.96	\$281.88	\$450.00	\$731.88	\$96,420.60	149353
118	9/23/14	9/23/14	2019194	934660	Dump Trailer	12.16	9.90	\$215.33	\$450.00	\$665.33	\$97,085.92	149353
119	9/23/14	9/23/14	2019195	934661	Dump Trailer	12.16	7.96	\$173.13	\$450.00	\$623.13	\$97,709.05	149353
120	9/23/14	9/23/14	2019196	934662	Dump Trailer	12.16	10.42	\$226.64	\$450.00	\$676.64	\$98,385.69	149353
121	9/23/14	9/23/14	2019197	934664	Dump Trailer	12.16	12.19	\$265.13	\$450.00	\$715.13	\$99,100.82	149353
122	9/23/14	9/23/14	2019198	934670	Dump Trailer	12.16	12.00	\$261.00	\$450.00	\$711.00	\$99,811.82	149353
123	9/23/14	9/23/14	2019199	934674	Dump Trailer	12.16	9.46	\$205.76	\$450.00	\$655.76	\$100,467.58	149353
124	9/23/14	9/23/14	2019200	934676	Dump Trailer	12.16	12.06	\$262.31	\$450.00	\$712.31	\$101,179.88	149353
125	9/23/14	9/23/14	2019201	934677	Dump Trailer	12.16	16.70	\$363.23	\$450.00	\$813.23	\$101,993.11	149353
126	9/23/14	9/23/14	2019202	934678	Dump Trailer	12.16	16.02	\$348.44	\$450.00	\$798.44	\$102,791.54	149353
127	9/23/14	9/23/14	2019203	934683	Dump Trailer	12.16	14.56	\$316.68	\$450.00	\$766.68	\$103,558.22	149353
128	9/23/14	9/23/14	2019204	934686	Dump Trailer	12.16	13.05	\$283.84	\$450.00	\$733.84	\$104,292.06	149353
129	9/23/14	9/23/14	2019205	934688	Dump Trailer	12.16	17.70	\$384.98	\$450.00	\$834.98	\$105,127.03	149353
130	9/23/14	9/23/14	2019206	934689	Dump Trailer	12.16	13.53	\$294.28	\$450.00	\$744.28	\$105,871.31	149353
131	9/23/14	9/23/14	2019207	934691	Dump Trailer	12.16	16.23	\$353.00	\$450.00	\$803.00	\$106,674.31	149353
132	9/23/14	9/23/14	2019208	934695	Dump Trailer	12.16	13.32	\$289.71	\$450.00	\$739.71	\$107,414.02	149353
133	9/23/14	9/23/14	2019209	934698	Dump Trailer	12.16	16.60	\$361.05	\$450.00	\$811.05	\$108,225.07	149353
134	9/23/14	9/23/14	2019210	934707	Dump Trailer	12.16	8.36	\$181.83	\$450.00	\$631.83	\$108,856.90	149353
135	9/23/14	9/23/14	2019211	934699	Dump Trailer	12.16	13.10	\$284.93	\$450.00	\$734.93	\$109,591.83	149353
136	9/23/14	9/23/14	2019212	934702	Dump Trailer	12.16	8.97	\$195.10	\$450.00	\$645.10	\$110,236.93	149353
137	9/23/14	9/23/14	2019213	934709	Dump Trailer	12.16	8.60	\$187.05	\$450.00	\$637.05	\$110,873.98	149353
138	9/23/14	9/23/14	2019214	934711	Dump Trailer	12.16	12.23	\$266.00	\$450.00	\$716.00	\$111,589.98	149353
139	9/23/14	9/23/14	2019215	934712	Dump Trailer	12.16	10.88	\$236.64	\$450.00	\$686.64	\$112,276.62	149353
140	9/23/14	9/23/14	2019216	934714	Dump Trailer	12.16	9.70	\$210.98	\$450.00	\$660.98	\$112,937.59	149353
141	9/23/14	9/23/14	2019217	934717	Dump Trailer	12.16	10.08	\$219.24	\$450.00	\$669.24	\$113,606.83	149353
142	9/23/14	9/23/14	2019218	934723	Dump Trailer	12.16	11.91	\$259.04	\$450.00	\$709.04	\$114,315.88	149353
143	9/23/14	9/23/14	2019219	934732	Dump Trailer	12.16	8.28	\$180.09	\$450.00	\$630.09	\$114,945.97	149353
144	9/23/14	9/23/14	2019220	934734	Dump Trailer	12.16	9.12	\$198.36	\$450.00	\$648.36	\$115,594.33	149353
145	9/23/14	9/23/14	2019221	934736	Dump Trailer	12.16	13.83	\$300.80	\$450.00	\$750.80	\$116,345.13	149353
146	9/23/14	9/23/14	2019222	934737	Dump Trailer	12.16	14.45	\$314.29	\$450.00	\$764.29	\$117,109.42	149353
147	9/23/14	9/23/14	2019223	934738	Dump Trailer	12.16	15.33	\$333.43	\$450.00	\$783.43	\$117,892.84	149353
148	9/23/14	9/23/14	2019224	934739	Dump Trailer	12.16	15.16	\$329.73	\$450.00	\$779.73	\$118,672.57	149353
149	9/23/14	9/23/14	2019225	934740	Dump Trailer	12.16	15.48	\$336.69	\$450.00	\$786.69	\$119,459.26	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					37	149	450.07	\$9,789.02	\$16,650.00	\$26,439.02	\$119,459.26	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
150	9/24/14	9/24/14	2019226	934751	Dump Trailer	19.25	23.73	\$516.13	\$450.00	\$966.13	\$120,425.39	149353
151	9/24/14	9/24/14	2019227	934752	Dump Trailer	19.25	23.96	\$521.13	\$450.00	\$971.13	\$121,396.52	149353
152	9/24/14	9/24/14	2019228	934759	Dump Trailer	19.25	24.10	\$524.18	\$450.00	\$974.18	\$122,370.70	149353
153	9/24/14	9/24/14	2019229	934756	Dump Trailer	19.25	19.48	\$423.69	\$450.00	\$873.69	\$123,244.39	149353
154	9/24/14	9/24/14	2019230	934760	Dump Trailer	19.25	21.57	\$469.15	\$450.00	\$919.15	\$124,163.53	149353
155	9/24/14	9/24/14	2019231	934764	Dump Trailer	19.25	21.67	\$471.32	\$450.00	\$921.32	\$125,084.86	149353
156	9/24/14	9/24/14	2019232	934768	Dump Trailer	19.25	16.22	\$352.79	\$450.00	\$802.79	\$125,887.64	149353
157	9/24/14	9/24/14	2019233	934767	Dump Trailer	19.25	21.15	\$460.01	\$450.00	\$910.01	\$126,797.65	149353
158	9/24/14	9/24/14	2019234	934786	Dump Trailer	19.25	19.60	\$426.30	\$450.00	\$876.30	\$127,673.95	149353
159	9/24/14	9/24/14	2019235	934789	Dump Trailer	19.25	22.60	\$491.55	\$450.00	\$941.55	\$128,615.50	149353
160	9/24/14	9/24/14	2019236	934792	Dump Trailer	19.25	18.47	\$401.72	\$450.00	\$851.72	\$129,467.23	149353
161	9/24/14	9/24/14	2019237	934796	Dump Trailer	19.25	20.37	\$443.05	\$450.00	\$893.05	\$130,360.27	149353
162	9/24/14	9/24/14	2019238	934795	Dump Trailer	19.25	16.32	\$354.96	\$450.00	\$804.96	\$131,165.23	149353
163	9/24/14	9/24/14	2019239	934798	Dump Trailer	19.25	18.51	\$402.59	\$450.00	\$852.59	\$132,017.83	149353
164	9/24/14	9/24/14	2019240	934800	Dump Trailer	19.25	18.46	\$401.51	\$450.00	\$851.51	\$132,869.33	149353
165	9/24/14	9/24/14	2019241	934801	Dump Trailer	19.25	16.69	\$363.01	\$450.00	\$813.01	\$133,682.34	149353
166	9/24/14	9/24/14	2019242	934811	Dump Trailer	19.25	16.49	\$358.66	\$450.00	\$808.66	\$134,491.00	149353
167	9/24/14	9/24/14	2019243	934813	Dump Trailer	19.25	16.56	\$360.18	\$450.00	\$810.18	\$135,301.18	149353
168	9/24/14	9/24/14	2019244	934816	Dump Trailer	19.25	15.62	\$339.74	\$450.00	\$789.74	\$136,090.91	149353
169	9/24/14	9/24/14	2019245	934820	Dump Trailer	19.25	17.40	\$378.45	\$450.00	\$828.45	\$136,919.36	149353
170	9/24/14	9/24/14	2019246	934824	Dump Trailer	19.25	18.25	\$396.94	\$450.00	\$846.94	\$137,766.30	149353
171	9/24/14	9/24/14	2019247	934827	Dump Trailer	19.25	19.09	\$415.21	\$450.00	\$865.21	\$138,631.51	149353
172	9/24/14	9/24/14	2019248	934826	Dump Trailer	19.25	15.45	\$336.04	\$450.00	\$786.04	\$139,417.54	149353
173	9/24/14	9/24/14	2019249	934837	Dump Trailer	19.25	18.42	\$400.64	\$450.00	\$850.64	\$140,268.18	149353
174	9/24/14	9/24/14	2019250	934840	Dump Trailer	19.25	16.13	\$350.83	\$450.00	\$800.83	\$141,069.01	149353
175	9/24/14	9/24/14	2019251	934846	Dump Trailer	19.25	19.72	\$428.91	\$450.00	\$878.91	\$141,947.92	149353
176	9/24/14	9/24/14	2019252	934847	Dump Trailer	19.25	19.61	\$426.52	\$450.00	\$876.52	\$142,824.43	149353
177	9/24/14	9/24/14	2019253	934854	Dump Trailer	19.25	19.97	\$434.35	\$450.00	\$884.35	\$143,708.78	149353
178	9/24/14	9/24/14	2019254	934857	Dump Trailer	19.25	23.93	\$520.48	\$450.00	\$970.48	\$144,679.26	149353
179	9/24/14	9/24/14	2019255	934861	Dump Trailer	19.25	21.09	\$458.71	\$450.00	\$908.71	\$145,587.97	149353
180	9/24/14	9/24/14	2019256	934866	Dump Trailer	19.25	16.52	\$359.31	\$450.00	\$809.31	\$146,397.28	149353
181	9/24/14	9/24/14	2019257	934867	Dump Trailer	19.25	15.01	\$326.47	\$450.00	\$776.47	\$147,173.74	149353
182	9/24/14	9/24/14	2019258	934868	Dump Trailer	19.25	21.11	\$459.14	\$450.00	\$909.14	\$148,082.89	149353
183	9/24/14	9/24/14	2019259	934869	Dump Trailer	19.25	18.64	\$405.42	\$450.00	\$855.42	\$148,938.31	149353
184	9/24/14	9/24/14	2019260	934870	Dump Trailer	19.25	21.99	\$478.28	\$450.00	\$928.28	\$149,866.59	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					35	184	673.90	\$14,657.33	\$15,750.00	\$30,407.33	\$149,866.59	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
185	9/25/14	9/25/14	2019261	934882	Dump Trailer	16.55	19.42	\$422.39	\$450.00	\$872.39	\$150,738.97	149353
186	9/25/14	9/25/14	2019262	934883	Dump Trailer	16.55	15.66	\$340.61	\$450.00	\$790.61	\$151,529.58	149353
187	9/25/14	9/25/14	2019263	934884	Dump Trailer	16.55	22.46	\$488.51	\$450.00	\$938.51	\$152,468.08	149353
188	9/25/14	9/25/14	2019264	934886	Dump Trailer	16.55	17.03	\$370.40	\$450.00	\$820.40	\$153,288.49	149353
189	9/25/14	9/25/14	2019265	934891	Dump Trailer	16.55	15.76	\$342.78	\$450.00	\$792.78	\$154,081.27	149353
190	9/25/14	9/25/14	2019266	934892	Dump Trailer	16.55	17.77	\$386.50	\$450.00	\$836.50	\$154,917.76	149353
191	9/25/14	9/25/14	2019267	934895	Dump Trailer	16.55	16.29	\$354.31	\$450.00	\$804.31	\$155,722.07	149353
192	9/25/14	9/25/14	2019268	934896	Dump Trailer	16.55	16.32	\$354.96	\$450.00	\$804.96	\$156,527.03	149353
193	9/25/14	9/25/14	2019269	934914	Dump Trailer	16.55	15.36	\$334.08	\$450.00	\$784.08	\$157,311.11	149353
Voided	Voided	Voided	2019270	Voided	Voided	Voided	Voided	Voided	Voided	Voided	\$157,311.11	149353
194	9/25/14	9/25/14	2019271	934915	Dump Trailer	16.55	18.77	\$408.25	\$450.00	\$858.25	\$158,169.36	149353
195	9/25/14	9/25/14	2019272	934916	Dump Trailer	16.55	17.89	\$389.11	\$450.00	\$839.11	\$159,008.47	149353
196	9/25/14	9/25/14	2019273	934918	Dump Trailer	16.55	15.18	\$330.17	\$450.00	\$780.17	\$159,788.63	149353
197	9/25/14	9/25/14	2019274	934921	Dump Trailer	16.55	17.38	\$378.02	\$450.00	\$828.02	\$160,616.65	149353
198	9/25/14	9/25/14	2019275	934922	Dump Trailer	16.55	18.02	\$391.94	\$450.00	\$841.94	\$161,458.58	149353
199	9/25/14	9/25/14	2019276	934926	Dump Trailer	16.55	15.26	\$331.91	\$450.00	\$781.91	\$162,240.49	149353
200	9/25/14	9/25/14	2019632	934927	Dump Trailer	16.55	19.21	\$417.82	\$450.00	\$867.82	\$163,108.30	149353
201	9/25/14	9/25/14	2019633	934936	Dump Trailer	16.55	15.96	\$347.13	\$450.00	\$797.13	\$163,905.43	149353
202	9/25/14	9/25/14	2019634	934940	Dump Trailer	16.55	16.90	\$367.58	\$450.00	\$817.58	\$164,723.01	149353
203	9/25/14	9/25/14	2019635	934945	Dump Trailer	16.55	22.53	\$490.03	\$450.00	\$940.03	\$165,663.04	149353
204	9/25/14	9/25/14	2019636	934948	Dump Trailer	16.55	17.20	\$374.10	\$450.00	\$824.10	\$166,487.14	149353
205	9/25/14	9/25/14	2019637	934947	Dump Trailer	16.55	18.99	\$413.03	\$450.00	\$863.03	\$167,350.17	149353
206	9/25/14	9/25/14	2019638	934951	Dump Trailer	16.55	18.23	\$396.50	\$450.00	\$846.50	\$168,196.67	149353
207	9/25/14	9/25/14	2019639	934953	Dump Trailer	16.55	17.93	\$389.98	\$450.00	\$839.98	\$169,036.65	149353
208	9/25/14	9/25/14	2019640	934954	Dump Trailer	16.55	16.24	\$353.22	\$450.00	\$803.22	\$169,839.87	149353
209	9/25/14	9/25/14	2019641	934966	Dump Trailer	16.55	22.69	\$493.51	\$450.00	\$943.51	\$170,783.38	149353
210	9/25/14	9/25/14	2019642	934968	Dump Trailer	16.55	24.59	\$534.83	\$450.00	\$984.83	\$171,768.21	149353
211	9/25/14	9/25/14	2019643	934970	Dump Trailer	16.55	5.65	\$122.89	\$450.00	\$572.89	\$172,341.10	149353
212	9/25/14	9/25/14	2019644	934971	Dump Trailer	16.55	5.72	\$124.41	\$450.00	\$574.41	\$172,915.51	149353
213	9/25/14	9/25/14	2019645	934973	Dump Trailer	16.55	20.43	\$444.35	\$450.00	\$894.35	\$173,809.86	149353
214	9/25/14	9/25/14	2019646	934977	Dump Trailer	16.55	19.76	\$429.78	\$450.00	\$879.78	\$174,689.64	149353
215	9/25/14	9/25/14	2019647	934978	Dump Trailer	16.55	20.76	\$451.53	\$450.00	\$901.53	\$175,591.17	149353
216	9/25/14	9/25/14	2019648	934979	Dump Trailer	16.55	7.39	\$160.73	\$450.00	\$610.73	\$176,201.90	149353
217	9/25/14	9/25/14	2019649	934993	Dump Trailer	16.55	23.49	\$510.91	\$450.00	\$960.91	\$177,162.81	149353
218	9/25/14	9/25/14	2019650	934996	Dump Trailer	16.55	20.49	\$445.66	\$450.00	\$895.66	\$178,058.47	149353
219	9/25/14	9/25/14	2019651	934997	Dump Trailer	16.55	11.66	\$253.61	\$450.00	\$703.61	\$178,762.07	149353
220	9/25/14	9/25/14	2019652	934998	Dump Trailer	16.55	16.81	\$365.62	\$450.00	\$815.62	\$179,577.69	149353
221	9/25/14	9/25/14	2019653	935002	Dump Trailer	16.55	14.36	\$312.33	\$450.00	\$762.33	\$180,340.02	149353
222	9/25/14	9/25/14	2019654	935003	Dump Trailer	16.55	8.57	\$186.40	\$450.00	\$636.40	\$180,976.42	149353
223	9/25/14	9/25/14	2019655	935004	Dump Trailer	16.55	8.46	\$184.01	\$450.00	\$634.01	\$181,610.42	149353
224	9/25/14	9/25/14	2019656	935005	Dump Trailer	16.55	9.52	\$207.06	\$450.00	\$657.06	\$182,267.48	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					40	224	662.11	\$14,400.89	\$18,000.00	\$32,400.89	\$182,267.48	



Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212, PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
225	9/26/14	9/26/14	2019657	935015	Dump Trailer	9.28	10.68	\$232.29	\$450.00	\$682.29	\$182,949.77	149353
226	9/26/14	9/26/14	2019658	935016	Dump Trailer	9.28	11.94	\$259.70	\$450.00	\$709.70	\$183,659.47	149353
227	9/26/14	9/26/14	2019659	935020	Dump Trailer	9.28	8.80	\$191.40	\$450.00	\$641.40	\$184,300.87	149353
228	9/26/14	9/26/14	2019660	935023	Dump Trailer	9.28	13.48	\$293.19	\$450.00	\$743.19	\$185,044.06	149353
229	9/26/14	9/26/14	2019661	935025	Dump Trailer	9.28	10.41	\$226.42	\$450.00	\$676.42	\$185,720.47	149353
230	9/26/14	9/26/14	2019662	935026	Dump Trailer	9.28	10.60	\$230.55	\$450.00	\$680.55	\$186,401.02	149353
231	9/26/14	9/26/14	2019663	935029	Dump Trailer	9.28	9.89	\$215.11	\$450.00	\$665.11	\$187,066.13	149353
232	9/26/14	9/26/14	2019664	935032	Dump Trailer	9.28	10.34	\$224.90	\$450.00	\$674.90	\$187,741.03	149353
233	9/26/14	9/26/14	2019665	935048	Dump Trailer	9.28	9.25	\$201.19	\$450.00	\$651.19	\$188,392.21	149353
234	9/26/14	9/26/14	2019666	935049	Dump Trailer	9.28	8.36	\$181.83	\$450.00	\$631.83	\$189,024.04	149353
235	9/26/14	9/26/14	2019667	935050	Dump Trailer	9.28	6.60	\$143.55	\$450.00	\$593.55	\$189,617.59	149353
236	9/26/14	9/26/14	2019668	935051	Dump Trailer	9.28	8.02	\$174.44	\$450.00	\$624.44	\$190,242.03	149353
237	9/26/14	9/26/14	2019669	935053	Dump Trailer	9.28	9.81	\$213.37	\$450.00	\$663.37	\$190,905.40	149353
238	9/26/14	9/26/14	2019670	935054	Dump Trailer	9.28	9.50	\$206.63	\$450.00	\$656.63	\$191,562.02	149353
239	9/26/14	9/26/14	2019671	935056	Dump Trailer	9.28	11.67	\$253.82	\$450.00	\$703.82	\$192,265.84	149353
240	9/26/14	9/26/14	2019672	935058	Dump Trailer	9.28	5.43	\$118.10	\$450.00	\$568.10	\$192,833.95	149353
241	9/26/14	9/26/14	2019673	935063	Dump Trailer	9.28	7.06	\$153.56	\$450.00	\$603.56	\$193,437.50	149353
242	9/26/14	9/26/14	2019674	935065	Dump Trailer	9.28	5.10	\$110.93	\$450.00	\$560.93	\$193,998.43	149353
243	9/26/14	9/26/14	2019675	935068	Dump Trailer	9.28	8.94	\$194.45	\$450.00	\$644.45	\$194,642.87	149353
244	9/26/14	9/26/14	2019676	935070	Dump Trailer	9.28	9.50	\$206.63	\$450.00	\$656.63	\$195,299.50	149353
245	9/26/14	9/26/14	2019677	935073	Dump Trailer	9.28	9.14	\$198.80	\$450.00	\$648.80	\$195,948.29	149353
246	9/26/14	9/26/14	2019678	935079	Dump Trailer	9.28	10.32	\$224.46	\$450.00	\$674.46	\$196,622.75	149353
247	9/26/14	9/26/14	2019679	935084	Dump Trailer	9.28	5.51	\$119.84	\$450.00	\$569.84	\$197,192.59	149353
248	9/26/14	9/26/14	2019680	935083	Dump Trailer	9.28	10.46	\$227.51	\$450.00	\$677.51	\$197,870.10	149353
249	9/26/14	9/26/14	2019681	935097	Dump Trailer	9.28	9.70	\$210.98	\$450.00	\$660.98	\$198,531.07	149353
250	9/26/14	9/26/14	2019682	935096	Dump Trailer	9.28	6.60	\$143.55	\$450.00	\$593.55	\$199,124.62	149353
251	9/26/14	9/26/14	2019683	935100	Dump Trailer	9.28	10.80	\$234.90	\$450.00	\$684.90	\$199,809.52	149353
252	9/26/14	9/26/14	2019684	935101	Dump Trailer	9.28	8.98	\$195.32	\$450.00	\$645.32	\$200,454.84	149353
253	9/26/14	9/26/14	2019685	935102	Dump Trailer	9.28	5.39	\$117.23	\$450.00	\$567.23	\$201,022.07	149353
254	9/26/14	9/26/14	2019686	935110	Dump Trailer	9.28	6.28	\$136.59	\$450.00	\$586.59	\$201,608.66	149353
255	9/26/14	9/26/14	2019687	935113	Dump Trailer	9.28	9.02	\$196.19	\$450.00	\$646.19	\$202,254.85	149353
256	9/26/14	9/26/14	2019688	935115	Dump Trailer	9.28	9.44	\$205.32	\$450.00	\$655.32	\$202,910.17	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					32	256	287.02	\$6,242.69	\$14,400.00	\$20,642.69	\$202,910.17	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
257	9/29/14	9/29/14	2019689	935143	Dump Trailer	12.24	5.95	\$129.41	\$450.00	\$579.41	\$203,489.58	149353
258	9/29/14	9/29/14	2019690	935144	Dump Trailer	12.24	15.86	\$344.96	\$450.00	\$794.96	\$204,284.53	149353
259	9/29/14	9/29/14	2019691	935141	Dump Trailer	12.24	12.80	\$278.40	\$450.00	\$728.40	\$205,012.93	149353
260	9/29/14	9/29/14	2019692	935146	Dump Trailer	12.24	4.88	\$106.14	\$450.00	\$556.14	\$205,569.07	149353
261	9/29/14	9/29/14	2019693	935148	Dump Trailer	12.24	11.70	\$254.48	\$450.00	\$704.48	\$206,273.55	149353
262	9/29/14	9/29/14	2019694	935155	Dump Trailer	12.24	5.83	\$126.80	\$450.00	\$576.80	\$206,850.35	149353
263	9/29/14	9/29/14	2019695	935150	Dump Trailer	12.24	6.78	\$147.47	\$450.00	\$597.47	\$207,447.82	149353
264	9/29/14	9/29/14	2019696	935170	Dump Trailer	12.24	11.13	\$242.08	\$450.00	\$692.08	\$208,139.89	149353
265	9/29/14	9/29/14	2019697	935171	Dump Trailer	12.24	5.57	\$121.15	\$450.00	\$571.15	\$208,711.04	149353
266	9/29/14	9/29/14	2019698	935173	Dump Trailer	12.24	10.69	\$232.51	\$450.00	\$682.51	\$209,393.55	149353
267	9/29/14	9/29/14	2019699	935174	Dump Trailer	12.24	5.54	\$120.50	\$450.00	\$570.50	\$209,964.04	149353
268	9/29/14	9/29/14	2019700	935176	Dump Trailer	12.24	10.18	\$221.42	\$450.00	\$671.42	\$210,635.46	149353
269	9/29/14	9/29/14	2019701	935180	Dump Trailer	12.24	8.55	\$185.96	\$450.00	\$635.96	\$211,271.42	149353
270	9/29/14	9/29/14	2019702	935183	Dump Trailer	12.24	10.82	\$235.34	\$450.00	\$685.34	\$211,956.76	149353
271	9/29/14	9/29/14	2019703	935191	Dump Trailer	12.24	9.58	\$208.37	\$450.00	\$658.37	\$212,615.12	149353
272	9/29/14	9/29/14	2019704	935208	Dump Trailer	12.24	10.53	\$229.03	\$450.00	\$679.03	\$213,294.15	149353
273	9/29/14	9/29/14	2019705	935197	Dump Trailer	12.24	7.98	\$173.57	\$450.00	\$623.57	\$213,917.71	149353
274	9/29/14	9/29/14	2019706	935199	Dump Trailer	12.24	8.81	\$191.62	\$450.00	\$641.62	\$214,559.33	149353
275	9/29/14	9/29/14	2019707	935201	Dump Trailer	12.24	7.63	\$165.95	\$450.00	\$615.95	\$215,175.28	149353
276	9/29/14	9/29/14	2019708	935203	Dump Trailer	12.24	8.90	\$193.58	\$450.00	\$643.58	\$215,818.86	149353
277	9/29/14	9/29/14	2019709	935204	Dump Trailer	12.24	12.33	\$268.18	\$450.00	\$718.18	\$216,537.04	149353
278	9/29/14	9/29/14	2019710	935214	Dump Trailer	12.24	12.24	\$266.22	\$450.00	\$716.22	\$217,253.26	149353
279	9/29/14	9/29/14	2019711	935215	Dump Trailer	12.24	12.98	\$282.32	\$450.00	\$732.32	\$217,985.57	149353
280	9/29/14	9/29/14	2019712	935217	Dump Trailer	12.24	13.18	\$286.67	\$450.00	\$736.67	\$218,722.24	149353
281	9/29/14	9/29/14	2019713	935219	Dump Trailer	12.24	13.82	\$300.59	\$450.00	\$750.59	\$219,472.82	149353
282	9/29/14	9/29/14	2019714	935221	Dump Trailer	12.24	10.62	\$230.99	\$450.00	\$680.99	\$220,153.81	149353
283	9/29/14	9/29/14	2019715	935222	Dump Trailer	12.24	11.48	\$249.69	\$450.00	\$699.69	\$220,853.50	149353
284	9/29/14	9/29/14	2019716	935227	Dump Trailer	12.24	20.12	\$437.61	\$450.00	\$887.61	\$221,741.11	149353
285	9/29/14	9/29/14	2019717	935235	Dump Trailer	12.24	15.21	\$330.82	\$450.00	\$780.82	\$222,521.92	149353
286	9/29/14	9/29/14	2019718	935236	Dump Trailer	12.24	20.28	\$441.09	\$450.00	\$891.09	\$223,413.01	149353
287	9/29/14	9/29/14	2019719	935237	Dump Trailer	12.24	20.67	\$449.57	\$450.00	\$899.57	\$224,312.59	149353
288	9/29/14	9/29/14	2019720	935238	Dump Trailer	12.24	23.26	\$505.91	\$450.00	\$955.91	\$225,268.49	149353
289	9/29/14	9/29/14	2019721	935239	Dump Trailer	12.24	24.87	\$540.92	\$450.00	\$990.92	\$226,259.41	149353
290	9/29/14	9/29/14	2019722	935240	Dump Trailer	12.24	21.47	\$466.97	\$450.00	\$916.97	\$227,176.39	149353
291	9/29/14	9/29/14	2019723	935241	Dump Trailer	12.24	16.01	\$348.22	\$450.00	\$798.22	\$227,974.60	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					35	291	428.25	\$9,314.44	\$15,750.00	\$25,064.44	\$227,974.60	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
292	9/30/14	9/30/14	2019724	935305	Dump Trailer	13.54	15.03	\$326.90	\$450.00	\$776.90	\$228,751.51	149353
293	9/30/14	9/30/14	2019725	935308	Dump Trailer	13.54	11.42	\$248.39	\$450.00	\$698.39	\$229,449.89	149353
294	9/30/14	9/30/14	2019726	935309	Dump Trailer	13.54	11.97	\$260.35	\$450.00	\$710.35	\$230,160.24	149353
295	9/30/14	9/30/14	2019727	935311	Dump Trailer	13.54	10.31	\$224.24	\$450.00	\$674.24	\$230,834.48	149353
296	9/30/14	9/30/14	2019728	935313	Dump Trailer	13.54	13.96	\$303.63	\$450.00	\$753.63	\$231,588.11	149353
297	9/30/14	9/30/14	2019729	935334	Dump Trailer	13.54	11.53	\$250.78	\$450.00	\$700.78	\$232,288.89	149353
298	9/30/14	9/30/14	2019730	935335	Dump Trailer	13.54	10.64	\$231.42	\$450.00	\$681.42	\$232,970.31	149353
299	9/30/14	9/30/14	2019731	935336	Dump Trailer	13.54	15.40	\$334.95	\$450.00	\$784.95	\$233,755.26	149353
300	9/30/14	9/30/14	2019732	935280	Dump Trailer	13.54	10.36	\$225.33	\$450.00	\$675.33	\$234,430.59	149353
301	9/30/14	9/30/14	2019733	935282	Dump Trailer	13.54	12.22	\$265.79	\$450.00	\$715.79	\$235,146.37	149353
302	9/30/14	9/30/14	2019734	935283	Dump Trailer	13.54	13.07	\$284.27	\$450.00	\$734.27	\$235,880.65	149353
303	9/30/14	9/30/14	2019735	935284	Dump Trailer	13.54	10.55	\$229.46	\$450.00	\$679.46	\$236,560.11	149353
304	9/30/14	9/30/14	2019736	935285	Dump Trailer	13.54	11.88	\$258.39	\$450.00	\$708.39	\$237,268.50	149353
305	9/30/14	9/30/14	2019737	935288	Dump Trailer	13.54	21.95	\$477.41	\$450.00	\$927.41	\$238,195.91	149353
306	9/30/14	9/30/14	2019738	935287	Dump Trailer	13.54	16.19	\$352.13	\$450.00	\$802.13	\$238,998.04	149353
307	9/30/14	9/30/14	2019739	935291	Dump Trailer	13.54	13.27	\$288.62	\$450.00	\$738.62	\$239,736.67	149353
308	9/30/14	9/30/14	2019740	935314	Dump Trailer	13.54	15.28	\$332.34	\$450.00	\$782.34	\$240,519.01	149353
309	9/30/14	9/30/14	2019741	935316	Dump Trailer	13.54	14.81	\$322.12	\$450.00	\$772.12	\$241,291.12	149353
310	9/30/14	9/30/14	2019742	935318	Dump Trailer	13.54	14.55	\$316.46	\$450.00	\$766.46	\$242,057.59	149353
311	9/30/14	9/30/14	2019743	935337	Dump Trailer	13.54	16.65	\$362.14	\$450.00	\$812.14	\$242,869.72	149353
312	9/30/14	9/30/14	2019744	935331	Dump Trailer	13.54	13.30	\$289.28	\$450.00	\$739.28	\$243,609.00	149353
313	9/30/14	9/30/14	2019745	935340	Dump Trailer	13.54	13.14	\$285.80	\$450.00	\$735.80	\$244,344.79	149353
314	9/30/14	9/30/14	2019746	935343	Dump Trailer	13.54	17.36	\$377.58	\$450.00	\$827.58	\$245,172.37	149353
315	9/30/14	9/30/14	2019747	935344	Dump Trailer	13.54	17.17	\$373.45	\$450.00	\$823.45	\$245,995.82	149353
316	9/30/14	9/30/14	2019748	935357	Dump Trailer	13.54	10.67	\$232.07	\$450.00	\$682.07	\$246,677.89	149353
317	9/30/14	9/30/14	2019749	935358	Dump Trailer	13.54	11.87	\$258.17	\$450.00	\$708.17	\$247,386.07	149353
318	9/30/14	9/30/14	2019750	935359	Dump Trailer	13.54	11.00	\$239.25	\$450.00	\$689.25	\$248,075.32	149353
319	9/30/14	9/30/14	2019751	935360	Dump Trailer	13.54	12.55	\$272.96	\$450.00	\$722.96	\$248,798.28	149353
320	9/30/14	9/30/14	2019752	935361	Dump Trailer	13.54	12.98	\$282.32	\$450.00	\$732.32	\$249,530.59	149353
321	9/30/14	9/30/14	2019753	935362	Dump Trailer	13.54	13.72	\$298.41	\$450.00	\$748.41	\$250,279.00	149353
322	9/30/14	9/30/14	2019754	935363	Dump Trailer	13.54	14.53	\$316.03	\$450.00	\$766.03	\$251,045.03	149353
323	9/30/14	9/30/14	2019755	935364	Dump Trailer	13.54	13.81	\$300.37	\$450.00	\$750.37	\$251,795.40	149353
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					32	323	433.14	\$9,420.80	\$14,400.00	\$23,820.80	\$251,795.40	



Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
324	10/1/14	10/1/14	2019756	935375	Dump Trailer	14.44	18.34	\$398.90	\$450.00	\$848.90	\$252,644.29	149928
325	10/1/14	10/1/14	2019757	935379	Dump Trailer	14.44	19.96	\$434.13	\$450.00	\$884.13	\$253,528.42	149928
326	10/1/14	10/1/14	2019758	935380	Dump Trailer	14.44	17.23	\$374.75	\$450.00	\$824.75	\$254,353.18	149928
327	10/1/14	10/1/14	2019759	935383	Dump Trailer	14.44	15.44	\$335.82	\$450.00	\$785.82	\$255,139.00	149928
328	10/1/14	10/1/14	2019760	935388	Dump Trailer	14.44	14.67	\$319.07	\$450.00	\$769.07	\$255,908.07	149928
329	10/1/14	10/1/14	2019761	935389	Dump Trailer	14.44	15.81	\$343.87	\$450.00	\$793.87	\$256,701.94	149928
330	10/1/14	10/1/14	2019762	935391	Dump Trailer	14.44	17.21	\$374.32	\$450.00	\$824.32	\$257,526.25	149928
331	10/1/14	10/1/14	2019763	935393	Dump Trailer	14.44	15.21	\$330.82	\$450.00	\$780.82	\$258,307.07	149928
332	10/1/14	10/1/14	2019764	935404	Dump Trailer	14.44	15.11	\$328.64	\$450.00	\$778.64	\$259,085.71	149928
333	10/1/14	10/1/14	2019765	935405	Dump Trailer	14.44	12.66	\$275.36	\$450.00	\$725.36	\$259,811.07	149928
334	10/1/14	10/1/14	2019766	935408	Dump Trailer	14.44	13.66	\$297.11	\$450.00	\$747.11	\$260,558.17	149928
335	10/1/14	10/1/14	2019767	935411	Dump Trailer	14.44	13.39	\$291.23	\$450.00	\$741.23	\$261,299.41	149928
336	10/1/14	10/1/14	2019768	935416	Dump Trailer	14.44	13.28	\$288.84	\$450.00	\$738.84	\$262,038.25	149928
337	10/1/14	10/1/14	2019769	935418	Dump Trailer	14.44	12.73	\$276.88	\$450.00	\$726.88	\$262,765.12	149928
338	10/1/14	10/1/14	2019770	935422	Dump Trailer	14.44	16.82	\$365.84	\$450.00	\$815.84	\$263,580.96	149928
339	10/1/14	10/1/14	2019771	935423	Dump Trailer	14.44	16.62	\$361.49	\$450.00	\$811.49	\$264,392.44	149928
340	10/1/14	10/1/14	2019772	935433	Dump Trailer	14.44	11.83	\$257.30	\$450.00	\$707.30	\$265,099.75	149928
341	10/1/14	10/1/14	2019773	935435	Dump Trailer	14.44	12.00	\$261.00	\$450.00	\$711.00	\$265,810.75	149928
342	10/1/14	10/1/14	2019774	935436	Dump Trailer	14.44	14.17	\$308.20	\$450.00	\$758.20	\$266,568.94	149928
343	10/1/14	10/1/14	2019775	935437	Dump Trailer	14.44	12.69	\$276.01	\$450.00	\$726.01	\$267,294.95	149928
344	10/1/14	10/1/14	2019776	935441	Dump Trailer	14.44	15.11	\$328.64	\$450.00	\$778.64	\$268,073.59	149928
345	10/1/14	10/1/14	2019777	935442	Dump Trailer	14.44	10.61	\$230.77	\$450.00	\$680.77	\$268,754.36	149928
346	10/1/14	10/1/14	2019778	935444	Dump Trailer	14.44	13.54	\$294.50	\$450.00	\$744.50	\$269,498.86	149928
347	10/1/14	10/1/14	2019779	935446	Dump Trailer	14.44	16.77	\$364.75	\$450.00	\$814.75	\$270,313.60	149928
348	10/1/14	10/1/14	2019780	935455	Dump Trailer	14.44	12.52	\$272.31	\$450.00	\$722.31	\$271,035.91	149928
349	10/1/14	10/1/14	2019781	935460	Dump Trailer	14.44	12.00	\$261.00	\$450.00	\$711.00	\$271,746.91	149928
350	10/1/14	10/1/14	2019782	935461	Dump Trailer	14.44	11.12	\$241.86	\$450.00	\$691.86	\$272,438.77	149928
351	10/1/14	10/1/14	2019783	935464	Dump Trailer	14.44	9.45	\$205.54	\$450.00	\$655.54	\$273,094.31	149928
352	10/1/14	10/1/14	2019784	935465	Dump Trailer	14.44	9.72	\$211.41	\$450.00	\$661.41	\$273,755.72	149928
353	10/1/14	10/1/14	2019785	935467	Dump Trailer	14.44	9.32	\$202.71	\$450.00	\$652.71	\$274,408.43	149928
354	10/1/14	10/1/14	2019786	935468	Dump Trailer	14.44	9.75	\$212.06	\$450.00	\$662.06	\$275,070.49	149928
355	10/1/14	10/1/14	2019787	935471	Dump Trailer	14.44	10.70	\$232.73	\$450.00	\$682.73	\$275,753.22	149928
356	10/1/14	10/1/14	2019788	935482	Dump Trailer	14.44	17.60	\$382.80	\$450.00	\$832.80	\$276,586.02	149928
357	10/1/14	10/1/14	2019789	935491	Dump Trailer	14.44	18.44	\$401.07	\$450.00	\$851.07	\$277,437.09	149928
358	10/1/14	10/1/14	2019790	935493	Dump Trailer	14.44	17.88	\$388.89	\$450.00	\$838.89	\$278,275.98	149928
359	10/1/14	10/1/14	2019791	935492	Dump Trailer	14.44	16.33	\$355.18	\$450.00	\$805.18	\$279,081.16	149928
360	10/1/14	10/1/14	2019792	935494	Dump Trailer	14.44	15.18	\$330.17	\$450.00	\$780.17	\$279,861.32	149928
361	10/1/14	10/1/14	2019793	935495	Dump Trailer	14.44	14.32	\$311.46	\$450.00	\$761.46	\$280,622.78	149928
362	10/1/14	10/1/14	2019794	935496	Dump Trailer	14.44	14.83	\$322.55	\$450.00	\$772.55	\$281,395.33	149928
363	10/1/14	10/1/14	2019795	935497	Dump Trailer	14.44	20.76	\$451.53	\$450.00	\$901.53	\$282,296.86	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					40	363	574.78	\$12,501.47	\$18,000.00	\$30,501.47	\$282,296.86	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
364	10/2/14	10/2/14	2019796	935517	Dump Trailer	15.87	18.35	\$399.11	\$450.00	\$849.11	\$283,145.98	149928
365	10/2/14	10/2/14	2019797	935518	Dump Trailer	15.87	14.82	\$322.34	\$450.00	\$772.34	\$283,918.31	149928
366	10/2/14	10/2/14	2019798	935519	Dump Trailer	15.87	17.43	\$379.10	\$450.00	\$829.10	\$284,747.41	149928
367	10/2/14	10/2/14	2019799	935520	Dump Trailer	15.87	14.60	\$317.55	\$450.00	\$767.55	\$285,514.96	149928
368	10/2/14	10/2/14	2019800	935522	Dump Trailer	15.87	13.86	\$301.46	\$450.00	\$751.46	\$286,266.42	149928
369	10/2/14	10/2/14	2019801	935523	Dump Trailer	15.87	17.14	\$372.80	\$450.00	\$822.80	\$287,089.21	149928
370	10/2/14	10/2/14	2019802	935527	Dump Trailer	15.87	17.92	\$389.76	\$450.00	\$839.76	\$287,928.97	149928
371	10/2/14	10/2/14	2019803	935528	Dump Trailer	15.87	14.34	\$311.90	\$450.00	\$761.90	\$288,690.87	149928
372	10/2/14	10/2/14	2019804	935544	Dump Trailer	15.87	16.71	\$363.44	\$450.00	\$813.44	\$289,504.31	149928
373	10/2/14	10/2/14	2019805	935545	Dump Trailer	15.87	17.11	\$372.14	\$450.00	\$822.14	\$290,326.45	149928
374	10/2/14	10/2/14	2019806	935549	Dump Trailer	15.87	17.39	\$378.23	\$450.00	\$828.23	\$291,154.69	149928
375	10/2/14	10/2/14	2019807	935546	Dump Trailer	15.87	14.41	\$313.42	\$450.00	\$763.42	\$291,918.10	149928
376	10/2/14	10/2/14	2019808	935554	Dump Trailer	15.87	17.42	\$378.89	\$450.00	\$828.89	\$292,746.99	149928
377	10/2/14	10/2/14	2019809	935556	Dump Trailer	15.87	14.60	\$317.55	\$450.00	\$767.55	\$293,514.54	149928
378	10/2/14	10/2/14	2019810	935557	Dump Trailer	15.87	17.42	\$378.89	\$450.00	\$828.89	\$294,343.42	149928
379	10/2/14	10/2/14	2019811	935559	Dump Trailer	15.87	13.60	\$295.80	\$450.00	\$745.80	\$295,089.22	149928
380	10/2/14	10/2/14	2019812	935573	Dump Trailer	15.87	18.53	\$403.03	\$450.00	\$853.03	\$295,942.25	149928
381	10/2/14	10/2/14	2019813	935574	Dump Trailer	15.87	17.27	\$375.62	\$450.00	\$825.62	\$296,767.87	149928
382	10/2/14	10/2/14	2019814	935576	Dump Trailer	15.87	12.74	\$277.10	\$450.00	\$727.10	\$297,494.97	149928
383	10/2/14	10/2/14	2019815	935578	Dump Trailer	15.87	15.98	\$347.57	\$450.00	\$797.57	\$298,292.53	149928
384	10/2/14	10/2/14	2019816	935581	Dump Trailer	15.87	16.09	\$349.96	\$450.00	\$799.96	\$299,092.49	149928
385	10/2/14	10/2/14	2019817	935582	Dump Trailer	15.87	16.12	\$350.61	\$450.00	\$800.61	\$299,893.10	149928
386	10/2/14	10/2/14	2019818	935584	Dump Trailer	15.87	15.86	\$344.96	\$450.00	\$794.96	\$300,688.06	149928
Voided	Voided	Voided	2019919	Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	
387	10/2/14	10/2/14	2019820	935585	Dump Trailer	15.87	13.97	\$303.85	\$450.00	\$753.85	\$301,441.90	149928
388	10/2/14	10/2/14	2019821	935604	Dump Trailer	15.87	14.34	\$311.90	\$450.00	\$761.90	\$302,203.80	149928
389	10/2/14	10/2/14	2019822	935602	Dump Trailer	15.87	19.57	\$425.65	\$450.00	\$875.65	\$303,079.45	149928
390	10/2/14	10/2/14	2019823	935605	Dump Trailer	15.87	17.07	\$371.27	\$450.00	\$821.27	\$303,900.72	149928
391	10/2/14	10/2/14	2019824	935606	Dump Trailer	15.87	14.80	\$321.90	\$450.00	\$771.90	\$304,672.62	149928
Voided	Voided	Voided	2019825	Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	
392	10/2/14	10/2/14	2019826	935608	Dump Trailer	15.87	15.26	\$331.91	\$450.00	\$781.91	\$305,454.52	149928
393	10/2/14	10/2/14	2019827	935609	Dump Trailer	15.87	10.11	\$219.89	\$450.00	\$669.89	\$306,124.42	149928
394	10/2/14	10/2/14	2019828	935610	Dump Trailer	15.87	15.39	\$334.73	\$450.00	\$784.73	\$306,909.15	149928
395	10/2/14	10/2/14	2019829	935612	Dump Trailer	15.87	13.90	\$302.33	\$450.00	\$752.33	\$307,661.47	149928
396	10/2/14	10/2/14	2019830	935626	Dump Trailer	15.87	15.51	\$337.34	\$450.00	\$787.34	\$308,448.82	149928
397	10/2/14	10/2/14	2019831	935627	Dump Trailer	15.87	15.66	\$340.61	\$450.00	\$790.61	\$309,239.42	149928
398	10/2/14	10/2/14	2019853	935626	Dump Trailer	15.87	17.97	\$390.85	\$450.00	\$840.85	\$310,080.27	149928
399	10/2/14	10/2/14	2019854	935628	Dump Trailer	15.87	15.05	\$327.34	\$450.00	\$777.34	\$310,857.61	149928
400	10/2/14	10/2/14	2019855	935629	Dump Trailer	15.87	18.14	\$394.55	\$450.00	\$844.55	\$311,702.15	149928
401	10/2/14	10/2/14	2019856	935630	Dump Trailer	15.87	9.51	\$206.84	\$450.00	\$656.84	\$312,358.99	149928
402	10/2/14	10/2/14	2019857	935632	Dump Trailer	15.87	17.34	\$377.15	\$450.00	\$827.15	\$313,186.14	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					39	402	613.30	\$13,339.28	\$17,550.00	\$30,889.28	\$313,186.14	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212, PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
403	10/6/14	10/6/14	2019858	935694	Dump Trailer	10.76	14.52	\$315.81	\$450.00	\$765.81	\$313,951.95	149928
404	10/6/14	10/6/14	2019859	935696	Dump Trailer	10.76	15.54	\$338.00	\$450.00	\$788.00	\$314,739.94	149928
405	10/6/14	10/6/14	2019860	935699	Dump Trailer	10.76	14.98	\$325.82	\$450.00	\$775.82	\$315,515.76	149928
406	10/6/14	10/6/14	2019861	935700	Dump Trailer	10.76	15.58	\$338.87	\$450.00	\$788.87	\$316,304.62	149928
407	10/6/14	10/6/14	2019862	935704	Dump Trailer	10.76	17.68	\$384.54	\$450.00	\$834.54	\$317,139.16	149928
408	10/6/14	10/6/14	2019863	935705	Dump Trailer	10.76	19.63	\$426.95	\$450.00	\$876.95	\$318,016.12	149928
409	10/6/14	10/6/14	2019864	935714	Dump Trailer	10.76	17.10	\$371.93	\$450.00	\$821.93	\$318,838.04	149928
410	10/6/14	10/6/14	2019865	935713	Dump Trailer	10.76	17.84	\$388.02	\$450.00	\$838.02	\$319,676.06	149928
411	10/6/14	10/6/14	2019866	935733	Dump Trailer	10.76	18.71	\$406.94	\$450.00	\$856.94	\$320,533.00	149928
412	10/6/14	10/6/14	2019867	935735	Dump Trailer	10.76	13.29	\$289.06	\$450.00	\$739.06	\$321,272.06	149928
413	10/6/14	10/6/14	2019868	935737	Dump Trailer	10.76	9.99	\$217.28	\$450.00	\$667.28	\$321,939.34	149928
414	10/6/14	10/6/14	2019869	935740	Dump Trailer	10.76	10.97	\$238.60	\$450.00	\$688.60	\$322,627.94	149928
415	10/6/14	10/6/14	2019870	935743	Dump Trailer	10.76	9.76	\$212.28	\$450.00	\$662.28	\$323,290.22	149928
416	10/6/14	10/6/14	2019871	935745	Dump Trailer	10.76	8.84	\$192.27	\$450.00	\$642.27	\$323,932.49	149928
417	10/6/14	10/6/14	2019872	935750	Dump Trailer	10.76	7.94	\$172.70	\$450.00	\$622.70	\$324,555.19	149928
418	10/6/14	10/6/14	2019873	935753	Dump Trailer	10.76	9.07	\$197.27	\$450.00	\$647.27	\$325,202.46	149928
419	10/6/14	10/6/14	2019874	935764	Dump Trailer	10.76	9.06	\$197.06	\$450.00	\$647.06	\$325,849.51	149928
420	10/6/14	10/6/14	2019875	935768	Dump Trailer	10.76	10.82	\$235.34	\$450.00	\$685.34	\$326,534.85	149928
421	10/6/14	10/6/14	2019876	935772	Dump Trailer	10.76	9.50	\$206.63	\$450.00	\$656.63	\$327,191.47	149928
422	10/6/14	10/6/14	2019877	935776	Dump Trailer	10.76	7.75	\$168.56	\$450.00	\$618.56	\$327,810.04	149928
423	10/6/14	10/6/14	2019878	935780	Dump Trailer	10.76	7.18	\$156.17	\$450.00	\$606.17	\$328,416.20	149928
424	10/6/14	10/6/14	2019879	935782	Dump Trailer	10.76	7.03	\$152.90	\$450.00	\$602.90	\$329,019.10	149928
425	10/6/14	10/6/14	2019880	935783	Dump Trailer	10.76	6.90	\$150.08	\$450.00	\$600.08	\$329,619.18	149928
426	10/6/14	10/6/14	2019881	935785	Dump Trailer	10.76	7.38	\$160.52	\$450.00	\$610.52	\$330,229.69	149928
427	10/6/14	10/6/14	2019882	935803	Dump Trailer	10.76	8.66	\$188.36	\$450.00	\$638.36	\$330,868.05	149928
428	10/6/14	10/6/14	2019883	935804	Dump Trailer	10.76	8.56	\$186.18	\$450.00	\$636.18	\$331,504.23	149928
429	10/6/14	10/6/14	2019884	935805	Dump Trailer	10.76	9.41	\$204.67	\$450.00	\$654.67	\$332,158.90	149928
430	10/6/14	10/6/14	2019885	935809	Dump Trailer	10.76	9.27	\$201.62	\$450.00	\$651.62	\$332,810.52	149928
431	10/6/14	10/6/14	2019886	935811	Dump Trailer	10.76	9.16	\$199.23	\$450.00	\$649.23	\$333,459.75	149928
432	10/6/14	10/6/14	2019887	935817	Dump Trailer	10.76	9.31	\$202.49	\$450.00	\$652.49	\$334,112.24	149928
433	10/6/14	10/6/14	2019888	935819	Dump Trailer	10.76	8.10	\$176.18	\$450.00	\$626.18	\$334,738.42	149928
434	10/6/14	10/6/14	2019889	935821	Dump Trailer	10.76	7.77	\$169.00	\$450.00	\$619.00	\$335,357.41	149928
435	10/6/14	10/6/14	2019890	935841	Dump Trailer	10.76	7.63	\$165.95	\$450.00	\$615.95	\$335,973.37	149928
436	10/6/14	10/6/14	2019891	935842	Dump Trailer	10.76	10.47	\$227.72	\$450.00	\$677.72	\$336,651.09	149928
437	10/6/14	10/6/14	2019892	935845	Dump Trailer	10.76	11.11	\$241.64	\$450.00	\$691.64	\$337,342.73	149928
438	10/6/14	10/6/14	2019893	935846	Dump Trailer	10.76	8.95	\$194.66	\$450.00	\$644.66	\$337,987.39	149928
439	10/6/14	10/6/14	2019894	935848	Dump Trailer	10.76	8.13	\$176.83	\$450.00	\$626.83	\$338,614.22	149928
440	10/6/14	10/6/14	2019895	935850	Dump Trailer	10.76	6.18	\$134.42	\$450.00	\$584.42	\$339,198.64	149928
441	10/6/14	10/6/14	2019896	935853	Dump Trailer	10.76	8.86	\$192.71	\$450.00	\$642.71	\$339,841.34	149928
442	10/6/14	10/6/14	2019897	935852	Dump Trailer	10.76	11.78	\$256.22	\$450.00	\$706.22	\$340,547.56	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					40	442	430.41	\$9,361.42	\$18,000.00	\$27,361.42	\$340,547.56	



Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
443	10/7/14	10/7/14	2019898	935871	Dump Trailer	7.88	3.97	\$86.35	\$450.00	\$536.35	\$341,083.90	149928
444	10/7/14	10/7/14	2019899	935872	Dump Trailer	7.88	15.21	\$330.82	\$450.00	\$780.82	\$341,864.72	149928
445	10/7/14	10/7/14	2019900	935873	Dump Trailer	7.88	12.33	\$268.18	\$450.00	\$718.18	\$342,582.90	149928
446	10/7/14	10/7/14	2019901	935874	Dump Trailer	7.88	3.32	\$72.21	\$450.00	\$522.21	\$343,105.11	149928
447	10/7/14	10/7/14	2019902	935875	Dump Trailer	7.88	14.05	\$305.59	\$450.00	\$755.59	\$343,860.70	149928
448	10/7/14	10/7/14	2019903	935876	Dump Trailer	7.88	10.30	\$224.03	\$450.00	\$674.03	\$344,534.72	149928
449	10/7/14	10/7/14	2019904	935877	Dump Trailer	7.88	4.17	\$90.70	\$450.00	\$540.70	\$345,075.42	149928
450	10/7/14	10/7/14	2019905	935881	Dump Trailer	7.88	6.18	\$134.42	\$450.00	\$584.42	\$345,659.83	149928
451	10/7/14	10/7/14	2019906	935901	Dump Trailer	7.88	11.11	\$241.64	\$450.00	\$691.64	\$346,351.48	149928
452	10/7/14	10/7/14	2019907	935902	Dump Trailer	7.88	6.94	\$150.95	\$450.00	\$600.95	\$346,952.42	149928
453	10/7/14	10/7/14	2019908	935903	Dump Trailer	7.88	8.75	\$190.31	\$450.00	\$640.31	\$347,592.73	149928
454	10/7/14	10/7/14	2019909	935904	Dump Trailer	7.88	3.99	\$86.78	\$450.00	\$536.78	\$348,129.52	149928
455	10/7/14	10/7/14	2019910	935906	Dump Trailer	7.88	14.20	\$308.85	\$450.00	\$758.85	\$348,888.37	149928
456	10/7/14	10/7/14	2019911	935908	Dump Trailer	7.88	7.04	\$153.12	\$450.00	\$603.12	\$349,491.49	149928
457	10/7/14	10/7/14	2019912	935911	Dump Trailer	7.88	9.52	\$207.06	\$450.00	\$657.06	\$350,148.55	149928
458	10/7/14	10/7/14	2019913	935912	Dump Trailer	7.88	6.81	\$148.12	\$450.00	\$598.12	\$350,746.66	149928
459	10/7/14	10/7/14	2019914	935929	Dump Trailer	7.88	7.26	\$157.91	\$450.00	\$607.91	\$351,354.57	149928
460	10/7/14	10/7/14	2019915	935930	Dump Trailer	7.88	9.55	\$207.71	\$450.00	\$657.71	\$352,012.28	149928
461	10/7/14	10/7/14	2019916	935931	Dump Trailer	7.88	5.23	\$113.75	\$450.00	\$563.75	\$352,576.03	149928
462	10/7/14	10/7/14	2019917	935933	Dump Trailer	7.88	6.22	\$135.29	\$450.00	\$585.29	\$353,161.32	149928
463	10/7/14	10/7/14	2019918	935935	Dump Trailer	7.88	6.88	\$149.64	\$450.00	\$599.64	\$353,760.96	149928
464	10/7/14	10/7/14	2019919	935937	Dump Trailer	7.88	7.53	\$163.78	\$450.00	\$613.78	\$354,374.74	149928
465	10/7/14	10/7/14	2019920	935943	Dump Trailer	7.88	9.09	\$197.71	\$450.00	\$647.71	\$355,022.44	149928
466	10/7/14	10/7/14	2019921	935944	Dump Trailer	7.88	6.27	\$136.37	\$450.00	\$586.37	\$355,608.82	149928
467	10/7/14	10/7/14	2019922	935963	Dump Trailer	7.88	7.35	\$159.86	\$450.00	\$609.86	\$356,218.68	149928
468	10/7/14	10/7/14	2019923	935967	Dump Trailer	7.88	6.76	\$147.03	\$450.00	\$597.03	\$356,815.71	149928
469	10/7/14	10/7/14	2019924	935968	Dump Trailer	7.88	6.50	\$141.38	\$450.00	\$591.38	\$357,407.08	149928
470	10/7/14	10/7/14	2019925	935972	Dump Trailer	7.88	7.24	\$157.47	\$450.00	\$607.47	\$358,014.55	149928
471	10/7/14	10/7/14	2019926	935973	Dump Trailer	7.88	6.85	\$148.99	\$450.00	\$598.99	\$358,613.54	149928
472	10/7/14	10/7/14	2019927	935977	Dump Trailer	7.88	6.35	\$138.11	\$450.00	\$588.11	\$359,201.65	149928
473	10/7/14	10/7/14	2019928	935986	Dump Trailer	7.88	7.24	\$157.47	\$450.00	\$607.47	\$359,809.12	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					31	473	244.21	\$5,311.57	\$13,950.00	\$19,261.57	\$359,809.12	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
474	10/8/14	10/8/14	2019929	936010	Dump Trailer	7.21	8.31	\$180.74	\$450.00	\$630.74	\$360,439.87	149928
475	10/8/14	10/8/14	2019930	936011	Dump Trailer	7.21	10.52	\$228.81	\$450.00	\$678.81	\$361,118.68	149928
476	10/8/14	10/8/14	2019931	936020	Dump Trailer	7.21	7.78	\$169.22	\$450.00	\$619.22	\$361,737.89	149928
477	10/8/14	10/8/14	2019932	936016	Dump Trailer	7.21	6.86	\$149.21	\$450.00	\$599.21	\$362,337.10	149928
478	10/8/14	10/8/14	2019933	936017	Dump Trailer	7.21	8.09	\$175.96	\$450.00	\$625.96	\$362,963.05	149928
479	10/8/14	10/8/14	2019934	936019	Dump Trailer	7.21	9.32	\$202.71	\$450.00	\$652.71	\$363,615.76	149928
480	10/8/14	10/8/14	2019935	936025	Dump Trailer	7.21	10.25	\$222.94	\$450.00	\$672.94	\$364,288.70	149928
481	10/8/14	10/8/14	2019936	936047	Dump Trailer	7.21	6.40	\$139.20	\$450.00	\$589.20	\$364,877.90	149928
482	10/8/14	10/8/14	2019937	936049	Dump Trailer	7.21	9.40	\$204.45	\$450.00	\$654.45	\$365,532.35	149928
483	10/8/14	10/8/14	2019938	936055	Dump Trailer	7.21	10.46	\$227.51	\$450.00	\$677.51	\$366,209.86	149928
484	10/8/14	10/8/14	2019939	936056	Dump Trailer	7.21	7.25	\$157.69	\$450.00	\$607.69	\$366,817.54	149928
485	10/8/14	10/8/14	2019940	936060	Dump Trailer	7.21	9.20	\$200.10	\$450.00	\$650.10	\$367,467.64	149928
486	10/8/14	10/8/14	2019941	936067	Dump Trailer	7.21	5.99	\$130.28	\$450.00	\$580.28	\$368,047.93	149928
487	10/8/14	10/8/14	2019942	936074	Dump Trailer	7.21	5.98	\$130.07	\$450.00	\$580.07	\$368,627.99	149928
488	10/8/14	10/8/14	2019943	936078	Dump Trailer	7.21	8.61	\$187.27	\$450.00	\$637.27	\$369,265.26	149928
489	10/8/14	10/8/14	2019944	936082	Dump Trailer	7.21	6.67	\$145.07	\$450.00	\$595.07	\$369,860.33	149928
490	10/8/14	10/8/14	2019945	936085	Dump Trailer	7.21	8.01	\$174.22	\$450.00	\$624.22	\$370,484.55	149928
491	10/8/14	10/8/14	2019946	936086	Dump Trailer	7.21	5.49	\$119.41	\$450.00	\$569.41	\$371,053.96	149928
492	10/8/14	10/8/14	2019947	936091	Dump Trailer	7.21	5.84	\$127.02	\$450.00	\$577.02	\$371,630.98	149928
493	10/8/14	10/8/14	2019948	936097	Dump Trailer	7.21	5.12	\$111.36	\$450.00	\$561.36	\$372,192.34	149928
494	10/8/14	10/8/14	2019949	936102	Dump Trailer	7.21	4.12	\$89.61	\$450.00	\$539.61	\$372,731.95	149928
Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	Voided	
495	10/8/14	10/8/14	2019951	936112	Dump Trailer	7.21	3.14	\$68.30	\$450.00	\$518.30	\$373,250.24	149928
496	10/8/14	10/8/14	2019952	936116	Dump Trailer	7.21	9.13	\$198.58	\$450.00	\$648.58	\$373,898.82	149928
497	10/8/14	10/8/14	2019953	936118	Dump Trailer	7.21	8.54	\$185.75	\$450.00	\$635.75	\$374,534.56	149928
498	10/8/14	10/8/14	1954502	936124	Dump Trailer	7.21	6.32	\$137.46	\$450.00	\$587.46	\$375,122.02	149928
499	10/8/14	10/8/14	1954503	936125	Dump Trailer	7.21	6.04	\$131.37	\$450.00	\$581.37	\$375,703.39	149928
500	10/8/14	10/8/14	1954504	936130	Dump Trailer	7.21	3.59	\$78.08	\$450.00	\$528.08	\$376,231.48	149928
501	10/8/14	10/8/14	1954505	936069	Dump Trailer	7.21	6.31	\$137.24	\$450.00	\$587.24	\$376,818.72	149928
502	10/8/14	10/8/14	1954506	936135	Dump Trailer	7.21	4.91	\$106.79	\$450.00	\$556.79	\$377,375.51	149928
503	10/8/14	10/8/14	1954507	936136	Dump Trailer	7.21	3.80	\$82.65	\$450.00	\$532.65	\$377,908.16	149928
504	10/8/14	10/8/14	1954508	936141	Dump Trailer	7.21	4.73	\$102.88	\$450.00	\$552.88	\$378,461.04	149928
505	10/8/14	10/8/14	1954509	936146	Dump Trailer	7.21	8.43	\$183.35	\$450.00	\$633.35	\$379,094.39	149928
506	10/8/14	10/8/14	1954510	936149	Dump Trailer	7.21	8.14	\$177.05	\$450.00	\$627.05	\$379,721.44	149928
507	10/8/14	10/8/14	1954511	936153	Dump Trailer	7.21	8.11	\$176.39	\$450.00	\$626.39	\$380,347.83	149928
508	10/8/14	10/8/14	1954512	936154	Dump Trailer	7.21	8.02	\$174.44	\$450.00	\$624.44	\$380,972.26	149928
509	10/8/14	10/8/14	1954513	936155	Dump Trailer	7.21	10.82	\$235.34	\$450.00	\$685.34	\$381,657.60	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					36	509	259.70	\$5,648.48	\$16,200.00	\$21,848.48	\$381,657.60	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
510	10/9/14	10/9/14	1954514	936175	Dump Trailer	8.03	9.96	\$216.63	\$450.00	\$666.63	\$382,324.23	149928
511	10/9/14	10/9/14	1954515	936179	Dump Trailer	8.03	10.19	\$221.63	\$450.00	\$671.63	\$382,995.86	149928
512	10/9/14	10/9/14	1954516	936180	Dump Trailer	8.03	5.35	\$116.36	\$450.00	\$566.36	\$383,562.22	149928
513	10/9/14	10/9/14	1954517	936186	Dump Trailer	8.03	8.95	\$194.66	\$450.00	\$644.66	\$384,206.89	149928
514	10/9/14	10/9/14	1954518	936183	Dump Trailer	8.03	5.04	\$109.62	\$450.00	\$559.62	\$384,766.51	149928
515	10/9/14	10/9/14	1954519	936187	Dump Trailer	8.03	6.02	\$130.94	\$450.00	\$580.94	\$385,347.44	149928
516	10/9/14	10/9/14	1954520	936189	Dump Trailer	8.03	5.38	\$117.02	\$450.00	\$567.02	\$385,914.46	149928
517	10/9/14	10/9/14	1954521	936188	Dump Trailer	8.03	11.10	\$241.43	\$450.00	\$691.43	\$386,605.88	149928
518	10/9/14	10/9/14	1954522	936213	Dump Trailer	8.03	12.18	\$264.92	\$450.00	\$714.92	\$387,320.80	149928
519	10/9/14	10/9/14	1954523	936220	Dump Trailer	8.03	10.64	\$231.42	\$450.00	\$681.42	\$388,002.22	149928
520	10/9/14	10/9/14	1954524	936221	Dump Trailer	8.03	6.60	\$143.55	\$450.00	\$593.55	\$388,595.77	149928
521	10/9/14	10/9/14	1954525	936224	Dump Trailer	8.03	9.72	\$211.41	\$450.00	\$661.41	\$389,257.18	149928
522	10/9/14	10/9/14	1954526	936227	Dump Trailer	8.03	10.63	\$231.20	\$450.00	\$681.20	\$389,938.38	149928
523	10/9/14	10/9/14	1938476	936229	Dump Trailer	8.03	8.13	\$176.83	\$450.00	\$626.83	\$390,565.21	149928
524	10/9/14	10/9/14	1938477	936230	Dump Trailer	8.03	11.71	\$254.69	\$450.00	\$704.69	\$391,269.90	149928
525	10/9/14	10/9/14	1938478	936243	Dump Trailer	8.03	4.51	\$98.09	\$450.00	\$548.09	\$391,817.99	149928
526	10/9/14	10/9/14	1938479	936250	Dump Trailer	8.03	9.00	\$195.75	\$450.00	\$645.75	\$392,463.74	149928
527	10/9/14	10/9/14	1938480	936254	Dump Trailer	8.03	6.34	\$137.90	\$450.00	\$587.90	\$393,051.64	149928
528	10/9/14	10/9/14	1938481	936255	Dump Trailer	8.03	8.53	\$185.53	\$450.00	\$635.53	\$393,687.16	149928
529	10/9/14	10/9/14	1938482	936256	Dump Trailer	8.03	8.05	\$175.09	\$450.00	\$625.09	\$394,312.25	149928
530	10/9/14	10/9/14	1938483	936262	Dump Trailer	8.03	7.69	\$167.26	\$450.00	\$617.26	\$394,929.51	149928
531	10/9/14	10/9/14	1938484	936263	Dump Trailer	8.03	9.51	\$206.84	\$450.00	\$656.84	\$395,586.35	149928
532	10/9/14	10/9/14	1938485	936265	Dump Trailer	8.03	5.98	\$130.07	\$450.00	\$580.07	\$396,166.42	149928
533	10/9/14	10/9/14	1938486	936287	Dump Trailer	8.03	7.66	\$166.61	\$450.00	\$616.61	\$396,783.02	149928
534	10/9/14	10/9/14	1938487	936289	Dump Trailer	8.03	8.90	\$193.58	\$450.00	\$643.58	\$397,426.60	149928
535	10/9/14	10/9/14	1938488	936295	Dump Trailer	8.03	7.33	\$159.43	\$450.00	\$609.43	\$398,036.02	149928
536	10/9/14	10/9/14	1938489	936296	Dump Trailer	8.03	5.46	\$118.76	\$450.00	\$568.76	\$398,604.78	149928
537	10/9/14	10/9/14	1938490	936297	Dump Trailer	8.03	7.16	\$155.73	\$450.00	\$605.73	\$399,210.51	149928
538	10/9/14	10/9/14	1938491	936300	Dump Trailer	8.03	6.62	\$143.99	\$450.00	\$593.99	\$399,804.49	149928
539	10/9/14	10/9/14	1938492	936304	Dump Trailer	8.03	6.59	\$143.33	\$450.00	\$593.33	\$400,397.83	149928
540	10/9/14	10/9/14	1938493	936305	Dump Trailer	8.03	7.94	\$172.70	\$450.00	\$622.70	\$401,020.52	149928
541	10/9/14	10/9/14	1938494	936325	Dump Trailer	8.03	5.22	\$113.54	\$450.00	\$563.54	\$401,584.06	149928
542	10/9/14	10/9/14	1938495	936326	Dump Trailer	8.03	8.64	\$187.92	\$450.00	\$637.92	\$402,221.98	149928
543	10/9/14	10/9/14	1938496	936328	Dump Trailer	8.03	6.17	\$134.20	\$450.00	\$584.20	\$402,806.17	149928
544	10/9/14	10/9/14	1938497	936329	Dump Trailer	8.03	10.23	\$222.50	\$450.00	\$672.50	\$403,478.68	149928
545	10/9/14	10/9/14	1938498	936331	Dump Trailer	8.03	6.77	\$147.25	\$450.00	\$597.25	\$404,075.92	149928
546	10/9/14	10/9/14	1938499	936332	Dump Trailer	8.03	9.12	\$198.36	\$450.00	\$648.36	\$404,724.28	149928
547	10/9/14	10/9/14	1938500	936334	Dump Trailer	8.03	6.73	\$146.38	\$450.00	\$596.38	\$405,320.66	149928
548	10/9/14	10/9/14	1938436	936335	Dump Trailer	8.03	8.65	\$188.14	\$450.00	\$638.14	\$405,958.80	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					39	548	310.40	\$6,751.20	\$17,550.00	\$24,301.20	\$405,958.80	



Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
549	10/10/14	10/10/14	1938437	936351	Dump Trailer	7.44	8.52	\$185.31	\$450.00	\$635.31	\$406,594.11	149928
550	10/10/14	10/10/14	1938438	936353	Dump Trailer	7.44	6.79	\$147.68	\$450.00	\$597.68	\$407,191.79	149928
551	10/10/14	10/10/14	1938439	936354	Dump Trailer	7.44	7.18	\$156.17	\$450.00	\$606.17	\$407,797.96	149928
552	10/10/14	10/10/14	1938440	936355	Dump Trailer	7.44	5.44	\$118.32	\$450.00	\$568.32	\$408,366.28	149928
553	10/10/14	10/10/14	1938441	936358	Dump Trailer	7.44	7.60	\$165.30	\$450.00	\$615.30	\$408,981.58	149928
554	10/10/14	10/10/14	1938442	936362	Dump Trailer	7.44	8.95	\$194.66	\$450.00	\$644.66	\$409,626.24	149928
555	10/10/14	10/10/14	1938443	936361	Dump Trailer	7.44	8.98	\$195.32	\$450.00	\$645.32	\$410,271.55	149928
556	10/10/14	10/10/14	1938444	936360	Dump Trailer	7.44	7.16	\$155.73	\$450.00	\$605.73	\$410,877.28	149928
557	10/10/14	10/10/14	1938445	936389	Dump Trailer	7.44	6.75	\$146.81	\$450.00	\$596.81	\$411,474.10	149928
558	10/10/14	10/10/14	1938446	936391	Dump Trailer	7.44	7.52	\$163.56	\$450.00	\$613.56	\$412,087.66	149928
559	10/10/14	10/10/14	1938447	936393	Dump Trailer	7.44	8.98	\$195.32	\$450.00	\$645.32	\$412,732.97	149928
560	10/10/14	10/10/14	1938448	936394	Dump Trailer	7.44	7.90	\$171.83	\$450.00	\$621.83	\$413,354.80	149928
561	10/10/14	10/10/14	1938449	936398	Dump Trailer	7.44	6.16	\$133.98	\$450.00	\$583.98	\$413,938.78	149928
562	10/10/14	10/10/14	1938450	936400	Dump Trailer	7.44	7.31	\$158.99	\$450.00	\$608.99	\$414,547.77	149928
563	10/10/14	10/10/14	1938451	936403	Dump Trailer	7.44	7.95	\$172.91	\$450.00	\$622.91	\$415,170.68	149928
564	10/10/14	10/10/14	1938452	936406	Dump Trailer	7.44	7.33	\$159.43	\$450.00	\$609.43	\$415,780.11	149928
565	10/10/14	10/10/14	1938453	936415	Dump Trailer	7.44	7.25	\$157.69	\$450.00	\$607.69	\$416,387.80	149928
566	10/10/14	10/10/14	1938454	936417	Dump Trailer	7.44	8.93	\$194.23	\$450.00	\$644.23	\$417,032.02	149928
567	10/10/14	10/10/14	1938455	936418	Dump Trailer	7.44	9.13	\$198.58	\$450.00	\$648.58	\$417,680.60	149928
568	10/10/14	10/10/14	1938456	936419	Dump Trailer	7.44	9.41	\$204.67	\$450.00	\$654.67	\$418,335.27	149928
569	10/10/14	10/10/14	1938457	936422	Dump Trailer	7.44	7.18	\$156.17	\$450.00	\$606.17	\$418,941.43	149928
570	10/10/14	10/10/14	1938458	936425	Dump Trailer	7.44	5.20	\$113.10	\$450.00	\$563.10	\$419,504.53	149928
571	10/10/14	10/10/14	1938459	936428	Dump Trailer	7.44	8.40	\$182.70	\$450.00	\$632.70	\$420,137.23	149928
572	10/10/14	10/10/14	1938460	936431	Dump Trailer	7.44	7.74	\$168.35	\$450.00	\$618.35	\$420,755.58	149928
573	10/10/14	10/10/14	1938461	936445	Dump Trailer	7.44	8.80	\$191.40	\$450.00	\$641.40	\$421,396.98	149928
574	10/10/14	10/10/14	1938462	936446	Dump Trailer	7.44	8.60	\$187.05	\$450.00	\$637.05	\$422,034.03	149928
575	10/10/14	10/10/14	1938463	936449	Dump Trailer	7.44	12.29	\$267.31	\$450.00	\$717.31	\$422,751.34	149928
576	10/10/14	10/10/14	1938464	936451	Dump Trailer	7.44	6.51	\$141.59	\$450.00	\$591.59	\$423,342.93	149928
577	10/10/14	10/10/14	1938465	936453	Dump Trailer	7.44	6.39	\$138.98	\$450.00	\$588.98	\$423,931.91	149928
578	10/10/14	10/10/14	1938466	936455	Dump Trailer	7.44	6.98	\$151.82	\$450.00	\$601.82	\$424,533.73	149928
579	10/10/14	10/10/14	1938467	936457	Dump Trailer	7.44	6.89	\$149.86	\$450.00	\$599.86	\$425,133.58	149928
580	10/10/14	10/10/14	1938468	936459	Dump Trailer	7.44	5.41	\$117.67	\$450.00	\$567.67	\$425,701.25	149928
581	10/10/14	10/10/14	1938469	936468	Dump Trailer	7.44	7.08	\$153.99	\$450.00	\$603.99	\$426,305.24	149928
582	10/10/14	10/10/14	1938470	936469	Dump Trailer	7.44	4.86	\$105.71	\$450.00	\$555.71	\$426,860.95	149928
583	10/10/14	10/10/14	1938471	936474	Dump Trailer	7.44	8.59	\$186.83	\$450.00	\$636.83	\$427,497.78	149928
584	10/10/14	10/10/14	1938472	936475	Dump Trailer	7.44	6.99	\$152.03	\$450.00	\$602.03	\$428,099.81	149928
585	10/10/14	10/10/14	1938473	936481	Dump Trailer	7.44	5.03	\$109.40	\$450.00	\$559.40	\$428,659.21	149928
586	10/10/14	10/10/14	1938474	936482	Dump Trailer	7.44	6.57	\$142.90	\$450.00	\$592.90	\$429,252.11	149928
587	10/10/14	10/10/14	1938475	1938475	Dump Trailer	7.44	5.89	\$128.11	\$450.00	\$578.11	\$429,830.22	149928
588	10/10/14	10/10/14	1938360	936484	Dump Trailer	7.44	5.15	\$112.01	\$450.00	\$562.01	\$430,392.23	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					40	588	295.79	\$6,433.43	\$18,000.00	\$24,433.43	\$430,392.23	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
589	10/14/14	10/14/14	1938361	936636	Dump Trailer	6.10	4.66	\$101.36	\$450.00	\$551.36	\$430,943.59	149928
590	10/14/14	10/14/14	1938362	936635	Dump Trailer	6.10	6.80	\$147.90	\$450.00	\$597.90	\$431,541.49	149928
591	10/14/14	10/14/14	1938363	936640	Dump Trailer	6.10	5.08	\$110.49	\$450.00	\$560.49	\$432,101.98	149928
592	10/14/14	10/14/14	1938364	936641	Dump Trailer	6.10	8.41	\$182.92	\$450.00	\$632.92	\$432,734.89	149928
593	10/14/14	10/14/14	1938365	936642	Dump Trailer	6.10	7.43	\$161.60	\$450.00	\$611.60	\$433,346.50	149928
594	10/14/14	10/14/14	1938366	936644	Dump Trailer	6.10	8.66	\$188.36	\$450.00	\$638.36	\$433,984.85	149928
595	10/14/14	10/14/14	1938367	936645	Dump Trailer	6.10	5.73	\$124.63	\$450.00	\$574.63	\$434,559.48	149928
596	10/14/14	10/14/14	1938368	936648	Dump Trailer	6.10	5.41	\$117.67	\$450.00	\$567.67	\$435,127.15	149928
597	10/14/14	10/14/14	1938369	936674	Dump Trailer	6.10	5.46	\$118.76	\$450.00	\$568.76	\$435,695.90	149928
598	10/14/14	10/14/14	1938370	936676	Dump Trailer	6.10	3.66	\$79.61	\$450.00	\$529.61	\$436,225.51	149928
599	10/14/14	10/14/14	1938371	936677	Dump Trailer	6.10	7.21	\$156.82	\$450.00	\$606.82	\$436,832.32	149928
600	10/14/14	10/14/14	1938372	936679	Dump Trailer	6.10	4.84	\$105.27	\$450.00	\$555.27	\$437,387.59	149928
601	10/14/14	10/14/14	1938373	936680	Dump Trailer	6.10	4.76	\$103.53	\$450.00	\$553.53	\$437,941.12	149928
602	10/14/14	10/14/14	1938374	936681	Dump Trailer	6.10	4.13	\$89.83	\$450.00	\$539.83	\$438,480.95	149928
603	10/14/14	10/14/14	1938375	936682	Dump Trailer	6.10	5.77	\$125.50	\$450.00	\$575.50	\$439,056.45	149928
604	10/14/14	10/14/14	1938376	936687	Dump Trailer	6.10	7.19	\$156.38	\$450.00	\$606.38	\$439,662.83	149928
605	10/14/14	10/14/14	1938377	936699	Dump Trailer	6.10	4.14	\$90.05	\$450.00	\$540.05	\$440,202.88	149928
606	10/14/14	10/14/14	1938378	936705	Dump Trailer	6.10	6.74	\$146.60	\$450.00	\$596.60	\$440,799.47	149928
607	10/14/14	10/14/14	1938379	936701	Dump Trailer	6.10	6.17	\$134.20	\$450.00	\$584.20	\$441,383.67	149928
608	10/14/14	10/14/14	1938380	936703	Dump Trailer	6.10	3.79	\$82.43	\$450.00	\$532.43	\$441,916.10	149928
609	10/14/14	10/14/14	1938381	936706	Dump Trailer	6.10	6.99	\$152.03	\$450.00	\$602.03	\$442,518.13	149928
610	10/14/14	10/14/14	1938382	936708	Dump Trailer	6.10	7.15	\$155.51	\$450.00	\$605.51	\$443,123.65	149928
611	10/14/14	10/14/14	1938383	936711	Dump Trailer	6.10	6.01	\$130.72	\$450.00	\$580.72	\$443,704.36	149928
612	10/14/14	10/14/14	1938384	936727	Dump Trailer	6.10	7.95	\$172.91	\$450.00	\$622.91	\$444,327.28	149928
613	10/14/14	10/14/14	1938385	936728	Dump Trailer	6.10	5.89	\$128.11	\$450.00	\$578.11	\$444,905.38	149928
614	10/14/14	10/14/14	1938386	936729	Dump Trailer	6.10	5.61	\$122.02	\$450.00	\$572.02	\$445,477.40	149928
615	10/14/14	10/14/14	1938387	936732	Dump Trailer	6.10	8.54	\$185.75	\$450.00	\$635.75	\$446,113.15	149928
616	10/14/14	10/14/14	1938388	936733	Dump Trailer	6.10	7.61	\$165.52	\$450.00	\$615.52	\$446,728.66	149928
617	10/14/14	10/14/14	1938389	936734	Dump Trailer	6.10	5.41	\$117.67	\$450.00	\$567.67	\$447,296.33	149928
618	10/14/14	10/14/14	1938391	936737	Dump Trailer	6.10	6.14	\$133.55	\$450.00	\$583.55	\$447,879.88	149928
619	10/14/14	10/14/14	1938391	936738	Dump Trailer	6.10	5.06	\$110.06	\$450.00	\$560.06	\$448,439.93	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					31	619	188.40	\$4,097.70	\$13,950.00	\$18,047.70	\$448,439.93	

Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
620	10/15/14	10/15/14	1938392	936768	Dump Trailer	5.71	1.06	\$23.06	\$450.00	\$473.06	\$448,912.99	149928
621	10/15/14	10/15/14	1939393	936769	Dump Trailer	5.71	4.86	\$105.71	\$450.00	\$555.71	\$449,468.69	149928
622	10/15/14	10/15/14	1938394	936771	Dump Trailer	5.71	8.97	\$195.10	\$450.00	\$645.10	\$450,113.79	149928
623	10/15/14	10/15/14	1938395	936772	Dump Trailer	5.71	5.46	\$118.76	\$450.00	\$568.76	\$450,682.54	149928
624	10/15/14	10/15/14	1938396	936773	Dump Trailer	5.71	6.03	\$131.15	\$450.00	\$581.15	\$451,263.70	149928
625	10/15/14	10/15/14	1938397	936774	Dump Trailer	5.71	6.50	\$141.38	\$450.00	\$591.38	\$451,855.07	149928
626	10/15/14	10/15/14	1938398	936778	Dump Trailer	5.71	4.78	\$103.97	\$450.00	\$553.97	\$452,409.04	149928
627	10/15/14	10/15/14	1938399	936779	Dump Trailer	5.71	5.05	\$109.84	\$450.00	\$559.84	\$452,968.87	149928
628	10/15/14	10/15/14	1938400	936806	Dump Trailer	5.71	3.58	\$77.87	\$450.00	\$527.87	\$453,496.74	149928
629	10/15/14	10/15/14	1938401	936807	Dump Trailer	5.71	6.61	\$143.77	\$450.00	\$593.77	\$454,090.51	149928
630	10/15/14	10/15/14	1938402	936808	Dump Trailer	5.71	6.04	\$131.37	\$450.00	\$581.37	\$454,671.88	149928
631	10/15/14	10/15/14	1938403	936809	Dump Trailer	5.71	4.17	\$90.70	\$450.00	\$540.70	\$455,212.57	149928
632	10/15/14	10/15/14	1938404	936812	Dump Trailer	5.71	7.98	\$173.57	\$450.00	\$623.57	\$455,836.14	149928
633	10/15/14	10/15/14	1938405	936811	Dump Trailer	5.71	4.93	\$107.23	\$450.00	\$557.23	\$456,393.37	149928
634	10/15/14	10/15/14	1938406	936815	Dump Trailer	5.71	6.69	\$145.51	\$450.00	\$595.51	\$456,988.87	149928
635	10/15/14	10/15/14	1938407	936816	Dump Trailer	5.71	3.26	\$70.91	\$450.00	\$520.91	\$457,509.78	149928
636	10/15/14	10/15/14	1938408	936832	Dump Trailer	5.71	3.61	\$78.52	\$450.00	\$528.52	\$458,038.30	149928
637	10/15/14	10/15/14	1938409	936833	Dump Trailer	5.71	9.48	\$206.19	\$450.00	\$656.19	\$458,694.49	149928
638	10/15/14	10/15/14	1938410	936838	Dump Trailer	5.71	4.12	\$89.61	\$450.00	\$539.61	\$459,234.10	149928
639	10/15/14	10/15/14	1938411	936840	Dump Trailer	5.71	7.66	\$166.61	\$450.00	\$616.61	\$459,850.70	149928
640	10/15/14	10/15/14	1938412	936842	Dump Trailer	5.71	7.46	\$162.26	\$450.00	\$612.26	\$460,462.96	149928
641	10/15/14	10/15/14	1938413	936841	Dump Trailer	5.71	3.21	\$69.82	\$450.00	\$519.82	\$460,982.77	149928
642	10/15/14	10/15/14	1938414	936846	Dump Trailer	5.71	8.45	\$183.79	\$450.00	\$633.79	\$461,616.56	149928
643	10/15/14	10/15/14	1938415	936849	Dump Trailer	5.71	8.69	\$189.01	\$450.00	\$639.01	\$462,255.57	149928
644	10/15/14	10/15/14	1938416	936865	Dump Trailer	5.71	6.13	\$133.33	\$450.00	\$583.33	\$462,838.90	149928
645	10/15/14	10/15/14	1938417	936866	Dump Trailer	5.71	7.95	\$172.91	\$450.00	\$622.91	\$463,461.81	149928
646	10/15/14	10/15/14	1938418	936867	Dump Trailer	5.71	8.76	\$190.53	\$450.00	\$640.53	\$464,102.34	149928
647	10/15/14	10/15/14	1938419	936871	Dump Trailer	5.71	8.09	\$175.96	\$450.00	\$625.96	\$464,728.30	149928
648	10/15/14	10/15/14	1938420	936873	Dump Trailer	5.71	6.15	\$133.76	\$450.00	\$583.76	\$465,312.06	149928
649	10/15/14	10/15/14	1938421	936875	Dump Trailer	5.71	2.59	\$56.33	\$450.00	\$506.33	\$465,818.39	149928
650	10/15/14	10/15/14	1938422	936877	Dump Trailer	5.71	4.33	\$94.18	\$450.00	\$544.18	\$466,362.57	149928
651	10/15/14	10/15/14	1938423	936880	Dump Trailer	5.71	7.14	\$155.30	\$450.00	\$605.30	\$466,967.86	149928
652	10/15/14	10/15/14	1938424	936894	Dump Trailer	5.71	2.54	\$55.25	\$450.00	\$505.25	\$467,473.11	149928
653	10/15/14	10/15/14	1938425	936896	Dump Trailer	5.71	5.52	\$120.06	\$450.00	\$570.06	\$468,043.17	149928
654	10/15/14	10/15/14	1938426	936897	Dump Trailer	5.71	4.36	\$94.83	\$450.00	\$544.83	\$468,588.00	149928
655	10/15/14	10/15/14	1938427	936898	Dump Trailer	5.71	6.29	\$136.81	\$450.00	\$586.81	\$469,174.81	149928
656	10/15/14	10/15/14	1938428	936899	Dump Trailer	5.71	4.32	\$93.96	\$450.00	\$543.96	\$469,718.77	149928
657	10/15/14	10/15/14	1938429	936901	Dump Trailer	5.71	3.88	\$84.39	\$450.00	\$534.39	\$470,253.16	149928
658	10/15/14	10/15/14	1938430	936900	Dump Trailer	5.71	5.07	\$110.27	\$450.00	\$560.27	\$470,813.43	149928
659	10/15/14	10/15/14	1938431	936903	Dump Trailer	5.71	5.25	\$114.68	\$450.00	\$564.68	\$471,378.11	149928
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					40	659	227.02	\$4,938.18	\$18,000.00	\$22,938.18	\$471,378.11	



Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
660	10/16/14	10/16/14	1938432	936921	Dump Trailer	6.99	7.37	\$160.30	\$450.00	\$610.30	\$471,988.41	150313
661	10/16/14	10/16/14	1938433	936926	Dump Trailer	6.99	6.61	\$143.77	\$450.00	\$593.77	\$472,582.17	150313
662	10/16/14	10/16/14	1938434	936946	Dump Trailer	6.99	6.89	\$149.86	\$450.00	\$599.86	\$473,182.03	150313
663	10/16/14	10/16/14	1938435	936948	Dump Trailer	6.99	6.48	\$140.94	\$450.00	\$590.94	\$473,772.97	150313
664	10/16/14	10/16/14	1955738	936967	Dump Trailer	6.99	9.09	\$197.71	\$450.00	\$647.71	\$474,420.68	150313
665	10/16/14	10/16/14	1955739	936969	Dump Trailer	6.99	7.54	\$164.00	\$450.00	\$614.00	\$475,034.67	150313
666	10/16/14	10/16/14	1955740	936987	Dump Trailer	6.99	7.42	\$161.39	\$450.00	\$611.39	\$475,646.06	150313
667	10/16/14	10/16/14	1955741	936990	Dump Trailer	6.99	6.68	\$145.29	\$450.00	\$595.29	\$476,241.35	150313
668	10/16/14	10/16/14	1955742	937002	Dump Trailer	6.99	7.14	\$155.30	\$450.00	\$605.30	\$476,846.64	150313
669	10/16/14	10/16/14	1955743	937004	Dump Trailer	6.99	4.72	\$102.66	\$450.00	\$552.66	\$477,399.30	150313
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					10	669	69.94	\$1,521.20	\$4,500.00	\$6,021.20	\$477,399.30	

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
670	10/17/14	10/17/14	1955744	937020	Dump Trailer	11.06	8.26	\$179.66	\$450.00	\$629.66	\$478,028.96	150313
671	10/17/14	10/17/14	1955760	937026	Dump Trailer	11.06	7.55	\$164.21	\$450.00	\$614.21	\$478,643.17	150313
672	10/17/14	10/17/14	1955761	937046	Dump Trailer	11.06	9.86	\$214.46	\$450.00	\$664.46	\$479,307.63	150313
673	10/17/14	10/17/14	1955762	937052	Dump Trailer	11.06	9.41	\$204.67	\$450.00	\$654.67	\$479,962.29	150313
674	10/17/14	10/17/14	1955763	937071	Dump Trailer	11.06	20.69	\$450.01	\$450.00	\$900.01	\$480,862.30	150313
675	10/17/14	10/17/14	1955764	937074	Dump Trailer	11.06	9.58	\$208.37	\$450.00	\$658.37	\$481,520.67	150313
676	10/17/14	10/17/14	1955765	937094	Dump Trailer	11.06	12.56	\$273.18	\$450.00	\$723.18	\$482,243.85	150313
677	10/17/14	10/17/14	1955766	937095	Dump Trailer	11.06	10.60	\$230.55	\$450.00	\$680.55	\$482,924.40	150313
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					8	677	88.51	\$1,925.09	\$3,600.00	\$5,525.09	\$482,924.40	

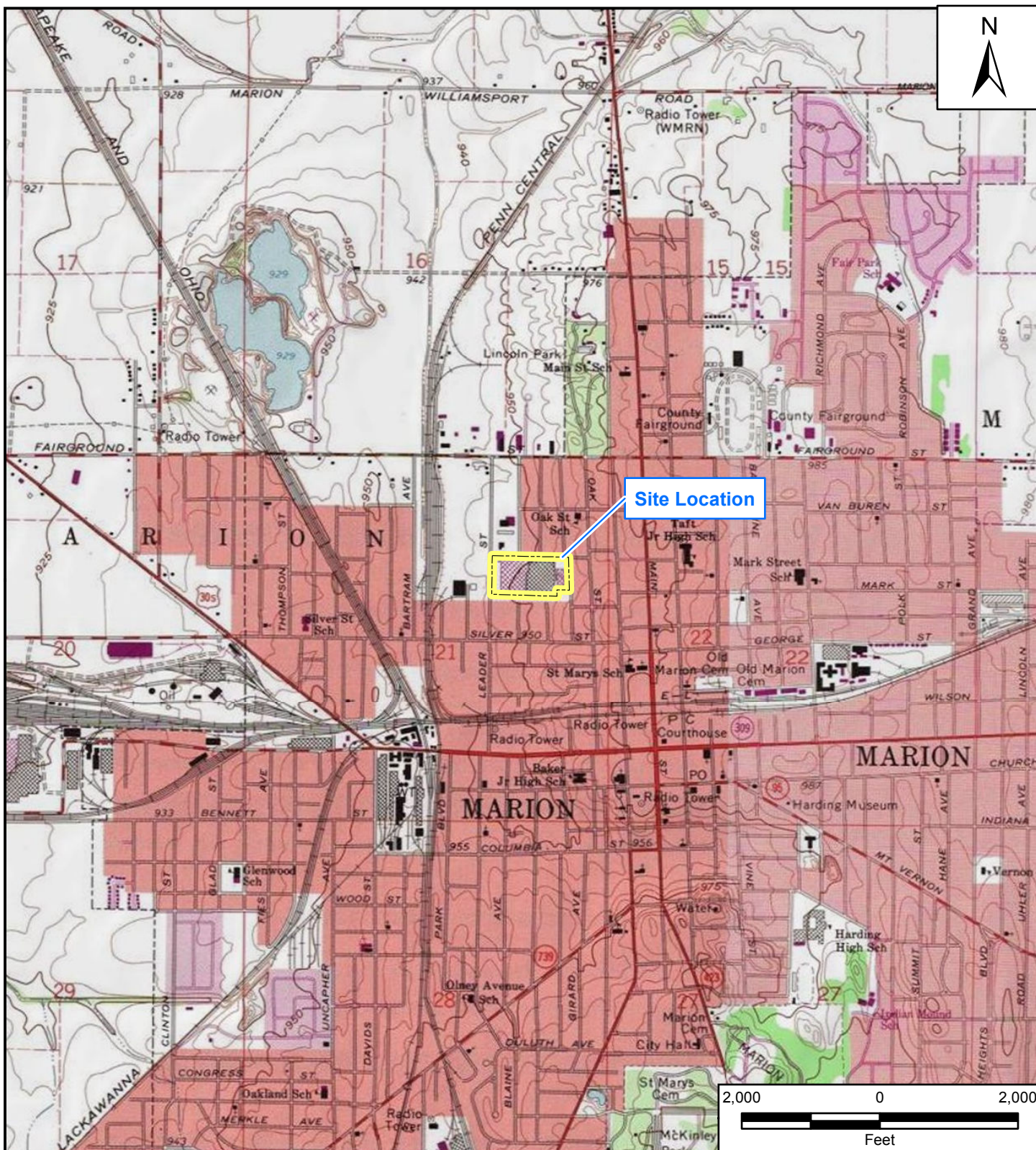
Table 5  
Non-Haz Soil Waste  
Disposal Log  
Asbestos, 9, NA2212,PG 3

Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
678	10/27/14	10/27/14	1955767	937536	Dump Trailer	18.18	27.19	\$591.38	\$450.00	\$1,041.38	\$483,965.78	150313
679	10/27/14	10/27/14	1955768	937558	Dump Trailer	18.18	17.40	\$378.45	\$450.00	\$828.45	\$484,794.23	150313
680	10/27/14	10/27/14	1955769	937584	Dump Trailer	18.18	12.92	\$281.01	\$450.00	\$731.01	\$485,525.24	150313
681	10/27/14	10/27/14	1955770	937597	Dump Trailer	18.18	15.19	\$330.38	\$450.00	\$780.38	\$486,305.62	150313
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					4	681	72.70	\$1,581.23	\$1,800.00	\$3,381.23	\$486,305.62	



Load #	Date From Site	Date Delivered To Landfill	Manifest #	Weight Ticket #	Type of Truck	Est. Tons	Actual Tons	Disposal Cost	Trans Cost	Total Cost	Total Cost to Date	Invoice #
678	10/28/14	10/28/14	1955771	937618	Dump Trailer	15.72	12.70	\$276.23	\$450.00	\$726.23	\$487,031.85	150313
679	10/28/14	10/28/14	1955772	937648	Dump Trailer	15.72	14.63	\$318.20	\$450.00	\$768.20	\$487,800.05	150313
680	10/28/14	10/28/14	1955773	937678	Dump Trailer	15.72	19.83	\$431.30	\$450.00	\$881.30	\$488,681.35	150313
681	10/28/14	10/28/14	1955774	937704	Dump Trailer	15.72	16.61	\$361.27	\$450.00	\$811.27	\$489,492.62	150313
					Daily Loads	Total Loads to Date	Daily Tonnage	Daily Disposal Costs	Daily Trans Costs	Daily Total Costs	Total Costs To Date	
					4	685	63.77	\$1,387.00	\$1,800.00	\$3,187.00	\$489,492.62	
						Avg. Tons/Load To Date	Total Tonnage To Date	Total Disposal Costs To Date	Total Trans Costs To Date	Total (All) Costs To Date		
						12.16	8332.95	\$181,242.62	\$308,250.00	\$489,492.62		

**APPENDIX D**  
**SITE FIGURES**



#### Legend

Site Boundary

Joseph Street Asbestos Site  
333 Joseph Street  
Marion, Marion County, Ohio

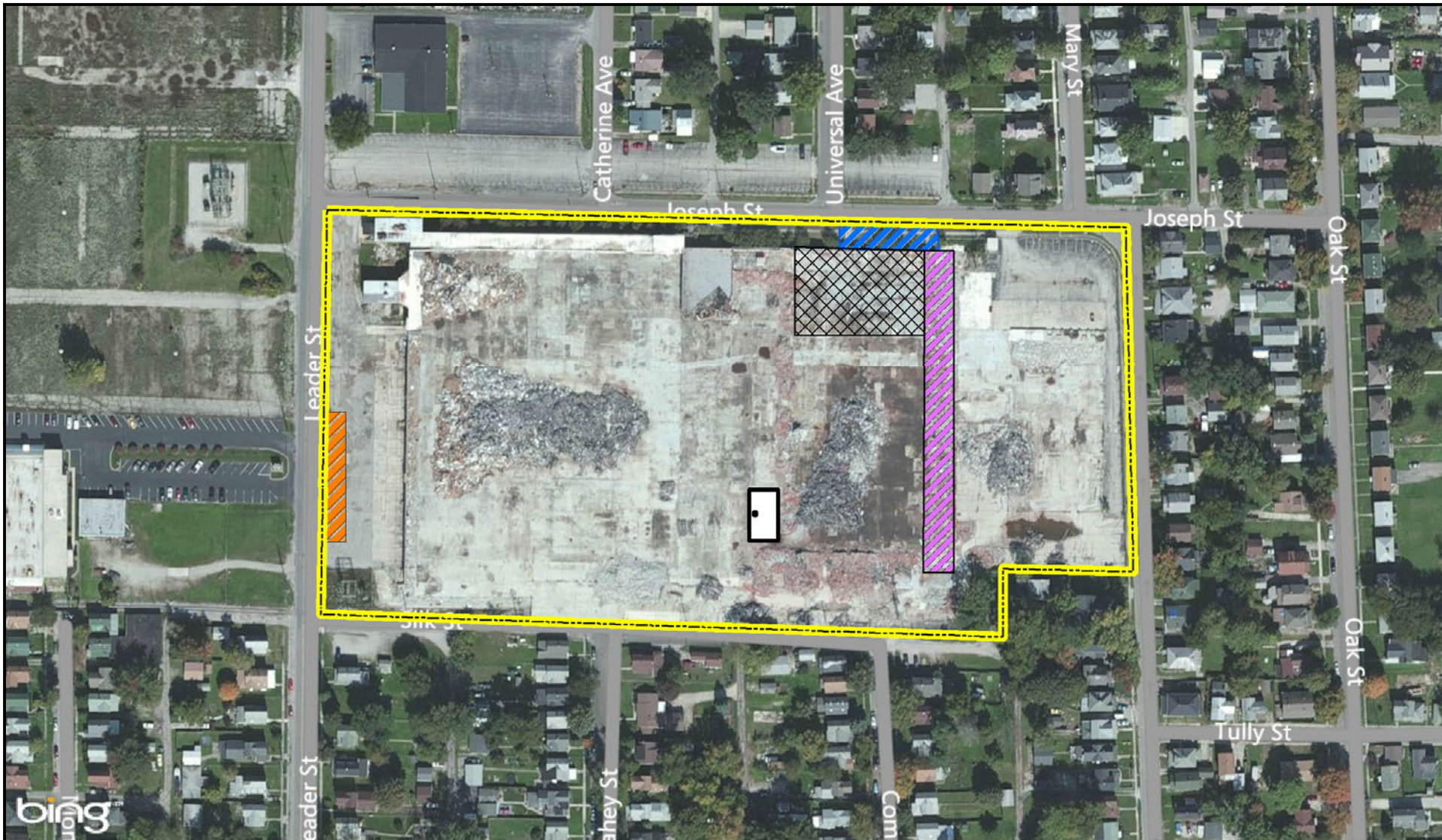
**Figure 1**  
**Site Location Map**



Prepared For: US EPA

Prepared By: Tetra Tech

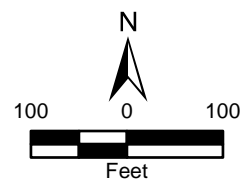




# Legend

-  Cistern
-  Command Post
-  Pipe Trench
-  Test Area for Activity Based Air Sampling
-  Basement Area
-  Site Boundary

Source: Aerial Imagery, Bing Maps 2010



Joseph Street Asbestos Site  
333 Joseph Street  
Marion, Marion County, Ohio

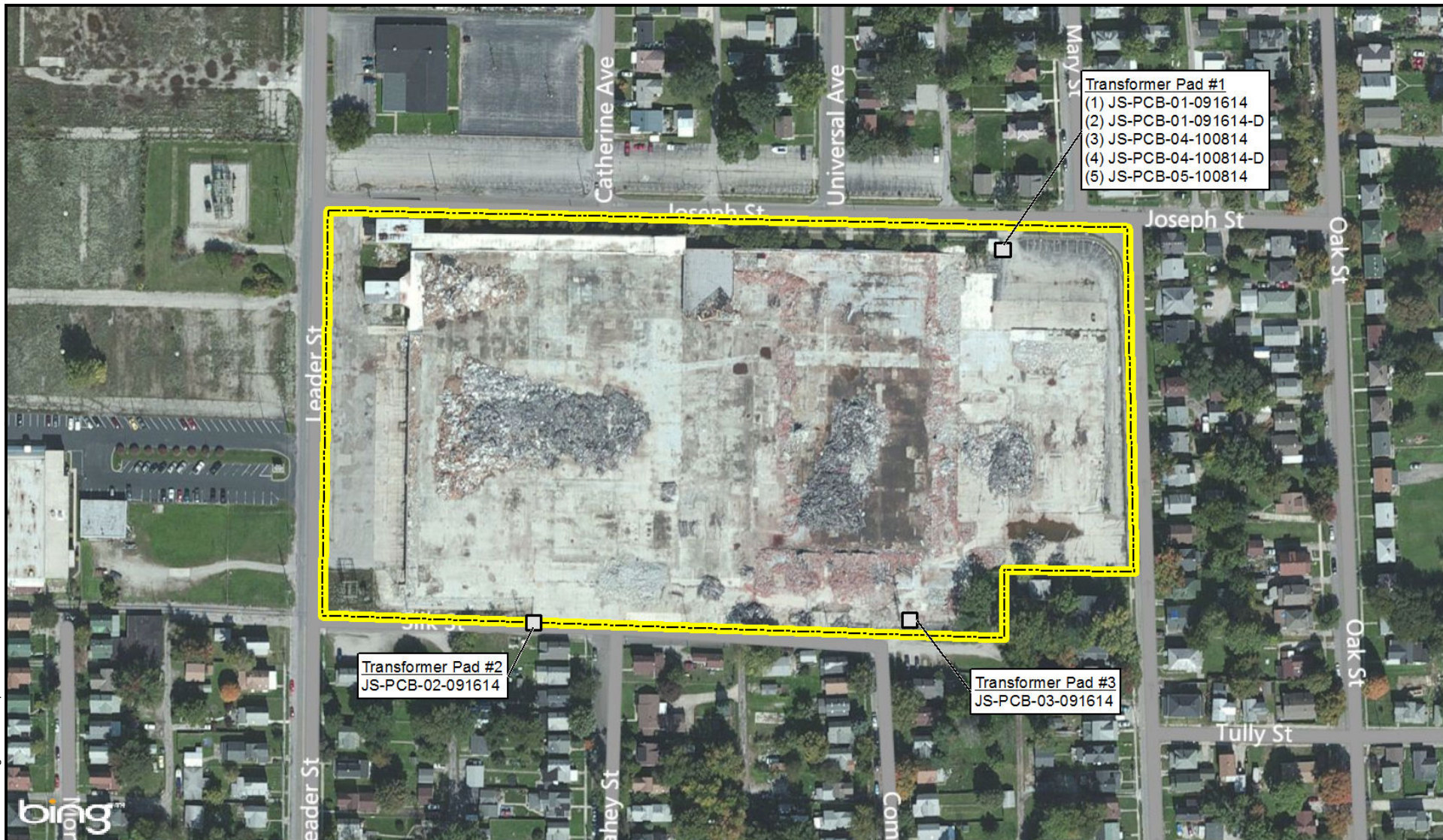
**Figure 2**  
**Site Features Map**



Prepared For: US EPA

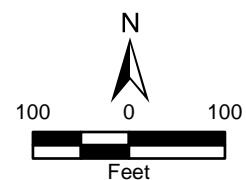
Prepared By: Tetra Tech





# Legend

- Transformer Location
- Site Boundary



Joseph Street Asbestos Site  
333 Joseph Street  
Marion, Marion County, Ohio

**Figure 3**  
**PCB Soil Sample Locations**



Prepared For: US EPA

Prepared By: Tetra Tech

Source: Aerial Imagery, Bing Maps 2010

Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet Projection: Lambert Conformal Conic Datum: North American 1983 Units: Foot US

**ATTACHMENT A**

**ANALYTICAL RESULTS AND DATA VERIFICATION REPORT:  
PERIMETER AIR SAMPLES**



**DATA VERIFICATION REPORT**  
**PERIMETER AIR SAMPLES**  
**Joseph Street Asbestos Removal Site, Marion, Ohio**

This report presents a data verification for the analytical reports of perimeter air samples collected from the Joseph Street Asbestos Removal Site in Marion, Ohio, during September and October 2014 by Tetra Tech START personnel. The samples were sent by overnight courier to EMSL Analytical, Inc. (EMSL), for analysis for asbestos. Most samples were sent to EMSL's Ann Arbor, Michigan, laboratory for analysis by National Institute for Occupational Safety and Health (NIOSH) Method 7400, which uses phase-contrast light microscopy (PCM), and NIOSH Method 7402, which uses transmission electron microscopy (TEM) with energy-dispersive X-ray (EDX) analysis to identify the crystalline species of detected fibers. Some of the earlier samples were sent to EMSL's laboratories in South Portland, Maine, or Indianapolis, Indiana, for the same analyses. The following section discusses the results of the NIOSH analyses of perimeter air samples, with emphasis on any apparent problems. A final section provides an overall evaluation. EMSL's reported analytical results are included following this report.

## **1.0 NIOSH Analyses**

The reports for the NIOSH asbestos analyses included no laboratory quality control (QC) information, other than field blanks and field duplicates. No significant irregularities were seen in these analyses. Most fibers detected by PCM were identified as non-asbestos by TEM. The exception was 1 chrysotile fiber identified for sample JS-AS-004H-090414, collected on September 4.

## **2.0 Overall Evaluation**

No problems were encountered during the analyses, and no data were qualified or rejected. All results may be used, as reported, for any purpose.

**EMSL Analytical, Inc.**

161 John Roberts Road, South Portland, ME 04106

Phone/Fax: (207) 517-6921 / (207) 517-6922

<http://www.EMSL.com>[portlandlab@emsl.com](mailto:portlandlab@emsl.com)

EMSL Order: 621401106

CustomerID: LATA34A

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**756 Park Meadow Road**  
**Westerville, OH 43081**

Phone: (519) 884-0510  
Fax:  
Received: 09/09/14 10:19 AM  
Analysis Date: 9/9/2014  
Collected: 9/4/2014

Project: **Joseph Street Asbestos/0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-090414 621401106-0001	SOUTHERN PERIMETER - UPWIND	9/4/2014	4797.60	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-090414 621401106-0002	WESTERN PERIMETER - CROSSWIND	9/4/2014	4951.20	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-090414 621401106-0003	NORTHERN PERIMETER - DOWNWIND	9/4/2014	5450.40	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-004H-090414 621401106-0004	EASTERN PERIMETER - CROSSWIND	9/4/2014	4812.00	7.5	100	0.001	9.55	0.001	
JS-FB-001-090414 621401106-0005	- FIELD BLANK	9/4/2014		<5.5	100		<7.01		Field Blank
JS-EQB-001-090414 621401106-0006	- EQUIPMENT BLANK	9/4/2014		<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Christina Walker (6)

Christina Walker, Laboratory Manager  
or other approved signatory

\*Following EMSL Analytical SOP Asbestos and Other Fibers by PCM. Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.35, 21-50 fibers = 0.30, 51-100 fibers = 0.20. The laboratory is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears not responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. South Portland, ME

Initial report from 09/10/2014 13:49:56

**EMSL Analytical, Inc.**

161 John Roberts Road, South Portland, ME 04106

Phone/Fax: (207) 517-6921 / (207) 517-6922

<http://www.EMSL.com>[portlandlab@emsl.com](mailto:portlandlab@emsl.com)

EMSL Order: 621401106

CustomerID: LATA34A

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**756 Park Meadow Road**  
**Westerville, OH 43081**

Phone: (519) 884-0510  
Fax:  
Received: 09/09/14 10:19 AM  
Analysis Date: 9/10/2014  
Collected: 9/4/2014

Project: **Joseph Street Asbestos/0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-090414 621401106-0001	4797.6	2	<0.001			0	<0.001	
JS-AS-002H-090414 621401106-0002	4951.2	5	<0.001			0	<0.001	
JS-AS-003H-090414 621401106-0003	5450.4	3	<0.0005			0	<0.0005	
JS-AS-004H-090414 621401106-0004	4812.0	4	0.001	Chrysotile	1	20	<0.001	
JS-FB-001-090414 621401106-0005	0	0	n/a			0	n/a	Field Blank
JS-EQB-001-090414 621401106-0006	0	0	n/a			0	n/a	Field Blank

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks: 0

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Leslie McCluskeyEissing (6)

Christina Walker, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. South Portland, ME

Initial report from 09/10/2014 13:49:56



**EMSL Analytical, Inc.**

161 John Roberts Road, South Portland, ME 04106

Phone/Fax: (207) 517-6921 / (207) 517-6922

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EMSL Order: 621401107

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**2424 Louisiana Blvd NE**  
**Suite 201**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/09/14 10:30 AM  
Analysis Date: 9/9/2014  
Collected: 9/5/2014

Project: **Joseph Street Asbestos/0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-090514 621401107-0001	SOUTHERN PERIMETER - UPWIND	9/5/2014	5186.40	7	100	0.001	8.92	0.001	
JS-AS-002H-090514 621401107-0002	WESTERN PERIMETER - CROSSWIND	9/5/2014	4831.20	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-090514 621401107-0003	NORTHERN PERIMETER - DOWNWIND	9/5/2014	4567.20	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-090514 621401107-0004	EASTERN PERIMETER - CROSSWIND	9/5/2014	4741.24	8	100	0.001	10.2	0.001	
JS-FB-001-090514 621401107-0005	- FIELD BLANK	9/5/2014		<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Christina Walker (5)

Christina Walker, Laboratory Manager  
or other approved signatory

\*Following EMSL Analytical SOP Asbestos and Other Fibers by PCM. Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.35, 21-50 fibers = 0.30, 51-100 fibers = 0.20. The laboratory is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears not responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. South Portland, ME

Initial report from 09/10/2014 13:43:19

**EMSL Analytical, Inc.**

161 John Roberts Road, South Portland, ME 04106

Phone/Fax: (207) 517-6921 / (207) 517-6922

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EMSL Order: 621401107

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CustomerPO:

ProjectID:

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**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/09/14 10:30 AM  
Analysis Date: 9/10/2014  
Collected: 9/5/2014

Project: **Joseph Street Asbestos/0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-090514 621401107-0001	5186.4	5	0.001			0	<0.001	
JS-AS-002H-090514 621401107-0002	4831.2	1	<0.001			0	<0.001	
JS-AS-003H-090514 621401107-0003	4567.2	0	<0.001			0	<0.001	
JS-AS-004H-090514 621401107-0004	4741.24	1	0.001			0	<0.001	
JS-FB-001-090514 621401107-0005	0	0	n/a			0	n/a	Field Blank

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Leslie McCluskeyEissing (5)

Christina Walker, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. South Portland, ME

Initial report from 09/10/2014 13:43:19

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2001 East 52nd St., Indianapolis, IN 46205

Phone/Fax: (317) 803-2997 / (317) 803-3047

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EMSL Order: 161413746

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**2424 Louisiana Blvd NE**  
**Suite 201**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/10/14 9:05 AM  
Analysis Date: 9/10/2014  
Collected: 9/8/2014

Project: JOSEPH STREET ASBESTOS / 0072

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-090814 161413746-0001	upwind/eastern perimeter	9/8/2014	4755.00	8.5	100	0.001	10.8	0.001	
JS-AS-002H-090814 161413746-0002	crosswind/southern	9/8/2014	4547.00	5.5	100	0.001	7.01	0.001	
JS-AS-003H-090814 161413746-0003	downwind western	9/8/2014	5210.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-090814 161413746-0004	crosswind/northern	9/8/2014	4845.00	<5.5	100	0.001	<7.01	<0.001	

No discernable field blanks submitted with this sample set.

Analyst(s)

Susan Harding (4)

Richard Harding, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.39, 21-50 fibers = 0.28, 51-100 fibers = 0.21. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LAP, LLC--IHLAP 157245, AZ0939, CO AL-15132, TX 300262

Initial report from 09/12/2014 14:50:01



**EMSL Analytical, Inc.**

2001 East 52nd St., Indianapolis, IN 46205

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EMSL Order: 161413746

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**2424 Louisiana Blvd NE**  
**Suite 201**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/10/14 9:05 AM  
Analysis Date: 9/11/2014  
Collected: 9/8/2014

Project: **JOSEPH STREET ASBESTOS / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-090814 161413746-0001	4755	1	0.001			0	<0.001	PCM Data From Client
JS-AS-002H-090814 161413746-0002	4547	0	<0.001			0	<0.001	PCM Data From Client
JS-AS-003H-090814 161413746-0003	5210	0	<0.001			0	<0.001	PCM Data From Client
JS-AS-004H-090814 161413746-0004	4845	0	0.001			0	<0.001	PCM Data From Client

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks: n/a

Average number of non-asbestos fibers on field blanks: n/a

Analyst(s)

Richard Harding (4)

Richard Harding, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN

Initial report from 09/12/2014 14:50:05

**EMSL Analytical, Inc.**

2001 East 52nd St., Indianapolis, IN 46205

Phone/Fax: (317) 803-2997 / (317) 803-3047

<http://www.EMSL.com>[indianapolislab@emsl.com](mailto:indianapolislab@emsl.com)

EMSL Order: 161413854

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**6501 Americas Parkway NE**  
**Suite 200**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/11/14 9:25 AM  
Analysis Date: 9/12/2014  
Collected: 9/9/2014

Project: JOSEPH STREET ASBESTOS / 0072

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-090914 161413854-0001	downwind northern	9/9/2014	4447.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-090914 161413854-0002	crosswind eastern	9/9/2014	4509.00	6	100	0.001	7.64	0.001	
JS-AS-003H-090914 161413854-0003	upwind southern	9/9/2014	4807.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-090914 161413854-0004	crosswind western	9/9/2014	4707.00	<5.5	100	0.001	<7.01	<0.001	

No discernable field blanks submitted with this sample set.

Analyst(s)

Susan Harding (4)

Richard Harding, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.39, 21-50 fibers = 0.28, 51-100 fibers = 0.21. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LAP, LLC--IHLAP 157245, AZ0939, CO AL-15132, TX 300262

Initial report from 11/07/2014 10:42:25

**EMSL Analytical, Inc.**

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EMSL Order: 161413854

CustomerID: LATA34

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Fax: (614) 508-1201  
Received: 09/11/14 9:25 AM  
Analysis Date: 9/16/2014  
Collected: 9/9/2014

Project: **JOSEPH STREET ASBESTOS / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-090914 161413854-0001	4447	0	<0.001			0	<0.001	
JS-AS-002H-090914 161413854-0002	4509	0	0.001			0	<0.001	
JS-AS-003H-090914 161413854-0003	4807	0	<0.001			0	<0.001	
JS-AS-004H-090914 161413854-0004	4707	0	<0.001			0	<0.001	

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks: n/a

Average number of non-asbestos fibers on field blanks: n/a

Analyst(s)

Susan Harding (4)

Richard Harding, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.  
Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN

Initial report from 09/16/2014 14:02:19



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Phone: (505) 884-3800  
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Received: 09/11/14 9:25 AM  
Analysis Date: 9/12/2014  
Collected: 9/10/2014

Project: JOSEPH STREET ASBESTOS / 0072

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091014 161413862-0001	upwind southern	9/10/2014	2835.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-091014 161413862-0002	crosswind eastern	9/10/2014	2890.00	5.5	100	0.001	7.01	0.001	
JS-AS-003H-091014 161413862-0003	downwind northern	9/10/2014	2964.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-091014 161413862-0004	crosswind western	9/10/2014	2897.00	6	100	0.001	7.64	0.001	

No discernable field blanks submitted with this sample set.

Analyst(s)

Susan Harding (4)

Richard Harding, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.39, 21-50 fibers = 0.28, 51-100 fibers = 0.21. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LAP, LLC--IHLAP 157245, AZ0939, CO AL-15132, TX 300262

Initial report from 11/07/2014 10:43:32

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EMSL Order: 161413862

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Fax: (614) 508-1201  
Received: 09/11/14 9:25 AM  
Analysis Date: 9/16/2014  
Collected: 9/10/2014

Project: **JOSEPH STREET ASBESTOS / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091014 161413862-0001	2835	0	<0.001			0	<0.001	
JS-AS-002H-091014 161413862-0002	2890	0	0.001			0	<0.001	
JS-AS-003H-091014 161413862-0003	2964	0	<0.001			0	<0.001	
JS-AS-004H-091014 161413862-0004	2897	0	0.001			0	<0.001	

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks: n/a

Average number of non-asbestos fibers on field blanks: n/a

Analyst(s)

Susan Harding (4)

Richard Harding, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.  
Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN

Initial report from 09/16/2014 13:14:55

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/15/14 8:00 AM  
Analysis Date: 9/15/2014  
Collected:

Project: **Joseph Street Asbestos/0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091114 161414026-0001	Upwind/Northern Perimeter		4900.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-091114 161414026-0002	Crosswind/Eastern Perimeter		4803.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-091114 161414026-0003	Downwind/Southern Perimeter		4806.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-091114 161414026-0004	Crosswind/Western Perimeter		4864.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-EQB-002 161414026-0005	Equipment Blank 2			<5.5	100		<7.01		Field Blank
JS-AS-FB-002 161414026-0006	Field Blank 2			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Susan Harding (6)

Richard Harding, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.39, 21-50 fibers = 0.28, 51-100 fibers = 0.21. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

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Initial report from 09/18/2014 13:26:32

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EMSL Order: 161414026

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Fax: (614) 508-1201  
Received: 09/15/14 8:00 AM  
Analysis Date: 9/18/2014  
Collected:

Project: **Joseph Street Asbestos/0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091114 161414026-0001	4900	0	<0.001			0	<0.001	
JS-AS-002H-091114 161414026-0002	4803	0	<0.001			0	<0.001	
JS-AS-003H-091114 161414026-0003	4806	0	<0.001			0	<0.001	
JS-AS-004H-091114 161414026-0004	4864	0	<0.001			0	<0.001	
JS-AS-EQB-002 161414026-0005	0	0	n/a			0	n/a	Field Blank
JS-AS-FB-002 161414026-0006	0	0	n/a			0	n/a	Field Blank

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Richard Harding (6)

Richard Harding, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN

Initial report from 09/18/2014 13:26:38



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Fax: (614) 508-1201  
Received: 09/16/14 10:05 AM  
Analysis Date: 9/16/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091214 081402594-0001	Upwind/Northern Perimeter		3913.00	13	100	0.001	16.6	0.002	
JS-AS-002H-091214 081402594-0002	Crosswind/Eastern Perimeter		4070.00	18	100	0.001	22.9	0.002	
JS-AS-003H-091214 081402594-0003	Downwind/Southern Perimeter		3971.00	11	100	0.001	14	0.001	
JS-AS-004H-091214 081402594-0004	Crosswind/Western Perimeter		4197.00	12	100	0.001	15.3	0.001	

No discernable field blanks submitted with this sample set.

Analyst(s)

Orlando J. Ivey II (4)

Chris Dojlikko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/19/2014 11:03:32

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Fax: (614) 508-1201  
Received: 09/16/14 10:05 AM  
Analysis Date: 9/19/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091214 081402594-0001	3913	0	0.002			0	<0.001	
JS-AS-002H-091214 081402594-0002	4070	0	0.002			0	<0.001	
JS-AS-003H-091214 081402594-0003	3971	0	0.001			0	<0.001	
JS-AS-004H-091214 081402594-0004	4197	2	0.001			0	<0.001	

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks: n/a

Average number of non-asbestos fibers on field blanks: n/a

Analyst(s)

Chris Dojlidko (4)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/19/2014 11:03:32

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Fax: (614) 508-1201  
Received: 09/17/14 10:12 AM  
Analysis Date: 9/17/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091514 081402605-0001	Upwind/Eastern Perimeter		6594.58	11	100	0.0004	14.0	0.001	
JS-AS-002H-091514 081402605-0002	Crosswind/Southeastern Perimeter		4984.28	17	100	0.001	21.7	0.002	
JS-AS-003H-091514 081402605-0003	Downwind/Western Perimeter		4811.39	6	100	0.001	7.64	0.001	
JS-AS-004H-091514 081402605-0004	Crosswind/Northern Perimeter		4950.13	8.5	100	0.001	10.8	0.001	
JS-FB-001-091514 081402605-0005	Field Blank			<5.5	100		<7.0		Field Blank
JS-FB-002-091514 081402605-0006	Field Blank			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Orlando J. Ivey II (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/22/2014 09:34:02

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EMSL Order: 081402605

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/17/14 10:12 AM  
Analysis Date: 9/22/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091514 081402605-0001	6594.28	1	0.001			0	<0.0004	
JS-AS-002H-091514 081402605-0002	4984.28	0	0.002			0	<0.001	
JS-AS-003H-091514 081402605-0003	4811.39	1	0.001			0	<0.001	
JS-AS-004H-091514 081402605-0004	4950.13	2	0.001			0	<0.001	
JS-FB-001-091514 081402605-0005	0	0				0	#Error	
JS-FB-002-091514 081402605-0006	0	0				0	#Error	

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Chris Dojlidko (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/22/2014 09:34:12



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EMSL Order: 081402614

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/18/14 9:35 AM  
Analysis Date: 9/19/2014  
Collected:

Project: **Joseph St Asbestos / 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091614 081402614-0001	Upwind / Northern Perimeter		5700.57	16.2	100	0.0005	20.6	0.001	
JS-AS-002H-091614 081402614-0002	Crosswind/ Eastern Perimeter		5674.20	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-003H-091614 081402614-0003	Downwind / Southern Perimeter		2937.64	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-091614-D 081402614-0004	Downwind / Southern Perimeter		2937.64	7.2	100	0.001	9.17	0.001	
JS-AS-004H-091614 081402614-0005	Crosswind/ /Western Perimeter		5642.69	7.8	100	0.0005	9.94	0.001	
JS-FB-001 - 091614 081402614-0006	Field Blank			<5.5	100		<7.01		Field Blank
JS-FB-002 - 091614 081402614-0007	Field Blank			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Orlando J. Ivey II (7)

Chris Dojliko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/22/2014 16:07:34

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ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**2424 Louisiana Blvd NE**  
**Suite 201**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/18/14 9:35 AM  
Analysis Date: 9/22/2014  
Collected:

Project: **Joseph St Asbestos / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091614 081402614-0001	5700.57	1	0.001			0	<0.0005	
JS-AS-002H-091614 081402614-0002	5674.20	1	<0.0005			0	<0.0005	
JS-AS-003H-091614 081402614-0003	2937.64	0	<0.001			0	<0.001	
JS-AS-003H-091614-D 081402614-0004	2937.64	1	0.001			0	<0.001	
JS-AS-004H-091614 081402614-0005	5642.69	2	0.001			0	<0.0005	
JS-FB-001 - 091614 081402614-0006	0	0				0	#Error	
JS-FB-002 - 091614 081402614-0007	0	1				0	#Error	

Analyst(s)

Chris Dojlidko (7)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.  
Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/22/2014 16:07:44

**EMSL Analytical, Inc.**

212 South Wagner Road, Ann Arbor, MI 48103

Phone/Fax: (734) 668-6810 / (734) 668-8532

<http://www.EMSL.com>[annarborlab@emsl.com](mailto:annarborlab@emsl.com)

EMSL Order: 081402614

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
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**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/18/14 9:35 AM  
Analysis Date: 9/22/2014  
Collected:

Project: **Joseph St Asbestos / 0072**

## Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
--------	--------------------	---------------------------	-------------	---------------------	--------------------	---------------------------	--------------------------------	-------

NIOSH 7402 method only reports fibers > 5µm in length and > 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0.5

Analyst(s)

Chris Dojlidko (7)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/22/2014 16:07:44

**EMSL Analytical, Inc.**

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EMSL Order: 081402634

CustomerID: LATA34

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Attn: **James Moore**  
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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/19/14 9:55 AM  
Analysis Date: 9/19/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091714 081402634-0001	Upwind/Eastern Perimeter		4780.88	10.8	100	0.001	13.8	0.001	
JS-AS-002H-091714 081402634-0002	Crosswind/Southern Perimeter		4953.90	7.8	100	0.001	9.94	0.001	
JS-AS-003H-091714 081402634-0003	Downwind/Western Perimeter		4884.32	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-091714 081402634-0004	Crosswind/Northern Perimeter		5025.25	<5.5	100	0.001	<7.01	<0.001	
JS-FB-001-091714 081402634-0005	Field Blank			<5.5	100		<7.01		Field Blank
JS-FB-002-091714 081402634-0006	Field Blank			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Orlando J. Ivey II (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/23/2014 10:40:23



**EMSL Analytical, Inc.**

212 South Wagner Road, Ann Arbor, MI 48103

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EMSL Order: 081402634

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Attn: **James Moore**  
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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/19/14 9:55 AM  
Analysis Date: 9/23/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091714 081402634-0001	4780.88	1	0.001			0	<0.001	
JS-AS-002H-091714 081402634-0002	4953.90	2	0.001			0	<0.001	
JS-AS-003H-091714 081402634-0003	4884.32	1	<0.001			0	<0.001	
JS-AS-004H-091714 081402634-0004	5025.25	1	<0.001			0	<0.001	
JS-FB-001-091714 081402634-0005	0	0				0	#Error	
JS-FB-002-091714 081402634-0006	0	0				0	#Error	

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Chris Dojlidko (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/23/2014 10:40:30

**EMSL Analytical, Inc.**

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/22/14 9:25 AM  
Analysis Date: 9/24/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091814 081402650-0001	Upwind/Western Perimeter		4912.25	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-091814 081402650-0002	Crosswind/Northern Perimeter		5039.00	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-091814 081402650-0003	Downwind/Eastern Perimeter		5031.50	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-091814 081402650-0004	Crosswind/Southern Perimeter		4947.28	<5.5	100	0.001	<7.01	<0.001	
JS-FB-001-091814 081402650-0005	Field Blank			<5.5	100		<7.01		Field Blank
JS-FB-002-091814 081402650-0006	Field Blank			<5.5	100		<7.01		Field Blank
JS-EQB-001-091814 081402650-0007	Equipment Blank			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Ryan Shannon (7)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/24/2014 12:28:18

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EMSL Order: 081402650

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/22/14 9:25 AM  
Analysis Date: 9/23/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

### Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091814 081402650-0001	4912.25	2	<0.001			0	<0.001	
JS-AS-002H-091814 081402650-0002	5039.00	2	<0.001			0	<0.001	
JS-AS-003H-091814 081402650-0003	5031.50	1	<0.001			0	<0.001	
JS-AS-004H-091814 081402650-0004	4947.28	2	<0.001			0	<0.001	
JS-FB-001-091814 081402650-0005	0	0				0	#Error	
JS-FB-002-091814 081402650-0006	0	0				0	#Error	
JS-EQB-001-091814 081402650-0007	0	0				0	#Error	

Analyst(s)

Chris Dojlidko (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.  
Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/24/2014 12:28:18

**EMSL Analytical, Inc.**

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EMSL Order: 081402650

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/22/14 9:25 AM  
Analysis Date: 9/23/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

## Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
--------	--------------------	---------------------------	-------------	---------------------	--------------------	---------------------------	--------------------------------	-------

NIOSH 7402 method only reports fibers &gt; 5µm in length and &gt; 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Chris Dojlidko (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/24/2014 12:28:18



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EMSL Order: 081402648

CustomerID: LATA34

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/22/14 9:20 AM  
Analysis Date: 9/24/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-091914 081402648-0001	Upwind/Eastern Perimeter		4625.99	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-091914 081402648-0002	Crosswind/Southern Perimeter		4563.88	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-091914 081402648-0003	Downwind/Western Perimeter		4670.39	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-091914 081402648-0004	Crosswind/Northern Perimeter		4531.05	<5.5	100	0.001	<7.01	<0.001	
JS-FB-001-091914 081402648-0005	Field Blank			<5.5	100		<7.01		Field Blank
JS-FB-002-091914 081402648-0006	Field Blank			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Ryan Shannon (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/24/2014 12:42:32



# EMSL Analytical, Inc.

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EMSL Order: 081402648

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/22/14 9:20 AM  
Analysis Date: 9/23/2014  
Collected:

Project: **Joseph Street Asbestos / 0072**

## Test Report: Asbestos Analysis of Air Samples by Transmission Electron Microscopy via NIOSH Method 7402

Sample	Volume (Liters)	Non Asbestos Fibers	PCM F/cc	Asbestos Type(s)	Asbestos Fibers	Asbestos % of total	7402 Adjusted (TEM) F/cc	Notes
JS-AS-001H-091914 081402648-0001	4625.99	2	<0.001			0	<0.001	
JS-AS-002H-091914 081402648-0002	4563.88	1	<0.001			0	<0.001	
JS-AS-003H-091914 081402648-0003	4670.39	4	<0.001			0	<0.001	
JS-AS-004H-091914 081402648-0004	4531.05	0	<0.001			0	<0.001	
JS-FB-001-091914 081402648-0005	0	0				0	#Error	
JS-FB-002-091914 081402648-0006	0	0				0	#Error	

NIOSH 7402 method only reports fibers > 5µm in length and > 0.25µm in width.

This method requires a minimum of 2 field blanks analyses per set. The results above are blank corrected when possible.

Average number of asbestos fibers on field blanks:

Average number of non-asbestos fibers on field blanks: 0

Analyst(s)

Chris Dojlidko (6)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.  
Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 09/24/2014 12:42:32

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EMSL Order: 081402747

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/30/14 10:25 AM  
Analysis Date: 10/2/2014  
Collected:

Project: **Joseph Street Asbestos/ 0072**

### Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94\*

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-092214 081402747-0001	Upwind/ Northwest Corner		5758.48	12.5	100	0.0005	15.9	0.001	
JS-AS-002H-092214 081402747-0002	Crosswind/ Northern Perimeter		5708.36	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-003H-092214 081402747-0003	Downwind/ Southeast corner		5588.55	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-004H-092214 081402747-0004	Crosswind/ Southern Perimeter		5834.24	10.5	100	0.0005	13.4	0.001	
JS-AS-003H-092314 081402747-0005	Downwind: Western Perimeter		2301.54	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-092314-D 081402747-0006	Downwind: Western Perimeter		2301.54	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-092514 081402747-0007	Downwind: Northwest Corner		2703.68	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-092514-D 081402747-0008	Downwind: Northwest Corner		2703.68	8	100	0.001	10.2	0.001	

Analyst(s)

Orlando J. Ivey II (10)

Chris Dojliko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/02/2014 13:09:25

**EMSL Analytical, Inc.**

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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 09/30/14 10:25 AM  
Analysis Date: 10/2/2014  
Collected:

Project: **Joseph Street Asbestos/ 0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-FB-001-092614 081402747-0009	Field Blank			<5.5	100		<7.01		Field Blank
JS-FB-002-092614 081402747-0010	Field Blank			<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Orlando J. Ivey II (10)

Chris Dojliko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/02/2014 13:09:25



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EMSL Order: 041429232

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**6501 Americas Parkway NE**  
**Suite 200**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 10/06/14 8:40 AM  
Analysis Date: 10/6/2014  
Collected: 10/1/2014

Project: JOSEPH STREET ASBESTOS / 0072

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,  
Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-100114 041429232-0001	UPWIND/NORTHEAST CORNER - PUMP ID: 201408001	10/1/2014	5913.87	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-002H-100114 041429232-0002	CROSSWIND/EASTERN PERIMETER - PUMP ID: 201407010	10/1/2014	5792.17	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-003H-100114 041429232-0003	DOWNWIND/SOUTHEASTERN CORNER - PUMP ID: 201407009	10/1/2014	5555.55	<5.5	100	0.0005	<7.01	<0.0005	
JS-AS-004H-100114 041429232-0004	CROSSWIND/NORTHWESTERN CORNER - PUMP ID: 201408002	10/1/2014	5878.88	11	100	0.0005	14.0	0.001	
JS-FB-001-100114 041429232-0007	FIELD BLANK	10/1/2014		<5.5	100		<7.01		Field Blank
JS-FB-002-100114 041429232-0008	FIELD BLANK	10/1/2014		<5.5	100		<7.01		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s)

Susan Muir (6)

Stephen Siegel, CIH, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.31, 21-50 fibers = 0.30, 51-100 fibers = 0.25. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. The results in this report meet all requirements of the NELAC standards unless otherwise noted. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NYS ELAP 10872, AIHA-LAP, LLC--IHLAP Accredited #100194, NJ DEP 03036, PA ID# 68-00367

Initial report from 10/06/2014 16:24:20

**EMSL Analytical, Inc.**

212 South Wagner Road, Ann Arbor, MI 48103

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EMSL Order: 081402893

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
**LATA Kemron**  
**6501 Americas Parkway NE**  
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**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 10/14/14 9:35 AM  
Analysis Date: 10/16/2014  
Collected:

Project: **Joseph Street Asbestos**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-100814			5698.58	13.2	100	0.0005	16.8	0.001	
081402893-0001									
JS-AS-002H-100814			5542.90	10.8	100	0.0005	13.8	0.001	
081402893-0002									
JS-AS-003H-100814			2439.33	9.8	100	0.001	12.5	0.002	
081402893-0003									
JS-AS-003H-100814D			2439.33	6.8	100	0.001	8.66	0.001	
081402893-0004									
JS-AS-004H-100814			5161.46	16.8	100	0.001	21.4	0.002	
081402893-0005									
JS-AS-003H-100914			2594.25	11.8	100	0.001	15.0	0.002	
081402893-0006									
JS-AS-003H-100914D			2594.25	6.8	100	0.001	8.66	0.001	
081402893-0007									
JS-FB-001-101314				<5.5	100		<7.01		Field Blank
081402893-0008									

Analyst(s)

Orlando J. Ivey II (10)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/16/2014 16:46:18

**EMSL Analytical, Inc.**

212 South Wagner Road, Ann Arbor, MI 48103

Phone/Fax: (734) 668-6810 / (734) 668-8532

<http://www.EMSL.com>[annarborlab@emsl.com](mailto:annarborlab@emsl.com)

EMSL Order: 081402893

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
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**6501 Americas Parkway NE**  
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**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 10/14/14 9:35 AM  
Analysis Date: 10/16/2014  
Collected:

Project: **Joseph Street Asbestos**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-FB-002-101314				<5.5	100		<7.01		Field Blank
081402893-0009									
JS-EQB-001-101314				<5.5	100		<7.01		Lab Blank
081402893-0010									

The results reported have been blank corrected as applicable.

Analyst(s)

Orlando J. Ivey II (10)

Chris Dojliko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/16/2014 16:46:18

**EMSL Analytical, Inc.**

212 South Wagner Road, Ann Arbor, MI 48103

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EMSL Order: 081402965

CustomerID: LATA34

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ProjectID:

Attn: **James Moore**  
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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 10/21/14 11:31 AM  
Analysis Date: 10/22/2014  
Collected: 10/17/2014

Project: **Joseph Street Asbestos/0072**

### Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94\*

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-101714 081402965-0001	Upwind: southwest corner	10/17/2014	4388.93	11.5	100	0.001	14.6	0.001	
JS-AS-002H-101714 081402965-0002	Crosswind: norther perimeter	10/17/2014	4381.27	11	100	0.001	14.0	0.001	
JS-AS-003H-101714 081402965-0003	Downwind: northeastern corner	10/17/2014	4288.46	6	100	0.001	7.64	0.001	
JS-AS-004H-101714 081402965-0004	Crosswind: southern perimeter	10/17/2014	4291.86	10	100	0.001	12.7	0.001	
JS-AS-003H-101614 081402965-0005	Downwind: northern perimeter	10/16/2014	2285.71	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-101614-D 081402965-0006	Downwind: northern perimeter	10/16/2014	2285.71	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H101514 081402965-0007	Downwind: eastern perimeter	10/15/2014	2455.88	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H101514D 081402965-0008	Downwind: eastern perimeter	10/15/2014	2455.88	<5.5	100	0.001	<7.01	<0.001	

Analyst(s)

Orlando J. Ivey II (11)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/23/2014 10:08:11



**EMSL Analytical, Inc.**

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EMSL Order: 081402965

CustomerID: LATA34

CustomerPO:

ProjectID:

Attn: **James Moore**  
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**Suite 200**  
**Albuquerque, NM 87110**

Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 10/21/14 11:31 AM  
Analysis Date: 10/22/2014  
Collected: 10/17/2014

Project: **Joseph Street Asbestos/0072**

**Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method,**  
**Revision 3, Issue 2, 8/15/94\***

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-FB-001-102014 081402965-0009	Field blank			<5.5	100		<7.01		Field Blank
JS-FB-002-102014 081402965-0010	Field blank			<5.5	100		<7.01		Field Blank
JS-EQB-001-102014 081402965-0011	Equipment blank			<5.5	100		<7.01		

The results reported have been blank corrected as applicable.

Analyst(s)

Orlando J. Ivey II (11)

Chris Dojliko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/23/2014 10:08:11

**EMSL Analytical, Inc.**

212 South Wagner Road, Ann Arbor, MI 48103

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EMSL Order: 081403030

CustomerID: LATA34

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Attn: **James Moore**  
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Phone: (505) 884-3800  
Fax: (614) 508-1201  
Received: 10/28/14 11:36 AM  
Analysis Date: 10/29/2014  
Collected: 10/23/2014

Project: **Joseph Street Asbestos / 0072**

### Test Report: Fiber Count by Phase Contrast Microscopy (PCM), NIOSH 7400 Method, Revision 3, Issue 2, 8/15/94\*

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm <sup>2</sup>	Fibers/ cc	Notes
JS-AS-001H-102314 081403030-0001	Upwind: Northern Perimeter	10/23/2014	4985.26	<5.5	100	0.001	<7.01	<0.001	
JS-AS-002H-102314 081403030-0002	Crosswind: Northeastern Corner	10/23/2014	4907.23	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-102314 081403030-0003	Downwind: Southern Perimeter	10/23/2014	2456.40	<5.5	100	0.001	<7.01	<0.001	
JS-AS-003H-102314-D 081403030-0004	Crosswind: Southern Perimeter	10/23/2014	2456.40	<5.5	100	0.001	<7.01	<0.001	
JS-AS-004H-102314 081403030-0005	Downwind: Southwestern Corner	10/23/2014	4826.71	<5.5	100	0.001	<7.01	<0.001	
JS-FB-001-102314 081403030-0006	Field Blank	10/23/2014		<5.5	100		<7.01		
JS-FB-002-102314 081403030-0007	Field Blank	10/23/2014		<5.5	100		<7.01		

No discernable field blanks submitted with this sample set.

Analyst(s)

Orlando J. Ivey II (7)

Chris Dojlidko, Laboratory Manager  
or other approved signatory

Limit of detection is 7 fibers/mm<sup>2</sup>. Intra-laboratory Sr values: 5-20 fibers = 0.47, 21-50 fibers = 0.29, 51-100 fibers = 0.17. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.29. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above 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. EMSL is not responsible for data reported in fibers/cc, which is dependent on volume collected by non-laboratory personnel. Results have been blank corrected as applicable. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Ann Arbor, MI

Initial report from 10/29/2014 17:17:20

**ATTACHMENT B**

**ANALYTICAL RESULTS AND DATA VERIFICATION REPORT:  
ACTIVITY-BASED AIR SAMPLES**

**DATA VERIFICATION REPORT**  
**ACTIVITY-BASED AIR SAMPLES**  
**Joseph Street Asbestos Removal Site, Marion, Ohio**

This report presents a data verification for the analytical reports of activity-based air samples collected from the Joseph Street Asbestos Removal Site in Marion, Ohio, on October 1, 2014 by Tetra Tech START personnel. The samples were sent to EMSL Analytical, Inc. (EMSL), in Cinnaminson, New Jersey, for analysis for asbestos by the International Organization for Standardization (ISO) Method 10312, which also uses transmission electron microscopy (TEM) with energy-dispersive X-ray (EDX) analysis. The following section discusses the results of the ISO analyses, with emphasis on any apparent problems. A final section provides an overall evaluation. EMSL's reported analytical results are included following this report.

## **1.0 ISO Analyses**

While ISO Method 10312 is generally similar to the NIOSH methods used to analyze perimeter air samples, there are several differences in how the methods define a "fiber." The NIOSH methods require a length of greater than 5 micrometers ( $\mu\text{m}$ ), a thickness greater than 0.25  $\mu\text{m}$ , and an "aspect ratio" (AR, the ratio of length to width) of 3:1 or greater. "Bundles" and other "structures" of fibers and other shapes are counted as single fibers. ISO Method 10312 requires a length of 0.5  $\mu\text{m}$  or more, an AR of 5:1 or more, and has no thickness requirement. All individually recognized fibers are counted, even if they are in a "bundle" or other structure. For these analyses, the AR was changed to 3:1 or more. Nevertheless, the ISO method is not fully comparable to the NIOSH methods.

The report for the ISO analyses was complete, including the laboratory's standard operating procedure as well as the results of the blank analysis, calibrations, and other QC measures. No significant problems were observed during the analyses. Only one asbestos fiber was found in a "disperse matrix" structure in sample JS-ABS-001H-100114. The fiber was identified as tremolite using EDX. The report notes "uneven filter loading," but this conclusion is an artifact due to only two structures being seen in the sample, both in only 1 of the 56 grid openings examined, and the statistical test (which assumes a continuous distribution) is not appropriate for so few data points.

## **2.0 Overall Evaluation**

The analyses without any problems, and no data were qualified or rejected. All results may be used, as reported, for any purpose.





**EMSL Analytical, Inc.**

**Asbestos Data Package**

**EMSL Order ID 041429232**

**LATA Kemron**  
**Joseph Street Asbestos/0072**

**Prepared By: EMSL Special Projects Group**

**Date: October 13, 2014**



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6. Equipment Performance Checks
7. NVLAP/AIHA Certifications
8. Current Laboratory SOP
9. Shipping Documentation



# 1. Case Narrative



October 14, 2014

LATA Kemron  
James Moore  
6501 Americas Parkway NE, Suite 200  
Albuquerque, NM 87110  
505-884-3800  
[jmoore@lata.com](mailto:jmoore@lata.com)

**Re: Project Joseph Street Asbestos/0072 Narrative; TEM ISO 10312; EMSL Order ID 041429232**

Dear James:

On October 6, 2014 EMSL Analytical, Inc. in Cinnaminson, NJ received 6 PCM air samples, 2 TEM Air samples, and one soil sample for asbestos content analysis via TEM ISO 10312. All samples were logged in following normal lab procedures. Sample preparation and analysis was performed at the receiving lab.

### **TEM ISO 10312**

Transmission Electron Microscopy (TEM) analysis was performed using a modified TEM ISO 10312: 1995 Ambient Air Determination of Asbestos Fibres Direct Transfer Transmission Electron Microscopy Method.

The following modifications to the method and client specifications were followed:

- The overloading criteria was 25%
- An analytical sensitivity of 0.001 str/cc was specified
- Aspect ratio applied was  $\geq 3:1$ .
- The minimum limit of identification accepted for reporting structures was CD for Chrysotile and ADX for Amphibole asbestos.

### **Results**

The samples were analyzed via TEM using procedures from TEM ISO 10312. Analysis was performed at our Cinnaminson, NJ laboratory on a JEOL 1200 EX microscope at approximately 20,000X magnification. All asbestos structures greater than 0.5  $\mu\text{m}$  in length were counted and identified. Sample JS-ABS-001H-100114 did not pass the Chi<sup>2</sup> test for uniformity. Please note that the filter pore size was not supplied by the client.

Results were reported using the NADES TEM Air & Dust Template, v13, at the client's request. An uncontrolled copy of the ISO 10312 SOP is included in this data package.

### **Quality Control Performed**

Quality control (QC) and equipment calibrations were performed in compliance with EMSL's Quality Assurance Manual. One lab blank was analyzed. All QC results presented with this package were found to be concordant.





EMSL ANALYTICAL, INC.  
200 RT. 130 NORTH  
CINNAMINSON, NJ 08077  
PHONE: (800) 220-3675  
FAX: (856) 786-0235

---

**I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.**

---

**Robyn Denton**  
*Asbestos Special Projects Manager*  
*EMSL Cinnaminson, NJ*



## 2. Tabulated Sample Results

# Joseph Street Asbestos

version 13-  
DRAFT

## National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM

### ANALYTICAL REPORT

FILE NAME: 0072\_EMSL04\_JS-ABS-001H-100114\_10-07-14\_041429232\_TEM\_D.xls

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	JS-ABS-001H-100114	Lab Sample Number	041429232-0005	Effective filter area (mm2)	385
Media	Air	Preparation	Direct	F-factor	1.00E+00
Sample Type	Field Sample	Sample Status	Analyzed	Grid opening area (mm2)	0.0132
Air Volume (L)	524.69	Analysis Date	10/7/2014	# GOs counted High Magnification	56
QA Sample Type	Not QC	Method SOP	0	# GOs counted Low Magnification	0
Stopping Rule(s):	Max Area = , Structures = , Sensitivity = 1.00E-03			Sensitivity (1/cc)	
Recording Rule(s):	Min Aspect Ratio = , Min Length = 0.5µm, Min Width = 0µm			Total Asbestos	0.0009926
				PCME	0.0009926
				Maximum Area Examined	
				High Magnification	7.4E-01
				Low Magnification	0.0E+00

\* Chrysotile was not counted for all grid openings evaluated; this field is utilized only for the Libby site.

Number of Structures with Fatal Data Entry Errors **0** (Structures with fatal errors are excluded from calculations below)

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm <sup>2</sup> )	Air Conc (c) (s/cc)	95% Poisson Confidence Interval for this Sample	Desired Confidence Interval (%):	95
Total TEM Structures					Binning Rule Description:	
Total Asbestos	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03	Apply to fibers (F) only: L ≥ 0.5µm, AR ≥ 3  No restrictions for other structure types.	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Total Amphibole	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03		
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
tremolite (TR)	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03		
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03	ChiSq test for even filter loading for Total TEM Structures	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03	Filter loading appears uneven. Results may be uncertain.	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
PCM Equivalent Structures (PCME)					Binning Rule Description:	
Total Asbestos	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03	Apply to all structures where Total column > 0  L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Total Amphibole	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03		
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
tremolite (TR)	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03		
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03	ChiSq test for even filter loading for PCMe Structures	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03	Filter loading is OK	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
USER DEFINED					Binning Rule Description:	
Total Asbestos	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03	Apply binning rules to: all structures  Length restrictions: lower bound -- >0.5 µm upper bound -- none  Width restrictions: lower bound -- none upper bound -- none  Aspect Ratio criterion: >=0.2090277777777778	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Total Amphibole	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03		
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
tremolite (TR)	1	1.4E+00	9.9E-04	2.5E-05 - 5.5E-03		
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03		

(a) Based on countable structures only.

(b) Loading on Filter (s/mm<sup>2</sup>) = N structures / (GOs Counted \* GO Area). Results for indirect samples are based on the secondary filter.

(c) Air Concentration (s/cc) = (N structures \* EFA) / (GOs Counted \* GO Area \* F-factor \* Air Volume \* 1000).

Dust Loading (s/cm2) = (N structures \* EFA) / (GOs Counted \* GO Area \* F-factor \* Dust Collection Area).

# Joseph Street Asbestos

version 13-  
DRAFT

## National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM

### ANALYTICAL REPORT

FILE NAME: 0072\_EMSL04\_JS-ABS-002H-100114\_10-08-14\_041429232\_TEM\_D.xls

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	JS-ABS-002H-100114	Lab Sample Number	041429232-0006	Effective filter area (mm2)	385
Media	Air	Preparation	Direct	F-factor	1.00E+00
Sample Type	Field Sample	Sample Status	Analyzed	Grid opening area (mm2)	0.0132
Air Volume (L)	1320.48	Analysis Date	10/8/2014	# GOs counted High Magnification	23
QA Sample Type	Not QC	Method SOP	0	# GOs counted Low Magnification	0
Stopping Rule(s):	Max Area = , Structures = , Sensitivity = 1.00E-03			Sensitivity (1/cc)	
Recording Rule(s):	Min Aspect Ratio = , Min Length = 0.5µm, Min Width = 0µm			Total Asbestos	0.0009603
				PCME	0.0009603
				Maximum Area Examined	
				High Magnification	3.0E-01
				Low Magnification	0.0E+00

\* Chrysotile was not counted for all grid openings evaluated; this field is utilized only for the Libby site.

Number of Structures with Fatal Data Entry Errors **0** (Structures with fatal errors are excluded from calculations below)

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm <sup>2</sup> )	Air Conc (c) (s/cc)	95% Poisson Confidence Interval for this Sample	Desired Confidence Interval (%):
					95
<b>Total TEM Structures</b>					<b>Binning Rule Description:</b>
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	Apply to fibers (F) only: L ≥ 0.5µm, AR ≥ 3
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	No restrictions for other structure types.
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	<b>ChiSq test for even filter loading for Total TEM Structures</b>
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	Filter loading is OK
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	<b>Binning Rule Description:</b>
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	Apply to all structures where Total column > 0
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3
<b>PCM Equivalent Structures (PCME)</b>					<b>ChiSq test for even filter loading for PCMe Structures</b>
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	<b>Binning Rule Description:</b>
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	Apply binning rules to: all structures
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	<b>Length restrictions:</b>
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	lower bound -- >0.5 µm
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	upper bound -- none
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	<b>Width restrictions:</b>
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	lower bound -- none
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	upper bound -- none
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	<b>Aspect Ratio criterion:</b> >=0.2090277777777778
<b>USER DEFINED</b>					
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.5E-03	

(a) Based on countable structures only.

(b) Loading on Filter (s/mm<sup>2</sup>) = N structures / (GOs Counted \* GO Area). Results for indirect samples are based on the secondary filter.

(c) Air Concentration (s/cc) = (N structures \* EFA) / (GOs Counted \* GO Area \* F-factor \* Air Volume \* 1000).

Dust Loading (s/cm2) = (N structures \* EFA) / (GOs Counted \* GO Area \* F-factor \* Dust Collection Area).





### 3. Worksheets/ Bench Sheets

FILE NAME: 0072\_EMSL04\_JS-ABS-001H-100114\_10-07-14\_041429232\_TEM\_D.xls

FILE TYPE: Original

**National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM**

Site or Project Name:	Joseph Street Asbestos	Site/Project Identifier Code:	0072
State/Federal Site or Project Identifier:			

Laboratory name:	EMSL04
Instrument:	JEOL-1200-EX (04-03)
Voltage (kV):	100
Magnification: [Enter one or both here (a)]	20,000
Grid opening area (mm <sup>2</sup> ):	0.0132

	High Mag:	Low Mag:
Scale: 1L =	1	1
Scale: 1D =	1	1
Filter Size (mm):	25	
Filter Pore Size (um):		
Method:	Modified ISO 10312	
Grid Storage Location:	0414-LATA-01	
Archive filter(s) storage location:		

Client Sample Number:	JS-ABS-001H-100114
Date received by lab:	10/06/14
Lab Job Number:	041429232
Lab Sample Number:	041429232-0005
Chain of Custody Number:	

Sample Type:	Field Sample
QC Sample Type:	Not QC
Media:	Air
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> ):	525

Number of grids prepared:	5
Prepared by:	K. Ford
Preparation date:	10/06/14
Preparation Type:	Direct
If sample type = air, is there loose material or debris in the cowl?	

Primary filter area (mm <sup>2</sup> ):	385
Secondary Filter Area (mm <sup>2</sup> ):	
F- factor: [proposed value shown, cell formula can be over-written if neccessary]	1.000
Filter Status:	Analyzed
Analyzed by:	P. Harrison
Analysis date:	10/07/14

**F-factor Input Parameters:****Indirect Prep Inputs**

Fraction of primary filter used for indirect prep o  
[For dust and dustfall, enter 1.0]  
First resuspension volume or rinsate volume (mL)  
Volume applied to secondary filter (mL) or used serial dilution

**Inputs for Serial Dilutions**

Second resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution  
Third resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution

**Input for Ashing of Secondary Filter**

Fraction of secondary filter used for ashing

**COMMENTS**

--

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20,000x OR 5,000x OR 20,000/5,000x



Check box if this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates

If sample was analyzed using more than one TEM instrument, enter TEM Instrument details below.

	Instrument #2	Instrument #3
Instrument:		
Voltage (KV):		

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

	Analyst/Date #2	Analyst/Date #3
Analyzed by:		
Analysis date:		

V

Grid opening traverse direction

**Joseph Street Asbestos**  
**National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM**

FILE NAME 0072\_EMSL04\_JS-ABS-001H-100114\_10-07-14\_041429232\_TEM\_D.xls

CLIENT SAMPLE ID: JS-ABS-001H-100114  
 LAB SAMPLE ID: 041429232-0005

Media Air  
 Sample Prep Direct

Sample Type Field Sample  
 QC Sample Type Not QC  
 Sample Status Analyzed  
 Analysis Date 10/7/2014

Data Entry by: P. Harrison  
 Data Entry Date: 10/7/2014

QA by: R. Denton  
 QA Date: 10/9/2014

**One or more stopping rules have been met, no additional grid openings need to be evaluated.**

Grid	Grid Opening	Structure Type	No. of Structures		Size (um)		Identification Code (b)	Mineral Type (c)	Other Mineral Description	1 = yes, blank = no			Multiple (d)	Low Mag (e)	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS			
A1	A9	ND													
A1	A7	ND													
A1	A5	ND													
A1	A3	MD11	1		6.5	3	ADX	TR							
A1	A3	MF		1	5.7	0.3	ADX	TR		1	1	1			
A1	A1	ND													
A1	B2	ND													
A1	B4	ND													
A1	B6	ND													
A1	B8	ND													
A1	B10	ND													
A1	C9	ND													
A1	C5	ND													
A1	C3	ND													
A1	C1	ND													
A1	D2	ND													
A1	D4	ND													
A1	D6	ND													
A1	D8	ND													
A1	D10	ND													
A1	E9	ND													
A1	E7	ND													
A1	E5	ND													
A1	E3	ND													
A1	E1	ND													
A1	F2	ND													
A1	F4	ND													
A1	F6	ND													
A1	F8	ND													
A1	F10	ND													
A2	A10	ND													
A2	A8	ND													
A2	A6	ND													
A2	A4	ND													

A2	A2	ND													
A2	B1	ND													
A2	B5	ND													
A2	B7	ND													
A2	B9	ND													
A2	C10	ND													
A2	C8	ND													
A2	C4	ND													
A2	C2	ND													
A2	D3	ND													
A2	D5	ND													
A2	E8	ND													
A2	E6	ND													
A2	E4	ND													
A2	F1	ND													
A2	F3	ND													
A2	F5	ND													
A2	F7	ND													
A2	F9	ND													
A2	G10	ND													
A2	G8	ND													
A2	G6	ND													
A2	H1	ND													





## Structure Sketch Sheet for Direct Data Entry

EMSL Sample ID: 041423292-0005

Client: Lata-Kemron

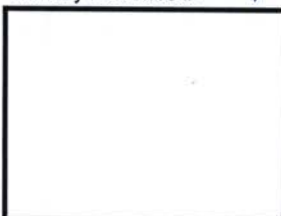
Client Sample: JS-ABS-0074-100114

Page 1 of 1

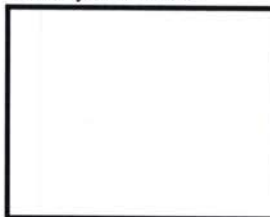
Primary Structure # 1



Primary Structure # 11714



Primary Structure #



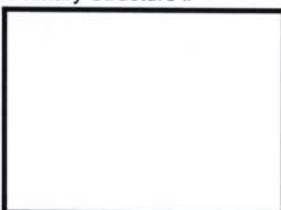
Primary Structure #



Primary Structure #



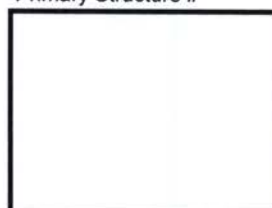
Primary Structure #



Primary Structure #



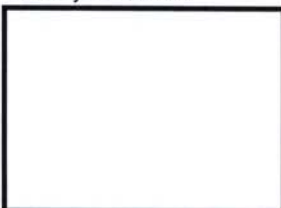
Primary Structure #



Primary Structure #



Primary Structure #



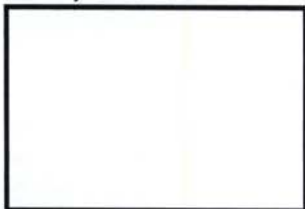
Primary Structure #



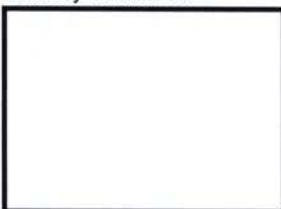
Primary Structure #



Primary Structure #



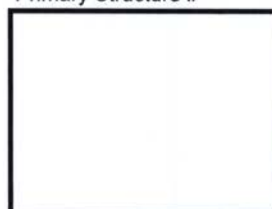
Primary Structure #



Primary Structure #



Primary Structure #



Primary Structure #



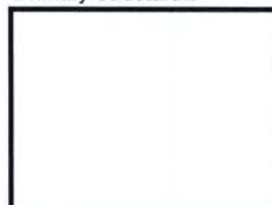
Primary Structure #



Primary Structure #



Primary Structure #



Analyst: [Signature]

Date: 10/7/14

Scope: 04-03

200 Route 130 North Cinnaminson, NJ 08077

[www.emsl.com](http://www.emsl.com)



# Energy Dispersive X-Ray Analysis

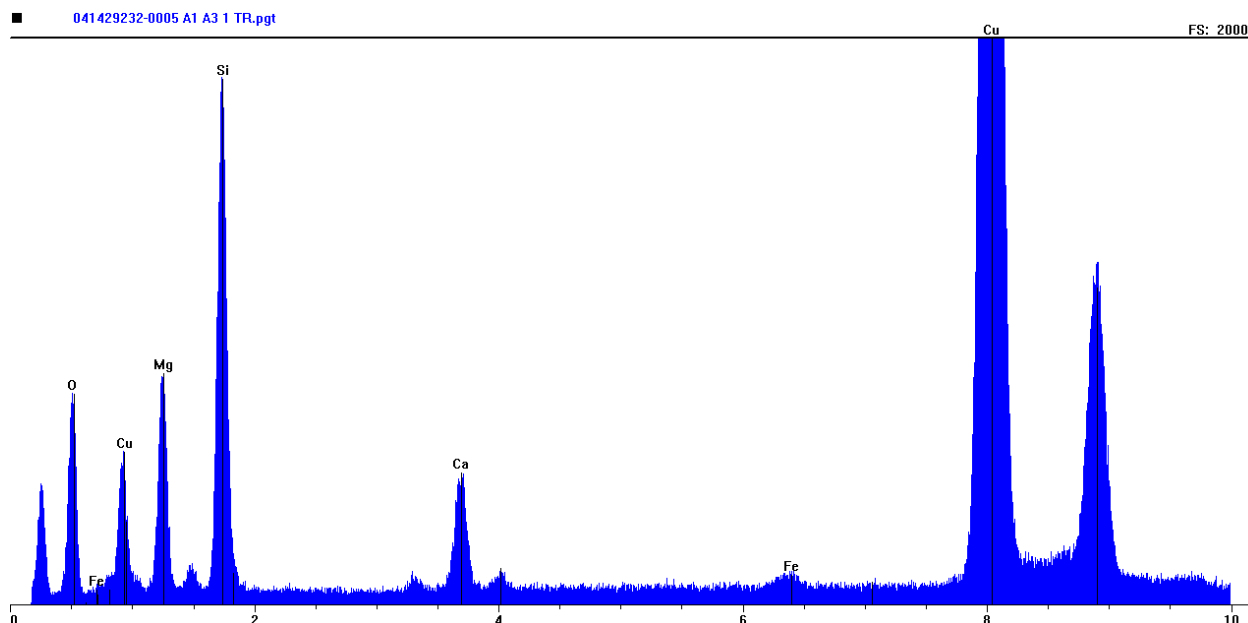
## Quantitative Spectra & Data

EMSL ANALYTICAL, INC.

File: L:\EDS Spe...Spectra\Scope 04-03\2014\041429232-0005 A1 A3 1 TR.pgt  
Collected: October 07, 2014 07:20:20

Report: Wednesday, October 08, 2014

Live Time: 137.85 Count Rate: 3748 Dead Time: 37.70 %  
Beam Voltage: 20.00 Beam Current: 2.00 Takeoff Angle: 31.00  
Thickness limit: 26967.13



Element	Line	keV	CL Ratio	Wt%	At%	At Prop	Compound	Cmpd Wt%
Mg	KA1	1.254	1.4000	18.73	17.07	7.9	MgO	31.05
Si	KA1	1.740	1.0000	34.21	26.99	12.4	SiO	53.69
Ca	KA1	3.691	1.1000	10.22	5.65	2.6	CaO	14.30
Fe	KA1	6.403	1.3900	0.74	0.29	0.1	FeO	0.95
Cu	KA1	8.046	0.0000	0.00	0.00	0.0		
O	KA1	0.523	0.0000	36.10	50.00	23.0		
Total			0.0000	100.00	100.00	46.0	Total	100.00

Element	Line	Gross (cps)	BKG (cps)	Net (cps)	P:B Ratio
Mg	KA1	83.5	8.6	74.9	8.7
Si	KA1	200.9	9.4	191.5	20.5
Ca	KA1	63.8	11.7	52.0	4.4
Fe	KA1	18.9	15.9	3.0	0.2
Cu	KA1	1572.3	26.7	1545.6	57.8
O	KA1	66.7	4.1	62.6	15.3

# AMPHIBOLE SAED INDEXING FORM

EMSL Order Number: 041429232

Date: Oct 07, 2014

Image Number: 04540

Reference / Sample Number: 0005

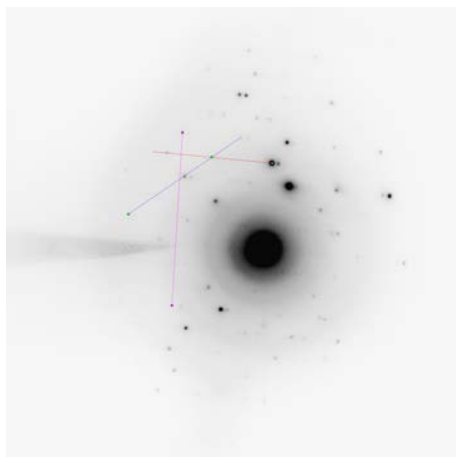
Preliminary ID: TREMOLITE

Camera Constant: 1.967e-003

1/A Pixels

Calibration Reference: 100614-04-03-04536\_C

	Measured	Reference	-5%	+5%
Inter-row Spacing: <input type="checkbox"/> <input type="checkbox"/>	5.230	5.278	5.014	5.542
d2 or hk0 (Camera K/zero row dist.):	1.909	1.958	1.860	2.056
d1 or hkl (Camera K/slant vector dist.):	3.320	3.376	3.207	3.545
Ratio of hk0/hkl:	0.575	0.580	0.551	0.609
Vector Angle:	39.78	40.120	38.114	42.126



From SAED Reference Book, "unknown" diffraction pattern was found to be that of: **TREMOLITE**

With a Zone Axis of: [ **9-14** ]

Preliminary Identification was:

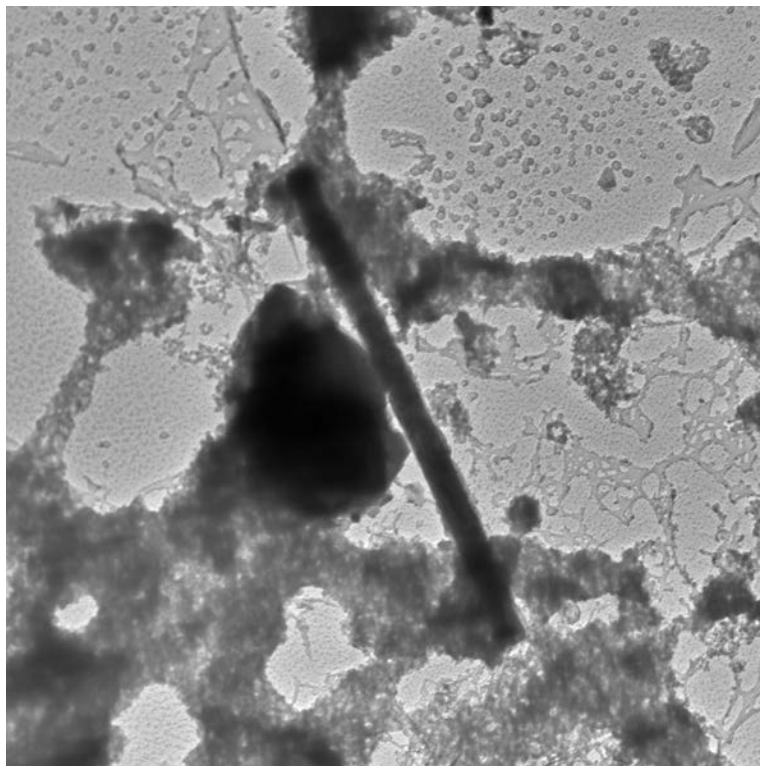
☒ X

CORRECT

☐

INCORRECT

**EMSL Analytical, Inc.**  
*Photomicrograph Report*



*Micrograph Information*

<b>Sample ID:</b>	0005
<b>Order ID:</b>	041429232
<b>Image Number:</b>	04541
<b>Mineral Type:</b>	TREMOLITE
<b>Date:</b>	10/7/2014
<b>Magnification:</b>	20000
<b>Microscope:</b>	3



FILE NAME: 0072\_EMSL04\_JS-ABS-002H-100114\_10-08-14\_041429232\_TEM\_D.xls

FILE TYPE: Original

**National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM**

Site or Project Name:	Joseph Street Asbestos	Site/Project Identifier Code:	0072
State/Federal Site or Project Identifier:			

Laboratory name:	EMSL04
Instrument:	JEOL-1200-EX (04-03)
Voltage (kV):	100
Magnification: [Enter one or both here (a)]	20,000
Grid opening area (mm <sup>2</sup> ):	0.0132

	High Mag:	Low Mag:
Scale: 1L =	1	1
Scale: 1D =	1	1
Filter Size (mm):	25	
Filter Pore Size (um):		
Method:	Modified ISO 10312	
Grid Storage Location:	0414-LATA-01	
Archive filter(s) storage location:		

Client Sample Number:	JS-ABS-002H-100114
Date received by lab:	10/06/14
Lab Job Number:	041429232
Lab Sample Number:	041429232-0006
Chain of Custody Number:	

Sample Type:	Field Sample
QC Sample Type:	Not QC
Media:	Air
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> ):	1320

Number of grids prepared:	5
Prepared by:	K. Ford
Preparation date:	10/06/14
Preparation Type:	Direct
If sample type = air, is there loose material or debris in the cowl?	

Primary filter area (mm <sup>2</sup> ):	385
Secondary Filter Area (mm <sup>2</sup> ):	
F- factor: [proposed value shown, cell formula can be over-written if neccessary]	1.000
Filter Status:	Analyzed
Analyzed by:	P. Harrison
Analysis date:	10/08/14

**F-factor Input Parameters:****Indirect Prep Inputs**

Fraction of primary filter used for indirect prep o  
[For dust and dustfall, enter 1.0]  
First resuspension volume or rinsate volume (mL)  
Volume applied to secondary filter (mL) or used serial dilution

**Inputs for Serial Dilutions**

Second resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution  
Third resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution

**Input for Ashing of Secondary Filter**

Fraction of secondary filter used for ashing

**COMMENTS**

--

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20,000x OR 5,000x OR 20,000/5,000x



Check box if this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates

If sample was analyzed using more than one TEM instrument, enter TEM Instrument details below.

	Instrument #2	Instrument #3
Instrument:		
Voltage (KV):		

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

	Analyst/Date #2	Analyst/Date #3
Analyzed by:		
Analysis date:		

V

Grid opening traverse direction

## Joseph Street Asbestos

**National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM**

FILE NAME 0072\_EMSL04\_JS-ABS-002H-100114\_10-08-14\_041429232\_TEM\_D.xls

CLIENT SAMPLE ID: JS-ABS-002H-100114

LAB SAMPLE ID: 041429232-0006

Media Air

Sample Prep Direct

Sample Type Field Sample

QC Sample Type Not QC

Sample Status Analyzed

Analysis Date 10/8/2014

Data Entry by: P. Harrison

QA by: R. Denton

Data Entry Date: 10/8/2014

QA Date: 10/9/2014

**One or more stopping rules have been met, no additional grid openings need to be evaluated.**

Grid	Grid Opening	Structure Type	No. of Structures		Size (um)		Identification Code (b)	Mineral Type (c)	Other Mineral Description	1 = yes, blank = no			Multiple (d)	Low Mag (e)	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS			
B2	A1	ND													
B2	A3	ND													
B2	A5	ND													
B2	A7	ND													
B2	C2	ND													
B2	C4	ND													
B2	C6	ND													
B2	C8	ND													
B2	E2	ND													
B2	E4	ND													
B2	E6	ND													
B2	E8	ND													
B3	A1	ND													
B3	A3	ND													
B3	A5	ND													
B3	C1	ND													
B3	C3	ND													
B3	C5	ND													
B3	E3	ND													
B3	E5	ND													
B3	G1	ND													
B3	G5	ND													
B3	G7	ND													



## Structure Sketch Sheet for Direct Data Entry

EMSL Sample ID: 041423292-0006

Client: Lata-Kemron

Client Sample: JS-ABS-002H-100114

Page 6 of 1

Primary Structure #

ND

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Analyst: [Signature]

Date: 10/8/14

Scope: 04-03

200 Route 130 North Cinnaminson, NJ 08077

[www.emsl.com](http://www.emsl.com)



## 4. QC Data Reports/Logs



# Joseph Street Asbestos

version 13-  
DRAFT

## National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM

### ANALYTICAL REPORT

FILE NAME: 0072\_EMSL04\_Lab Blank\_10-07-14\_041429232\_TEM\_D\_LB.xls

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	Lab Blank	Lab Sample Number	041429232 Lab Blank	Effective filter area (mm2)	385
Media	N/A	Preparation	Direct	F-factor	1.00E+00
Sample Type	Lab QC	Sample Status	Analyzed	Grid opening area (mm2)	0.0132
		Analysis Date	10/7/2014	# GOs counted High Magnification	10
QA Sample Type	LB	Method SOP	0	# GOs counted Low Magnification	0
Stopping Rule(s):	Max Area = , Structures = , Sensitivity = 1.00E-03			Sensitivity (1/cc)	
Recording Rule(s):	Min Aspect Ratio = , Min Length = 0.52µm, Min Width = 0µm			Total Asbestos	blank
				PCME	blank
				Maximum Area Examined	
				High Magnification	1.3E-01
				Low Magnification	0.0E+00

\* Chrysotile was not counted for all grid openings evaluated; this field is utilized only for the Libby site.

Number of Structures with Fatal Data Entry Errors  (Structures with fatal errors are excluded from calculations below)

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm <sup>2</sup> )		95% Poisson Confidence Interval for this Sample	Desired Confidence Interval (%): <input type="text" value="95"/>
<b>Total TEM Structures</b>					<b>Binning Rule Description:</b>
Total Asbestos	0	0.0E+00	blank	blank - blank	Apply to fibers (F) only: L ≥ 0.5µm, AR ≥ 3  No restrictions for other structure types.
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank	
Total Amphibole	0	0.0E+00	blank	blank - blank	
actinolite (AC)	0	0.0E+00	blank	blank - blank	
amosite (AM)	0	0.0E+00	blank	blank - blank	
anthophyllite (AN)	0	0.0E+00	blank	blank - blank	
crocidolite (CR)	0	0.0E+00	blank	blank - blank	
tremolite (TR)	0	0.0E+00	blank	blank - blank	
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	blank	blank - blank	
other amphibole (OA)	0	0.0E+00	blank	blank - blank	
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank	<b>ChiSq test for even filter loading for Total TEM Structures</b> Filter loading is OK
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank	
other mineral class (OM)	0	0.0E+00	blank	blank - blank	
<b>PCM Equivalent Structures (PCME)</b>					<b>Binning Rule Description:</b>
Total Asbestos	0	0.0E+00	blank	blank - blank	Apply to all structures where Total column > 0  L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank	
Total Amphibole	0	0.0E+00	blank	blank - blank	
actinolite (AC)	0	0.0E+00	blank	blank - blank	
amosite (AM)	0	0.0E+00	blank	blank - blank	
anthophyllite (AN)	0	0.0E+00	blank	blank - blank	
crocidolite (CR)	0	0.0E+00	blank	blank - blank	
tremolite (TR)	0	0.0E+00	blank	blank - blank	
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	blank	blank - blank	
other amphibole (OA)	0	0.0E+00	blank	blank - blank	
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank	<b>ChiSq test for even filter loading for PCME Structures</b>
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank	
other mineral class (OM)	0	0.0E+00	blank	blank - blank	
<b>USER DEFINED</b>					<b>Binning Rule Description:</b>
Total Asbestos	0	0.0E+00	blank	blank - blank	Apply binning rules to: all structures  <u>Length restrictions:</u> lower bound -- >0.5 µm upper bound -- none  <u>Width restrictions:</u> lower bound -- none upper bound -- none  <u>Aspect Ratio criterion:</u> >=0.209027777777778
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank	
Total Amphibole	0	0.0E+00	blank	blank - blank	
actinolite (AC)	0	0.0E+00	blank	blank - blank	
amosite (AM)	0	0.0E+00	blank	blank - blank	
anthophyllite (AN)	0	0.0E+00	blank	blank - blank	
crocidolite (CR)	0	0.0E+00	blank	blank - blank	
tremolite (TR)	0	0.0E+00	blank	blank - blank	
winchite/richterite/tremolite /actinolite (WRTA)	0	0.0E+00	blank	blank - blank	
other amphibole (OA)	0	0.0E+00	blank	blank - blank	
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank	
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank	
other mineral class (OM)	0	0.0E+00	blank	blank - blank	

(a) Based on countable structures only.

(b) Loading on Filter (s/mm<sup>2</sup>) = N structures / (GOs Counted \* GO Area). Results for indirect samples are based on the secondary filter.

(c) Air Concentration (s/cc) = (N structures \* EFA) / (GOs Counted \* GO Area \* F-factor \* Air Volume \* 1000).

Dust Loading (s/cm<sup>2</sup>) = (N structures \* EFA) / (GOs Counted \* GO Area \* F-factor \* Dust Collection Area).

FILE NAME: 0072\_EMSL04\_Lab Blank\_10-07-14\_041429232\_TEM\_D\_LB.xls

FILE TYPE: Original

**National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM**

Site or Project Name:	Joseph Street Asbestos	Site/Project Identifier Code:	0072
State/Federal Site or Project Identifier:			

Laboratory name:	EMSL04
Instrument:	JEOL-1200-EX (04-03)
Voltage (kV):	100
Magnification: [Enter one or both here (a)]	20,000
Grid opening area (mm <sup>2</sup> ):	0.0132

	High Mag:	Low Mag:
Scale: 1L =	1	1
Scale: 1D =	1	1
Filter Size (mm):		
Filter Pore Size (um):		
Method:	Modified ISO 10312	
Grid Storage Location:	0414-LATA-01	
Archive filter(s) storage location:		

Client Sample Number:	Lab Blank
Date received by lab:	10/06/14
Lab Job Number:	041429232
Lab Sample Number:	041429232 Lab Blank
Chain of Custody Number:	

Sample Type:	Lab QC	
QC Sample Type:	Lab Blank	
Media:	N/A	
Air volume (L), dust area (cm <sup>2</sup> ), or dustfall container area (cm <sup>2</sup> ):	0	

Number of grids prepared:	5	
Prepared by:	K. Ford	
Preparation date:	10/06/14	
Preparation Type:	Direct	
If sample type = air, is there loose material or debris in the cowl?	No	

Primary filter area (mm <sup>2</sup> ):	385	
Secondary Filter Area (mm <sup>2</sup> ):		
F- factor: [proposed value shown, cell formula can be over-written if neccessary]	1.000	
Filter Status:	Analyzed	
Analyzed by:	P. Harrison	
Analysis date:	10/07/14	

**F-factor Input Parameters:****Indirect Prep Inputs**

Fraction of primary filter used for indirect prep o  
[For dust and dustfall, enter 1.0]  
First resuspension volume or rinsate volume (mL)  
Volume applied to secondary filter (mL) or used serial dilution

**Inputs for Serial Dilutions**

Second resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution  
Third resuspension volume (mL)  
Volume applied to secondary filter (mL) or used for serial dilution

**Input for Ashing of Secondary Filter**

Fraction of secondary filter used for ashing

**COMMENTS**

--

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20,000x OR 5,000x OR 20,000/5,000x

☐ Check box if this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates

If sample was analyzed using more than one TEM instrument, enter TEM Instrument details below.

	Instrument #2	Instrument #3
Instrument:		
Voltage (KV):		

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

	Analyst/Date #2	Analyst/Date #3
Analyzed by:		
Analysis date:		

V	Grid opening traverse direction
---	---------------------------------

**Joseph Street Asbestos**  
**National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM**

FILE NAME 0072\_EMSL04\_Lab Blank\_10-07-14\_041429232\_TEM\_D\_LB.xls

CLIENT SAMPLE ID: Lab Blank  
 LAB SAMPLE ID: 041429232 Lab Blank

Media: N/A  
 Sample Prep: Direct

Sample Type: Lab QC  
 QC Sample Type: LB  
 Sample Status: Analyzed  
 Analysis Date: 10/7/2014

Data Entry by: P. Harrison  
 Data Entry Date: 10/7/2014

QA by: R. Denton  
 QA Date: 10/9/2014

**One or more stopping rules have been met, no additional grid openings need to be evaluated.**

Grid	Grid Opening	Structure Type	No. of Structures		Size (um)		Identification Code (b)	Mineral Type (c)	Other Mineral Description	1 = yes, blank = no			Multiple (d)	Low Mag (e)	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS			
C1	D1	ND													
C1	D4	ND													
C1	A7	ND													
C2	A4	ND													
C2	C8	ND													
C2	E7	ND													
C2	G9	ND													
C2	I7	ND													
C3	B8	ND													
C3	D6	ND													



## 5. Client and EMSL Internal Chains of Custody





EMSL ANALYTICAL, INC.  
LABORATORY PRODUCTS-TRAINING

# Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

041429232

EMSL ANALYTICAL, INC.  
200 ROUTE 130 NORTH  
CINNAMINSON, NJ 08077  
PHONE: (856) 858-4800  
FAX: (856) 858-4960

Company : Lata-Kemron		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 6501 Americas Parkway, NE, Suite 200		Third Party Billing requires written authorization from third party	
City: Albuquerque	State/Province: NM	Zip/Postal Code:	Country:
Report To (Name): James Moore		Fax #:	
Telephone #: 614-508-1232		Email Address: jmoore@lata.com	
Project Name/Number: Joseph Street Asbestos / 0072			
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order:	U.S. State Samples Taken: Ohio
<b>Turnaround Time (TAT) Options* - Please Check</b>			
<input type="checkbox"/> 3 Hour <input type="checkbox"/> 6 Hour <input type="checkbox"/> 24 Hour <input type="checkbox"/> 48 Hour <input checked="" type="checkbox"/> 72 Hour <input type="checkbox"/> 96 Hour <input type="checkbox"/> 1 Week <input type="checkbox"/> 2 Week			
<small>*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.</small>			
<b>PCM - Air</b> <input checked="" type="checkbox"/> NIOSH 7400 <input type="checkbox"/> w/ OSHA 8hr. TWA		<b>TEM - Air</b> <input type="checkbox"/> 4-4.5hr TAT (AHERA only) <input type="checkbox"/> AHERA 40 CFR, Part 763 <input checked="" type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II <input checked="" type="checkbox"/> ISO 10312	
<b>PLM - Bulk (reporting limit)</b> <input type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> PLM EPA NOB (<1%) Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%) <input type="checkbox"/> NYS 198.1 (friable in NY) <input type="checkbox"/> NYS 198.6 NOB (non-friable-NY) <input type="checkbox"/> NIOSH 9002 (<1%)		<b>TEM - Bulk</b> <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> NYS NOB 198.4 (non-friable-NY) <input type="checkbox"/> Chatfield SOP <input type="checkbox"/> TEM Mass Analysis-EPA 600 sec. 2.5 <b>TEM - Water:</b> EPA 100.2 Fibers >10µm <input type="checkbox"/> Waste <input type="checkbox"/> Drinking All Fiber Sizes <input type="checkbox"/> Waste <input type="checkbox"/> Drinking	
		<b>TEM- Dust</b> <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 <input type="checkbox"/> Carpet Sonication (EPA 600/J-93/167)	
		<b>Soil/Rock/Vermiculite</b> <input type="checkbox"/> PLM CARB 435 - A (0.25% sensitivity) <input type="checkbox"/> PLM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - B (0.1% sensitivity) <input type="checkbox"/> TEM CARB 435 - C (0.01% sensitivity) <input type="checkbox"/> EPA Protocol (Semi-Quantitative) <input type="checkbox"/> EPA Protocol (Quantitative)	
		<b>Other:</b> <span style="border: 1px solid red; padding: 2px;">EMSL INC.</span>	
<input type="checkbox"/> Check For Positive Stop - Clearly Identify Homogenous Group			
Samplers Name: Michael Browning		Samplers Signature: <i>Michael Browning</i>	

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
✓ JS-AS-001H-100114	Upwind/Northeast Corner (NIOSH 7400 and 7402)	5,913.87 Liters	100114/1715
✓ JS-AS-002H-100114	Crosswind/Eastern Perimeter (NIOSH 7400 and 7402)	5,792.17 Liters	100114/1710
✓ JS-AS-003H-100114	Downwind/Southeastern Corner (NIOSH 7400 and 7402)	5,555.55 Liters	100114/1705
✓ JS-AS-004H-100114	Crosswind/Northwestern Corner (NIOSH 7400 and 7402)	5,878.88 Liters	100114/1720
✓ JS-ABS-001H-100114	Activity-based Asbestos Sampling (ISO 10312 Method)	524.69	100114/1053
✓ JS-ABS-002H-100114	Activity-based Asbestos Sampling (ISO 10312 Method)	1,320.48	100114/1205
✓ JS-FB-001-100114	Field Blank	NA	100114
✓ JS-FB-002-100114	Field Blank	NA	100114

Client Sample # (s): 9	Total # of Samples: 9
Relinquished (Client): <i>Michael Browning</i>	Date: 10/2/14 Time: 1305
Received (Lab): <i>EMSL</i>	Date: 10/6/14 Time: 8:40 am
Comments/Special Instructions: (1) Please prepare a Level 4 data package for the results; (2) all "AS" samples are to be on a 3-Day turn-around-time for both NIOSH 7400 and NIOSH 7402; (3) the ISO 10312 samples will have a standard turn-around-time; (4) please complete the provided checklist (ISO 10312 TEM); (5) for all "AS" samples, If fiber concentrations, by PCM	





041429232

TDD #: 0001/S05-0001-1407-003

Site: Joseph Street Asbestos

Method: NIOSH 7400 and NIOSH 7402

Air Sampling Technician: Michael Browning

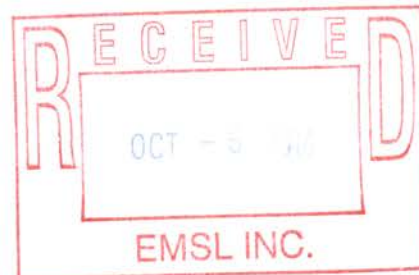
Date: 10/01/14

Primary Calibration: Bios Calibrator Defender 510

Pump ID	Sample I.D.	Start Time	Stop Time	Total Min.	Start Flow Rate (L/min)	Stop Flow Rate (L/min)	Corrected Flow Rate	Total Volume (liters)	Location
201408001	JS-AS-001H-100114	0725	1715	590	10.046	10.001	10.024	5913.87	Upwind: Northeast Corner
201407010	JS-AS-002H-100114	0730	1710	580	10.015	9.958	9.987	5792.17	Crosswind: Eastern Perimeter
20070502012	JS-ABS-002L-100114	1005	1205	120	3.433	3.484	3.459	415.02	Low Flow ABS 002
201407009	JS-AS-003H-100114	0750	1705	555	10.025	9.995	10.010	5555.55	Downwind: Southwestern Corner
2007052011	JS-ABS-001L-100114	1005	1205	120	3.514	3.653	3.584	430.02	Low Flow ABS 001
201408002	JS-AS-004H-100114	0740	1720	580	10.191	10.081	10.136	5878.88	Crosswind: Northwestern Corner
R214355	JS-ABS-001H-100114	1005	1053	48	10.931	10.931	10.931	524.69	High ABS 001
R214356	JS-ABS-002H-100114	1005	1205	120	11.004	11.004	11.004	1320.48	High ABS 002

See attached COC.

Comments/Observations:



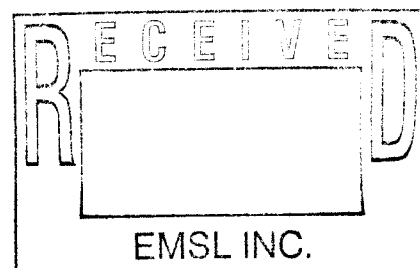
Revised 3/19/09

ASBESTOS TEM 10312 DELIVERABLES REQUIREMENTS

- I. Please be advised that samples are not to be subcontracted to other laboratories without written consent from Lata Kemron.
- II. Checklists for applicable sample analyses are attached for your use. **Please complete and return checklists along with the data package.**

All other data packages are to include the following (where applicable):

- ✓ **Case Narrative:** Detailing **ALL** deviations to the laboratory SOP or Analytical Method. Include an explanation of all un-resolvable NADES error codes and any modifications to the method/counting rules and/or mineral identification criteria. The un-resolvable error code explanations must be entered into the NADES Data Entry 1 comment section of each reviewed sample.
- ✓ Copy of the current laboratory SOP (including indirect analysis SOP, if performed) used for analysis and QC SOP if QC requirements are not included in the analytical SOP.
- ✓ Chain of Custody
- ✓ Copies of all analyst notebooks and handwritten bench sheets
- ✓ Tabulated sample results in NADES format, including Excel, pdf files, and Certificate of Analysis.
- ✓ Tabulated QA/QC results including QC limits/acceptance criteria, results of statistical evaluations,
- ✓ Tabulated TEM and EDX instrument calibrations including, instrument #, date analyzed, QC acceptance criteria and required QC frequencies.
- ✓ Tabulated Laboratory Blank results including QC limits/acceptance criteria and required QC frequencies
- ✓ Calculation sheet (at least one example of the calculation per analyte must be provided)
- ✓ Copies of all raw data including:
- ✓ Mn resolution check (<180ev)
- ✓ EDX resolution checks:
- ✓ Cu peak
- ✓ Crocidolite: NIST Standard 1866 or equivalent, Na peak
- ✓ Chrysotile: Si and Mg peak
- ✓ Chrysotile confirmation by ED, amphibole by ED or Xray
- ✓ Grid opening measurement
- ✓ Magnification 20000x for structures <5um, 5000-10000x for >5um, 80-120Kv
- ✓ 2 grids per sample, separate grid preparation for each grid
- ✓ Filtration filter and process blanks (including indirect lab blanks as required); minimum 2 media blank/100 filters
- ✓ Spectra provided for confirmation.
- ✓ Worksheets documenting number of grids analyzed, structure type, morphology and size.
- ✓ **Calibration Results for:**
- ✓ Calibration of TEM magnification at magnifications typically used for counting both on-screen and in the negative mode.
- ✓ Calibration of Camera Constant both negative and on screen.
- ✓ Beam Dose Check for 90% of pattern.
- ✓ K factors for:
- ✓ Mg-Si
- ✓ Ca-Si
- ✓ Fe-Si
- ✓ Mg-Fe
- ✓ Na-Si
- ✓ Al-Si





041429232

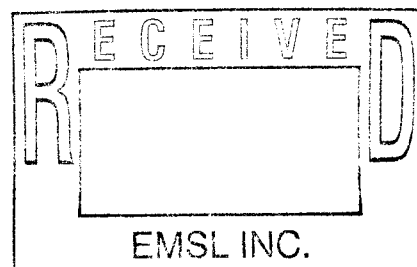
✓	Spot Size measurements.
✓	Detector Resolution Check
✓	Resolvable Mg, Si and Na peaks.
✓	Calibration of 0.5 and 5.0 micron measuring aids.
✓	Daily TEM EDXA system calibrations of low energy and high energy peaks usually Al and Cu.
✓	Prep Blanks and Raw Data
N/A	Inter and Intra analyst, re-preparation and verification QC samples, QC Summary Table with results of statistical evaluations, QC acceptance criteria, required frequency, raw data and bench sheets.
✓	Spectra confirmation for all hits as required.

### III. Electronic Data Deliverable

- ✓ Results reported in the latest version of the National Asbestos Data Entry Spreadsheet (NADES) for TEM
- ISO 10312 in ExCel for all samples, QC samples and blanks including all required laboratory blanks.
- ✓ A final report in pdf format including all of the above preferably in a single file

### TURN AROUND TIME

The turnaround time begins with the date your laboratory takes custody of the samples. If the receipt of the samples is after 10:30AM, the turn-around time will begin on the following day, unless fast turnaround is specified in writing.



# INTERNAL CHAIN OF CUSTODY

Order ID: 041429232

10/6/2014 11:19:52 AM

Attn: James Moore  
LATA Kemron  
6501 Americas Parkway NE  
Suite 200  
Albuquerque, NM 87110

Fax: (614) 508-1201 Phone: (505) 884-3800  
Project: JOSEPH STREET ASBESTOS / 0072

Customer ID: LATA34  
Customer PO:  
Received: 10/06/14 8:40 AM

EMSL Order: 041429232  
EMSL Proj ID:  
Cust COC ID

## REPORT TO INSTRUCTIONS

- ☒ Send Receipt Confirmation Emails  
☐ No electronic signatures  
☐ Project ID required  
☐ Cust. COC ID required  
☐ Miscellaneous account

Sales Rep and Comment: EPODELL

### Instructions

reports are to be emailed NO HARD COPIES

### Internal Comment

## BILL TO INSTRUCTIONS

- ☐ Exempt from prep charge  
☐ Exempt from off hour min charges  
☐ Exempt from layer/aliquot charges  
☐ Authorization to use credit card  
☐ P.O. Required

### Billing Frequency

With Report -- Create and send an invoice for each Order ID

Use Billing Contact:

Accounting Terms: N30

Payment Directions: With Report

### Instructions

**Test:** TEM ISO 10312

**Matrix:** Air

**TAT:** 1 Week

**Qty:** 2

**Desc:** Asbestos analysis of air samples by ISO 10312 meth

**Logged:** msmollock

**Date:** 10/6/2014

- ☐ Lab Opening Exempt For Test  
☐ Layer/Aliquot Charge Exempt For Test  
☐ Prep Charge Exempt For Test  
☒ Free Shipping Eligible

**Sample Condition:**  
☐ Acceptable  
☐ Unacceptable

### Comments

0414 LATA 01 A-B-C

**Prepped:** Kina

**Analyzed:** PA

**Data Entry:** I

**Screened:** RD

**Mailed:** umd

**Date:** 10/6/14

**Date:** 10/7/14 - 10/8/14

**Date:** I

**Date:** 10-8-14

**Date:** 10/14/14

## Special Test Instructions

Lab Sample #	Cust. Sample #	Location	Due Date
041429232-0005	JS-ABS-001H-100114	HIGH ABS 001	10/13/2014 8:40:00 AM
041429232-0006	JS-ABS-002H-100114	HIGH ABS 002	10/13/2014 8:40:00 AM



## 6. Equipment Performance Checks



## Daily TEM Calibration Sheet

Month:

Oct / AM

Year:

2014

Scope:

04-03

Day (1-31)	Analyst Initials	Scope Aligned	LN Dewar Filled	Al Peak		Cu Peak		Al Cu Pass/Fail*
				Actual	Accepted Range	Actual	Accepted Range	
1	PH	PH	DP	1.484	1.47-1.49	8.041	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
2	PH	PH	FL	1.484	1.47-1.49	8.046	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
3	PH	PH	PH	1.489	1.47-1.49	8.041	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
4					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
5					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
6	PH	PH	DP	1.489	1.47-1.49	8.041	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
7	PH	PH	DP	1.489	1.47-1.49	8.046	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
8	PH	PH	PH	1.489	1.47-1.49	8.041	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
9	PH	PH	PH	1.489	1.47-1.49	8.041	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
10	PH	PH	PH	1.489	1.47-1.49	8.041	8.03-8.05	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
11					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
12					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
13					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
14					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
15					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
16					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
17					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
18					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
19					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
20					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
21					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
22					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
23					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
24					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
25					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
26					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
27					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
28					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
29					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
30					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
31					1.47-1.49		8.03-8.05	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

\* Any failing results need immediate corrective action

Controlled Document

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# Monthly Report for TEM Calibrations

Laboratory: **Cinnaminson**

Scope: **04-03**

Detector: **PGT Avalon**

## Chrysotile Beam Dose Sensitivity

(Quarterly)

Date	Initials	Negative Numbers		At least 90% of patterns >15 seconds ?
		SAED	Morphology	
2/7/2012	RD	MSL 0403 12	EMSL 0403 129	PASS
4/30/2012	PH	03128	03129	PASS
7/23/2012	PH	03303	03304	PASS
10/15/2012	PH	03466	03467	PASS
1/7/2013	PH	03617	03618	PASS
4/1/2013	PH	03728	03729	PASS
6/24/2013	PH	03882	03883	PASS
9/16/2013	PH	04095	04096	PASS
12/10/2013	PH	04189	04190	PASS
3/4/2014	PH	04262	04263	PASS
5/27/2014	PH	04360	04361	PASS
8/22/2014	PH	04464	04465	PASS

Comments:

## Camera Constant Calibrations

(Monthly / Weekly when Water Analysis is performed)

Negative (Camera)					
Date	Initials	Negative Number	Camera Length	Camera Constant	Is 2 Standard Dev. < 5% Mean?
5/27/2014	PH	04359	100	533.63	PASS
6/2/2014	PH	04363	100	539.56	PASS
6/9/2014	PH	04372	100	537.96	PASS
6/17/2014	PH	04390	100	537.92	PASS
6/23/2014	PH	04397	100	534.68	PASS
6/30/2014	PH	04404	100	534.12	PASS
7/7/2014	PH	04411	100	512.42	PASS
7/14/2014	PH	04421	100	510.31	PASS
7/22/2014	PH	04439	100	510.41	PASS
7/28/2014	PH	04443	100	511.69	PASS
8/6/2014	PH	04447	100	511.35	PASS
8/11/2014	PH	04452	100	509.61	PASS
8/22/2014	PH	04463	100	510.80	PASS
8/25/2014	PH	04467	100	509.81	PASS
9/1/2014	PH	04483	100	515.49	PASS
9/8/2014	PH	04488	100	508.66	PASS
9/15/2014	PH	04497	100	514.39	PASS
9/22/2014	PH	04510	100	510.25	PASS
9/29/2014	PH	04517	100	512.43	PASS
10/6/2014	PH	04536	100	509.02	PASS

Comments:



# Monthly Report for TEM Calibrations

Laboratory: **Cinnaminson**

Scope: **04-03**  
Detector: **PGT Avalon**

## Magnification Calibrations (Monthly)

### 20,000x - Negative

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
3/17/2014	PH	20730	20736	PASS
3/18/2014	PH	20730	20520	PASS
3/19/2014	PH	20730	20736	PASS
3/20/2014	PH	20730	20844	PASS
3/25/2014	PH	20730	20844	PASS
3/26/2014	PH	20730	20952	PASS
3/27/2014	PH	20730	20736	PASS
3/28/2014	PH	20730	20736	PASS
3/31/2014	PH	20730	20844	PASS
4/1/2014	PH	20730	20736	PASS
4/2/2014	PH	20730	20736	PASS
4/4/2014	PH	20730	20628	PASS
4/8/2014	PH	20730	20736	PASS
4/21/2014	PH	20730	20628	PASS
5/19/2014	PH	20730	20736	PASS
6/17/2014	PH	20730	20736	PASS
7/14/2014	PH	20730	20736	PASS
8/6/2014	PH	20730	20520	PASS
9/1/2014	PH	20730	20736	PASS
9/29/2014	PH	20730	20736	PASS

Comments:

### 20,000x - Screen

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
3/17/2014	PH	14325	14400	PASS
3/18/2014	PH	14325	14281	PASS
3/19/2014	PH	14325	14400	PASS
3/20/2014	PH	14325	14400	PASS
3/25/2014	PH	14325	14164	PASS
3/26/2014	PH	14325	14400	PASS
3/27/2014	PH	14325	14164	PASS
3/28/2014	PH	14325	14281	PASS
3/31/2014	PH	14325	14400	PASS
4/1/2014	PH	14325	14400	PASS
4/2/2014	PH	14325	14281	PASS
4/4/2014	PH	14325	14400	PASS
4/8/2014	PH	14325	14281	PASS
4/21/2014	PH	14325	14400	PASS
5/19/2014	PH	14325	14281	PASS
6/17/2014	PH	14325	14281	PASS
7/14/2014	PH	14325	14281	PASS
8/6/2014	PH	14325	14281	PASS
9/1/2014	PH	14325	14400	PASS
9/29/2014	PH	14325	14281	PASS

Comments:

### 10,000x - Negative

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
3/17/2014	PH	10152	10368	PASS
3/18/2014	PH	10152	10260	PASS
3/19/2014	PH	10152	9936	PASS
3/20/2014	PH	10152	9936	PASS
3/25/2014	PH	10152	10152	PASS
3/26/2014	PH	10152	10368	PASS
3/27/2014	PH	10152	10368	PASS
3/28/2014	PH	10152	10368	PASS
3/31/2014	PH	10152	9936	PASS
4/1/2014	PH	10152	9936	PASS
4/2/2014	PH	10152	9936	PASS
4/4/2014	PH	10152	9936	PASS
4/8/2014	PH	10152	9936	PASS
4/21/2014	PH	10152	10260	PASS
5/19/2014	PH	10152	9936	PASS
6/17/2014	PH	10152	10476	PASS
7/14/2014	PH	10152	10476	PASS
8/6/2014	PH	10152	10260	PASS
9/1/2014	PH	10152	10044	PASS
9/29/2014	PH	10152	10044	PASS

Comments:

### 10,000x - Screen

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
3/17/2014	PH	6974	7053	PASS
3/18/2014	PH	6974	7053	PASS
3/19/2014	PH	6974	6912	PASS
3/20/2014	PH	6974	6776	PASS
3/25/2014	PH	6974	6912	PASS
3/26/2014	PH	6974	7053	PASS
3/27/2014	PH	6974	7053	PASS
3/28/2014	PH	6974	7053	PASS
3/31/2014	PH	6974	7053	PASS
4/1/2014	PH	6974	6912	PASS
4/2/2014	PH	6974	6912	PASS
4/4/2014	PH	6974	6912	PASS
4/8/2014	PH	6974	6776	PASS
4/21/2014	PH	6974	7053	PASS
5/19/2014	PH	6974	6776	PASS
6/17/2014	PH	6974	7200	PASS
7/14/2014	PH	6974	7082	PASS
8/6/2014	PH	6974	7053	PASS
9/1/2014	PH	6974	6912	PASS
9/29/2014	PH	6974	6912	PASS

Comments:

# Monthly Report for TEM Calibrations

Laboratory: **Cinnaminson**

Scope: **04-03**  
Detector: **PGT Avalon**

## Calibration of On Screen 0.5 and 5µm Measuring Aids at EPA AHERA Magnification (Monthly)

Date	Initials	Small Circle microns	Large Circle microns
3/17/2014	PH	0.56	5.56
3/18/2014	PH	0.56	5.60
3/19/2014	PH	0.56	5.56
3/20/2014	PH	0.56	5.56
3/25/2014	PH	0.56	5.65
3/26/2014	PH	0.56	5.56
3/27/2014	PH	0.56	5.65
3/28/2014	PH	0.56	5.60
3/31/2014	PH	0.56	5.56
4/1/2014	PH	0.56	5.56
4/2/2014	PH	0.56	5.60
4/4/2014	PH	0.56	5.56
4/8/2014	PH	0.56	5.60
4/21/2014	PH	0.56	5.56
5/19/2014	PH	0.56	5.60
6/17/2014	PH	0.56	5.60
7/14/2014	PH	0.56	5.60
8/6/2014	PH	0.56	5.60
9/1/2014	PH	0.56	5.56
9/29/2014	PH	0.56	5.60

Comments:

## Calibration of On Screen 1.0 and 10µm Measuring Aids at EPA 100.2 Magnification (Monthly)

Date	Initials	Small Circle microns	Large Circle microns
3/17/2014	PH	1.13	11.34
3/18/2014	PH	1.13	11.34
3/19/2014	PH	1.16	11.57
3/20/2014	PH	1.18	11.81
3/25/2014	PH	1.16	11.57
3/26/2014	PH	1.13	11.34
3/27/2014	PH	1.13	11.34
3/28/2014	PH	1.13	11.34
3/31/2014	PH	1.13	11.34
4/1/2014	PH	1.16	11.57
4/2/2014	PH	1.16	11.57
4/4/2014	PH	1.16	11.57
4/8/2014	PH	1.18	11.81
4/21/2014	PH	1.13	11.34
5/19/2014	PH	1.18	11.81
6/17/2014	PH	1.11	11.11
7/14/2014	PH	1.13	11.30
8/6/2014	PH	1.13	11.34
9/1/2014	PH	1.16	11.57
9/29/2014	PH	1.16	11.57

Comments:

## Spot Size Measurements

(Quarterly)

Date	Initials	Actual Spot	Target Spot Size	FAIL ≤250nm =	Is 2 SD <25% of
3/4/2014	PH	170.57	≤ 250 nm	PASS	PASS
3/11/2014	PH	191.90	≤ 250 nm	PASS	PASS
3/13/2014	PH	192.90	≤ 250 nm	PASS	PASS
3/14/2014	PH	214.78	≤ 250 nm	PASS	PASS
3/17/2014	PH	217.01	≤ 250 nm	PASS	PASS
3/18/2014	PH	194.93	≤ 250 nm	PASS	PASS
3/19/2014	PH	217.01	≤ 250 nm	PASS	PASS
3/20/2014	PH	239.88	< 250 nm	PASS	PASS
3/25/2014	PH	215.89	≤ 250 nm	PASS	PASS
3/26/2014	PH	190.91	≤ 250 nm	PASS	PASS
3/27/2014	PH	192.90	≤ 250 nm	PASS	PASS
3/28/2014	PH	168.79	≤ 250 nm	PASS	PASS
3/31/2014	PH	167.91	≤ 250 nm	PASS	PASS
4/1/2014	PH	168.79	≤ 250 nm	PASS	PASS
4/2/2014	PH	168.79	≤ 250 nm	PASS	PASS
4/4/2014	PH	193.91	≤ 250 nm	PASS	PASS
4/8/2014	PH	192.90	≤ 250 nm	PASS	PASS
4/21/2014	PH	193.91	≤ 250 nm	PASS	PASS
7/14/2014	PH	192.90	≤ 250 nm	PASS	PASS
10/6/2014	PH	168.79	≤ 250 nm	PASS	PASS

Comments:



# Monthly Report for TEM Calibrations

Laboratory: **Cinnaminson**

Scope: **04-03**

Detector: **PGT Avalon**

## K Factors

(Semi-Annually)

Date	Initials	K Factor	Pass Criteria	Actual	PASS / FAIL	Acceptance Criteria	PASS / FAIL
8/6/2014 PH		Standard Used: BIR1G					
		Na:Si	1.0 - 4.0	1.34	PASS	2SD < 20% Mean	PASS
		Mg:Si	1.0 - 2.0	1.40	PASS	2SD < 10% Mean	PASS
		Al:Si	1.0 - 1.75	1.19	PASS	2SD < 10% Mean	PASS
		Ca:Si	1.0 - 1.75	1.10	PASS	2SD < 10% Mean	PASS
		Fe:Si	1.0 - 2.0	1.39	PASS	2SD < 10% Mean	PASS
		Mg:Fe	1.5 or less	1.00	PASS	N / A	N/A
8/6/2014 PH		Standard Used: Orthoclase					
		Na:Si	1.0 - 4.0	----	N/A	2SD < 20% Mean	N/A
		Al:Si	1.0 - 1.75	----	N/A	2SD < 10% Mean	N/A
		K:Si	1.0 - 1.75	1.06	PASS	2SD < 10% Mean	PASS
Comments:		New detector installed on 2/11/14, old data removed.					

## Detector Resolution

(Semi-Annually / Quarterly when necessary to meet TNI Standard)

Date	@Mn K $\alpha$ Peak Initials	Resolution	<175?	Resolution + 2(s) <180?
7/23/2012	PH	124.4	Pass	Pass
10/15/2012	PH	127.7	Pass	Pass
1/7/2013	PH	128.0	Pass	Pass
4/1/2013	PH	130.0	Pass	Pass
6/24/2013	PH	128.0	Pass	Pass
9/16/2013	PH	128.0	Pass	Pass
12/10/2013	PH	130.0	Pass	Pass
2/10/2014	PH	130.0	Pass	Pass
5/8/2014	PH	130.0	Pass	Pass
8/6/2014	PH	132.0	Pass	Pass

Comments:

## Significant Na and Resolvable Mg-Si Peaks

(Quarterly)

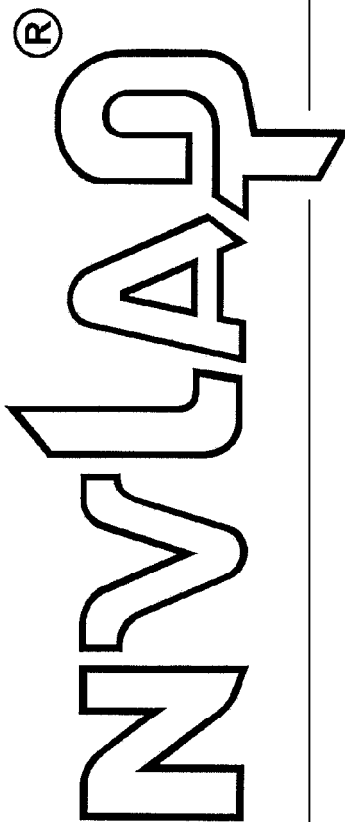
Significant				Resolvable			
Date	Initials	Na		Date	Initials	Mg	Si
7/23/2012	PH	Pass		7/23/12	PH	Yes	Yes
10/15/2012	PH	Pass		10/15/12	PH	Yes	Yes
1/7/2013	PH	Pass		1/7/13	PH	Yes	Yes
4/1/2013	PH	Pass		4/1/13	PH	Yes	Yes
6/24/2013	PH	Pass		6/24/13	PH	Yes	Yes
9/16/2013	PH	Pass		9/16/13	PH	Yes	Yes
12/10/2013	PH	Pass		12/10/13	PH	Yes	Yes
2/10/2014	PH	Pass		2/10/14	PH	Yes	Yes
5/8/2014	PH	Pass		5/8/14	PH	Yes	Yes
8/6/2014	PH	Pass		8/6/14	PH	Yes	Yes

Comments:



## 7. NVLAP/AIHA Certifications

United States Department of Commerce  
National Institute of Standards and Technology



# Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101048-0

**EMSL Analytical, Inc.**  
Cinnaminson, NJ

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

## AIRBORNE 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 Communiqué dated January 2009).*

2014-07-01 through 2015-06-30

*Effective dates*



A handwritten signature in black ink, appearing to read "Michael R. M. L. D.", is written over a horizontal line.

*For the National Institute of Standards and Technology*



**National Voluntary  
Laboratory Accreditation Program**



**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005**

**EMSL Analytical, Inc.**  
200 Route 130 North  
Cinnaminson, NJ 08077  
Mr. Stephen Siegel, CIH  
Phone: 800-220-3675 Fax: 856-786-5973  
E-Mail: [ssiegel@emsl.com](mailto:ssiegel@emsl.com)  
URL: <http://www.emsl.com>

**AIRBORNE ASBESTOS FIBER ANALYSIS (TEM)**

**NVLAP LAB CODE 101048-0**

***NVLAP Code      Designation / Description***

18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.
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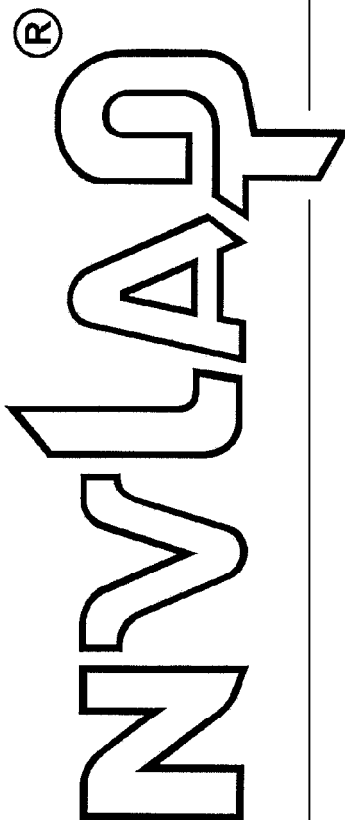
2014-07-01 through 2015-06-30

*Effective dates*

*For the National Institute of Standards and Technology*



United States Department of Commerce  
National Institute of Standards and Technology



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**Certificate of Accreditation to ISO/IEC 17025:2005**

---

NVLAP LAB CODE: 101048-0

**EMSL Analytical, Inc.**  
Cinnaminson, NJ

*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).*

2014-07-01 through 2015-06-30

*Effective dates*



A handwritten signature in black ink, appearing to read "William R. M. L. D.", is written over a horizontal line.

*For the National Institute of Standards and Technology*



**National Voluntary  
Laboratory Accreditation Program**



**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005**

**EMSL Analytical, Inc.**  
200 Route 130 North  
Cinnaminson, NJ 08077  
Mr. Stephen Siegel, CIH  
Phone: 800-220-3675 Fax: 856-786-5973  
E-Mail: [ssiegel@emsl.com](mailto:ssiegel@emsl.com)  
URL: <http://www.emsl.com>

**BULK ASBESTOS FIBER ANALYSIS (PLM)**

**NVLAP LAB CODE 101048-0**

***NVLAP Code      Designation / Description***

18/A01	EPA 600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

2014-07-01 through 2015-06-30

*Effective dates*

*For the National Institute of Standards and Technology*



August 28, 2014

Laboratory ID: 100194

Patricia Kirkland  
EMSL Analytical, Inc.  
200 Route 130 North  
Cinnaminson, NJ 08077

Dear Ms. Kirkland:

AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC) has approved an extension to your laboratory's current certificate of accreditation in the Industrial Hygiene Laboratory Accreditation Program (IHLAP), Environmental Lead Accreditation Program (ELLAP) and Environmental Microbiology Accreditation Program (EMLAP). This extension will expire on November 1, 2014. Remember that your laboratory must maintain proficiency per Policy Module 6 in order for the new certificate to be issued.

Your laboratory remains an accredited laboratory in IHLAP, ELLAP, and EMLAP. Please keep a copy of this letter with your expired certificate. If you have questions or concerns, please feel free to contact Patricia Sheehan, Laboratory Accreditation Specialist at (703) 846-0739.

Sincerely,

Cheryl O. Morton  
Managing Director  
AIHA Laboratory Accreditation Programs, LLC



## AIHA Laboratory Accreditation Programs, LLC

*acknowledges that*

### EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Laboratory ID: 100194

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

#### LABORATORY ACCREDITATION PROGRAMS

- |                               |                                   |
|-------------------------------|-----------------------------------|
| ✓ INDUSTRIAL HYGIENE          | Accreditation Expires: 07/01/2014 |
| ✓ ENVIRONMENTAL LEAD          | Accreditation Expires: 07/01/2014 |
| ✓ ENVIRONMENTAL MICROBIOLOGY  | Accreditation Expires: 07/01/2014 |
| <input type="checkbox"/> FOOD | Accreditation Expires:            |

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website ([www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org)) for the most current Scope.

S. D. Allen Iske, PhD, CIH, CSP  
Chairperson, Analytical Accreditation Board

Cheryl O. Morton  
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 12: 03/29/2012

Date Issued: 07/31/2012





## AIHA Laboratory Accreditation Programs, LLC

### SCOPE OF ACCREDITATION

#### EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Laboratory ID: **100194**

Issue Date: 07/31/2012

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or revocation. A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: <http://www.aihaaccreditedlabs.org>

#### Industrial Hygiene Laboratory Accreditation Program (IHLAP)

**Initial Accreditation Date: 02/01/1989**

IHLAP Scope Category	Field of Testing (FoT)	Technology sub-type/ Detector	Published Reference Method/Title of In-house Method	Method Description or Analyte (for internal methods only)
Chromatography Core	Gas Chromatography	GC/ FID	NIOSH 1003	
			NIOSH 1005	
			NIOSH 1400	
			NIOSH 1500	
			NIOSH 1550	
			NIOSH 1603	
			NIOSH 2000	
		GC/ECD	NIOSH 5502	
			NIOSH 5503	
			NIOSH 5510	
		GC/NPD	OSHA 1010	
			NIOSH 2551	
	GC/MS		EPA TO-15	
	Gas Chromatography (Diffusive Samplers)		NIOSH 1501	
	Ion Chromatography (IC)		NIOSH 6004	
			NIOSH 6011	
			NIOSH 7903	
			OSHA ID-214	
			OSHA ID-215	
	Liquid Chromatography	HPLC/FL	NIOSH 5506	
		HPLC/UV	NIOSH 2016	



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Spectrometry Core	Atomic Absorption	CVAA	NIOSH 6009	
			OSHA ID-145	SOP LM-015
			OSHA ID-145	SOP LM-013
		FAA	NIOSH 7082	
	Inductively-Coupled Plasma	GFAA	NIOSH 7105	
		ICP/MS	NIOSH 7300 Modified	
	X-ray Diffraction (XRD)		ICP/AES	NIOSH 7300
			NIOSH 7500	
Asbestos/Fiber Microscopy Core	UV/VIS (Colorimetric)		OSHA ID-142	
			NIOSH 6010	
	Polarized Light Microscopy (PLM)		EPA 600/R-93/116	
	Phase Contrast Microscopy (PCM)		NIOSH 7400	
	Transmission Electron Microscopy (TEM)		EPA AHERA - 40 CFR Part 763	
Miscellaneous Core	Gravimetric		NIOSH 7402	
			NIOSH 0500	
			NIOSH 0600	
	Thermo-optical Analysis (TOA)		NIOSH 5524	
			NIOSH 5040	

The laboratory participates in the following AIHA-LAP, LLC-approved proficiency testing programs:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>✓ AIHA-PAT Programs, LLC IHPAT Metals</li> <li>✓ AIHA-PAT Programs, LLC IHPAT Organic Solvents</li> <li>✓ AIHA-PAT Programs, LLC IHPAT Silica</li> <li>✓ AIHA-PAT Programs, LLC IHPAT Diffusive Sampler (3M)</li> <li>☐ AIHA-PAT Programs, LLC IHPAT Diffusive Sampler (SKC)</li> <li>☐ AIHA-PAT Programs, LLC IHPAT Diffusive Sampler (AT)</li> <li>✓ AIHA-PAT Programs, LLC IHPAT Asbestos</li> <li>☐ AIHA-PAT Programs, LLC Bulk Asbestos (BAPAT)</li> <li>☐ AIHA-PAT Programs, LLC Beryllium (BePAT)</li> <li>✓ HSE Workplace Analytical Scheme for Proficiency (WASP) (Formaldehyde)</li> <li>☐ HSE Workplace Analytical Scheme for Proficiency (WASP) (Thermal Desorption Tubes)</li> </ul> | <ul style="list-style-type: none"> <li>☐ Pharmaceutical Round Robin</li> <li>☐ Compressed/Breathing Air Round Robin</li> <li>✓ National Voluntary Laboratory Accreditation Program (NVLAP - determined at the time of site assessment)</li> <li>☐ New York State Department of Health (NYS DOH – PCM and TEM)</li> <li>✓ ERA Air and Emissions standards for indoor air quality</li> <li>☐ Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung (IFA, formerly BGIA)</li> <li>☐ Institut de Recherche Robert-Sauvé en Santé et en Sécurité du Travail (IRSST)</li> </ul> |
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## 8. Current Laboratory SOP



# EMSL Analytical S.O.P.

## ISO 10312

### Ambient air - Determination of asbestos fibres - Direct-transfer transmission electron microscopy method

*First edition 1995-05-01*

#### 1.0 Method Description

##### 1.1 Applicable Matrix

This method is appropriate for air samples only.

##### 1.2 Scope and application

This method is for the determination of asbestos concentrations in air samples by transmission electron microscopy (TEM); it is applicable to the determination of airborne asbestos in a wide range of ambient air situations both exterior and interior. The range of concentrations which can be determined is 50 structures/mm<sup>2</sup> to 7000 structures/mm<sup>2</sup> on the filter.

##### 1.3 Summary of Method

Samples are collected on a membrane filter, prepped via a direct prep method and analyzed with an electron microscope at  $\approx 20,000\times$  magnification. Asbestos structures are identified by a combination of morphology, elemental chemistry via Energy Dispersive X-Ray Analysis (EDXA), and Selected Area Electron Diffraction (SAED). All structures  $\geq 0.5$  micron in length with at least a 5:1 aspect ratio are counted, and recorded. Structures are differentiated as primary or total structures, a primary structure may be composed of numerous total structures. The report includes a breakdown of fibers and bundles  $> 5$  microns as well as true PCM equivalent fibers ( $> 5$  microns in length, diameter between 0.2 and 3 microns, and a 3:1 aspect ratio). Unless the client specifies otherwise, the lab will attempt to reach an analytical sensitivity of 0.005 structures/cc.

##### 1.4 Detection Limit

The analytical sensitivity is defined as the calculated airborne asbestos structure concentration in asbestos structures per Liter, equivalent to the counting of 1 asbestos structure in the analysis. The analytical sensitivity can be lowered by increasing the volume of air collected and also by increasing the area of the filter analyzed. The Limit of Detection is defined by this method as the upper, one-sided 95% confidence limit of the Poisson distribution for a count of 0 structures. In the absence of background contamination this is equivalent to 2.99 asbestos structures. The limit of detection can be lowered by collecting a larger initial volume of air or by analyzing additional surface area of the filter (grid openings).

#### 2.0 Interferences

Interferences for this method include but are not limited to:

- 2.1 Non-regulated asbestos minerals such as the two polymorphs of Chrysotile, Lizardite and Antigorite.
- 2.2 Non regulated amphiboles such as winchite and richterite, and pyroxenes.
- 2.3 Cleavage fragments of the regulated asbestos types which may at times have aspect ratios similar to the true asbestiform varieties.





- 2.4 Clay minerals that can have similar morphology to asbestos such as sepiolite and pallygorskite.
- 2.5 All non-asbestos particulate, fibrous or not which can partially or wholly obscure asbestos fibers.

### 3.0 Definitions

- 3.1 Analytical Sensitivity - The airborne concentration represented by one asbestos structure counted under the electron microscope. The air volume collected and the proportion of the filter examined determine the analytical sensitivity. There is no set target A.S. with this method. If not directed otherwise by the client, EMSL will attempt to reach an A.S. of 0.005 s/cc up to 10 G.O. unless the method stopping rule of 100 asbestos structures is reached. A minimum of 4 grid openings must be analyzed.
- 3.2 Asbestos - Generic term for a group of hydrated mineral silicates
- 3.3 Aspect Ratio - The ratio of the length to the width of a particle. Minimum aspect ratio for this method is 5:1 (3:1 for optional PCMe phase of analysis).
- 3.4 Bundle - A grouping of apparently attached parallel fibers. A structure composed of parallel, smaller diameter fibers attached along their lengths. A bundle may exhibit diverging fibers at one or both ends.
- 3.5 Cluster - A structure in which 2 or more fibers or fiber bundles are randomly oriented in a connected grouping. There are two types of clusters, disperse and compact.
- 3.6 Compact Cluster - Complex and tightly bound network in which one or both ends of each individual fiber or bundle is (are) obscured, such that the dimensions of individual fibers and bundles cannot be unambiguously determined. As such, no subcomponents or residuals will be listed.
- 3.7 Compact Matrix - A structure consisting of one or more particles, greater than 0.5 microns in which fibers or bundles can be seen either within the structure or projecting from it, such that the dimensions of individual fibers and bundles cannot be unambiguously determined. As such, no subcomponents or residuals will be listed.
- 3.8 Disperse Cluster - A disperse and open network in which at least one of the individual fibers or bundles can be separately identified and its dimensions measured.
- 3.9 Disperse Matrix - A structure consisting of one or more particle greater than 0.5 microns with overlapping or attached fibers or bundles in which at least one of the individual fibers or bundles can be separately identified and measured.
- 3.10 EDXA -Energy dispersive X-ray analysis.
- 3.11 Fiber - An elongated particle which has parallel or stepped sides. For this method it must have a minimum length of 0.5  $\mu$ m and an aspect ratio of 5:1 or greater.
- 3.12 Fiber Bundle - See bundle.
- 3.13 Grid - A thin metal (usually Cu) foil with openings that the sample is mounted on to aid in its examination in the TEM.
- 3.14 Grid Opening (GO) - One opening of the grid. For this method the area of the grid opening must be known.
- 3.15 Matrix - One or more fibers or fiber bundles that are attached to or partially concealed by a single particle or group of overlapping non fibrous particles. There are two types of matrices, disperse and compact.
- 3.16 MCE Filters - Mixed cellulose ester filter.
- 3.17 PC Filters - Polycarbonate filters.
- 3.18 PCM Equivalent Fiber - A fiber of aspect ratio 3:1 or greater, longer than 5 microns and a diameter between 0.2 and 3 microns.



- 3.19** PCM Equivalent Structure - A fibrous structure of aspect ratio 3:1 or greater, longer than 5 microns and a diameter between 0.2 and 3 microns.
- 3.20** Primary Structure - A fibrous structure that is a separate entity in the TEM image and shall be recorded as one of the fundamental structures: fiber, bundle, cluster or matrix.
- 3.21** Residual - A localized group of fibers that remain after the 5 largest prominent features of a primary structure has been documented. Residuals are named cluster residual (CR) or matrix residual (MR) depending on the identity of the primary structure. Record up to 5 residuals for each primary structure.
- 3.22** SAED - Selected area electron diffraction.
- 3.23** Structure - A single fiber, fiber bundle, cluster, or matrix which may contain asbestos.
- 3.24** TEM - Transmission Electron Microscopy.
- 3.25** Total Structure - Structure or structures associated with the primary structure. Total structures are enumerated separately from primary structures and are used to classify and measure the important features of each primary structure.

## **4.0 Safety**

All personnel performing preparation and/or analysis of samples must be familiar with the EMSL Chemical Hygiene Plan (EMSLChemHygiene 200.0). Specific hazards and precautions associated with this analysis include:

### **4.1 Asbestos**

- 4.1.1** Prudent measures must be taken to prevent any possible airborne asbestos fiber release from occurring during sample handling.
- 4.1.2** Any filter handling performed prior to the filter collapse step should be performed under the safety hood.

### **4.2 Acetone**

- 4.2.1** Keep away from heat, sparks, and flame.
- 4.2.2** Avoid breathing vapors - use with adequate ventilation.
- 4.2.3** Avoid contact with eyes.
- 4.2.4** Prevent prolonged or repeated contact with skin.

### **4.3 Carbon Spark**

- 4.3.1** Shield eyes from the glow of the spark during the carbon coating process with welder's type goggles or similar protection.

### **4.4 Oxygen**

- 4.4.1** The oxygen used with the plasma asher is an explosion hazard. Use only vacuum pumps filled with non hydrocarbon (Fomblin) oil.
- 4.4.2** Keep Oxygen tank strapped to wall at all times.

## **5.0 Equipment and Supplies**

- 5.1**  $\leq 0.45$  micron MCE or  $\leq 0.4$  micron PC filters
- 5.2** Glass Petri Dishes
- 5.3** Glass microscope slides
- 5.4** Low Temperature Plasma Asher
- 5.5** Vacuum Evaporator (Carbon Coater)
- 5.6** Graphite or Carbon rods
- 5.7** HEPA Laminar Flow Hood
- 5.8** Grids – Copper and Gold
- 5.9** Fine Forceps



- 5.10 Grid Clips and Grid Storage Boxes
- 5.11 Jaffe Wick or Sponge
- 5.12 Kimwipes or alternative paper
- 5.13 Transmission Electron Microscope with the following capabilities:
  - 100 Kev
  - fine probe size <250 nm
  - Elemental Chemistry via X-Ray Detector

## 6.0 Reagents and Standards

All reagents should be of recognized analytical grade or better:

- 6.1 Acetone
- 6.2 Di-Methyl Formamide (DMF)
- 6.3 Glacial Acetic Acid
- 6.4 NIST SRM 1876b
- 6.5 NIST SRM 2063
- 6.6 Albite Standard
- 6.7 Aluminum Coated Copper Grid Standard
- 6.8 Gold Coated Grid Standard
- 6.9 Magnification (cross grating replica) Calibration Standard
- 6.10 NIST Traceable Asbestos on Grids
- 6.11 Non Asbestos Standards on Grids
- 6.12 Ethylenediamine
- 6.13 1-methyl 2-pyrrolidone

## 7.0 Sample Collection, Preservation, Shipment and Storage

- 7.1 Samples are collected on  $\leq 0.45$  micron Mixed Cellulose Ester (MCE) or  $\leq 0.4$  micron Polycarbonate (PC) filter cassettes (EMSL recommends MCE filters).
- 7.2 Air flow should be between 2.4 LPM and 15 LPM (not to exceed 10 LPM recommended)
- 7.3 Typically 1800 liters or more are collected. The total volume that can be collected will be partially determined by the air being sampled.
- 7.4 No sample preservation is needed and samples can be stored indefinitely prior to analysis.
- 7.5 Samples are best transported to the lab by hand. When mailing, try to package samples carefully to minimize disturbance and possible dislocation of particulate from the filter surface. Use packing materials that will minimize static charge.
- 7.6 All air cassettes must be retained in an easily retrievable manner for a minimum of 60 days.
- 7.7 All samples prepped to grid (both on the grid clip and in the grid box), will be retained for a minimum of 3 years.

## 8.0 Calibration and Standardization

Each major component of the method is calibrated and/or standardized including the analyst. Examples follow:

- 8.1 Sample collection vacuum pumps are calibrated at the beginning and end of a sampling event (with the sample cassette in line) using a rotometer.
- 8.2 The rotometer in turn needs to be calibrated to a primary standard periodically. (Rotometer use and calibration is the responsibility of the sample collection entity).



- 8.3** The Electron Microscope is calibrated with various standards for
  - 8.3.1** Exact screen magnification at 20,000 X.
  - 8.3.2** Exact film magnification at 20,000 X.
  - 8.3.3** Spot Size (must be less than 250 nm).
- 8.4** The X-Ray system attached to the Electron Microscope is calibrated with various standards for:
  - 8.4.1** Proper location of Al and Cu peaks.
  - 8.4.2** Resolution <175 eV at the Mn peak.
  - 8.4.3** Relative Sensitivity (K Factors) determined for various elements.
  - 8.4.4** A background-subtracted NaK $\alpha$  integrated peak count rate of more than 1 count per second from a fiber of UICC Crocidolite, 50nm diameter or smaller at an accelerating voltage of 80 kV. The peak to background ratio should exceed 1.0.
    - 8.4.4.1** The mineral used for calibration of the EDXA system for sodium shall be prepared using a TEM gold grid.

## **9.0 Procedure**

### **9.1 Sample Receipt**

- 9.1.1** Upon receipt of samples, check that the sample information on the Chain of Custody (COC) matches the information on the samples and other paperwork. Any discrepancies must be resolved before proceeding.
- 9.1.2** If the samples do not have a COC then one is completed at time of log in. Have the client fill out the necessary information completely.
- 9.1.3** Information required on the Chain of Custody includes:
  - 9.1.3.1** Client name, address, telephone number, contact person, fax number
  - 9.1.3.2** Project number/ name, state where samples were taken
  - 9.1.3.3** Number of samples sent and sample ID's
  - 9.1.3.4** Type of analysis requested
  - 9.1.3.5** Sample volumes or areas if applicable
  - 9.1.3.6** Turn around time. "RUSH" is not acceptable
  - 9.1.3.7** A date and signature of the person relinquishing the samples
  - 9.1.3.8** All samples MUST be accounted for with the proper sample ID's
  - 9.1.3.9** All samples MUST be sealed, properly bagged and undamaged.
- 9.1.4** All samples must be clocked in at the time of receipt and signed and dated by an EMSL employee. If the lab does not have clock for sample receipt the receiving employee should record the time of receipt also.
- 9.1.5** Check to see if the samples match the COC and if the cassettes are open, damaged, or contaminated. If samples are delivered in the same container or bag as bulk asbestos material samples, if the samples are damaged or if the COC does not match, notify the client.

### **9.2 Sample Log In**

If all of the above criteria for sample receiving are met then the sample can be logged in to Sample Master (LIMS) as per the Sample Master SOP.

- 9.2.1** This process will assign a unique EMSL order number for the project as well as unique lab sample ID's.
- 9.2.2** Sample Master generates an Internal Chain of Custody; however at this time it does not create bench sheets or produce reports. For samples analyzed by ISO





10312, bench sheets and the final report are generated using an EMSL prepared Excel spreadsheet.

### **9.3 Sample Preparation**

- 9.3.1** ISO 10312 samples may be collected on mixed cellulose ester (MCE) filters ( $\leq 0.45 \mu\text{m}$ ) or Polycarbonate (PC) filters ( $\leq 0.4 \mu\text{m}$ ).
- 9.3.2** A direct-transfer preparation is required for this method.
- 9.3.3** The method specifies that MCE filters are collapsed using a mixture 35 ml DMF / 15 ml Glacial Acetic Acid / 50 ml fiber free DI water. The dissolution of the filters after collapsing may be performed with acetone.
- 9.3.4** A minimum of 3 grids per sample are prepped and stored.
- 9.3.5** The specific procedures for direct transfer preparation of the filters are outlined in the Direct Prep of Sample Filters SOP.

### **9.4 Grid Storage**

- 9.4.1** Grids are stored and location recorded following section 9.5 of EMSL's Direct Transfer Prep SOP.
- 9.4.2** All ISO 10312 grid clips and grid boxes (analyzed preps and backup grids not mounted on clips, are stored for 3 years or as specified by client/project requirements.

### **9.5 Sample Preparation Acceptance**

- 9.5.1** Remove the first sample grid clip from the box and insert it into the TEM.
- 9.5.2** Bring the TEM to a magnification of 300 to 500x and inspect the grids to determine if all of the following conditions are being met.
  - 9.5.2.1** More than 75% of the grid must be covered with replica
  - 9.5.2.2** Grid must have at least 75% intact grid openings.
  - 9.5.2.3** Grids must not have more than 10% opaque area due to incomplete filter dissolution.
  - 9.5.2.4** Total grid area must have  $< 25\%$  overlapping or folded replica.
  - 9.5.2.5** Sample must have  $< 10\%$  overall particulate loading.
  - 9.5.2.6** Particulate loading is uniform from grid opening to grid opening.
  - 9.5.2.7** The fibrous structure loading should be  $\leq 7000 \text{ str/mm}^2$ .
  - 9.5.2.8** Grid openings selected must not have rips or overlapping folds.
- 9.5.3** If the samples are judged to be unacceptable due to poor prep quality, reprep the samples as necessary.
- 9.5.4** If the samples are judged to be overloaded ( $> 10\%$  particulate loading) or if the loading is non-uniform, it may be possible to achieve satisfactory preps and the samples analyzed using ISO 13794. This procedure allows for an indirect transfer preparation and can eliminate the problems of overloading and non-uniform distribution. The client needs to authorize this option if it is deemed appropriate.

### **9.6 Sample Analysis**

- 9.6.1** At a magnification of 100X, first locate and center the grid to be analyzed using both the specimen selector (located on the left side of the TEM column on top of the left translator where it enters the column) and if present, the grid selector knob located on the specimen arm (see diagram below).

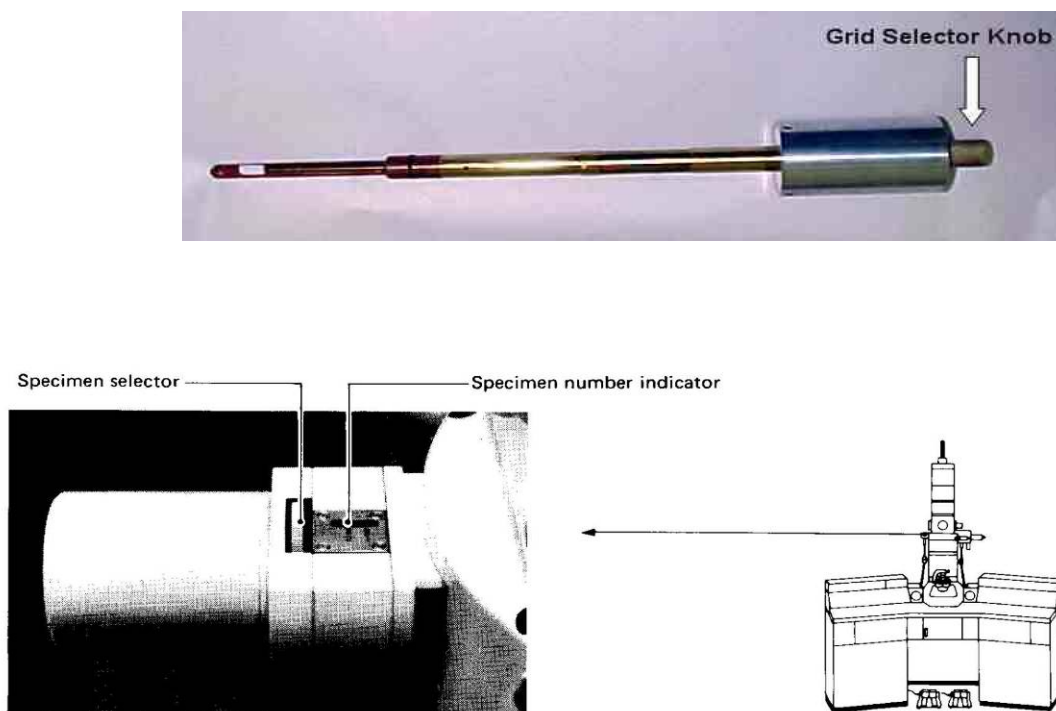


Fig. 4. 17 Specimen selector

- 9.6.2** The first grid should be located on screen as the grid to the extreme left.
- 9.6.3** The specimen locator on the scope should be used to find the first grid but only the grid selector knob (if present) located on the specimen arm needs to be employed to move from grid to grid. (Detailed instruction on the use of both long and short clips and their associated sample arms can be found in EMSL's Grid Clip SOP).
- 9.6.4** Initially, no matter which grid is to be analyzed, you will need to locate grid number 1 and then proceed to the grid of interest (if not grid 1). As analysis proceeds from grid to grid you can simply proceed in the same direction (at 100X) to the next grid.
- 9.6.5** Next, orient an intact grid opening on the middle of the screen with the left and right stage controls.
- 9.6.6** Choose an acceptable grid opening to analyze.
- 9.6.7** Increase magnification to approximately 20,000X taking care to remain in the chosen grid opening.
- 9.6.8** Log the grid opening identification on the sample worksheet.
- 9.6.9** Move to the upper left corner of the grid square and begin traversing the grid using only one directional control.
- 9.6.10** Once the opposite grid bar has been reached, move over/down one field of view using the other directional control (approximately one large circle width  $\approx 5\mu\text{m}$ ) and proceed scanning with the original directional controller in the opposite direction.
- 9.6.11** Repeat this procedure until the entire grid opening has been scanned. Take care not to count any structure twice or to miss any area of the grid opening.



- 9.6.12** If no fibrous structures have been located , record “ND” for the grid opening and repeat steps 9.6.5 to 9.6.11 until one of the stopping procedures in step 9.6.21 have been reached.
- 9.6.13** Do not analyze adjacent grid openings. Grid openings selected should be split evenly and randomly between a minimum of 2 grid preps.
- 9.6.14** Do not count structures that intersect the top and left grid bars. Structures that intersect the bottom and right grid bar are to be counted as twice the length observed extending from the grid bar.
- 9.6.15** If a fibrous structure has been located, (remember minimum fiber length = 0.5µm with 5:1 aspect ratio) then follow the analysis protocol for each structure encountered as outlined in the flowchart on page 38 of the method for fibers with tubular morphology, and the flowchart on page 41 of the method for fibers without tubular morphology. Both flowcharts are in section 16 of this procedure. Detailed procedures for SAED and EDXA analysis are in their respective EMSL SOPs (SAED SOP and Energy Dispersive X-Ray Analysis SOP).
- 9.6.16** Record only fibrous Non - Asbestos Minerals (NAM's) that required close inspection to identify. Enumerate NAM structures with a “0” in the total column and proceed to record all pertinent classifications and distinctions. Both the mineral type and level of ID will be a NAM.
- 9.6.17** Unless the client specifies otherwise EMSL will attempt to classify Chrysotile to at least a level of “**CD**” (table D.1 page 37 of the method) and Amphiboles to at least “**ADX**” (table D.2 page 37 of the method), both tables are located section 16 of this procedure.
- 9.6.18** Record at least one SAED pattern on film for each type of asbestos, per sample. Record diffraction information on the sample worksheet. See SAED SOP for detailed information on obtaining and recording SAED patterns.
- 9.6.19** At least 1 EDXA spectra per asbestos and non-asbestos type, per sample should be printed out or alternately stored to disk as a .pgt file if possible. Record EDXA information on the sample worksheet.
- 9.6.20** Record all structure information on the bench sheet as follows:
- 9.6.20.1** Primary Structure # Tabulate Primary Structures SEQUENTIALLY
  - 9.6.20.2** Total Structure # Tabulate Total Structures SEQUENTIALLY
  - 9.6.20.3** Length of all structures, both primary and total.
  - 9.6.20.4** Width of all structures, both primary and total.
  - 9.6.20.5** Level of ID (for primary structures, this will be the highest level of identification achieved on the associated total structures).
  - 9.6.20.6** Mineral Identification
  - 9.6.20.7** Sketches and/or comments
  - 9.6.20.8** Any photo ID information for negatives taken.
  - 9.6.20.9** Whether the EDXA was printed/saved and which structure it corresponds to.
- 9.6.21** Definitions for the basic structure types are found in the definitions section of this SOP. Example sketches of various structure types are found in the ISO 10312 method and in section 16 of this procedure. Record the structure using the following notation.
- 9.6.21.1** Structure types and abbreviations are:
    - 9.6.21.1.1** F - Fiber
    - 9.6.21.1.2** B - Bundle



- 9.6.21.1.3 CD - Cluster (disperse)
- 9.6.21.1.4 CF - Cluster Fiber
- 9.6.21.1.5 CB - Cluster Bundle
- 9.6.21.1.6 CR - Cluster residual
- 9.6.21.1.7 CC - Cluster (compact)
- 9.6.21.1.8 MD - Matrix (disperse)
- 9.6.21.1.9 MF - Matrix Fiber
- 9.6.21.1.10 MB - Matrix Bundle
- 9.6.21.1.11 MR - Matrix Residual
- 9.6.21.1.12 MC - Matrix (compact)
- 9.6.21.2 Following all primary structures, except for fibers (F) and bundles (B) are two characters:
  - 9.6.21.2.1 The first character is an estimate of fibers and bundles comprising the structure. A "+" is recorded when there are more than 9 component fibers or bundles within a structure.
  - 9.6.21.2.2 The second character corresponds to the number of component structures described in the first character that are also  $> 5\mu\text{m}$ . A "+" is recorded when there are more than 9 subcomponents that are  $> 5\mu\text{m}$ .
- 9.6.21.3 Record the 5 largest prominent subcomponents, (fibers or bundles), that makeup the structure. Fill in the same information on the bench sheet for these compositional structures as were completed for the primary structures. Do not record more than 5 prominent subcomponents for each primary structure.
- 9.6.21.4 If, after accounting for prominent component structures, a group of fibers remains, record this as a residual. Do not record more than 5 residuals for each primary structure. A residual is measured and assigned a two digit number derived in the same manner as specified in the primary structure coding above.
- 9.6.21.5 Compact structures (cluster and matrix) by definition have no sub-components that cannot be isolated and labeled; therefore sub-components or residuals **should not be** recorded.
- 9.6.21.6 Cluster and Matrix structures can occur in which the characteristics of both types, disperse and compact, happen in the same structure. In instances like this, the structure should be assigned as a disperse structure and a logical procedure should be followed for recording the subcomponents.
- 9.6.21.7 When in a matrix, the proportion of the length of a fiber or bundle that is obscured by other particles shall be used as the basis for determining whether it is to be recorded as a separate component. (See flow chart in section 16.7)
  - 9.6.21.7.1 If obscured length could not be more than  $1/3^{\text{rd}}$  of the total length, then record that fiber or bundle accordingly, as either a Matrix Fiber (MF) or Matrix Bundle (MB)





- 9.6.21.7.2** If obscured length could be more than  $1/3^{\text{rd}}$  of the total length then the fiber or bundle shall be recorded as Compact Matrix (MC) or a Matrix Residual (MR)
- 9.6.21.7.2.1** Record as MC if no other subcomponent can be separately identified in the structure.
- 9.6.21.7.2.2** Record as MR if other subcomponents can be separately identified in the structure.
- 9.6.21.7.3** If a fiber or bundle crosses a matrix particle (greater than or equal to 0.5 microns) and both ends can be located, the structure should be recorded as a Matrix Fiber (MF) or Matrix Bundle (MB)

**9.6.22** Examples of proper syntax follows:

- 9.6.22.1** **MD31** is a disperse matrix comprised of 3 distinct fibers or structures one of which is greater than 5 microns.
- 9.6.22.2** **MC30** is a compact matrix estimated to have no more than 3 subcomponents none of which is greater than 5 microns.
- 9.6.22.3** **CD+1** is a disperse cluster with more than 9 fibers or structures ("+" means more than 9), one greater than 5 microns.
- 9.6.22.4** **MD+0** is a disperse matrix with more than 9 fibers or structures none greater than 5 microns.

**9.6.23** Stopping Criteria

- 9.6.23.1** Analysis may be terminated after the required analytical sensitivity is achieved, or
- 9.6.23.2** Analysis may be terminated after the completion of analysis of the grid opening in which the 100<sup>th</sup> structure was encountered.
- 9.6.23.3** Regardless of which step above terminates the analytical process, a minimum of 4 grid openings must be analyzed.

**9.6.24** Blanks

- 9.6.24.1** One laboratory blank must be processed with each slide of samples. (Only 1 of the laboratory blanks needs to be analyzed per Order ID.)
- 9.6.24.2** At least one field blank should be processed with each batch of samples.
- 9.6.24.3** Filter lot blanks are required at a minimum of 2 for every 100 filters.

**9.6.25** There is no method required analytical sensitivity for this procedure; the target analytical sensitivity is set with mutual consent of the client. Unless otherwise specified EMSL will analyze sample to an analytical sensitivity of 0.005 s/cc.

**9.6.26** A Pass / Fail Criteria is not given for this method.

## 10.0 Calculations

Examples of the calculations are displayed below. Variables include but are not limited to the volume and GOA (grid opening area) which is calculated with every batch of grids.

EFA - Effective filter area of a 25mm cassette =  $385\text{mm}^2$

GOA - Grid opening area ( $0.00635\text{ mm}^2$ )

N - Number of fibers (If N=0 then default to 1 structure)

V - Volume (1200 liters)



- AA - Area analyzed (0.06985 mm<sup>2</sup>)  
NO - Number of grid openings analyzed (11)  
n - Number of Samples  
AS - Analytical Sensitivity

#### 10.1 Area analyzed (AA)

$$AA = GOA \times NO \quad AA = 0.00635 \text{ mm}^2 \times 11 \quad AA = 0.06985 \text{ mm}^2$$

#### 10.2 Structures per square millimeter (str/mm<sup>2</sup>)

$$\text{str/mm}^2 = (N/AA) \quad \text{str/mm}^2 = (1/0.06985 \text{ mm}^2) \quad \text{str/mm}^2 = 14.3$$

#### 10.3 Structures per cubic centimeter of air (str/cc)

$$\text{str/cc} = \frac{EFA \times N}{AA \times 1000 \times V} \quad \text{str/cc} = \frac{385 \text{ mm}^2 \times 5}{0.06985 \text{ mm}^2 \times 1000 \times 1200 \text{ L}} = 0.023$$

#### 10.4 Analytical Sensitivity (AS)

To calculate the analytical sensitivity, calculate the str/cc using 1 for the number of structures (N) in the formula above.

$$AS = \frac{EFA \times N}{AA \times 1000 \times V} \quad AS = \frac{385 \text{ mm}^2 \times 1}{0.06985 \text{ mm}^2 \times 1000 \times 1200 \text{ L}} = 0.0046$$

#### 10.5 Grid Openings (NO) required to be analyzed

The number of grid openings (NO) that are required to be analyzed is dependent on grid opening area (GOA), the volume (V) of sample collected and the requested analytical sensitivity (AS) of the analysis.

$$NO = \frac{EFA}{AS \times GOA \times 1000 \times V} \quad NO = \frac{385}{0.005 \times 0.0635 \times 1000 \times 1200} = 10.1 = 11$$

#### **Important!!**

For this calculation round the result to an integer and ALWAYS round the result UP regardless of rounding rules. In the above example, even though the first decimal place is below 5 (10.1), the result is rounded up to produce 11 required openings.

#### 10.6 Chi Square the test for uniform fiber distribution.

This test is performed to quantify the randomness of the fibers distributed on the filter surface. It is calculated with the following equation:

$$\sum_{i=1}^{i=k} \frac{(n_i - np_i)^2}{np_i}$$

Where (p<sub>i</sub>) is the grid opening area divided by the total area of the TEM grid examined. (See 10.1 above)

Where n<sub>i</sub> is the observed number of primary structures on that grid opening.

Where n is the total number of primary structures observed in the sample.



The value from the above calculation is compared with the significance points of the Chi Square table, having (k-1) degrees of freedom at the 0.001 significance level. Where k is the total number of grid openings analyzed.

## 11.0 Reporting

The following items are included in the final report (on EMSL letterhead) to the client:

### 11.1 Asbestos concentration in structures/liter (str/L) categorized as follows

#### 11.1.1 Total asbestos concentration for all asbestos types meeting minimum Identification required, typically CD and ADX

11.1.1.1 For sample where 3 or less structures were counted, report the concentration as less than the corresponding one-sided upper 95% confidence limit for the Poisson distribution.

11.1.1.2 For samples where 4 or greater structures are counted report the mean asbestos structure concentration.

#### 11.1.2 Chrysotile asbestos concentrations are reported as follows:

11.1.2.1 Determine which identification and structure categories will be used to calculate the concentration. This is specified by the client. If it is not specified by the client, use all Total structures identified as CD or better.

11.1.2.2 For sample where 3 or less chrysotile structures were counted, report the concentration as less than the corresponding one-sided upper 95% confidence limit for the Poisson distribution.

11.1.2.3 For samples where 4 or greater structures are counted report both

11.1.2.3.1 The mean chrysotile concentration

11.1.2.3.2 The upper and lower chrysotile concentrations based on the corresponding two-sided Poisson 95% confidence intervals.

#### 11.1.3 Total amphibole asbestos concentrations are reported as follows:

11.1.3.1 Determine which identification and structure categories will be used to calculate the concentration. This is specified by the client. If it is not specified by the client, use all Total structures identified as ADX or better.

11.1.3.2 For samples where 3 or less amphibole structures were counted, report the concentration as less than the corresponding one-sided upper 95% confidence limit for the Poisson distribution.

11.1.3.3 For samples where 4 or greater structures are counted report both

11.1.3.3.1 The mean amphibole concentration

11.1.3.3.2 The upper and lower amphibole concentrations based on the corresponding two-sided Poisson 95% confidence intervals.

11.2 The compositional data for the principle varieties of amphiboles present (if any).

11.3 The analytical sensitivity in str/L.

11.4 The detection limit in str/L.

11.5 Total number of primary structures counted.

11.6 Number of total asbestos structures counted.

11.7 Number of asbestos structures > 5µm.

11.8 Number of asbestos fibers and bundles (combined) > 5µm.

11.9 Number of PCM equivalent asbestos structures.



- 11.10 Number of PCM equivalent asbestos fibers.
- 11.11 The level of analysis used when identifying chrysotile and amphibole structures.
- 11.12 Aspect ratio used to define fibers for the analysis.
- 11.13 Reference to the Method.
- 11.14 Client Identification and contact information
- 11.15 EMSL's order ID.
- 11.16 Date of receipt of the samples.
- 11.17 Date of sample collection (if provided).
- 11.18 Date of the report.
- 11.19 EMSL and client sample ID numbers.
- 11.20 Volume of air collected in the sample.
- 11.21 Effective filter area of the sample media.
- 11.22 Area of the grid openings used during analysis.
- 11.23 Microscope magnification used during analysis.
- 11.24 Initials of the analyst.
- 11.25 Count sheets are supplied with final results.

## 12.0 Method Performance

Method performance data can be found in the method Ambient air - Determination of asbestos fibres - Direct-transfer transmission electron microscopy method ISO 10312 First edition 1995-05-01.

### 12.1 MDL

When no structures are counted the detection limit is considered to be the upper limit of the one-sided Poisson confidence interval, or 2.99 structures

### 12.2 DOC's

Demonstrations of Capability are required for each analytical method.

### 12.3 PT's

Proficiency tests do not exist for this procedure at the current time.

### 12.4 Accuracy

Since it is not possible to create a standard filter with a known structure concentration the exact accuracy of the method cannot be determined.

### 12.5 Precision

The analytical precision is dependant on the number of structures counted and the uniformity of the particulate deposit. Assuming a uniform distribution and structure loading of at least 3.5 structures per grid opening, the coefficient of variance of the counting procedure can be estimated at 10%. It should be noted that in practice, particulate deposits obtained by filtration of ambient air samples are rarely ideally distributed.

## 13.0 Quality Control

13.1 All QC data must be maintained and available for easy reference and inspection.

### 13.2 Blanks

13.2.1 Laboratory Blanks: A lab blank is included with each slide of samples prepared. The last slide's lab blank will be prepared for analysis, At least one lab blank for every Order ID should be analyzed.

13.2.2 Field Blanks: at least 1 field blank should be processed with each sample set.





13.2.3 Lot Blanks: A minimum of 2 unused filters from each filter lot of 100 will be analyzed.

**13.3** Inter-Analyst QC is at least 4% reanalysis of the same grid openings.

**13.4** Intra-Analyst QC is at least 2% reanalysis of the same grid openings.

**13.5** Verified analysis is used for training and will be performed as need for discordant sample QC reconciliation.

**13.6** 0.5% reparation and analysis of sample filter QC.

**13.7** Inter-laboratory analysis is performed in order to monitor systematic errors among microscopists as needed or as determined by client.

## **14.0 Data Assessment**

### **14.1 Acceptance criteria for QC measures**

These are addressed in the EMSL's QA Manual Module A section A.12.6.2

**14.1.1** If a sample falls outside the acceptable limits it needs to be reconciled with participating analysts and/or a third analyst when necessary.

**14.1.2** The Pass/Fail criteria for repeat results (inter and intra analyst) should not differ at the 5% significance level.

**14.1.3** For Verified Analysis, the results should be  $\leq 80\%$  of true positives,  $\leq 20\%$  false negatives, and  $\leq 10\%$  false positives of the Total Structure count.

**14.1.4** Repreparations from different sectors of the filter is a test for the reproducibility of the whole method. Since this type of QC is impacted by circumstances outside the control of the analysis, no statistical evaluation is currently performed on this data. The data is simply compiled for informational purposes only.

**14.1.5** Criteria for the maximum allowable contamination levels for laboratory blanks: on all filter types (MCE and PC) Filters, cannot exceed the methods limit for lot blanks, which is 10 str/mm<sup>2</sup>, or if the mean fiber count for asbestsos fibers and bundles longer than 5 microns is more than 0.1 fiber/mm<sup>2</sup>.

**14.1.6** The Chi Square uniformity test shall be conducted using the number of primary structures found on individual grid openings. (See section 10.6 of this SOP) This value will be compared with significance points of the Chi Square distribution. If the structure count fails this test, the precision of the result may be in question and if new air samples cannot be collected, additional grid openings may need to be examined or alternatively, the sample should be prepared indirectly by ISO 13794.

### **14.2 Corrective actions**

These policies are addressed fully in the EMSL's QA manual section 18.

**14.2.1** All corrective actions should look for the root cause of the error.

**14.2.2** All out of control or unacceptable data must be brought to the attention of the Laboratory Manager.

**14.2.3** The Laboratory manager is responsible for generating a corrective action including an investigation of calibration procedures, a review of analytical technique and investigation of training policies and compliance.

**14.2.4** Corrective actions will be reported to the QA Department by means of the Quarterly Management Report or sooner when appropriate.

### **14.3 Contingencies for handling out-of control or unacceptable data.**

Any quality control requirements not met must have an explanation to their Non-conformance.



## 15.0 Pollution Prevention / Waste Management

### 15.1 Pollution Prevention

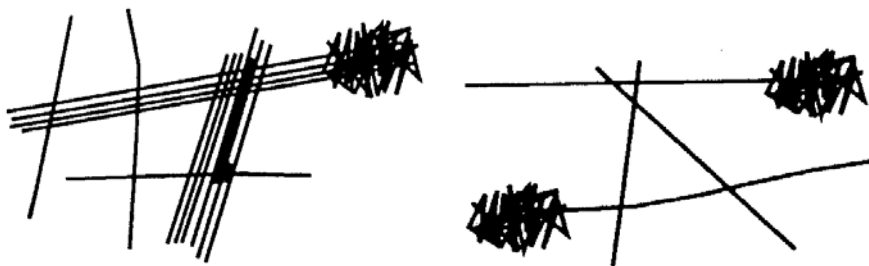
EMSL Analytical makes all efforts to reduce the volume and toxicity of the waste generated by the laboratory. An effort to manage procurement of hazardous materials has been implemented in order to avoid over ordering. Hazardous waste is classified for proper disposal.

### 15.2 Waste Management

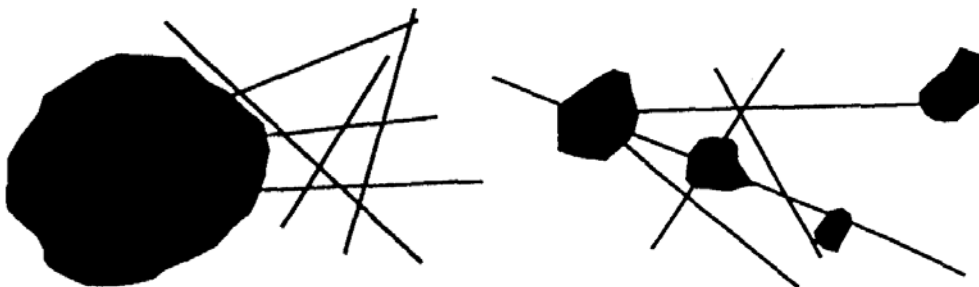
The waste generated during prep and analysis will be disposed of following safety procedures outlined in the chemical hygiene plan (EMSLChemHygiene 200.0).

## 16.0 Tables, Diagrams, Flowcharts, and Validation Data

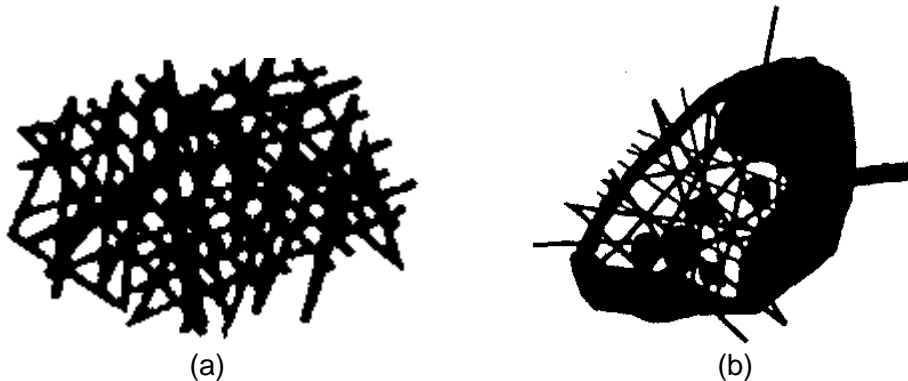
### 16.1 Example of disperse clusters:



### 16.2 Examples of disperse matrices:



### 16.3 Examples of compact Cluster (a) and Matrix (b):



## 16.4 Structure Classification Tables

**Table D.1 — Classification of fibres with tubular morphology**

Category	Description
TM	Tubular Morphology, not sufficiently characteristic for classification as chrysotile
CM	Characteristic Chrysotile Morphology
CD	Chrysotile SAED pattern
CQ	Chrysotile composition by Quantitative EDXA
CMQ	Chrysotile Morphology and composition by Quantitative EDXA
CDQ	Chrysotile SAED pattern and composition by Quantitative EDXA
NAM	Non-Asbestos Mineral

**Table D.2 — Classification of fibres without tubular morphology**

Category	Description
UF	Unidentified Fibre
AD	Amphibole by random orientation SAED (shows layer pattern of 0,53 nm spacing)
AX	Amphibole by qualitative EDXA. Spectrum has elemental components consistent with amphibole
ADX	Amphibole by random orientation SAED and qualitative EDXA
AQ	Amphibole by Quantitative EDXA
AZ	Amphibole by one Zone-axis SAED pattern
ADQ	Amphibole by random orientation SAED and Quantitative EDXA
AZQ	Amphibole by one Zone-axis SAED pattern and Quantitative EDXA
AZZ	Amphibole by two Zone-axis SAED patterns, with consistent interaxial angle
AZZQ	Amphibole by two Zone-axis SAED patterns, with consistent interaxial angle, and Quantitative EDXA
NAM	Non-Asbestos Mineral

## 16.5 Identification Flowchart for fibers with Tubular Morphology



ISO 10312:1995(E)

© ISO

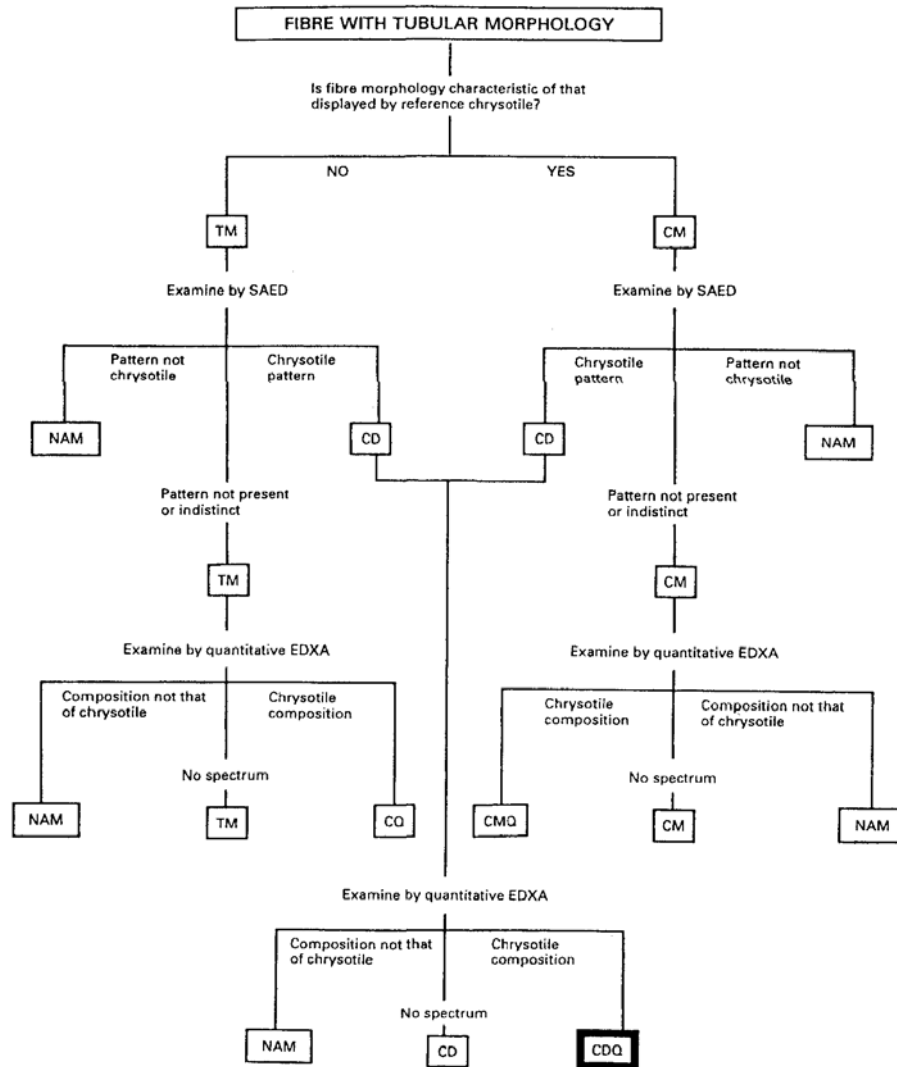


Figure D.2 — Classification chart for fibre with tubular morphology

## 16.6 Identification Flowchart for fibers without Tubular Morphology



© ISO

ISO 10312:1995(E)

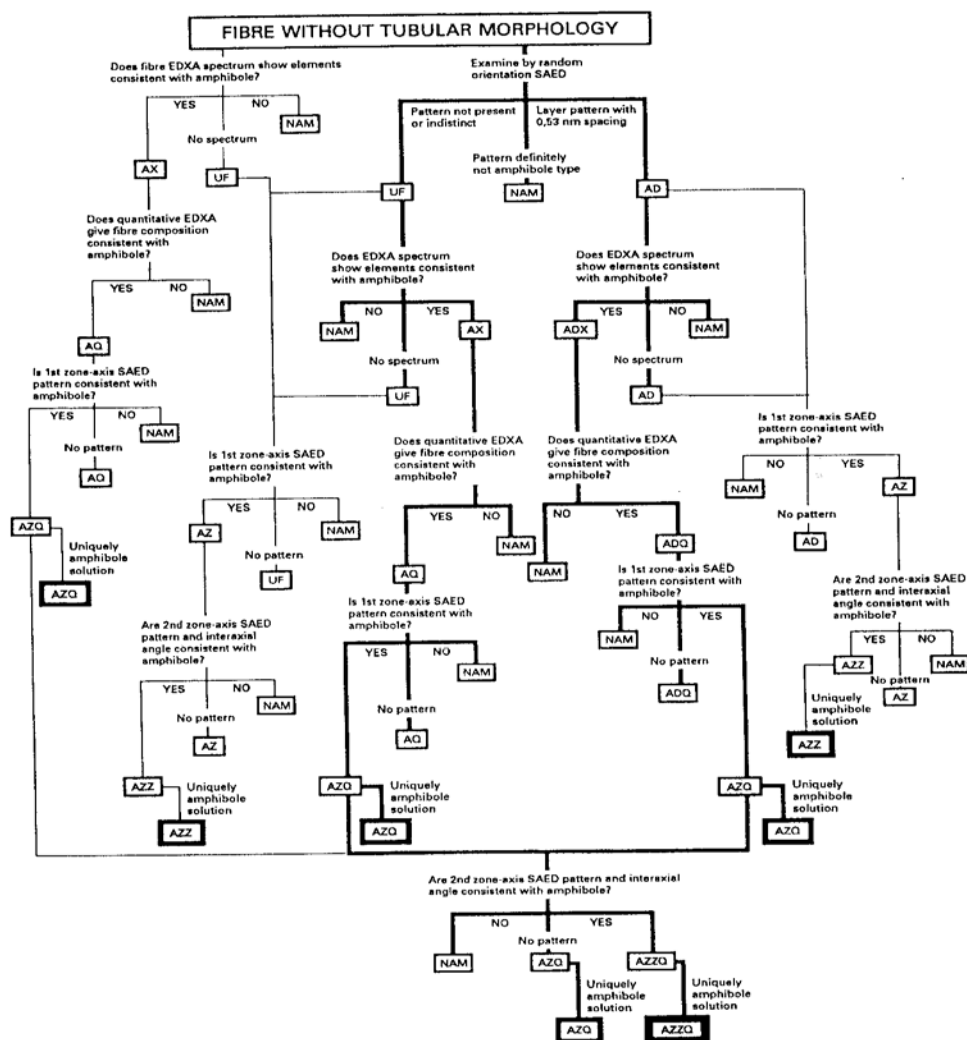
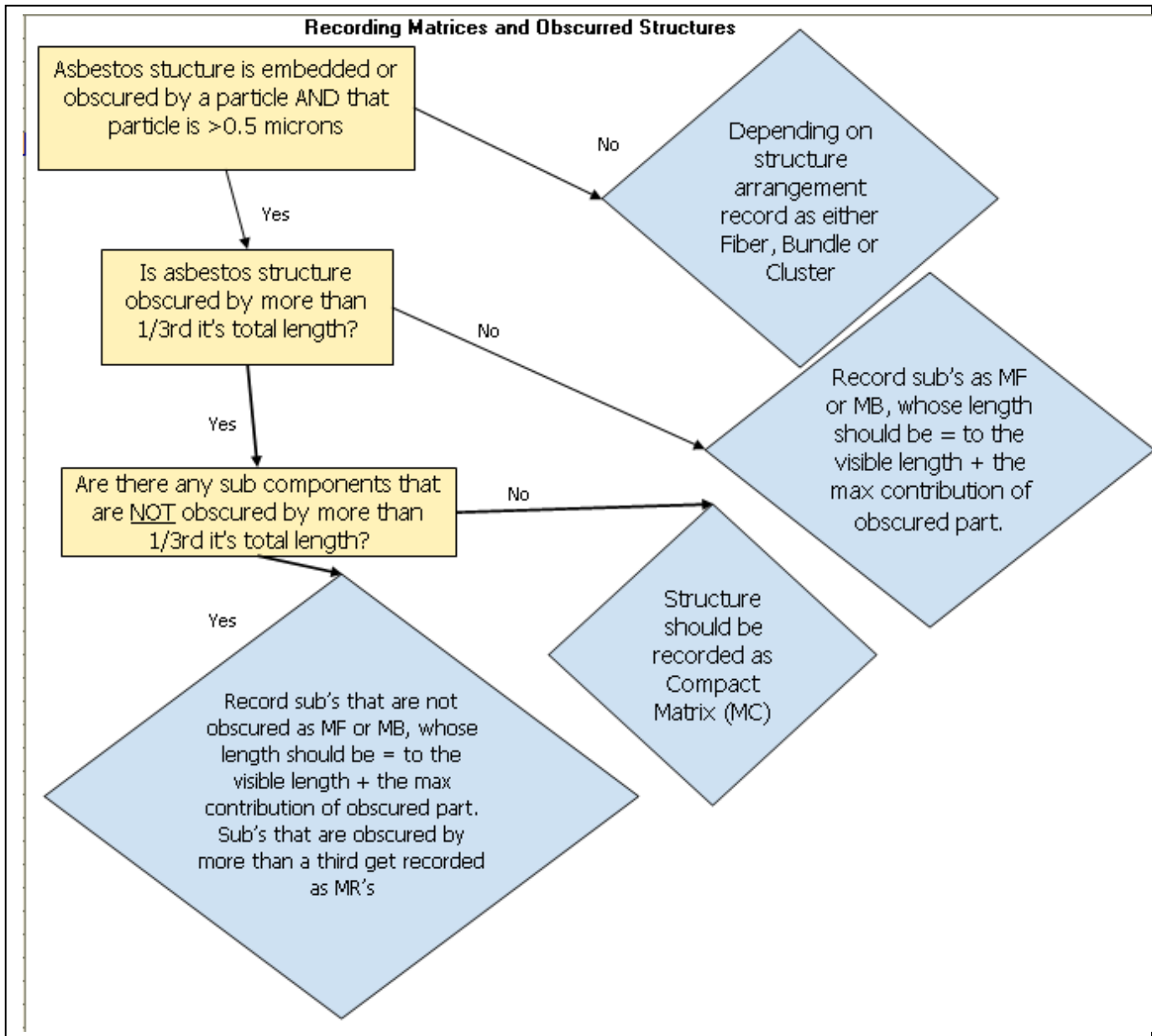


Figure D.4 — Classification chart for fibre without tubular morphology





## 16.7 Flow chart for recording partially obscured fiber and bundles





## 17.0 References

- 17.1 Ambient air - Determination of asbestos fibres - Direct-transfer transmission electron microscopy method ISO 10312 First edition 1995- 05- 01.
- 17.2 Less is Better- Guide to Minimizing Waste in Laboratories prepared by the Task Force on
- 17.3 Laboratory Environment, Health and Safety- American Chemical Society 2002.
- 17.4 EMSL QA 101.7 Revision 7, September 2004– EMSL Quality Assurance Manual
- 17.5 EMSL QA Manual Revision 9 April 2007
- 17.6 EMSL Chemical Hygiene Plan Revision 0, September 2004

## 18.0 Revision History

Revision #	Date	Revision	Initials
7	01/23/08	Edited for content and NELAC compliance.	KN
8	04/17/08	Corrected syntax description in step 9.6.22.3, original was incorrect for example syntax.	KN
8.1	01/19/09	Reformatted to conform to newer SOP format. Grid storage and recording changed to refer to EMSL Direct Prep SOP.	KN
9.0	02/06/12	Revised section 8.4 (Calibration and Standardization) to include Na sensitivity requirements. Revised section 10.6 to include the chi square test. Revised section 11 (Reporting) to provide a statement as to which structure category and identification category to include in the calculation of the asbestos concentration. Revised section 13 (Quality Control) and section 14 (Data acceptance) to conform to the quality assurance measurements defined in the method. Revised section 16 to include flow chart detailing the recording of partially obscured fibers or bundles. Revised Blank QC determinations	RD
9.1	02/16/12	Revision of section 1.3: definition of a True PCMe fiber.	RD



### Authorizing Signatures

<u>Robyn Denton</u> Author (Print)	<u></u> Author Signature	<u>02/16/2012</u> Date
<u>Ed Cahill</u> Reviewer (Print)	<u></u> Reviewer Signature	<u>02/16/2012</u> Date
<u>Ed Cahill</u> Corporate Approval (Print)	<u></u> Corporate Approval Signature	<u>02/16/2012</u> Date



## SOP Review and Acknowledgement Form

**Instructions:** Ensure all personnel in laboratory affected by this procedure read and acknowledge. Once completed, the page shall be retained in an Acknowledgments binder along with personnel training.

### Laboratory Manager Acknowledgement

My signature below signifies that I have read and understand the entire contents of this document. My signature represents that I agree to fully comply with, implement, and enforce all requirements, procedures, and protocols specified in these procedures set forth in this document and any supporting reference materials or methodologies.

\_\_\_\_\_  
Laboratory Manager Signature

\_\_\_\_\_  
Date

### Laboratory Staff Acknowledgement

My signature below signifies that I have read and understand the entire contents of this document. My signature represents that I agree to fully comply with, implement, and enforce all requirements, procedures, and protocols specified in these procedures set forth in this document and any supporting reference materials or methodologies.

**Signature**

**Date**

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## 9. Shipping Documentation



From: (734) 688-6810  
Contact Name:  
EMSL Analytical, Inc.  
1 212 S. Wagner Rd  
Ann Arbor, MI 48103

Origin ID: ARBA

**FedEx**  
Express



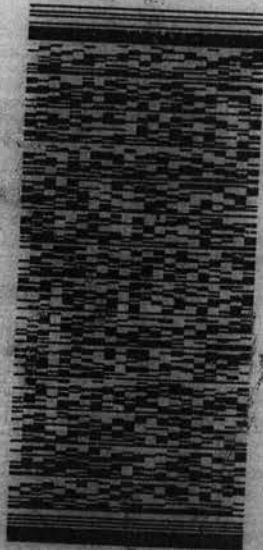
J142214022303M

BILL SENDER

SHIP TO: (800) 220-3675

Sample Receiving  
EMSL Analytical, Inc.  
200 Route 130 North

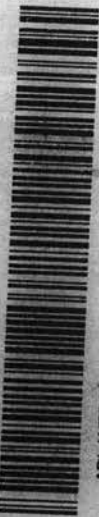
2 Cinnaminson, NJ 08077



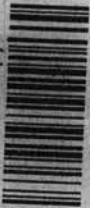
**B**  
6481  
10.03

Ship Date: 03OCT14  
Act Wgt: 1.0 LB  
CA# 102509583WSX12500

Delivery Address Bar Code



Ref # ARL-WEB(A)



RMA # EMSL08  
Return Reason:

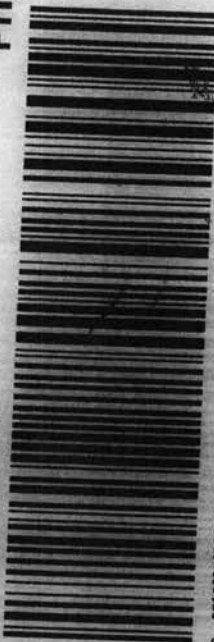
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MON - 06 OCT 10:30A  
PRIORITY OVERNIGHT

**K5 WWDA**

08077  
NJ-US  
PHL



FTD 551563 03OCT14 ARBA 522C1/DTW/6500

Rev. Date 1/12 • Part 11/10/02 • ©2012 FedEx • PRINTED IN U.S.A. 50P

**FedEx**

TRK# 0200 8064 5332 6481

**66 ARBA**

06 OCT 10:30A  
PRIORITY OVERNIGHT

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FTD 533060 02OCT14 ARBA

**ATTACHMENT C**  
**ANALYTICAL RESULTS AND DATA VALIDATION REPORTS:**  
**SOIL SAMPLES**

**DATA VERIFICATION REPORT**  
**Joseph Street Asbestos Removal Site, Marion, Ohio**  
**ALS Group USA Corp. Data Packages 1409817 and 1410540**

This report presents a data verification for the analytical reports of samples collected from the Joseph Street Asbestos Removal Site in Marion, Ohio, during September and October 2014 by Tetra Tech START personnel. The samples were sent by overnight courier to ALS Group USA Corp. (ALS), in Holland, Michigan, for analysis. ALS analyzed the samples for polychlorinated biphenyls (PCBs) via U.S. Environmental Protection Agency (EPA) SW-846 Method 8081B.

Tetra Tech reviewed the data from the analyses in general accordance with the EPA Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (June 2008). The requirements of the NFG were modified, as appropriate, to correspond to the specific requirements of the non-CLP methods used in the analyses. Tetra Tech's data verification was based on the following quality control (QC) parameters:

- Holding times and sample preservation
- Method blanks
- Laboratory control samples (LCS)
- Matrix spike and matrix spike duplicate (MS/MSD) analyses
- Surrogate recoveries
- Field duplicate precision

ALS logged in these samples as data packages 1409517 and 1410540. These data packages include five soil samples and two field duplicates that were collected on September 16 and October 8, 2014. The following sections discuss the analysis, focusing only on parameters with irregularities. The final section of this report provides an overall evaluation of the results of all samples and analyses. The following is a list of possible qualifications applied to the results based on this data verification effort, as well as their definitions.

- J: The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
- J+: The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
- J-: The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
- R: The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.

- U: The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
- UJ: The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

## **1.0 Polychlorinated Biphenyls Analyses**

The PCB analyses presented no problems regarding sample preservation and holding times, method blanks, and LCSs.

The MS/MSDs performed for these data packages were on samples that did not come from the Joseph Street Asbestos Removal site. Because these MS/MSD results are not indicative of site conditions, they were not evaluated.

The surrogate recovery results for the samples in data package 1409817 are not presented on the sample summaries. Surrogate recovery results are presented with the QC samples, which indicates that they were included as required by the method. The case narratives do not indicate any exceedances of QC criteria occurred for the surrogate spikes.

For the field duplicate pair of JS-PCB-01-091614 and JS-PCB-01-091614-D, the relative percent differences calculated for Aroclor 1260 and total PCBs were both 52.0 percent. The associated results for both samples were qualified as estimated (flagged “J”).

The results reported in these data packages appear to have been reported to the reporting limit; therefore, positive results below the lowest calibration standard were not reported.

## **2.0 Overall Evaluation**

On the whole, the analyses went well, with no results rejected and a typical incidence of qualifications applied for commonly seen irregularities. The results may be used, as qualified.



22-Sep-2014

Chris Burns  
Tetra Tech EM Inc.  
1 South Wacker Dr  
Suite 3700  
Chicago, IL 60606

Re: **Joseph Street Asbestos 9.16.14**

Work Order: **1409817**

Dear Chris,

ALS Environmental received 4 samples on 17-Sep-2014 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston  
Project Manager



Certificate No: MN 532786

### Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER



---

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos 9.16.14  
**Work Order:** 1409817

**Work Order Sample Summary**

---

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1409817-01	JS-PCB-01-091614	Soil		9/16/2014 09:45	9/17/2014 09:30	<input type="checkbox"/>
1409817-02	JS-PCB-01-091614-D	Soil		9/16/2014 09:45	9/17/2014 09:30	<input type="checkbox"/>
1409817-03	JS-PCB-02-091614	Soil		9/16/2014 10:13	9/17/2014 09:30	<input type="checkbox"/>
1409817-04	JS-PCB-03-091614	Soil		9/16/2014 10:27	9/17/2014 09:30	<input type="checkbox"/>

---

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos 9.16.14  
**Work Order:** 1409817

---

**Case Narrative**

Samples for the above noted Work Order were received on 09/17/2014. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Extractable Organics :  
No deviations or anomalies noted.

Wet Chemistry:  
No deviations or anomalies noted.

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos 9.16.14  
**WorkOrder:** 1409817

## **QUALIFIERS, ACRONYMS, UNITS**

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight

**ALS Group USA, Corp**

Date: 22-Sep-14

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos 9.16.14  
**Sample ID:** JS-PCB-01-091614  
**Collection Date:** 9/16/2014 09:45 AM

**Work Order:** 1409817  
**Lab ID:** 1409817-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
<b>PCBS</b>			<b>SW8082</b>		Prep: SW3541 / 9/17/14	Analyst: <b>JG</b>
Aroclor 1016	ND		97	µg/Kg-dry	1	9/18/2014 03:33 AM
Aroclor 1221	ND		97	µg/Kg-dry	1	9/18/2014 03:33 AM
Aroclor 1232	ND		97	µg/Kg-dry	1	9/18/2014 03:33 AM
Aroclor 1242	ND		97	µg/Kg-dry	1	9/18/2014 03:33 AM
Aroclor 1248	ND		97	µg/Kg-dry	1	9/18/2014 03:33 AM
Aroclor 1254	ND		97	µg/Kg-dry	1	9/18/2014 03:33 AM
<b>Aroclor 1260</b>	<b>940</b>		<b>97</b>	<b>µg/Kg-dry</b>	1	9/18/2014 03:33 AM
<b>PCBs, Total</b>	<b>940</b>			<b>µg/Kg-dry</b>	1	9/18/2014 03:33 AM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>RLM</b>
<b>Moisture</b>	<b>15</b>		<b>0.050</b>	<b>% of sample</b>	1	9/18/2014 01:50 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 22-Sep-14

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos 9.16.14  
**Sample ID:** JS-PCB-01-091614-D  
**Collection Date:** 9/16/2014 09:45 AM

**Work Order:** 1409817  
**Lab ID:** 1409817-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
<b>PCBS</b>			<b>SW8082</b>		Prep: SW3541 / 9/17/14	Analyst: <b>JG</b>
Aroclor 1016	ND		97	µg/Kg-dry	1	9/18/2014 03:49 AM
Aroclor 1221	ND		97	µg/Kg-dry	1	9/18/2014 03:49 AM
Aroclor 1232	ND		97	µg/Kg-dry	1	9/18/2014 03:49 AM
Aroclor 1242	ND		97	µg/Kg-dry	1	9/18/2014 03:49 AM
Aroclor 1248	ND		97	µg/Kg-dry	1	9/18/2014 03:49 AM
Aroclor 1254	ND		97	µg/Kg-dry	1	9/18/2014 03:49 AM
<b>Aroclor 1260</b>	<b>1,600</b>		<b>97</b>	<b>µg/Kg-dry</b>	1	9/18/2014 03:49 AM
<b>PCBs, Total</b>	<b>1,600</b>			<b>µg/Kg-dry</b>	1	9/18/2014 03:49 AM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>RLM</b>
<b>Moisture</b>	<b>15</b>		<b>0.050</b>	<b>% of sample</b>	1	9/18/2014 01:50 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



**ALS Group USA, Corp**

Date: 22-Sep-14

**Client:** Tetra Tech EM Inc.**Project:** Joseph Street Asbestos 9.16.14**Work Order:** 1409817**Sample ID:** JS-PCB-02-091614**Lab ID:** 1409817-03**Collection Date:** 9/16/2014 10:13 AM**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
<b>PCBS</b>			<b>SW8082</b>		Prep: SW3541 / 9/17/14	Analyst: <b>JG</b>
Aroclor 1016	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
Aroclor 1221	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
Aroclor 1232	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
Aroclor 1242	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
Aroclor 1248	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
Aroclor 1254	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
Aroclor 1260	ND		89	µg/Kg-dry	1	9/18/2014 05:26 AM
<b>PCBs, Total</b>	<b>ND</b>			<b>µg/Kg-dry</b>	1	9/18/2014 05:26 AM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>RLM</b>
<b>Moisture</b>	<b>9.2</b>		<b>0.050</b>	<b>% of sample</b>	1	9/18/2014 01:50 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**ALS Group USA, Corp**

Date: 22-Sep-14

Client: Tetra Tech EM Inc.

Project: Joseph Street Asbestos 9.16.14

Work Order: 1409817

Sample ID: JS-PCB-03-091614

Lab ID: 1409817-04

Collection Date: 9/16/2014 10:27 AM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
<b>PCBS</b>			<b>SW8082</b>		Prep: SW3541 / 9/17/14	Analyst: <b>JG</b>
Aroclor 1016	ND		89	µg/Kg-dry	1	9/18/2014 05:42 AM
Aroclor 1221	ND		89	µg/Kg-dry	1	9/18/2014 05:42 AM
Aroclor 1232	ND		89	µg/Kg-dry	1	9/18/2014 05:42 AM
Aroclor 1242	ND		89	µg/Kg-dry	1	9/18/2014 05:42 AM
Aroclor 1248	ND		89	µg/Kg-dry	1	9/18/2014 05:42 AM
<b>Aroclor 1254</b>	<b>380</b>		<b>89</b>	<b>µg/Kg-dry</b>	1	9/18/2014 05:42 AM
<b>Aroclor 1260</b>	<b>260</b>		<b>89</b>	<b>µg/Kg-dry</b>	1	9/18/2014 05:42 AM
<b>PCBs, Total</b>	<b>640</b>			<b>µg/Kg-dry</b>	1	9/18/2014 05:42 AM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>RLM</b>
<b>Moisture</b>	<b>8.3</b>		<b>0.050</b>	<b>% of sample</b>	1	9/18/2014 01:50 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

Client: Tetra Tech EM Inc.

Work Order: 1409817

Project: Joseph Street Asbestos 9.16.14

## QC BATCH REPORT

Batch ID: 62859

Instrument ID GC14

Method: SW8082

MBLK		Sample ID: PBLKS1-62859-62859				Units: µg/Kg		Analysis Date: 9/17/2014 09:19 PM		
Client ID:		Run ID: GC14_140917A				SeqNo: 2941322		Prep Date: 9/17/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	ND	83								
Aroclor 1221	ND	83								
Aroclor 1232	ND	83								
Aroclor 1242	ND	83								
Aroclor 1248	ND	83								
Aroclor 1254	ND	83								
Aroclor 1260	ND	83								
PCBs, Total	ND	0								
Surr: Decachlorobiphenyl	32.67	0	33.3	0	98.1	50-130	0			
Surr: Tetrachloro-m-xylene	30	0	33.3	0	90.1	45-124	0			

MBLK		Sample ID: PBLKS1-62859-62859				Units: µg/Kg		Analysis Date: 9/17/2014 09:19 PM		
Client ID:		Run ID: GC14_140917A				SeqNo: 2943221		Prep Date: 9/17/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	ND	83								
Aroclor 1221	ND	83								
Aroclor 1232	ND	83								
Aroclor 1242	ND	83								
Aroclor 1248	ND	83								
Aroclor 1254	ND	83								
Aroclor 1260	ND	83								
PCBs, Total	ND	0								
Surr: Decachlorobiphenyl	32.67	0	33.3	0	98.1	40-140	0			
Surr: Tetrachloro-m-xylene	30	0	33.3	0	90.1	45-124	0			

LCS		Sample ID: PLCSS1-62859-62859				Units: µg/Kg		Analysis Date: 9/17/2014 09:35 PM		
Client ID:		Run ID: GC14_140917A				SeqNo: 2941323		Prep Date: 9/17/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	793	83	833	0	95.2	50-130	0			
Aroclor 1260	841.7	83	833	0	101	50-130	0			
Surr: Decachlorobiphenyl	33.67	0	33.3	0	101	50-130	0			
Surr: Tetrachloro-m-xylene	29.67	0	33.3	0	89.1	45-124	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Tetra Tech EM Inc.  
 Work Order: 1409817  
 Project: Joseph Street Asbestos 9.16.14

## QC BATCH REPORT

Batch ID: 62859 Instrument ID GC14 Method: SW8082

LCS				Sample ID: <b>PLCSS1-62859-62859</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>9/17/2014 09:35 PM</b>	
Client ID:			Run ID: <b>GC14_140917A</b>			SeqNo: <b>2943222</b>		Prep Date: <b>9/17/2014</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Aroclor 1016	793	83	833	0	95.2	50-130	0				
Aroclor 1260	841.7	83	833	0	101	50-130	0				
<i>Surr: Decachlorobiphenyl</i>	<i>33.67</i>	<i>0</i>	<i>33.3</i>	<i>0</i>	<i>101</i>	<i>40-140</i>	<i>0</i>				
<i>Surr: Tetrachloro-m-xylene</i>	<i>29.67</i>	<i>0</i>	<i>33.3</i>	<i>0</i>	<i>89.1</i>	<i>45-124</i>	<i>0</i>				

MS				Sample ID: 1409698-03B MS				Units: µg/Kg			Analysis Date: 9/18/2014 12:19 AM			
Client ID:				Run ID: GC14_140917A				SeqNo:2941341			Prep Date: 9/17/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				
Aroclor 1016	780.6	82	819.9	0	95.2	40-140	0							
Aroclor 1260	835	82	819.9	0	102	40-140	0							
Surr: Decachlorobiphenyl	31.5	0	32.78	0	96.1	40-140	0							
Surr: Tetrachloro-m-xylene	28.22	0	32.78	0	86.1	45-124	0							

MS				Sample ID: 1409698-03B MS				Units: µg/Kg		Analysis Date: 9/18/2014 12:19 AM	
Client ID:			Run ID: GC14_140917A			SeqNo:2943225		Prep Date: 9/17/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Aroclor 1016	780.6	82	819.9	0	95.2	40-140	0				
Aroclor 1260	835	82	819.9	0	102	40-140	0				
Surr: Decachlorobiphenyl	31.5	0	32.78	0	96.1	40-140	0				
Surr: Tetrachloro-m-xylene	28.22	0	32.78	0	86.1	45-124	0				

MSD				Sample ID: 1409698-03B MSD				Units: µg/Kg		Analysis Date: 9/18/2014 12:35 AM	
Client ID:			Run ID: GC14_140917A			SeqNo:2941342		Prep Date: 9/17/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Aroclor 1016	797.9	82	823.6	0	96.9	40-140	780.6	2.19	50		
Aroclor 1260	856.2	82	823.6	0	104	40-140	835	2.5	50		
Surr: Decachlorobiphenyl	31.31	0	32.92	0	95.1	40-140	31.5	0.606	50		
Surr: Tetrachloro-m-xylene	27.35	0	32.92	0	83.1	45-124	28.22	3.11	50		

MSD				Sample ID: 1409698-03B MSD				Units: µg/Kg		Analysis Date: 9/18/2014 12:35 AM	
Client ID:			Run ID: GC14_140917A			SeqNo:2943226		Prep Date: 9/17/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Aroclor 1016	797.9	82	823.6	0	96.9	40-140	780.6	2.19	50		
Aroclor 1260	856.2	82	823.6	0	104	40-140	835	2.5	50		
Surr: Decachlorobiphenyl	31.31	0	32.92	0	95.1	40-140	31.5	0.606	50		
Surr: Tetrachloro-m-xylene	27.35	0	32.92	0	83.1	45-124	28.22	3.11	50		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Tetra Tech EM Inc.  
**Work Order:** 1409817  
**Project:** Joseph Street Asbestos 9.16.14

## QC BATCH REPORT

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Batch ID: **62859**      Instrument ID **GC14**      Method: **SW8082**

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**The following samples were analyzed in this batch:**

1409817-01A	1409817-02A	1409817-03A
1409817-04A		

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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.



**Client:** Tetra Tech EM Inc.  
**Work Order:** 1409817  
**Project:** Joseph Street Asbestos 9.16.14

## QC BATCH REPORT

Batch ID: **R148484**      Instrument ID **MOIST**      Method: **A2540 G**

<b>MBLK</b>		Sample ID: <b>WBLKS-R148484</b>				Units: % of sample		Analysis Date: <b>9/18/2014 01:50 PM</b>		
Client ID:		Run ID: <b>MOIST_140918B</b>				SeqNo: <b>2943336</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture      ND      0.050

<b>LCS</b>		Sample ID: <b>LCS-R148484</b>				Units: % of sample		Analysis Date: <b>9/18/2014 01:50 PM</b>		
Client ID:		Run ID: <b>MOIST_140918B</b>				SeqNo: <b>2943335</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture      100      0.050      100      0      100      99.5-100.5      0

<b>DUP</b>		Sample ID: <b>1409817-01A DUP</b>				Units: % of sample		Analysis Date: <b>9/18/2014 01:50 PM</b>		
Client ID: <b>JS-PCB-01-091614</b>		Run ID: <b>MOIST_140918B</b>				SeqNo: <b>2943330</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture      15.48      0.050      0      0      0      0-0      15.33      0.974      20

<b>DUP</b>		Sample ID: <b>1409817-02A DUP</b>				Units: % of sample		Analysis Date: <b>9/18/2014 01:50 PM</b>		
Client ID: <b>JS-PCB-01-091614-D</b>		Run ID: <b>MOIST_140918B</b>				SeqNo: <b>2943332</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture      15.13      0.050      0      0      0      0-0      15.21      0.527      20

The following samples were analyzed in this batch:

1409817-01A	1409817-02A	1409817-03A
1409817-04A		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.



**Environmental**

Cincinnati, OH  
+1 513 733 5336

Everett, WA  
+1 425 356 2600

Fort Collins, CO  
+1 970 490 1511

Holland, MI  
+1 616 399 6070

# Chain of Custody Form

Page 1 of 1

COC ID: 107021

Houston, TX  
+1 281 530 5656

Middletown, PA  
+1 717 944 5541

Spring City, PA  
+1 610 948 4903

Salt Lake City, UT  
+1 801 266 7700

South Charleston, WV  
+1 304 356 3168

York, PA  
+1 717 505 5280

ALS Project Manager:

ALS Work Order #: 1409817

Customer Information		Project Information		Parameter/Method Request for Analysis												
Purchase Order		Project Name	Joseph Street Asbestos	A	Total PCBs											
Work Order		Project Number	505-0001407-003	B												
Company Name	Tetra Tech EM Inc	Bill To Company	Tetra Tech EM Inc	C												
Send Report To	Chris Burns	Invoice Attn	Chris Burns	D												
Address	1 South Wacker Dr Suite 3700	Address	1 South Wacker Dr Suite 3700	E												
City/State/Zip	Chicago, IL 60606	City/State/Zip	Chicago, IL 60606	F												
Phone	(312) 201-7411	Phone	(312) 201-7411	G												
Fax	(312) 938-0118	Fax	(312) 938-0118	H												
e-Mail Address	Christopher.Burns@tetratech.com	e-Mail Address	Christopher.Burns@tetratech.com	I												
				J												

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	JS-PCB-01-091614	9/16/14	0945	Soil	None	1	✓										
2	JS-PCB-01-091614-D	9/16/14	0945	Soil	None	1	✓										
3	JS-PCB-02-091614	9/16/14	1013	Soil	None	1	✓										
4	JS-PCB-03-091614	9/16/14	1027	Soil	None	1	✓										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign Michael T. Browning		Shipment Method Fedex		Required Turnaround Time: (Check Box) <input type="checkbox"/> Std 10 WK Days <input type="checkbox"/> 5 WK Days <input checked="" type="checkbox"/> Other 3 days <input type="checkbox"/> 2 WK Days <input type="checkbox"/> 24 Hour				Results Due Date:									
Relinquished by Michael T. Browning		Date 9/16/14	Time 1230	Received by Fedex		Notes:											
Relinquished by Fedex		Date 9/17/14	Time 9:30	Received by (Laboratory) A. Mitchell													
Logged by (Laboratory) AJ		Date 9/17/14	Time 18:00	Checked by (Laboratory) [Signature]		Cooler ID	Cooler Temp. 4.8°C	QC Package: (Check One Box Below)									
<input type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Check List <input type="checkbox"/> Level III Std QC Raw Data <input checked="" type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV BWS48/CLP <input type="checkbox"/> Other																	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035																	

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Sample Receipt Checklist

Client Name: **TETRATECH-EM-CHI**

Date/Time Received: **17-Sep-14 09:30**

Work Order: **1409817**

Received by: **ANG**

Checklist completed by Andrea Gitchell 17-Sep-14  
eSignature Date

Reviewed by: Ann Preston 17-Sep-14  
eSignature Date

Matrices: **SOIL**  
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>4.8 C</u>		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	<u>9/17/2014 1:09:21 PM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:			

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

**ALS Environmental**  
 3852 128th Avenue  
 Holland, Michigan 49424  
 Tel: +1 616-939 0070  
 Fax: +1 616 939 6185



**CUSTODY SEAL**

Send Broken By:

Date: 9/16/14 Time: 12:30  
 Name: Michael T. Browning  
 Company: Tetra Tech

Date:

fedex.com 1800.GoFedEx 1800.463.3339

**FedEx** NEW Package  
 Express US Airbill

FedEx  
 Tracking  
 Number

FID 633869 16SEP14 MFDA 522C1/CD84/6500

8063 3947 2020

1 From  
 Date 9/16/14  
 Sender's Name Michael Browning Phone 248-259-4761  
 Company Seagull Environmental  
 Address 25213 Dequindre Road  
 City Madison Heights State MI 48071

2 Your Internal Billing Reference  
 103X902608015051407003.004AC

3 To  
 Recipient's Name Sample Receiving Phone 616 399-6070  
 Company ALSEnvironmental  
 Address 3352 128th Avenue  
 We request delivery to P.O. boxes or P.O. ZIP codes.  
 Address  
 Use this box for the HOLD location address or for confirmation of your shipping address.  
 City Holland State MI ZIP 49424

**HOLD Weekday**  
 FedEx location address  
 RESAMPLES NOT available for  
 FedEx First Overnight

**HOLD Saturday**  
 FedEx location address  
 RESAMPLES available ONLY for  
 FedEx Priority Overnight and  
 FedEx 2Day to select locations.

**4 Express Package Service**

NOTE: Service rates last changed. Please contact us for details.

**Next Business Day**

- ☐ FedEx First Overnight  
 Earliest next business morning delivery to select  
 locations. Friday shipments will be delivered on  
 Monday unless SATURDAY Delivery is selected.
- ☒ FedEx Priority Overnight  
 Next business morning. Friday shipments will be  
 delivered on Monday unless SATURDAY Delivery  
 is selected.
- ☐ FedEx Standard Overnight  
 Next business afternoon. Saturday Delivery NOT available.

**2 or 3 Business Days**

- ☐ FedEx 2Day A.M.  
 Second business morning. Saturday Delivery NOT available.
- ☐ FedEx 2Day  
 Second business afternoon. Thursday shipments  
 will be delivered on Monday unless SATURDAY  
 Delivery is selected.
- ☐ FedEx Express Saver  
 Third business day. Saturday Delivery NOT available.

**5 Packaging**

- ☐ FedEx Envelope ☐ FedEx Pak ☐ FedEx Box

**6 Special Handling and Delivery Signature Options**

- ☐ SATURDAY Delivery  
 NOT available for FedEx International Overnight, FedEx 2Day A.M., or FedEx Express Saver.
- ☒ No Signature Required  
 Package may be left without  
 obtaining a signature for delivery.
- ☐ Direct Signature  
 Someone may request signature  
 page for delivery. Not applicable.
- ☐ Indirect Signature  
 No one at address  
 available for delivery.
- Does this shipment contain dangerous goods?**
- ☒ No ☐ Yes  
 If Yes, please check the appropriate box(es).  
 Dangerous goods (including any liquid contents) are shipped in Master packaging  
 as defined by a FedEx Express Special Service.
- ☐ Signature Required  
 Signature must be checked.
- ☐ Signature Required - Not Required
- ☐ Dry Ice  
 Dry Ice, ICAO 9000
- ☐ Cargo Aircraft Only

**7 Payment**

- Sender's Account No. or Credit Card No. (Indicate)
- ☒ Sender's Account No. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/C.O.D.

Total Packages Total Weight

This label is limited to 100 lbs unless you declare a higher value. See the current FedEx Service Guide for details.

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Recipient's Copy

Packages up to 150 lbs.  
 For packages over 150 lbs., use the new  
 FedEx Express Freight US Airbill.

644



14-Oct-2014

Chris Burns  
Tetra Tech EM Inc.  
1 South Wacker Dr  
Suite 3700  
Chicago, IL 60606

Re: **Joseph Street Asbestos Removal Site 10.8.14**

Work Order: **1410540**

Dear Chris,

ALS Environmental received 3 samples on 09-Oct-2014 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 11.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston  
Project Manager



Certificate No: MN 532786

### Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental 

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER



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**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos Removal Site 10.8.14  
**Work Order:** 1410540

**Work Order Sample Summary**

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<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1410540-01	JS-PCB-04-100814	Soil		10/8/2014 11:22	10/9/2014 09:30	<input type="checkbox"/>
1410540-02	JS-PCB-04-100814-D	Soil		10/8/2014 11:22	10/9/2014 09:30	<input type="checkbox"/>
1410540-03	JS-PCB-05-100814	Soil		10/8/2014 11:27	10/9/2014 09:30	<input type="checkbox"/>

---

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos Removal Site 10.8.14  
**Work Order:** 1410540

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**Case Narrative**

Samples for the above noted Work Order were received on 10/9/2014. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Extractable Organics :  
No deviations or anomalies noted.

Wet Chemistry:  
No deviations or anomalies noted.

**Client:** Tetra Tech EM Inc.  
**Project:** Joseph Street Asbestos Removal Site 10.8.14  
**WorkOrder:** 1410540

**QUALIFIERS,  
ACRONYMS, UNITS**

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight

**ALS Group USA, Corp**

Date: 14-Oct-14

Client: Tetra Tech EM Inc.

Project: Joseph Street Asbestos Removal Site 10.8.14

Work Order: 1410540

Sample ID: JS-PCB-04-100814

Lab ID: 1410540-01

Collection Date: 10/8/2014 11:22 AM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>						
<b>PCBS</b>			<b>SW8082</b>		Prep: SW3541 / 10/10/14	Analyst: <b>JG</b>
Aroclor 1016	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
Aroclor 1221	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
Aroclor 1232	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
Aroclor 1242	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
Aroclor 1248	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
Aroclor 1254	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
Aroclor 1260	ND		91	µg/Kg-dry	1	10/13/2014 05:24 PM
<b>PCBs, Total</b>	<b>ND</b>			<b>µg/Kg-dry</b>	1	10/13/2014 05:24 PM
Surr: Decachlorobiphenyl	110		40-140	%REC	1	10/13/2014 05:24 PM
Surr: Tetrachloro-m-xylene	85.1		45-124	%REC	1	10/13/2014 05:24 PM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>RLM</b>
Moisture	14		0.050	% of sample	1	10/10/2014 07:33 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group USA, Corp

Date: 14-Oct-14

Client: Tetra Tech EM Inc.

Project: Joseph Street Asbestos Removal Site 10.8.14

Work Order: 1410540

Sample ID: JS-PCB-04-100814-D

Lab ID: 1410540-02

Collection Date: 10/8/2014 11:22 AM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>PCBS</b>						
			<b>SW8082</b>		Prep: SW3541 / 10/10/14	Analyst: <b>JG</b>
Aroclor 1016	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
Aroclor 1221	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
Aroclor 1232	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
Aroclor 1242	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
Aroclor 1248	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
Aroclor 1254	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
Aroclor 1260	ND		97	µg/Kg-dry	1	10/13/2014 05:40 PM
<b>PCBs, Total</b>	<b>ND</b>			<b>µg/Kg-dry</b>	1	10/13/2014 05:40 PM
Surr: Decachlorobiphenyl	109		40-140	%REC	1	10/13/2014 05:40 PM
Surr: Tetrachloro-m-xylene	82.1		45-124	%REC	1	10/13/2014 05:40 PM
<b>MOISTURE</b>						
			<b>A2540 G</b>			Analyst: <b>RLM</b>
<b>Moisture</b>	<b>14</b>		<b>0.050</b>	<b>% of sample</b>	1	10/10/2014 07:33 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



# ALS Group USA, Corp

Date: 14-Oct-14

Client: Tetra Tech EM Inc.

Project: Joseph Street Asbestos Removal Site 10.8.14

Work Order: 1410540

Sample ID: JS-PCB-05-100814

Lab ID: 1410540-03

Collection Date: 10/8/2014 11:27 AM

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>PCBS</b>						
			<b>SW8082</b>		Prep: SW3541 / 10/10/14	Analyst: <b>JG</b>
Aroclor 1016	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
Aroclor 1221	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
Aroclor 1232	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
Aroclor 1242	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
Aroclor 1248	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
Aroclor 1254	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
Aroclor 1260	ND		91	µg/Kg-dry	1	10/13/2014 05:56 PM
<b>PCBs, Total</b>	<b>ND</b>			<b>µg/Kg-dry</b>	1	10/13/2014 05:56 PM
Surr: Decachlorobiphenyl	116		40-140	%REC	1	10/13/2014 05:56 PM
Surr: Tetrachloro-m-xylene	84.1		45-124	%REC	1	10/13/2014 05:56 PM
<b>MOISTURE</b>						
			<b>A2540 G</b>			Analyst: <b>RLM</b>
<b>Moisture</b>	<b>13</b>		<b>0.050</b>	<b>% of sample</b>	1	10/10/2014 07:33 PM

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

Client: Tetra Tech EM Inc.

# QC BATCH REPORT

Work Order: 1410540

Project: Joseph Street Asbestos Removal Site 10.8.14

Batch ID: 63763

Instrument ID GC14

Method: SW8082

MBLK		Sample ID: PBLKS1-63763-63763				Units: µg/Kg		Analysis Date: 10/13/2014 04:03 PM		
Client ID:		Run ID: GC14_141013A				SeqNo: 2981011		Prep Date: 10/10/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	ND	83								
Aroclor 1221	ND	83								
Aroclor 1232	ND	83								
Aroclor 1242	ND	83								
Aroclor 1248	ND	83								
Aroclor 1254	ND	83								
Aroclor 1260	ND	83								
PCBs, Total	ND	0								
Surr: Decachlorobiphenyl	41	0	33.3	0	123	40-140	0			
Surr: Tetrachloro-m-xylene	36	0	33.3	0	108	45-124	0			

LCS		Sample ID: PLCSS1-63763-63763				Units: µg/Kg		Analysis Date: 10/13/2014 03:47 PM		
Client ID:		Run ID: GC14_141013A				SeqNo: 2981009		Prep Date: 10/10/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	918.7	83	833	0	110	50-130	0			
Aroclor 1260	899	83	833	0	108	50-130	0			
Surr: Decachlorobiphenyl	40.67	0	33.3	0	122	40-140	0			
Surr: Tetrachloro-m-xylene	40	0	33.3	0	120	45-124	0			

MS		Sample ID: 1410590-01C MS				Units: µg/Kg		Analysis Date: 10/13/2014 04:19 PM		
Client ID:		Run ID: GC14_141013A				SeqNo: 2981013		Prep Date: 10/10/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	936.1	82	817.6	0	114	40-140	0			
Aroclor 1260	1001	82	817.6	0	122	40-140	0			
Surr: Decachlorobiphenyl	38.28	0	32.69	0	117	40-140	0			
Surr: Tetrachloro-m-xylene	34.68	0	32.69	0	106	45-124	0			

MSD		Sample ID: 1410590-01C MSD				Units: µg/Kg		Analysis Date: 10/13/2014 04:35 PM		
Client ID:		Run ID: GC14_141013A				SeqNo: 2981015		Prep Date: 10/10/2014		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	898.6	82	816.6	0	110	40-140	936.1	4.09	50	
Aroclor 1260	939.4	82	816.6	0	115	40-140	1001	6.36	50	
Surr: Decachlorobiphenyl	36.6	0	32.64	0	112	40-140	38.28	4.5	50	
Surr: Tetrachloro-m-xylene	34.96	0	32.64	0	107	45-124	34.68	0.808	50	

The following samples were analyzed in this batch:

1410540-01A 1410540-02A 1410540-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Tetra Tech EM Inc.  
**Work Order:** 1410540  
**Project:** Joseph Street Asbestos Removal Site 10.8.14

## QC BATCH REPORT

Batch ID: **R150150** Instrument ID **MOIST** Method: **A2540 G**

<b>MBLK</b>		Sample ID: <b>WBLKS-R150150</b>				Units: % of sample		Analysis Date: <b>10/10/2014 07:33 PM</b>		
Client ID:		Run ID: <b>MOIST_141010B</b>				SeqNo: <b>2978995</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture ND 0.050

<b>LCS</b>		Sample ID: <b>LCS-R150150</b>				Units: % of sample		Analysis Date: <b>10/10/2014 07:33 PM</b>		
Client ID:		Run ID: <b>MOIST_141010B</b>				SeqNo: <b>2978994</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

<b>DUP</b>		Sample ID: <b>1410413-02B DUP</b>				Units: % of sample		Analysis Date: <b>10/10/2014 07:33 PM</b>		
Client ID:		Run ID: <b>MOIST_141010B</b>				SeqNo: <b>2978984</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 12.88 0.050 0 0 0 0-0 12.83 0.389 20

<b>DUP</b>		Sample ID: <b>1410413-03B DUP</b>				Units: % of sample		Analysis Date: <b>10/10/2014 07:33 PM</b>		
Client ID:		Run ID: <b>MOIST_141010B</b>				SeqNo: <b>2978986</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 11.82 0.050 0 0 0 0-0 12.35 4.39 20

The following samples were analyzed in this batch:

1410540-01A	1410540-02A	1410540-03A
-------------	-------------	-------------

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.



☐ ALS Environmental  
10450 Stancil Rd. #210  
Houston, Texas 77099  
(Tel) 281.530.5656  
(Fax) 281.530.5887

## Chain of Custody Form

Page 1 of 1

☒ ALS Environmental  
3352 128th Avenue  
Holland, Michigan 49424  
(Tel) 616.399.6070  
(Fax) 616.399.6185

ALS Project Manager: Ann Preston				ALS Work Order #: 1410540															
<b>Customer Information</b>				<b>Project Information</b>				<b>Parameter/Method Request for Analysis</b>											
Purchase Order				Project Name	Joseph Street Asbestos Removal Site			A	Total PCBs										
Work Order				Project Number	S05-0001-1407-003			B											
Company Name	Tetra Tech EM, Inc.			Bill To Company	Tetra Tech EM, Inc.			C											
Send Report To	Christopher Burns			Invoice Attn	Christopher Burns			D											
Address	1 South Wacker Drive Suite 3700			Address	1 South Wacker Drive Suite 3700			E											
City/State/Zip	Chicago, IL 60606			City/State/Zip	Chicago, IL 60606			F											
Phone	(312) 201-7411			Phone	(312) 201-7411			G											
Fax	(312) 938-0118			Fax	(312) 938-0118			H											
e-Mail Address	christopher.burns@tetratech.com							I											
								J											
No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold		
1	JS-PCB-04-100814	10/8/2014	1122	Soil	None	1	1												
2	JS-PCB-04-100814-D	10/8/2014	1122	Soil	None	1	1												
3	JS-PCB-05-100814	10/8/2014	1127	Soil	None	1	1												
4																			
5																			
6																			
7																			
8																			
9																			
10																			
Sampler(s): Please Print & Sign Michael Browning / Michael Browning				Shipment Method: Fedex		Required Turnaround Time: (Check Box) <input type="checkbox"/> 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 3 Wk Days <input checked="" type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Other: 3 Days				Results Due Date:					
Relinquished by: Michael Browning		Date: 10/8/14	Time: 1440	Received by: Fedex		Date:	Time:	Notes:											
Relinquished by: Fedex		Date: 10/9/14	Time: 030	Received by (Laboratory): Ashtabul		Date: 10/9/14	Time: 930	ALS Cooler ID	Cooler Temp	QC Package: (Check Box Below)									
Logged by (Laboratory): AJ		Date: 10/9/14	Time: 1204	Checked by (Laboratory):					4.0c	<input type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Raw Data <input type="checkbox"/> TRRP LRC <input checked="" type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV: SW846 Methods/CLP like <input type="checkbox"/> Other:									
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C								Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.											

Sample Receipt Checklist

Client Name: **TETRATECH-EM-CHI**

Date/Time Received: **09-Oct-14 09:30**

Work Order: **1410540**

Received by: **ANG**

Checklist completed by <u>Ann Preston</u>	10-Oct-14	Reviewed by: <u>Ann Preston</u>	10-Oct-14
eSignature	Date	eSignature	Date

Matrices: soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>4.0°C</u>		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:			

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: